

**PROCEEDINGS OF THE THIRTY-SECOND ANNUAL MEETING OF THE
BERKELEY LINGUISTICS SOCIETY**

February 10-12, 2006

GENERAL SESSION

and

**PARASESSION on THEORETICAL APPROACHES TO
ARGUMENT STRUCTURE**

Edited by

Zhenya Antić
Charles B. Chang
Emily Cibelli
Jisup Hong

Michael J. Houser
Clare S. Sandy
Maziar Toosarvandani
Yao Yao

**Berkeley Linguistics Society
Berkeley, CA, USA**

Berkeley Linguistics Society
University of California, Berkeley
Department of Linguistics
1203 Dwinelle Hall
Berkeley, CA 94720-2650
USA

All papers copyright © 2012 by the Berkeley Linguistics Society, Inc.

All rights reserved.

ISSN 0363-2946

LCCN 76-640143

Printed by Sheridan Books
100 N. Staebler Road
Ann Arbor, MI 48103

TABLE OF CONTENTS

A note regarding the contents of this volume	vi
Foreword	vii

GENERAL SESSION

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)	3
STEPHEN R. ANDERSON	
Cross-linguistic Variation in a Processing Account: The Case of Multiple <i>Wh</i> -questions	23
INBAL ARNON, NEIL SNIDER, PHILIP HOFMEISTER, T. FLORIAN JAEGER, and IVAN A. SAG	
Several Problems for Predicate Decompositions	37
JOHN BEAVERS and ITAMAR FRANCEZ	
Wh-Conditionals in Vietnamese and Chinese: Against Unselective Binding	49
BENJAMIN BRUENING and THUAN TRAN	
An Analysis of the Use of Cognitive Verbs in American English Conversation ..	61
SUSAN BUESCHER	
Methods for the Study of the Social Structure of Linguistic Variation	73
KATHRYN CAMPBELL-KIBLER	
“The thing is, is” Is No Mere Disfluency	85
ELIZABETH COPPOCK, JASON BRENIER, LAURA STAUM, and LAURA MICHAELIS	
On Non-Optimal Laryngeal Timing: The Case of Trique	97
CHRISTIAN DICANIO	
Non-Canonical Uses of the Article in Basque	111
LUIS EGUREN	
When Gesture Is and Is Not Language	123
SUSAN GOLDIN-MEADOW	

Re-binding and the Derivation of Parallelism Domains	143
DANIEL HARDT	
Remarks on Word-Prosodic Typology	157
JOSÉ IGNACIO HUALDE	
Phonological Optimization and Syntactic Variation: The Case of Optional <i>That</i>	175
T. FLORIAN JAEGER	
Tonal and Morphological Identity in Reduplication.....	189
AARON F. KAPLAN	
Light Verb Voicing and Japanese Phonological Lexicon.....	201
KAZUTAKA KURISU	
Polarity Sensitivity in Inflectional Morphology	215
DMITRY LEVINSON	
Semantic Changes in Apparent Time	227
JEAN-PHILIPPE MAGUÉ	
Spatial Language in Tarascan: Body Parts, Shape, and the Grammar of Location	237
MARTHA MENDOZA	
A Metaphor of Static Temporal “Location” in Wolof and English: Metonymy, Motivation, and Morphosyntax.....	251
KEVIN EZRA MOORE	
A Case of Rare Fluid Intransitivity in Europe: Russian	263
JOHANNA NICHOLS	
Prosody and Utterance Boundaries in American Sign Language Interpretation.....	275
BRENDA NICODEMUS and CAROLINE L. SMITH	
GO and COME Revisited: What Serves as a Reference Point?	287
DAVID Y. OSHIMA	
Punctuation as Social Action: The Ellipsis as a Discourse Marker in Computer-Mediated Communication	299
JOSHUA RACLAW	

Fictive Motion: Construction or Construal?	307
JOSEF RUPPENHOFER	
The Syntax of Floating Intensifiers in Polish and its Implications for the Determiner Phrase Hypothesis.....	321
PAWEŁ RUTKOWSKI	
Compromising Positions and Polarity Items	335
WILLIAM SALMON	
Right Adjunction in the Right Peripheries.....	349
SERKAN ŞENER	
Unergative Verbs in Norwegian Intransitive Expletive Constructions.....	363
KJERSTI G. STENSRUD	
Noun Incorporation and Case: Evidence from Sakha.....	375
CHRISTOPHER A. STRAUGHN	
Frame-Based Constraints on Lexical Choice in Metaphor.....	387
KAREN SULLIVAN	
From <i>Keigo</i> ‘Honorifics’ to <i>Keii-Hyougen</i> ‘Respect Expressions’: Linguistic Ideologies of Japanese Honorifics	401
MAKIKO TAKEKURO	
The Perfect Converb? Semantically-Related Functions of the Sinhala Conjunctive Participle.....	415
CHRIS TAYLOR	
Plurality of Events: Parallels between Language and Perception.....	429
TESS WOOD	
The Effects of Lexical Frequency and Stress on Coarticulation.....	441
GWANHI YUN	
Deskewing the Searlean Picture: A New Speech Act Ontology for Linguistics	453
DIETMAR ZAEFFERER	

**PARASESSION: THEORETICAL APPROACHES TO
ARGUMENT STRUCTURE**

Predicting the Productivity of Argument Structure Constructions	467
JÓHANNA BARÐDAL	
Constrained Flexibility in the Extension of Novel Causative Verbs	479
ANN BUNGER and JEFFREY LIDZ	
Argument Structure and Adjuncts: Perspectives from New Guinea	491
MARK DONOHUE	
A Closer Look at Salish Intransitive/Transitive Alternations	503
DONNA B. GERDTS and THOMAS E. HUKARI	
The States in Changes of State	515
ANDREW KOONTZ-GARBODEN	
Complementation by Construction	529
LAURA A. MICHAELIS	
A Best-Fit Approach to Productive Omission of Arguments	551
EVA H. MOK and JOHN BRYANT	
Some Remarks on the Morphosemantics of Multiple Causative Sequences	561
TYLER PETERSON	
Semantic Combinatorial Processes in Argument Structure: Evidence from Light-Verbs	573
MARIA M. PIÑANGO, JENNIFER MACK, and RAY JACKENDOFF	

A note regarding the contents of this volume

The following authors also presented papers at the conference, though their work does not appear in this volume: Anna Babel and Raomir Avila; Roberta D'Alessandro and Ian Roberts; Beth Levin; Michael R. Marlo; Franc Marusic and Rok Zaucer; Meylysa Tseng, Jung-Hee Kim, and Benjamin Bergen; and Walt Wolfram.

Foreword

We are pleased to present the proceedings of BLS 32, held at UC Berkeley in February 2006. We would like to thank the contributors to this volume and all those who attended and participated in the conference. A special thanks to the 2011 editing team: Roslyn Burns, Chundra Cathcart, Emily Cibelli, Kyung-Ah Kim, and Elise Stickles for helping finalize the volume.

Clare S. Sandy

GENERAL SESSION

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

STEPHEN R. ANDERSON

Yale University

Verb-second is a popular topic in the syntactic literature, but most of the discussion of this construction has centered on languages of the Germanic family.¹ Some syntacticians have also discussed Verb-second in Romance, primarily on the basis of older stages of the modern languages which are no longer available for direct examination.

The only modern Romance language which appears to display Verb-second in a robust form is Rumantsch, and the present paper is devoted primarily to one form of that language, Surmiran. This language is described in a normative grammar (Signorell *et al.* 1987) as well as in older work such as that of Grisch (1939). Haiman and Benincà (1992) provide a general survey of Rumantsch in its various forms, including its (controversial) relation to Dolomitic Ladin and Friulian within a larger “Rhaeto-Romance” unit, though their description is descriptively limited with regard to Surmiran.

After a brief description of the external situation of Surmiran in section 0, the basic structure of clauses is described in section 1. Central to an understanding of Verb-second in the language is the Inversion construction discussed in sections 1.1 and 1.2, and the set of post-verbal subject clitics that can appear if the verb and its subject are inverted. Section 2 discusses an element (*ins*) which at first glance appears to be merely an impersonal subject pronoun, comparable to French *on* or German *man*, but which turns out to have a more complex analysis than this. Section 3 concludes that the evidence of sentences with *ins* representing the subject,

¹ This work was supported in part by NSF award #BCS-0418410 to Yale University. The analysis here is an extended and partially revised version of that presented in Anderson (2005), an earlier version of which appeared as Anderson (2004). I am greatly indebted to my friends in Savognin and Salouf who have provided data for this study, especially Petra Uffer, Ursus Baltermia and Reto Capeder. Naturally, neither they nor the audiences at BLS and other venues (Melbourne, Yale, Stony Brook and the University of Massachusetts) where I have received valuable comments on this material are responsible for errors of interpretation or analysis on my part.

together with some additional facts, show that “Verb-second” is not in fact an accurate description of Surmiran, and compares this language with other Verb-second languages.

0. The Language

The Rumantsch languages of Switzerland are spoken by approximately 60,000 people, most of whom live in the canton of Graubünden in the southeast of the country. Rumantsch is one of the four official national languages, though this should not be taken to imply a status equal in significant respects to French, German or Italian except in very specific localities within Graubünden. There are five recognized standards (Surselvan, Sutsilvan, Surmiran, Puter and Vallader), each with its own history, although the actual degree of dialect diversity is considerably greater than this. In addition, an artificial pan-dialectal standard known as Rumantsch Grischun has been widely promoted in recent years as a medium of education and communication, though this language lacks a community of native speakers, at least at present.

Surmiran is (together with Sutsilvan, the most marginal form of Swiss Rumantsch) a “central Rumantsch” language, and has about 3,000 speakers. It is still being learned by children, and is taught in local elementary schools (though it is being replaced in this function by Rumantsch Grischun in many areas). Essentially all Surmiran speakers are (at least) bilingual in German, and in Italian as well in some areas.

Surmeir, where Surmiran is spoken, includes the valley of the Gelgia leading from around Tiefenkastel up to the Julia Pass (a major route to the Engadine) and several adjacent valleys. Much discussion in the literature has focused on the dialect of Bergün (Bravuogn in Rumantsch). This, as well as the dialect of Vaz, is actually quite divergent from the normative standard of Signorell *et al.* (1987), which is based on the speech of the region around Savognin. The present paper is based on this latter form of the language, as spoken in Savognin and Salouf (a village of about 200 people, of whom 85% are Rumantsch speakers, the highest proportion in the country).

1. Clause Structure

I will assume without argument that the basic word order of Surmiran clauses is SVO, as exemplified in (1).

- (1) Ursus discorra rumantsch stupent
Ursus speaks.3SG Rumantsch excellently
Ursus speaks Rumantsch very well

Non-subjects can, however, appear freely in initial position. As illustrated in (2), when this happens the subject appears after the finite (main or auxiliary) verb.

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

- (2) a. Rumantsch discorra Ursus stupent
 Rumantsch speaks.3SG Ursus excellently
 Ursus speaks *Rumantsch* very well
- b. Stupent discorra Ursus rumantsch
 excellently speaks.3SG Ursus Rumantsch
 Ursus speaks Rumantsch *very* well

When the subject is inverted with the finite verb, the verb can be accompanied by a clitic element referring to the subject, as in sentence (3a). Such a clitic is not possible, however, when Inversion has not taken place, as in (3b).

- (3) a. Rumantsch discorra=**'l** Ursus stupent
 Rumantsch speaks.3SG-3SGM Ursus excellently
Ursus speaks Rumantsch very well
- b. *Ursus discorra=**'l** rumantsch stupent
 Ursus speaks.3SG-3SGM Rumantsch excellently
 (Ursus speaks Rumantsch very well)

A table of the subject clitic elements is provided in (4). It is beyond the scope of the present paper to justify the designation of these as “clitics,” though there is some limited discussion of that matter in Anderson (2004).

Person/Number(/Gender)	Subject clitic
1sg	= a
2sg	= t
3sg masc.	= 'l
3sg fem.	= 'la
3sg impersonal	= (i)gl
1pl	= s(a)
2pl	∅
3pl masc/fem	= igl

When a non-subject occupies initial position, and the verb is accompanied by a subject clitic from the set in (4), this sanctions a phonetically null subject, as in (5).

- (5) Rumantsch discorra=**'l** stupent
 Rumantsch speaks.3SG-3SGM excellently
 He speaks Rumantsch very well

Surmiran is not in general a PRO-drop language: that is, null subjects are not allowed in the absence of a subject clitic, as shown by the ungrammaticality of sentences like (6).

- (6) a. *Discorra rumantsch stupent
 speaks.3SG Rumantsch excellently
 (He speaks Rumantsch very well)
- b. *Rumantsch discorra stupent
 Rumantsch speaks.3SG excellently
 (He speaks Rumantsch very well)

Just as with the third person subjects illustrated above, first and second person subjects cannot be phonetically null (or omitted) except in the presence of a subject clitic, though the fact that the second person plural clitic is itself null partially obscures this fact. First person examples are given in (7).

- (7) a. Ia/* \emptyset discor mal rumantsch
 (I) speak.1SG badly Rumantsch
 I speak Rumantsch badly
- b. Rumantsch discor ia/* \emptyset mal
 Rumantsch speak.1SG (I) badly
 I speak Rumantsch badly
- c. Rumantsch discorr=**a** (ia) mal
 Rumantsch speak.1SG-1SG I badly
 I (*I*) speak Rumantsch badly

In all persons, the presence of an overt inverted subject together with a subject clitic lends a contrastive or emphatic force to the sentence.

Surmiran also has a full set of object pronominal clitics, which behave in ways that are largely unsurprising for a Romance language. Some examples below will contain clitics of this type, but space considerations preclude a full analysis here.

1.1. The Inversion Construction

Against this general background, let us take a closer look at the Inversion construction. Among the non-subjects that can trigger this by appearing in initial position are argument DPs, PPs, participial phrases, entire clauses, etc., as illustrated in part in (8).

- (8) a. La steiva ò Ursus nattagea bagn
 the living room has.3SG Ursus cleaned well
 Ursus cleaned the living room well
- b. Tar igl gi da Rummy vala igl joker adegna
 in the game of rummy is.worth.3SG the joker always
 25 puncts
 25 points
 In the game of rummy, the joker is always worth 25 points

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

- c. Giond ier a spass ò Ursus scuntro Ladina
 going yesterday for a walk has.3SG Ursus met Ladina
 While walking yesterday, Ursus met Ladina

Among the variations on this theme that are worth noting is the possibility of having a bare past participle appear alone in initial position, as in the sentences in (9). When this happens, the participle cannot be accompanied by its object (if the verb is transitive) or by other complements. The only exception is certain short, common manner adverbs (such as *mal* ‘badly’), which some speakers accept in sentences like (9e). This complex of possibilities is reminiscent of the construction known as Stylistic Fronting in Icelandic and other Scandinavian languages.

- (9) a. Maglea va ia en traclo cun caschiel
 eaten have.1SG I a sandwich with cheese
 I ate a cheese sandwich
- b. *Maglea en traclo cun caschiel va ia
 eaten a sandwich with cheese have.1SG I
- c. La notg passada ò Gion durmia mal
 last night has.3SG John slept badly
 Last night John slept badly
- d. Durmia ò Gion mal la notg passada
 slept has.3SG John badly last night
 John slept badly last night
- e. (??)Durmia mal ò Gion la notg passada
 slept badly has.3SG John last night

Another interesting possibility is that of having an infinitive in initial position, followed by a finite form of the same verb. As with the participle construction in (9), the fronted infinitive cannot be accompanied by complements. These facts are illustrated in (10).

- (10) a. Cantar canta=’I Ursus ena canzung
 to.sing sings.3SG-3SG.M. Ursus a song
 Ursus is singing a song
- b. *cantar ena canzung canta=’I Ursus
 to.sing a song sings.3SG-3SG.M Ursus

This construction is again reminiscent of one found in other languages, such as the topicalized infinitives in Breton (Anderson 1981). Unlike Breton, however, Surmiran doubles the verb by a finite form of the same verb, rather than with a finite form of a dummy ‘light’ verb such as *far* ‘do’ as in the ungrammatical (11).

- (11) *screiver fatsch ia en codesch
to-write do-1sg I a book

For some (but not all) speakers, the construction in (10) is only possible with synthetic forms of the verb, and not with periphrastic forms. This contrast is illustrated in (12).

- (12) a. Cantar cantava=**1** Ursus bagn
to.sing sang.3SGIMPERF-3SG Ursus well
Ursus was singing well
- b.*/?Cantar ò=**1** canto Ursus bagn
to.sing has3SG-3SGM sung Ursus well
Ursus sang well

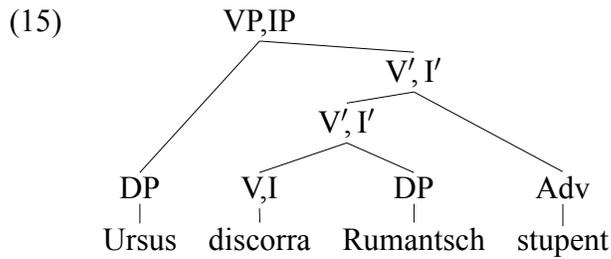
While constituents of a variety of types can appear initially, there is a limit of one such element in preverbal position. Sentences such as (13), in which the preverbal material does not correspond to a single constituent, are thus not possible.

- (13) *Ier la steiva ò Ursus nattagea
Yesterday the living room has.3SG Ursus cleaned

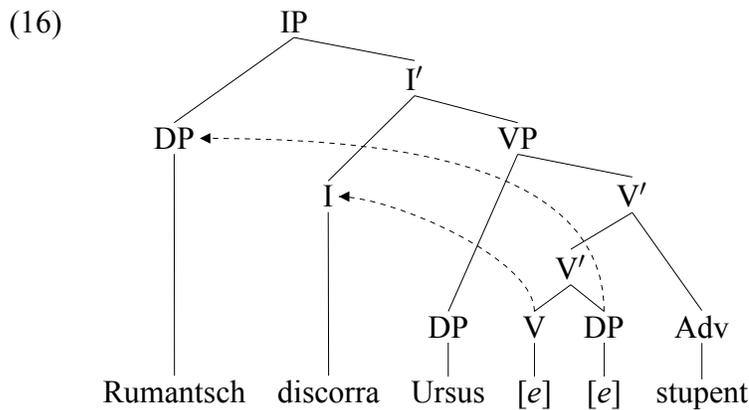
Finally, it is important to note that the verb in the Inversion construction is accompanied by any and all clitic elements (in addition to a subject clitic, if present) that would appear with it in uninverted sentences, as illustrated in (14).

- (14) a. Cleramaintg **n'ò=**1**** Ursus betg savia chegl
Obviously NEG-has.3SG-3SG.M. Ursus not known that
Obviously *Ursus* didn't know that
- b. Ier seira **n'=ans=ò** Maria betg telefono
Yesterday evening NEG-1PL-has.3SG Maria not phoned
Yesterday evening Maria didn't telephone us

In developing an analysis of the facts just reviewed, I propose to start from the “VP-internal subject” hypothesis, on which the basic subject position is that of the Specifier of VP. Assume further that the inflectional properties of the clause are realized on a verb which is head of IP. In a basic declarative clause with no (non-subject) topic or focus element in initial position, there is no reason to assume a structural distinction between IP and VP, so I will adopt a view of phrase structure that allows me to say this. On that picture, the structure of sentence (1) above is as in (15).



Where an initial non-subject position is required, I assume that this is Spec(IP). Since the Spec(IP) is no longer the same as Spec(VP) (the basic subject position), an additional layer of structure is required to distinguish IP from VP. In such a structure, some constituent of the core clause (the VP) is displaced to the Spec(IP) position.² The verb must also be displaced from the head position within VP to the I head position in the matrix IP; this is presumably driven by the fact that it is only a verb in the head of IP that will acquire the clause's inflectional features. A sentence like (2a) is thus assigned the structure in (16), with the two displacements just noted indicated by dashed arrows.



Note now that in a structure like (16) the finite verb (in I), which agrees with the subject, C-commands the basic subject position (Spec(VP)). This will be true precisely in the Inversion construction of which (16) is an instance, and I propose that it is this C-command relation between the agreeing verb and its subject that sanctions the presence of a clitic from the set in (4).

If the subject clitics themselves (as opposed to simple verbal agreement) are potentially referential, we can then say that a Binding relation exists between such a referential subject clitic and the subject DP position which it governs, and that this is what sanctions a null pronominal (*pro*) in subject position in the presence of such a clitic. This is all part of a larger theory of agreement, clitics, and doubling

² Sentence-initial non-subjects are presumably assigned a discourse function such as Topic or Focus, and it is this discourse role that motivates their displacement. I have no analysis to offer at this point of the precise discourse-structure considerations at work here, and will simply assume that there is some required interpretation associated with sentence-initial position.

relations which is developed in Anderson (2005), to which the reader is referred for further details and discussion.

1.2. Inversion in Other Clause Types

Inversion in Surmiran is not limited to declarative main clauses. For pragmatic reasons associated with the interpretation of non-subject material in initial position, such constituents are rare in subordinate clauses, but when they occur, they trigger Inversion as in the sentences of (17).

- (17) a. Cartez tg'igl settember turnan=s
 believe.2PL that-ART September return.SBJNCTVE.1PL-1PL
 ainten chel hotel
 in this hotel
 Do you think in September we'll come back to this hotel?
- b. Ia pains tgi dultschems vegia
 I think.1SG that sweets have.SBJNCTVE.3SG
 Corinna gugent
 Corinna gladly
 I think Corinna likes *sweets*

When question words are fronted, they also trigger Inversion as in (18).

- (18) a. Tge ò='la (Ladina) cumpro?
 what has.3SG-3SG.F. Ladina bought
 What did Ladina/she buy?
- b. Cura ò='la (Ladina) cumpro en auto?
 when has.3SG3SG.F Ladina a car
 When did Ladina/she buy a car?
- c. Igl auto da tgi ò='la (Ladina) cumpro?
 the car of whom has.3SG-3SG.F. Ladina bought
 Whose car did Ladina/she buy?

On the other hand, when the question word corresponds to the subject, Inversion would result in no change of word order. The fact that subject clitics are impossible when the subject is questioned, as shown in (19), while questions involving non-subjects do permit clitics (cf. (18)), suggests that in fact no Inversion occurs in this case.

- (19) Tgi ò(*='l/*='la) cumpro en auto?
 who has.3SG(-3SG.M./F.) bought a car
 Who bought a car?

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

When the question word is extracted from an embedded clause, that clause preserves the basic order, and it is the matrix clause that displays Inversion, as in (20).

- (20) Tge manegias te tgi Ladina vegia(*=**la**)
what think.2SG you that Ladina have.SBJNCTVE.3SG(*-3SG.F.)
cumpro?
bought
What do you think that Ladina bought?

Inversion is also characteristic of yes/no questions, although in this construction there is no (overt) sentence-initial non-subject. The uniformity of this structure with that of other instances of Inversion is confirmed by the presence of subject clitics in sentences like the last two examples in (21).

- (21) a. È igl viadi sto tger?
is.3SG the trip been expensive
Was the trip expensive?
b. Ast er te gost da neir?
have.2SG also you desire to come
Do you want to come too?
c. Lain=**sa** (nous) eir cugl tren?
want.1PL-1PL we go with.the train
Do we want to take the train?
d. **At=ò=gl** plaschia an Sicilia?
2SG-has.3SG-3IMPERS pleased in Sicily
Did you like Sicily?

On the other hand, Inversion does not occur in some instances where it might be expected. Subordinate clauses are commonly introduced by a complementizer *tge*, and we might expect this to count as a non-subject element in initial position. Sentences like (22) show that Inversion does not occur in this case.

- (22) Siva tg'els on en unfant, stat el pi savens
since that-they have.3PL a child is.3SG he more often
a tgesa
at home
Since they have a child, he is home more often

Finally, we can note that (unlike questions) relative clauses do not in general show Inversion, regardless of what is relativized, as in (23).

- (23) a. Igl codesch tgi è sen meisa pos=t aveir
 the book which is on the table can.2SG-2SG have
 The book which is on the table you can have
- b. Igl velo tgi Ursus ò cumpro n'=è betg nov
 the bike which Ursus has bought NEG-is.3SG not new
 The bike which Ursus bought is not new
- c. Igl gioven agl qual ia va scretg
 The youngster to.the which I have.1SG written
 è sto igl mies scolar
 is.3SG been the my student
 The youngster to whom I wrote was my student
- d. La matta dalla qualla te ast survagnia en canaster
 the girl from.the which you have.2SG received a basket
 mareida proximaintg
 marries.3SG in the near future
 The girl who turned you down is getting married soon

We might expect the relative pronoun *tgi* to be similar to the complementizer *tge* in this respect, but it is more striking that even complex relative expressions such as *agl qual* ‘to which/whom’ fail to produce inverted orders (or the associated subject clitics).

Let us now consider how to incorporate these additional facts into the account of Surmiran structure developed in section 1.1. I suggested there that Inversion was associated with a structural differentiation of IP and VP forced by the need to provide a clause-initial non-subject position. From the absence of Inversion in embedded clauses introduced by *tge*, I conclude that such structure is not necessary to provide for this Complementizer. In fact, it is suggested in Anderson (2005) that *tge* does not occupy a structural position in phrase structure at all, but is rather a clitic introduced into the phonological form of embedded clauses on the basis of their character as complements. In any event, no structure above the level of VP (or IP, in the case of exceptional sentences like (17) with initial non-subjects in embedded clauses) is required to host *tge*.

Inversion does occur in (most) questions, so let us suppose that these are characterized by an interrogative operator *Q*, a feature of I. The presence of *Q* alone characterizes yes/no questions; in content questions, the question word itself must occupy (or move to) the position of the Specifier of the I containing *Q*. To establish its scope, *Q* must govern the entire clause (in yes/no questions) or all of it except for the question word in its specifier (for information questions).

Since *Q* is associated with I, in order to establish its scope in yes/no questions the elaborated structure with IP distinct from VP is required, which in turn forces the verb to be displaced to the higher I, yielding Inversion. In content questions, the higher structure is again motivated when the question word is not the subject;

the question word is displaced as required to the higher specifier position, and the verb to I, again yielding Inversion. When the question word is the subject, however, the minimal structure with VP=IP meets all of the required conditions without elaboration. The question word, as subject, is located in the position of specifier of the head I (=V) bearing *Q*, and that element in turn governs the remainder of the clause. This accounts for the asymmetry by which Inversion is not found in content questions where the content word is the subject.

Relative clauses differ from questions, in that no operator such as *Q* is associated with I in a relative clause. The relative expression is preposed, and binds a gap within the clause. In subject relatives no word order changes are required, since the relative is already in clause initial position. In non-subject relatives, the relative expression is simply extracted and adjoined to the clause. In neither case is additional IP structure required, and as a result, none is projected, the verb remains in its base position, and the diagnostic properties of Inversion such as subject clitics do not appear.

Overall, then, I conclude that the implementation of “Verb-second” in Surmiran consists in displacing the verb from its base position as head of VP to the head of a containing IP where that is distinct. From this position, it C-commands the basic subject position, thus sanctioning the presence of a subject clitic. When such a clitic is present and interpreted as referential, this in turn sanctions phonologically null *pro* in subject position.

2. The Syntax of *ins*

Interesting additional light is shed on the nature of Verb-second in Surmiran by a consideration of the syntax of the element *ins*. This generally appears in lieu of an overt subject, with impersonal interpretation similar to that of German *man* or French *on* in sentences like (24).

- (24) *Ins* na pò betg eir quant spert tg'ins vot
ins NEG can-3sg not go as fast that-*ins* wants.3SG
sen las autostradas svizras
on the freeways Swiss

You can't go however fast you want on the Swiss freeways

Like impersonals in many other languages, *ins* cannot represent a non-subject argument, as illustrated in (25).

- (25) a. **I*gls pulizists na pon betg veir ins da lò
the policemen NEG can.3SG not see *ins* from there
The police can't see one from there

- b. *Mintgign digls guides ò la sia moda
 each of.the guides has.3SG the his way
 da trattar cun ins
 of to-deal with *ins*
 Each of the guides has his way of dealing with one

Although superficially just a sort of indefinite pronoun with a restriction to subject position, *ins* does not act like other arguments (full DPs or pronominals) occupying subject position. In particular, it does not undergo Inversion with the verb when a non-subject is clause initial, as in (26).

- (26) a. Dalla derivanza digls rets ins so tant scu
 of.the origin of.the Rhaeti *ins* know.3SG so-much as
 navot
 nothing
 Of the origins of the Rhaeti³ we know almost nothing.
- b. D'anviern ins pò eir sur tot igls pass cun auto
 In winter *ins* can.3SG go over all the passes with car
 In the winter you can go over all of the passes by car

Similarly, *ins* fails to invert in questions of either the yes/no or the content type, as illustrated in (27).

- (27) a. Ins viagia pi bagn cugl tren u
ins travels.3SG more good with-the train or
 cugl auto sch'ins fò viadis pi lungs?
 with-the car if-*ins* makes trips more long
 Does one travel better by train or by car when making longer trips?
- b. Tge meis digl onn ins dovra pneus
 what month of.the year *ins* needs.3SG tires
 d'anviern aint igl Grischun?
 of-winter in the Graubünden
 What month of the year do you need winter tires in Graubünden?

Although the position of *ins* immediately before the verb does not change in contexts such as (26) and (27) where we would expect Inversion, we do find another diagnostic of Inversion in these sentences. Specifically, a subject clitic **=(i)gl** can appear in *ins*-sentences precisely when we would expect to find Inversion: in the presence of an initial non-subject as in (28a), in yes/no questions like (28b), and in content questions like (28c). This is the same clitic that appears in Inversion structures with other impersonals, such as existentials and weather verbs.

³ Early indigenous people of the Rumantsch area.

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

- (28) a. Ainten chell’ustareia ins (na) magl=**igl** betg
 in this-inn ins **neg=** eat.3SG-3IMPERS not
 schi bagn, on=**igl** detg
 so well have.3PL-3PL said
 In this inn you don’t eat so well, they said
- b. Ins pò=**gl** fimar cò?
 ins can.3SG-3IMPERS to-smoke here
 Can you smoke here?
- c. Quant dei ins o=**gl** cugl auto anfignen
 how long ins has.3SG-3IMPERS with the car to
 sensom igl pass?
 top the pass
 How long is it by car to the top of the pass?

Etymologically, *ins* is derived from Latin UNUS like many other Romance impersonals. Its behavior, however, is not simply that of a pronoun. Rather, it seems more like the impersonal structures of Spanish or Italian in (29), which are based on a verbal clitic (in those languages, one identical with the third person reflexive) in association with an otherwise empty subject position, presumably occupied by a phonologically null pronominal of some sort.

- (29) **Spanish:** En México se trabaja mucho
 in Mexico *se* works.3SG much
 In Mexico one works a lot
- Italian:** Si lavora sempre troppo
si works.3SG always too much
 One always works too much

Another parallel is with certain impersonal verbal forms in Celtic. McCloskey (2005) has recently shown that the “autonomous” form of the verb in Irish, illustrated by example (30a), occurs with a phonologically null subject PRO_{ARB} with the semantics of an arbitrary pronoun. A similar analysis was proposed in (Anderson 1982) for the Breton verbal form in (30b).

- (30) a. (**Irish:**) Tugtar ‘madadh uisce’ go minic ar an
 give.PRES.AUT dog water often on the
 dobharchú
 otter
 The otter is often called a water-dog
- b. (**Breton:**) An eil pred a anver merenn
 the second meal PRT call.PRES.AUT lunch
 The second meal is called lunch

In these respects, Surmiran *ins* differs from the corresponding elements in other forms of Rumantsch, as illustrated in (31).

- (31) **Vallader:** Passand tras il desert as= chatta
Passing across the desert 3SGREFL finds.3SG
qualchevoutas skelets
sometimes skeletons
Crossing the desert, one sometimes finds skeletons
- Puter:** Passand tres il desert chatta ün qualchevoutas
passing across the desert finds.3SG *man* sometimes
skelets
skeletons
Crossing the desert, one sometimes finds skeletons
- Surselvan:** Nua ein ins cun la lavur? Ins ei alla
where is.3SG *ins* with the work *ins* is.3SG at-the
fin. Na, alla fin ein ins mai.
end no at-the end is.3SG *ins* never
Where are we with the job? We're finished. No, we're never
finished.

In Vallader, impersonals are formed using a third person singular reflexive verbal clitic, similar to the Spanish and Italian constructions of (29). In Puter, this construction is possible, as well as one with *ün* in subject position. Like Surmiran *ins*, this is a reflex of Latin UNUS, but unlike *ins*, it behaves as a normal pronoun and inverts with the verb when appropriate. In Surselvan, we have an element *ins* that is phonetically like the Surmiran form, but which (like Puter *ün*) acts like a normal pronoun. Finally, in Sutsilvan (which will be exemplified later below), we have *ign*, another reflex of UNUS which again acts like a normal pronoun.

It should be noted that some Surmiran speakers do accept sentences in which *ins* has inverted with the verb as in (32). They report, however, that this order “sounds like German.” Since nearly all speakers of Surmiran are bilingual in German, as noted above, this influence is not hard to account for. What is notable about it, indeed, is the fact that this order is still felt as foreign to Surmiran.

- (32) #Chegl dei ins dapertot
That says.3SG *ins* everywhere
That they say everywhere (OK, but ‘sounds like German’)

Since *ins* comes historically from UNUS used pronominally, it ought to behave as a pronoun. So why does it display the strange behavior it does? A clue is furnished by the fact that in at least one older description, Grisch (1939) transcribes

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

ins as homophonous with **ans=**, the first person plural object clitic. And indeed, in rapid speech for many speakers, the two may not be distinct phonetically.

A relation between impersonals and first person plural forms is known from both French and Italian. As illustrated in (33) impersonal forms in these languages can be used with first person plural reference.

- (33) **French:** Nous, on fait pas ça ici
 we on does.3SG not that here
We don't do that here
- Italian:** Si è contenti quando ci= scrivono
si is.3SG happy.PL when 1PL write.3PL
We are happy when they write to us (Burzio (1992))

Indeed, one occasionally finds Surmiran sentences such as (34) in which impersonal *ins* must be interpreted as having first person plural reference.

- (34) Scu indigen ins sa renda savens betg ple chint digls
 As natives *ins* REFL take often not much account of the
 prieveils da nossa nateira.
 dangers of our nature
 As locals, we often don't pay attention to the dangers in our natural setting.

It is not implausible to suggest, then, that a relation between impersonals and first person plural forms might have some role to play in the development of *ins*. This is not to suggest that they are the same element in the modern language: for one thing, they are phonetically distinct (as [Ins] vs. [əns]) outside of rapid speech. In addition, although both act as if they were clitics attached at the left of the finite verb, they occur in different positions with respect to other clitics, as shown in (35).

- (35) Da lò ins n'=ans= vei=gl betg cleramaintg
 from there *ins* NEG-1PL sees.3SG-3SG not clearly
 From there one doesn't see us clearly

Furthermore, in periphrastic modal constructions such as (36), *ins* always precedes the finite verb, while **ans=**, like other object clitics, can attach to the infinitive.

- (36) a. El vot **ans=** tarmetter dumang ena factura
 He wants.3SG 1PL to.send tomorrow a bill
 He wants to send us a bill tomorrow
- b. Mintgatant ins stò(=gl) spitgier en po
 often *ins* must.3SG(-3IMPERS) wait a bit
 Often you have to wait a bit

c.*Mintgatant stò(=gl) ins spitgier en po
 often must.3SG(-3IMPERIS) ins wait a bit
 Often you have to wait a bit

What should we conclude from these facts? The behavior of *ins*, and in particular its failure to invert when appropriate despite evidence (from subject clitics) that the associated verb has in fact been displaced in the same way as other Inversion constructions, finds a natural explanation if we say that it has been re-analyzed as a special sort of preverbal clitic. I propose, then, that sentences with *ins* have a structure parallel to that of the Spanish and Italian examples in (29), with the subject position occupied by phonetically null PRO_{ARB} and a clitic (here, **ins=**) attached to the verb and positioned before other clitics such as the first part of negation or an object pronominal.

Historically, I suggest that this situation arose as a result of the similarity of *ins* to the first person plural clitic **ans=**. This reanalysis was facilitated by similarities to Italian, a language in which (a) impersonal sentences involve PRO_{ARB} as subject and a preverbal clitic, and (b) first person and impersonal reference are closely related. Given widespread familiarity with Italian on the part of Surmiran speakers, especially before the more recent expansion of German influence in Graubünden, this does not seem an implausible suggestion, though of course more historical evidence would certainly be welcome to confirm it.

If this is correct, then under conditions triggering Inversion a verb whose subject is PRO_{ARB} is displaced from V to I, just like any other. It thus comes to C-command the basic subject position (containing PRO_{ARB}), resulting in the possible introduction of an appropriate subject clitic (= **(i)gl**).

3. Verb-second in Surmiran

What is the significance of these facts for an understanding of Verb-second in Surmiran? As a clitic, *ins* is attached to the finite verb, and does not alter its position with respect to that word under displacement in Inversion constructions. But that implies that the sequence '*ins*+verb' is simply another instance of the verb together with its accompanying clitic(s). As a consequence, sentences like (24) have no phonetically realized element preceding the verb, and so the verb is not in fact in second position, but rather first. If, on the contrary, we were to say that *ins* in (24) 'counts' as filling first position, then we would be in trouble with sentences like (26), where an initial non-subject, combined with *ins*, would result in the verb being in third position. Since no other re-orderings occur in these cases, we have to conclude that the verb in Surmiran is not in fact required to be in second position.

In fact, there are a few other sentence types that reinforce this point. Matrix experiencer predicates ('be unhappy', 'seem', etc.) with postposed sentential subjects and clitic pronominal experiencers, have the verb together with its object clitic in sentence-initial position, as in (37).

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

- (37) **Am=** displai /A me displai(=**gl**)
 1SG displeases / to me displeases (-3IMPERS)
 tgi chesta construcziun antscheva cugl verb
 that this sentence begins with.the verb
 I am unhappy that this sentence begins with the verb

Sentences of this sort are always impersonal. It is possible for them to have an initial dummy subject *igl*; such dummy subjects are normally obligatory in true impersonal sentences, but with a pronominal clitic representing the experiencer, need not appear. On the other hand, when the experiencer is represented by a full PP, as in the second variant of (37), initial *igl* is obligatory unless the experiencer PP is preposed (as here), in which case we have a normal Inversion construction as evidenced by the possibility of the subject clitic. The generalization seems to be that a preverbal clitic (*ins*, or **am=** in (37)) can count as “sort of” a subject, thus avoiding the need either for dummy *igl* or Inversion. Obviously, this suggestion remains to be made much more precise, but it seems a possible line of analysis.

For some perspective on these facts, consider their analogs in Sutsilvan, a closely related form of (“Central”) Rumantsch. Here the cognate of *ins*, namely *ign* (also etymologically from Latin UNUS) behaves like a normal pronoun occupying an argument position rather than like a clitic in sentences like those of (38). As a result, it undergoes Inversion in sentences parallel to ones in Surmiran above in which Inversion does not take place.

- (38) a. Ign dastga fimar dapartut an quell’ustreia
ins can.3SG to.smoke everywhere in that restaurant
 You can smoke anywhere in that restaurant
- b. Gl’unviern san ign ir cugl auto sur tut
 in winter can.3SG *ins* to.go with.the car over all
 igls pass
 the passes
 In the winter you can go over all of the passes by car (cf. (26b) above)
- c. Quant gitg ân ign cugl auto antocen senzum igl pass?
 how long has *ins* with.the car to top the pass
 How long is by car to the top of the pass? (cf. (28c) above)

Furthermore, impersonal experiencer sentences in Sutsilvan parallel to Surmiran examples in which the verb is initial, like the first variant of (37), always have dummy subjects as illustrated in (39).

- (39) Igl/* **mi=** disple ca questa seira sto jou star
it me displeases.3SG that this evening I must.1SG stay
a tgea
at home
I am sorry that I have to stay home this evening

I conclude that the grammar of Sutsilvan really does constrain the verb to occur in second position, through mechanisms discussed in Anderson (2005). The same appears to be true of the other Swiss Rumantsch languages, though a demonstration of that must be left to another occasion. In Surmiran, however, the element *ins* was reanalyzed as a clitic, under the influence of its similarity to **ans=** and other factors cited above. Such a reanalysis could not have taken place in Sutsilvan, since *ign* bears no particular resemblance to any preverbal clitic. As a result, for a significant class of sentences the Verb-second condition ceased to be true in Surmiran, and was lost from the grammar. In the modern language, the sense in which Surmiran is a “Verb-second” language is limited to the fact that Inversion occurs where it is motivated: that is, the verb is displaced from V to I exactly when the clause displays IP structure distinct from that of the core VP.

There is no little irony in this: the standard story about Verb-second in German that dominates the syntax literature claims that in this language, Verb-second consists in the requirement “Displace the verb from I to C”. Much of that literature treats the “second position” effect as epiphenomenal, and the required verb raising operation (which blocks under some circumstances) as primary. In Anderson (2005), however, it is argued that the best analysis of all of the Indo-European Verb-second languages (apart from Surmiran), including members of the Germanic, Celtic, and Indic families, involves explicit verb second requirements, with displacement of the verb following from these, rather than the other way around.

On this account, Surmiran works the way German is often thought to, and isn’t a Verb-second language in the sense of having a second position requirement in its grammar at all. It just looks like a Verb-second language, because the effect of Inversion (which is driven by something quite different) typically has the epiphenomenal consequence of locating the verb after exactly one sentence-initial constituent.

References

- Anderson, Stephen R. 1981. Topicalization in Breton. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 7:27–39.
Anderson, Stephen R. 1982. Where’s Morphology? *Linguistic Inquiry* 13:571–612.
Anderson, Stephen R. 2004. Subject Clitics and Verb-second in Surmiran Rumantsch. *MIT Working Papers in Linguistics* 47:1–22.
Anderson, Stephen R. 2005. *Aspects of the Theory of Clitics*. Oxford: Oxford University Press.

Verb Second, Subject Clitics, and Impersonals in Surmiran (Rumantsch)

- Burzio, Luigi. 1992. On the Morphology of Reflexives and Impersonals. In Christiane Lauefer and Terrell Morgan, eds., *Theoretical Analyses in Romance Linguistics (LSRL XIX)*, 399–414. Amsterdam: Benjamins.
- Grisch, Mena. 1939. *Die Mundart von Surmeir, Romanica Helvetica*, volume 12. Paris: E. Droz.
- Haiman, John, and Paola Benincà. 1992. *The Rhaeto-Romance Languages*. London: Routledge.
- McCloskey, James. 2005. The Grammar of Autonomy in Irish. Ms., University of California, Santa Cruz.
- Signorell, Faust, Wuethrich-Grisch, Mena, and Gion Pol Simeon. 1987. *Normas Surmiranas*. Coira: Tgesa editoura cantunala per stampats e meds d'instrucziun.

Stephen R. Anderson
Yale University
Department of Linguistics
370 Temple Street
New Haven, CT 06520-8366

sra@yale.edu

Cross-linguistic Variation in a Processing Account: The Case of Multiple *Wh*-questions

INBAL ARNON, NEIL SNIDER, PHILIP HOFMEISTER, T. FLORIAN
JAEGER, and IVAN A. SAG
*Stanford University*¹

0. Introduction

The distinction between acceptable and unacceptable sentences has long served as the empirical basis for theoretical linguistics. Traditionally, two kinds of explanations have been offered to account for perceived unacceptability. In the first, unacceptability reflects the violation of grammatical constraints. The second explanation attributes unacceptability to processing complexity: a construction is judged unacceptable because it is hard to process.² The unacceptability of nested constructions like (1) has been attributed to their extreme processing complexity (Gibson 2000; Miller and Chomsky 1963). The acceptability of this construction improves when the processing load is reduced by replacing the lexical NPs with pronouns, as in (2).

- (1) The boy **the cat the dog** bit scratched started crying
(2) The correspondent **everyone I** met trusts is interviewing the president

Interestingly, accounts of unacceptability in terms of processing complexity have been rare. Recent work, though, has focused on the possible advantages of identifying processing complexity as the source of perceived unacceptability. Several studies have demonstrated processing effects on the acceptability of

We wish to thank Igor Boguslavsky for access to the parsed Uppsala corpus, and Lev Blumenfeld, Tatiana Nikitina, and Dmitry Levinson for their patient help with the Russian corpus study. Thanks also to the 32nd BLS audience for a great QandA session. As six or more years have passed since we first wrote this paper, our views have advanced since then. We refer readers to Hofmeister et al. (2011) for a discussion of our own follow-up work and related work by others.

¹ Note: 2006 affiliations. Changes to affiliations as of publication: Arnon: Psychology Department, University of Haifa; Jaeger: Brain and Cognitive Sciences, Rochester University; Hofmeister: Department of Language and Linguistics, University of Essex.

² We include under this definition accounts along the line of Hawkins 2004, in which processing preferences can be grammaticalized.

structures previously considered to be ungrammatical (Featherston 2005; Kluender 2004, *inter alia*): when the processing load is reduced, acceptability increases. Some island constructions, for example, display improved acceptability when non-syntactic factors are manipulated (Keller 1996; Kluender 1998, 2004). Despite having the same syntactic structure, sentence (3), which has two lexical NPs, is judged as less acceptable than (4), which has two pronouns instead (Kluender 1998). Sentence (4), in fact, seems no different from (5), which is not an island construction:

- (3) That was the play that **the teacher** wondered whether **a student** will like
- (4) That was the play that **they** wondered whether **you** would like
- (5) That was the play that they wondered if you would like

What are the advantages of a processing-based account of unacceptability? Such an account captures, in the case of islands, the effect of the referential form of the NP (lexical vs. pronominal), which would not ordinarily be encoded in a grammar. In general, a processing-based explanation can not only model gradience in the data, which is hard to capture within a categorical theory of grammar, but also provide motivation for it.³ Moreover, it does so by appealing to factors that are independently motivated by other aspects of sentence processing. One challenge for processing-driven accounts is apparently categorical cross-linguistic variation in the acceptability of certain structures. Extending Kluender 1998, we argue that a processing-based account of islands can accommodate such cross-linguistic variation, and also better capture gradient variation.

In this paper, we will look at so called superiority violations (SUVs) in multiple *wh*-questions (e.g. *What did who read?*) to demonstrate the benefits of using processing complexity to account for perceived unacceptability. In the first part, we summarize recent studies demonstrating gradient acceptability in multiple *wh*-questions in English that can be partially captured by processing preferences (Featherston 2005; Hofmeister et al. 2007). These preferences, such as the distance between the filler and the gap (Gibson 2000) and accessibility of intervening material (Warren and Gibson 2002), are active in other unbounded dependencies. We suggest that the unacceptability of SUVs is due to processing complexity. Then, we review results about the processing of multiple *wh*-questions in other languages that a) reveal ordering preferences where there were claimed to be none (German) and b) confirm the apparent lack of them in others (Russian). These findings establish a cross-linguistic variation that is more subtle than previously assumed and which, we argue, cannot be accommodated within a categorical division of languages into those with ordering constraints and those without. In the third part, we suggest an account of cross-linguistic variation in

³Theories that allow gradient grammaticality such as Stochastic OT (Boersma and Hayes 2003) can capture gradient acceptability and provide a formal way of implementing it. However, one advantage of processing-based explanations is that they *motivate* specific constraints that cause the gradience.

which general processing preferences interact with language specific features. More specifically, we argue that the availability of case marking as a cue to thematic assignment underlies differences in the processing (and acceptability) of multiple *wh*-questions in English, German, and Russian.

1. Processing Accounts for Multiple *Wh*-phrase Ordering in English

English multiple *wh*-questions supposedly exhibit categorical order constraints. While (6a) is grammatical, the unacceptability of (6b) was originally explained by positing a language-specific constraint on *wh*-constructions that prohibits extraction over a syntactically “superior” *wh*-phrase (Superiority Constraint, Chomsky 1973). More recent accounts explain the distinction in terms of general grammatical principles (The Minimal Link Condition, Chomsky 1995), but still maintain a categorical difference in grammaticality between (6a) and (6b) (Pesetsky 2000):

- | | | |
|------|--------------------|--------------------------|
| (6a) | Who read what? | grammatical |
| (6b) | What did who read? | supposedly ungrammatical |

Several findings raise the need to re-examine the supposedly categorical contrast between (6a) and (6b). First, despite being labeled “ungrammatical”, sentences like (6b) can be found (albeit rarely) in natural speech (Hofmeister et al. 2011; Clifton, Fanselow, and Frazier 2006). More importantly, it has long been noted that there are exceptions to the “Superiority Constraint” in English: despite having the same syntactic configuration, sentences with *which*-phrases do not exhibit the contrast. (7a) and (7b) have both been argued to be grammatical (Bolinger 1978; Pesetsky 2000):

- | | |
|------|------------------------------------|
| (7a) | Which student read which book? |
| (7b) | Which book did which student read? |

An additional challenge to categorical grammatical accounts comes from evidence showing that *wh*-phrase ordering is conditioned by non-syntactic factors. Recent studies (Featherston 2005; Hofmeister et al. 2007) have demonstrated that SUVs display a pattern of gradient acceptability that is affected by the type of *wh*-phrase (bare phrase vs. *which* phrase), and is different from the simplistic contrast indicated by (6a) and (6b). Taken together, these findings suggest that the perceived unacceptability of SUVs like (6b) is gradient in nature and therefore not adequately captured by categorical grammatical accounts.

An alternative explanation that can capture the gradience of the data is given by the WH-Processing hypothesis (Hofmeister et al. 2007). Under this account, the relative rarity of structures like “*what did who do*” stems from their extreme processing cost: given the choice between several grammatical *wh*-orders (e.g. (6a) vs. (6b)), speakers disprefer those which (given the context) are associated with a greater processing cost. If multiple *wh*-questions are merely especially taxing unbounded dependencies, then they should be affected by the same factors

that affect the processing of other unbounded dependencies (relative clauses, clefts, etc.). Combined with existing theories of processing complexity (Gibson, 2000; Warren and Gibson, 2002), the WH-Processing hypothesis makes the following predictions for a *wh*-filler-gap dependency:

- I. Gaps that are further from the filler are harder to process.
- II. Less accessible fillers make the dependency harder to resolve.
- III. Less accessible intervenors make the dependency harder to resolve.

For fillers, accessibility refers to the boost in activation associated with the *wh*-phrase (Gernsbacher 1989; for further discussion, see Ariel 2001: 47, 68, who uses the term *future accessibility*). For intervenors, we assume that higher accessibility consumes fewer resources and therefore is less taxing during dependency-processing (Warren and Gibson 2002).⁴ SUVs have a bigger distance between the filler and the gap than their non-SUV counterpart. SUVs with bare *wh*-phrases, which correlate with lower accessibility than *which*-phrases (Frazier and Clifton 2002), are complex on all three levels (I – III). SUVs with *which*-phrases still have a larger distance between the filler and the gap than their non-SUV counterpart, but they have a more accessible filler and intervenor, rendering them less complex than bare SUVs.

In a series of studies, we (Hofmeister et al. 2007) investigated the extent to which the variance in acceptability of multiple *wh*-questions can be accounted for in terms of processing complexity by manipulating the distance between the filler and the gap and the accessibility of the filler and intervenor.⁵ The acceptability results were complemented by on-line measures of processing complexity collected using self-paced reading. The results demonstrate gradient acceptability of SUVs that is accounted for by the same processing factors that have been shown to influence other unbounded dependencies (I – III). To give an example, we briefly summarize our tests of prediction II and III. We used SUV examples like (8-11) in which the accessibility of the filler and the intervenor was manipulated:

- | | | |
|------|---------------------------------------------|-----------------------------|
| (8) | Pat wondered what who read. | BareFiller-BareIntervenor |
| (9) | Pat wondered what which student read. | BareFiller-WhichIntervenor |
| (10) | Pat wondered which book who read. | WhichIntervenor-BareFiller |
| (11) | Pat wondered which book which student read. | WhichFiller-WhichIntervenor |

The results for acceptability judgments and reading times are shown in Figure 1 and 2. Figure 1 shows the log-normalized acceptability judgments for SUVs in

⁴ Note that this notion of accessibility builds on, but differs from, the use in e.g. Ariel 2001. See Hofmeister et al. 2007 for further discussion of how to apply the notion accessibility to *wh*-phrases.

⁵ We assume increased processing cost correlates with reduced acceptability judgments (Fanselow and Frisch 2006; Hofmeister et al. 2007).

the different accessibility conditions (higher numbers correspond to higher acceptability). Figure 2 shows the mean residual reading times for the verb region in the different conditions. Importantly, higher numbers correspond to slower reading times and reflect more difficulty.⁶

Figure 1: Acceptability Judgments

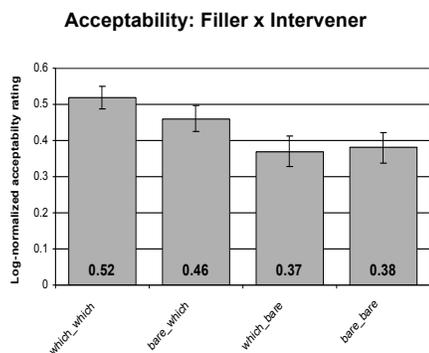
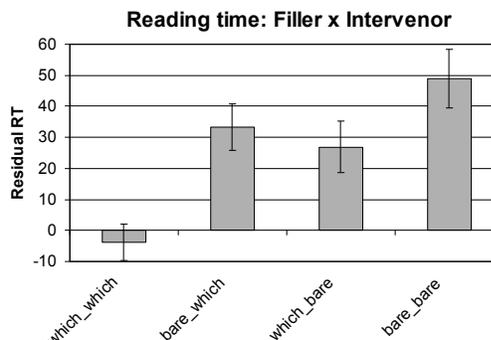


Figure 2: Residual reading times



SUVs with more accessible fillers and intervenors (11) show the highest acceptability ratings and fastest reading times. SUVs where only one of the entities was highly accessible (9, 10) show lower acceptability and slower reading times, while SUVs with less accessible fillers and intervenors show the lowest acceptability ratings and slowest reading times (8).

To summarize, recent findings on multiple *wh*-questions in English reveal that a contrast historically regarded to be one of discrete grammaticality involves a gradient space of judgments that can partially be explained by independently motivated processing preferences. The gradience of the phenomenon and its sensitivity to processing factors is hard to accommodate within discrete models of grammar. Instead, the results support the role of processing complexity in creating the perceived unacceptability in English.

However, one apparent advantage of the grammatical account is its potential for accounting for cross-linguistic variation. A grammatical constraint in one language but not in another could explain the difference between languages that display ordering constraints (like English) and languages that don't (like German or Russian). How could one account for cross-linguistic variation within a processing account? If unacceptability is the result of general processing preferences, why don't we see the effect of these preferences across languages? Next, we review recent cross-linguistic findings that bear on the issue.

2. Cross-linguistic Variation

With regard to SUV constructions, the distinction between languages like English and languages like German or Russian is crucially based on the assumption that

⁶ Negative residual reading times mean the region is read faster than expected given its length.

English, but not German or Russian, exhibits strict ordering preferences. The English data presented in the previous section demonstrates that the real space of judgments is more gradient than previously claimed and doesn't categorically rule out one of the orders. We now review additional work on multiple *wh*-questions in German and Russian that re-evaluates the constraints on ordering in these languages.⁷

The contrast between SUVs and non-SUVs has been claimed to be absent in German (Lutz 1996). Both (12a) and (12b) are considered equally acceptable.

- (12a) Maria fragt wer was gelesen hat.
Maria asks who what read has
'Maria asks who has read what'
- (12b) Maria fragt was wer gelesen hat.
Maria asks what who read has
'Maria asks what who has read'

Recent work, however, demonstrates the existence of ordering preferences in German that are consistent with the ones found in English. Featherston (2005) reports an ordering preference in German: SUV structures like (12b) were judged to be less acceptable than non-SUV structures like (12a). Moreover, the results demonstrate an effect of intervenor activation: SUVs with *which*-phrase intervenors (13) were judged more acceptable than ones with bare intervenors (14). No effect of filler activation was found:

- (13) Was hat welcher Zahnarzt dem Patienten empfohlen?
what has which dentist to.the patient recommended
'What has which dentist recommended to the patient?'
- (14) Was hat wer dem Patienten empfohlen?
what has who to.the patient recommended
'What has who recommended to the patient?'

Russian is also said not to exhibit a contrast between SUVs and non-SUVs: (15a) and (15b) are equally acceptable (Rudin 1988):

- (15a) Elena staralas' razobrat'sia kto chto zakazal.
Elena tried figure-out who what ordered
'Elena tried to figure out who ordered what.'
- (15b) Elena staralas' razobrat'sia chto kvo zakazal.
Elena tried figure-out what who ordered

⁷ Our work is influenced by previous work by Featherston (2005), but our interpretation differs.

‘Elena tried to figure out what who ordered.’

Indeed, Federenko 2005 found no ordering preference in Russian: both orders are judged equally acceptable and there is no effect of filler or intervenor accessibility.⁸

To summarize, German exhibits ordering preferences similar to the ones in English, while no ordering preferences were reported for Russian. Importantly, a closer comparison of Featherston’s 2005 results for German and our results for English suggests that the relative strength of these preferences differs between the languages. In both German and English, SUVs are judged as less acceptable than non-SUVs. But, the size of the “Superiority Effect” seems larger in English than in German. The empirical results from German and Russian reveal a cross-linguistic variation that is more subtle than previously claimed. Instead of a categorical difference between languages that have ordering constraints (e.g. English) and languages that don’t (e.g. German and Russian), we see a more gradient distinction between languages that have strong, but not categorical, ordering preferences (e.g. English), languages that have weaker ordering preferences (e.g. German), and languages that don’t seem to exhibit a preference (e.g. Russian).

3. Accommodating Cross-linguistic Variation in a Processing Account

There are several possible routes to account for cross-linguistic variation within a processing account. One is to say that the suggested preferences (distance is costly, less accessible intervenors are costly) are not universal, e.g. that in some languages, less accessible intervenors are not costly. This would require a bold statement about the directional influence of language on cognitive mechanisms, implying that different languages result in different processing mechanisms. Another is to say that the preferences are universal, but have different manifestations in different languages. For example, how distance is calculated can be different across languages. This is easy to apply for some preferences (e.g. distance), where language-specific features like free word order could affect the concept, but is harder to implement for other preferences (e.g. accessibility). A third route, and the one that we will argue for in this paper, is to say that processing preferences are universal, but that their strength depends on the availability of other cues.

Taking a step back, the motivating force behind the preferences we have identified as playing a role in the processing of *wh*-questions is to increase the ease of resolving an unbounded dependency. A bigger distance between the filler and the gap with more complex intervening material increases the difficulty of resolving the dependency. However, there are other language-specific features, like case marking or subject-verb agreement, which can assist resolution. In the absence of such additional cues, the “violation” of word order preferences

⁸ It is important to note that Fedorenko (2005) confirms our results for English using the same methodology and almost identical stimuli as in the study on Russian multiple *wh*-questions.

becomes more severe. For example, increased distance between the filler and the gap will induce more difficulty in the absence of additional cues that are used in resolving the dependency correctly (e.g. subject verb agreement, case marking, animacy preference for the Agent, etc.). How preferences surface in a given language will depend on the extent to which speakers can rely on other cues in on-line processing.

Next, we present an approach that draws heavily on the framework of the Competition Model (MacWhinney 2004) but extends it to account for differences in the surfacing of preferences in different languages. We propose an account of the reported cross-linguistic differences in *wh*-phrase ordering that attributes them to differences in the availability of case marking as a cue.

3.1. The General Approach

The idea that language specific features are responsible for cross-linguistic differences in on-line processing is not a new one. It is most fully elaborated in the Competition Model (MacWhinney 1987). In this framework, the relative strength of surface cues like word order, case marking and subject-verb agreement is responsible for differences between languages in on-line and off-line sentence interpretation. The strength of a cue is dependent on three factors. The first factor is availability, defined as the proportion of times that it is present. For case marking, availability would be calculated as the proportion of times that the noun has unambiguous case marking. The second factor is reliability, defined as the proportion of times where the cue marks the correct interpretation, when it is present. For case marking, this would mean the proportion of times a nominative-marked noun is the Agent of the sentence. The third factor is cost, which depends on the perceptual salience of the cue and the load it places on working memory.

The study of off-line thematic assignment demonstrates the different strength of surface cues in a variety of languages (MacWhinney and Bates 1989). The study of on-line thematic assignment reveals the effect of cue strength on reaction times. As predicted, the strongest cues lead to fastest reaction times and conflicting cues lead to inhibition and slowdown (Li, Bates, and MacWhinney 1993). In an expansion of the model, Kempe and MacWhinney 1999 looked at the way that the availability of a cue is reflected in the processing benefits associated with it in on-line processing. Participants heard simple transitive sentences and had to identify the Agent as quickly as possible. While some sentences were ambiguous, others had various cues to the thematic assignment. The study manipulated the existence of cues like animacy, word order, and case marking. Kempe and MacWhinney report that more available cues, ones that are more frequent, had a bigger benefit in on-line processing. Looking at German and Russian they compared the availability and reliability of animacy, case marking, and word order using a corpus. While reliability is identical in the two languages (when case marked the thematic role of the noun is unambiguous), case marking is less available in German than in Russian: there are more ambiguously marked nouns in German. Accordingly, reaction times were more speeded when case

marking was added in Russian in comparison to German. The results were interpreted as showing that because case marking is more available in Russian, Russian speakers rely on it more in on-line processing.

Drawing on these findings, we suggest that the cost of general processing preferences is mediated by the availability of other cues in the languages. In a language where case marking is a highly available cue, speakers will rely on that cue and will be able to ‘tolerate’ increased distance better. In other words, increased distance is costly across languages, as is lower accessibility, but the cost of ‘violating’ those preferences is lower when other cues are highly available. In a fixed word order language, with no case marking cues, increased distance is very costly⁹. In a language with case marking, distance is increasingly less costly, depending on the availability of other cues. Can this kind of model explain the reported cross-linguistic differences in the processing of multiple *wh*-questions?

3.2. The Case for Case

One striking difference between the three languages is the availability of case marking. Case marking on nouns is not an available cue in English. Case marking exists in both German and Russian, but the case marking paradigms of nouns in German are more ambiguous than the ones in Russian (Kempe and MacWhinney 1999 for declaratives). Crucially, this also seems to hold for the availability of case marking in question words. The morphological paradigm of German question words is more ambiguous than that of Russian. Three out of the seven German question words are ambiguous between nominative and accusative case, while only three out of ten Russian question words are.

We conducted a corpus study to test the hypothesis that German and Russian differ in the availability of case marking for question words. For German, we used the syntactically annotated TIGER (v. 1) and NEGRA corpora, which consist of 50,000 sentences (900,000 tokens) and 10,000 sentences (176,000 tokens) of newspaper text, respectively. For the Russian study, we used the dependency-parsed Uppsala corpus (Boguslavsky et al. 2002). The corpus consists of 17,772 sentences (256,034 tokens) of literary and informative text. We extracted the transitive embedded and non-embedded questions in each corpus that contained at least one *wh*-question word. This amounts to 167 questions in German, and 46 questions in Russian, with a total of 168 and 46 question words, respectively. To calculate the availability of case marking for question words, we calculated the percentage of question words that were unambiguously marked as nominative or accusative out of the total number of question words.¹⁰ For German, only 11.3% of the question words in our sample are unambiguously case marked. In Russian, availability was three times higher: 34.8% of question words were unambiguously

⁹ In similar fashion, in this kind of language, the addition of case marking (on pronouns for example) may not be very beneficial since speakers are not used to relying on that information.

¹⁰ For Russian we counted as unambiguous *kto*, *kogo*, *kakogo*, *kotorogo*, *kakaya*, *kotoraya*, *kakuyu*, *kotoruyu*, *kakikh*, and *kotorykh*, as well as *kakoj*, *kotoryj*, *kakie*, and *kotorye* when they were animate.

case marked. This difference is similar to the one reported in Kempe and MacWhinney for simple transitive sentences. The availability of case marking for nouns in their study was 68.5% for Russian and only 38.2% for German.¹¹ With the caveat that these two analyses were performed on different corpora, case marking seems to be more available for nouns than for question words. This could be due to the fact that the most common question word in both languages is the equivalent of English *what* (*was*, 71%; *что*, 45.7%), which is not case marked in either language. Consistent with our hypothesis, we find that case marking in Russian *wh*-questions is more available than in German *wh*-questions.

The differing effect of the processing preferences could be attributed to the differential availability of case marking as a cue. The effect of distance and accessibility is masked when case marking is a highly available (Russian). The effect is apparent when case marking is less available (German) and is the strongest when case marking is not an available cue (English). The gradient cross-linguistic difference is thus attributed to the different availability of case marking.

3.3. Summary

The model we have presented views cross-linguistic variation as an interaction of processing preferences and language specific features. More specifically, we suggest that different costs are associated with dispreferred options, depending on the availability of other cues. The availability of information about the thematic assignment that is conveyed by cues like case marking or subject-verb agreement reduces the burden posed by variants with a high processing cost (e.g. those with increased distance and/or low accessibility intervenors). The ‘cost’ of dispreferred options is mediated by the strength of cues like word order, case marking, etc. that bias to the intended parse. With regard to unbounded dependencies, we suggest that increased distance and costly intervening material will affect the ease of resolving a dependency across languages, but the extent of the difficulty will depend on speaker’s ability to draw on additional information. With regard to multiple *wh*-questions, we argue that the different manifestation of ordering preferences across English, German, and Russian can be partially attributed to the different availability of case marking in those languages. Case marking has been shown to be a more available cue in Russian than in German, both generally in transitive declaratives and more specifically in *wh*-questions; and case marking is more available in these languages than in English. This explains why the effect of distance and accessibility is most apparent in English, less so in German and not apparent in Russian.

¹¹ Kempe and MacWhinney report the availability of case marking separately for the first and second NP in a sentence and separately for nominative and accusative case while we report the availability for a given question word, regardless of position or thematic assignment. The percentage we are using for the comparison was calculated by averaging the four measures.

4. Conclusions and Future Work

We have presented findings about the gradient nature of multiple *wh*-questions in English and offered a framework in which multiple *wh*-questions are seen as no different from other types of long distance dependencies. Their unacceptability is partially captured by processing factors known to affect other types of unbounded dependencies. We also sketched a proposal to account for cross-linguistic variation in ordering preferences by appealing to an interaction between general processing mechanism and language specific factors. Specifically, we argued that the different availability of case marking is responsible for the different surfacing of processing preferences in the languages tested (English, German, and Russian). Why would one prefer the kind of account proposed here to one that uses categorical grammatical constraints to explain contrasts in acceptability within and between languages? First and importantly, the processing account can better capture gradient contrasts within languages and gradient differences between languages. As evidenced from the findings on multiple *wh*-questions, this kind of gradience is prevalent in language. Second, a processing account has wider coverage in explaining behavioral correlates of language use—the same mechanism that explains processing times is also assumed to underlie the relative acceptability of structures. Third, the processing account opens a fruitful research program into the ways that cross-linguistic variation can be modeled and quantified. For example, it makes the prediction that English multiple *wh*-dependencies should become easier to resolve when the likely thematic assignment is inferable from other cues, such as animacy of the *wh*-phrases. We are in the process of running experiments to test this hypothesis. We also predict that dependencies in case marking languages should become more difficult when the case marking cue is not available, as in the case for Russian multiple *wh*-questions with two inanimate entities. To conclude, we argue that an account that acknowledges the role of processing in multiple *wh*-phrase ordering will better account for variation in acceptability within and between languages.

References

- Ariel, M. 2001. Accessibility Theory: an overview. In T. Sanders et al. In *Text representation: Linguistic and psycholinguistic aspects*. Amsterdam: Benjamins.
- Boguslavsky, I., I. Chardin, S. Grigorjeva, N. Grigoriev, L. Iomdin, L. Kreidlin, N. Frid, 2002. Development of a dependency treebank for Russian and its possible applications in NLP. *Proceedings of LREC-2002*, Las Palmas. 3:852–856. <http://ruscorpora.ru/>
- Bolinger, D. L. 1978. Asking more than one thing at a time. In H. Hiz (Ed.), *Questions*. Dordrecht: D. Reidel 107-150.
- Boersma, P. and B. Hayes. 2003. Empirical tests of the Gradual Learning Algorithm, *Linguistic Inquiry* 32: 45-86.

Inbal Arnon, Neal Snider, Philip Hofmeister, T. Florian Jaeger, and Ivan A. Sag

- Chomsky, N. 1973. Conditions on transformations. In S. Anderson and P. Kiparsky (Ed.) *A Festschrift for Morris Halle*. New York: Holt, Rinehart and Winston
- Chomsky, N. 1995. *The Minimalist Program*. Cambridge, Mass.: MIT Press.
- Clifton, C. J., Fanselow, G., and Frazier, L. 2006. Amnestying superiority violations: processing multiple questions. *Linguistic Inquiry* 37: 51-68.
- Fanselow, G. and Frisch, S. 2006. Effects of processing difficulty on judgments of acceptability. In *Gradience in grammar*. G. Fanselow, C. Fery, M. Schlesewsky and R. Vogel (Eds.). Oxford: Oxford University Press.
- Featherston S. 2005. Universals and grammaticality: *Wh*-constraints in German and English. *Linguistics* 43:4.
- Fedorenko, E. 2005. Superiority violations in English and Russian: a cross-linguistic analysis. Presented at Ling-lunch talk series, MIT.
- Frazier, L. and Clifton, C. 2002. Processing D-linked phrases, *Journal of Psycholinguistic Research* 31(6): 633-659.
- Gibson, E. 2000. The Dependency Locality Theory: a distance-based theory of linguistic complexity. In Y. Miyashita, A. P. Marantz and W. O'Neil (Eds.), *Image, language, brain*. Cambridge, MA: MIT Press. 95-126.
- Hofmeister, Philip, T. Florian Jaeger, Inbal Arnon, Ivan A. Sag and Neal Snider. 2007. Locality and accessibility in *wh*-questions. In *Linguistic Evidence: Empirical, Theoretical, and Computational Perspectives*. S. Featherston and W. Sternefeld (Eds.) Berlin: Mouton de Gruyter. 185-205.
- Hofmeister, Philip, T. Florian Jaeger, Inbal Arnon, Ivan A. Sag and Neal Snider. 2011. The source ambiguity problem: Distinguishing the effects of grammar and processing on acceptability judgments. *Language and Cognitive Processes*.
- Keller, F. 1996. How do humans deal with ungrammatical input? experimental evidence and computational modeling. In *Natural Language Processing and Speech Technology: Results of the 3rd KONVENS Conference*. Dafydd Gibbon, (Ed.) Berlin: Mouton de Gruyter. 27-34.
- Kempe, V. and MacWhinney, B. 1999. Processing of morphological and semantic cues in Russian and German. *Language and Cognitive Processes*. 14: 129-171
- Kluender, R. 1998. On the distinction between strong and weak islands: A processing perspective. In *Syntax and Semantics 29: The limits of syntax*. P. Culicover and L. McNally (Eds.) San Diego, CA: Academic Press. 241-279.
- Kluender, R. 2004. Are subject islands subject to a processing account? In *Proceedings of the 23rd WCCFL*. Vineeta Chand, Ann Kelleher, Angelo J. Rodríguez, and Benjamin Schmeiser (Eds.) Somerville, MA: Cascadilla Press.
- Li, P., Bates, E. and MacWhinney, B. 1993. Processing a language without inflections: A reaction time study of sentence interpretation in Chinese. *Journal of Memory and Language* 32:169-192.
- Lutz U. 1996 Some notes on extraction theory. In *On Extraction and Extraposition in German*. Lutz U. and Pafel J. (Eds). *Linguistik Aktuell* 11. Amsterdam: Benjamins.

Cross-linguistic Variation in a Processing Account: Multiple Wh-questions

- MacWhinney, B. 1987. Toward a psycholinguistically plausible parser. In S. Thomason (Ed.) *ESCOL 1986*. Columbus, OH: Ohio State University.
- MacWhinney, B. and Bates, E. (Eds). 1989. *The crosslinguistic study of sentence processing*. New York: Cambridge University Press.
- Miller, G. A., and Chomsky, N. 1963. Finitary models of language users. In *Handbook of Mathematical Psychology*, vol. 2. Luce, D. R., Bush. R. R., and Galanter, E. (Eds.), New York: Wiley.
- Pesetsky, D. 2000. *Phrasal Movement and its Kin*. Cambridge, MA: MIT Press.
- Rudin, C. 1988. On multiple questions and multiple *wh*-fronting. *Natural Language and Linguistic Theory*. 6:445-502.
- Warren, T. and Gibson, E. 2002. The influence of referential processing on sentence complexity. *Cognition* 85:79-112.

Inbal Arnon
Stanford University
Department of Linguistics
Margaret Jacks Hall
Building 460
Stanford, CA 94305-2150

inbalar@stanford.edu
iarnon@psy.haifa.ac.il

Several Problems for Predicate Decompositions

JOHN BEAVERS and ITAMAR FRANCEZ
Stanford University

0. Introduction

This paper examines argument/oblique alternations, where a semantic argument of a predicate may be morphosyntactically realized either as a direct argument (e.g. subject or object) or as an oblique. The conative alternation in (1) is an example.

- (1) a. Kim cut the pie.
b. Kim cut at the pie.

In (1a) the patient *the pie* is realized as an object and in (1b) it is realized as an oblique marked by the preposition *at*. There is a semantic effect associated with this alternation: when *the pie* is a direct object it is known to have necessarily been affected in some way, but when it is an oblique it may or may not have been affected, depending on the context (i.e. it is **underspecified** for affectedness). We point out three general properties of such alternations, which a theory of argument realization should ideally capture. These are given in (2)–(4).

- (2) **Implicational Contrasts:** Direct argument variants often entail additional properties of the alternating participant not entailed by oblique variants.

What a direct argument variant says about the alternating participant entails what the oblique variant says about the alternating participant, but not conversely. In the conative alternation in (1) for example, all else being equal, (1a) specifies a result not specified (nor contradicted) for (1b). Following Beavers (2005, 2006, in prep), we argue that this property holds for many other alternations as well.

- (3) **Root Dependency:** The contrast exhibited by a given verb in a given alternation depends on the verb.

While the contrast an alternation exhibits may be characterized very generally, the exact contrast is always verb-dependent.

- (4) **Verb Hierarchies:** For certain alternations, the ability of certain verbs to alternate predicts the ability of other verbs to do so.

We argue that these properties derive from the lexical semantic properties that verbs associate with their arguments. We claim that predicate decomposition theories of argument realization (Dowty 1979, Levin and Rappaport (Hovav) 1988, 1995, Pinker 1989, Gropen et al. 1991, Wunderlich 1997, Van Valin and LaPolla 1997, Rappaport Hovav and Levin 1998, Davis 2001, *inter alia*) fail to capture these properties, because they are inherently structural rather than semantic in nature, i.e. they base generalizations on the structure of semantic representations, but these structures are not necessarily tied to any independently motivated semantics (a point made by Koenig and Davis 2004). We argue instead that entailment-based approaches to argument realization (Ladusaw and Dowty 1988, Dowty 1989, 1991, Primus 1999, Ackerman and Moore 2001, Beavers 2005, 2006, in prep) provide an appropriate language for capturing these properties.

1. Predicate Decomposition vs. Entailment-Based Approaches

Theories of predicate decomposition posit two components to a verb's meaning: an event template built of a small number of basic predicates (e.g. CAUSE, BECOME) that capture the subevent structure of the event, and an idiosyncratic root associated with the particular verb, as in the following example from Rappaport Hovav and Levin (1998:119, (33)):

(5) Phil swept the floor clean.

[[x ACT_{<sweep>} y] CAUSE [BECOME y < STATE >]]

In (5) the template defines an ACT event between two participants *x* and *y*, subscripted by the idiosyncratic root SWEEP, indicating that the ACT is a sweeping event. This serves as the first argument of a CAUSE predicate whose second argument is a resultant BECOME predicate indicating that *y* comes to change state as a result of the event. The relative prominence of *x* and *y* in the template determines their relative morphosyntactic prominence in the clause, such that the least embedded participant is the subject and the more embedded participant is the object.

In entailment-based approaches a verb instead assigns to each argument a set of entailments describing its role in the event, which determine argument realization according to some set of mapping principles. For example, Dowty (1991) defines subject/object selection in terms of two thematic proto-roles defined as follows (ignoring entailments having to do with existence independent of the event which Dowty posits but suggests may not ultimately be relevant):

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(6) Proto-Agent (Dowty 1991:572, (27))</p> <ul style="list-style-type: none"> i. volitional involvement in the event or state ii. sentience (and/or perception) iii. causing an event or change of state in another participant iv. movement (relative to the position of another participant) | <p>Proto-Patient (Dowty 1991:572, (28))</p> <ul style="list-style-type: none"> i. undergoes change of state ii. incremental theme iii. causally affected by another participant iv. stationary relative to movement of another participant |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Several Problems for Predicate Decompositions

On Dowty's approach the argument bearing the most proto-agent entailments is the subject and the argument bearing the most proto-patient entailments is the object (Dowty 1991:576). In (5) *Phil* is assigned all of the proto-agent entailments in (6) but none of the proto-patient entailments, while *the floor* is assigned all of the proto-patient entailments but none of the proto-agent entailments. Thus *Phil* is the subject and *the floor* is the object. The specific implementations aside, the crucial difference between these theories is that in decompositional approaches the structure of the event template determines argument realization whereas in entailment-based approaches it is the entailments assigned to each participant. In the next several sections we show how decomposition theories do not naturally capture the properties in (2)–(4), while entailment-based approaches provide a natural language for capturing these properties.

2. Implicational Contrasts

Consider first the well-known locative alternation (Fillmore 1968):

- (7) a. Kim loaded *hay* **onto the wagon**. (locatum=DO, location=OBL)
b. Kim loaded **the wagon** *with hay*. (location=DO, locatum=OBL)

In (7) there are two non-causer participants, a locatum (the thing that moves) and a location (where the locatum moves to), and either may be realized as the direct object, in which case the other is realized as an oblique marked by an appropriate preposition. This alternation is associated with a well-known semantic effect: the location receives a “holistic” interpretation (it comes to be completely full) when realized as the direct object (Anderson 1971). This is shown in (8), where the direct object variant is infelicitous with continuations contradicting the holistic reading, while the oblique variant is compatible both with continuations in which holistic affectedness is entailed and those in which it is contradicted:

- (8) a. #Kim loaded *the wagon* with hay, and had extra room for the grain.
b. Kim loaded hay *onto the wagon*, and had extra room for the grain.
c. Kim loaded hay *onto the wagon*, filling it up completely.

Levin and Rappaport (1988) characterize this contrast in terms of what they refer to as the “paraphrase property”: the location direct object variant (7b) entails the location oblique variant (7a) but not vice versa. They capture this in terms of two distinct but related event templates (*ibid*:26, (24)):

- (9) a. John loaded hay onto the wagon. (change-of-location, cf. *put*)
[x cause [y to come to be at z]/LOAD]
b. John loaded the wagon with hay. (change-of-state, cf. *fill*)
[[x cause [z to come to be in STATE]]
BY MEANS OF [x cause [y to come to be at z]/LOAD]]

On this analysis (9a) is essentially a change-of-location event of the locatum, whereas (9b) is a change-of-state event of the location by means of a change-of-location of the locatum. Levin and Rappaport (1988:25, (21)-(22)) propose a direct object linking rule in which the least embedded participant that is either moved or changed (i.e. the least embedded non-causer) is linked to the direct object. The morphosyntactic and semantic facts follow directly from this approach. Each template makes a different argument more prominent (less embedded) in the decomposition, which determines different direct object linking. Furthermore, (9b) embeds (9a), predicting the paraphrase relationship.

However, this approach is problematic for two reasons. First, both variants entail *some* degree of affectedness for *both* participants (at least partly moved or filled) whether holistic or not (as noted by Jackendoff 1990:129-130). However, (9) does not reflect the entailments of at least partial affectedness for either participant, and thus it is also not clear how (9) encodes the holistic vs. at least partial affectedness contrast for the location. Furthermore, it is not clear in general what kind of affectedness is encoded in (9b), which only says that the location comes to be in some state. But why this state is interpreted as a state of being completely full (rather than some other state) is unclear. Gropen et al. (1991:162) describe the holistic effect as “most natural” when the location is more prominent, but there is rarely an explicit explanation for why this is the case or how the interpretation actually arises.

Second, and more importantly, the “paraphrase property” is more complicated than (9) suggests. The entailment relation between the variants in (7) rests crucially on the fact that the locatum is a mass noun. However, bare plural/mass noun objects are known to force atelic readings for all transitive dynamic predicates, locative or otherwise, obscuring any potential holistic reading that might arise (Verkuyl 1972). When the locatum is a definite specific NP, it also yields a holistic reading (a point also made by Fillmore 1977, Jeffries and Willis 1984, Dowty 1991):

- (10) a. #Kim loaded *the hay* onto the wagon, but needed a truck for the rest.
 b. Kim loaded the wagon *with the hay*, but needed a truck for the rest.
 c. Kim loaded the wagon *with the hay*, leaving none behind.

Thus the paraphrase property, as much as it can be called that, is a general property that holds *relative to each participant*: each variant associates an additional property with its direct object not associated with the corresponding oblique in the other variant. In fact, as discussed extensively in Beavers (2005, 2006, in prep), this relativized version of the paraphrase property applies to many alternations that involve notions others than holistic affectedness and grammatical functions other than object, as shown in the following examples (cf. Beavers 2005:30-31, (6), (9)):

- (11) **Reciprocal alternation** **(Underspecified motion)**
 a. The car and the truck collided. (car and truck in motion)
 b. The car collided with the truck. (car in motion; truck not necessarily)

Several Problems for Predicate Decompositions

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(12) Dative alternation</p> <p style="margin-left: 20px;">a. John sent Mary the letter.</p> <p style="margin-left: 20px;">b. John sent the letter to Mary.</p> | <p>(Underspecified possession/goal)</p> <p style="margin-left: 20px;">(Mary a goal and possessor)</p> <p style="margin-left: 20px;">(Mary not necessarily possessor)</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Such data show that the morphosyntactic contrast between direct argument and oblique realization for a single participant corresponds to a very general, participant-based semantic contrast characterizable informally as in (13) (cf. Ackerman and Moore 2001, Beavers 2005, 2006, in prep).

- (13) In semantically contentful argument/oblique alternations direct arguments are specified for properties left underspecified for corresponding obliques.

The principle in (13) cross-cuts a range of possible alternations and semantic properties. Decompositions do not capture this since all they encode are *structural* differences between co-arguments in the decomposition (as discussed extensively in Koenig and Davis 2004), in particular regarding their relative embeddedness. But embeddedness is not itself inherently linked to any particular semantic contrast, least of all the one in (13). Ideally a theory of alternations should link the morphosyntactic contrasts to the appropriate semantic contrasts defined independently.

Entailment-based approaches to argument realization provide a language for doing exactly this. Since the semantics of a verb consists of sets of entailments, which constitute the thematic roles of the verb's arguments, then by definition there can be **subset relations** between such sets. Subset relations encode exactly the sorts of implicational contrasts discussed above:

- (14) For any two sets of entailments R and Q assigned to a participant x , if $R \subset Q$ then Q encodes strictly more information about x (contains more entailments) than R .

We can therefore place the following general constraint on linking rules governing argument/oblique alternations, restricting the semantic contrasts they allow:

- (15) An argument x of verb V has entailments Q_V as a direct argument and entailments R_V as an oblique, where $R_V \subset Q_V$.

Linking rules for particular alternations specify which sets of entailments are relevant. For example, however the locative alternation is analyzed, we would expect it to yield the following assignments of entailments, which obeys (15):

- | | | | |
|----------------------------------------|------------------------------------------------------------------------------------|-----------|-----------------------|
| (16) Entailments for locatum/location: | $\left\{ \begin{array}{l} \text{holistic} \\ \text{affected} \end{array} \right\}$ | \supset | $\{\text{affected}\}$ |
| Realization of locatum/location: | DO | | OBL |

Whichever participant is the direct object receives one additional entailment (the holistic interpretation) not associated with it as an oblique. Thus what were structural asymmetries in decompositions are implicational asymmetries in entailment-based approaches, capturing the contrast in (13) in an independently motivated way.

3. Root Dependency

The contrast governed by a given alternation varies, sometimes dramatically, depending on the verb that occurs in the alternation. Consider cutting, slicing, and chipping verbs, which exhibit realization patterns similar to locative alternations:

- (17) a. Kim cut/sliced/chipped **the window** *with the diamond*. (w. affected)
 b. Kim cut/sliced/chipped *the diamond* **on the window**. (d. affected)

We again have a three participant situation: some agent (*Kim*) moves some locatum/instrument (*the diamond*) into mutual contact with some location (*the window*), and one participant becomes affected as a result (see Gawron 1986 on such events with *hit* and Guerssel et al. 1985, Laughren 1988 on such an analysis for conative alternations with these verbs). In (17a) the location is the object and is entailed to have been affected, while in (17b) the locatum is the object and comes to be affected. In both cases the oblique is underspecified for any effect. Thus we have something like the locative alternation: either non-causer may be direct object, in which case it is specified for an effect for which it is not specified as an oblique. Though not canonical locative alternations, (17) share many properties in common with *spray/load* alternations that suggest these two are different manifestations of the same alternation (Fillmore 1977, Dowty 1991, Beavers 2005, 2006). First, both cases involve inherently three argument verbs with the same morphosyntax for the oblique participants (*with*-marking for the locatum, *in(to)/on(to)* marking for the location). Second, the locatum is always intermediate in the force-dynamic chain corresponding to both kinds of events (following the terminology of Croft 1991), i.e. the agent first acts on the locatum and then on the location:

- (18) a. x → y → z b. x → y → z
 ****load***** ****cut*****
 Kim hay wagon Kim diamond window

Finally, the locatum in both kinds of events always moves relative to the location.

Thus we have two verb classes, the *spray/load* and *cut/slice* classes, which describe similar events and exhibit the same argument realization alternation. Yet the contrast depends on the verb class: it is the (under)specification of holistic affectedness for *spray/load* and the (under)specification of affectedness for *cut/slice*. To be sure, the conative also allows both types of contrasts:

- (19) a. Kim ate the pie. (holistic) ⇔ b. Kim ate at the pie. (affected)
 c. Kim cut the pie. (affected) ⇔ d. Kim cut at the pie.

This suggests that the semantics of a given alternation is inherently tied to the verb. In decompositional theories we would expect to treat each verb the same in terms of the geometry of its event templates, e.g. we would expect the *with*-variants of *spray* and *cut* to have the following forms following Levin and Rappaport's (1988) analysis of the locative alternation above (see Guerssel et al. 1985, Laughren 1988 for related decompositions of *cut* in conative alternations):

Several Problems for Predicate Decompositions

- (20) a. *load with*: [[*x* cause [*z* to come to be in STATE]]
 BY MEANS OF [*x* cause [*y* to come to be at *z*]/LOAD]]
 b. *cut with*: [[*x* cause [*z* to come to be in STATE]]
 BY MEANS OF [*x* cause [*y* to come to be at *z*]/CUT]]

But such an analysis would not capture the lexical idiosyncrasy, i.e. the fact that the “same” alternation has different semantics with different verbal roots. Presumably, this comes from the root portion of the decomposition (the only thing differentiating the two representations). However, the link between the root and the event template is rarely explicated in detail in such theories (though see Rapaport Hovav and Levin 1998), and in general the root plays no role in assigning particular semantics to any participant, least of all assigning different semantics to a participant depending on its position in the template.

On an entailment-based approach root dependency follows naturally. Different verbs associate different entailments with their arguments; linking rules determine subset relations dependent on the entailments handed to them by the verb. For example, following Beavers (2005, 2006, in prep), assuming that holistic affectedness entails affectedness, whatever linking rule generates the locative paradigm can be seen as stripping away the strongest entailment of affectedness. *Spray* and *cut* assign different strongest entailments, generating the contrasts in (21).

(21)		spray/load		cut/slice
Entailments:	$\left\{ \begin{array}{l} \text{holistic} \\ \text{affected} \end{array} \right\}$	\supset	$\{\text{affected}\}$	$\left\{ \begin{array}{l} \text{affected} \\ \text{ } \end{array} \right\} \supset \{\}$
Realization:	DO		OBL	DO OBL

Thus the root is what determines the contrast exhibited by a given alternation. In fact, the very notions of “root” and “template” are no longer ontologically distinct on such an approach. Whereas before the template determined the existence of an alternation in terms of structural asymmetries between co-arguments, this work is here done by subset structures between sets of entailments, which are emergent from the entailments that constitute the semantics associated with a given root.

4. Verb Hierarchies

We turn now to the relationships between different verbs regarding their ability to undergo certain alternations. Consider the dative alternation, in which the recipient argument of a three-argument dative verb may be realized as either a first object (FO) of a double-object construction (or as a dative in languages with such a case) or as an allative oblique, marked in English by the preposition *to*:

- (22) a. Kim gave/sent/threw *Sandy* a ball.
 b. Kim gave/sent/threw a ball *to Sandy*.

Croft et al. (2001) show that, crosslinguistically, verbs meaning *give* and verbs meaning *send* form an implicational hierarchy regarding their ability to undergo

this alternation. *Give* is less likely than *send* to show oblique realization, but if *give* alternates then so does *send*. It is commonly assumed that FO realization encodes caused possession while oblique realizations encode directed motion (Green 1974, *inter alia*). Decomposition analyses associate these two meanings with two distinct event templates as in (23), adopted from Rappaport Hovav and Levin (2005) (RH&L).

- (23) a. [x CAUSE [y HAVE z]] (causation-of-possession; recipient is FO)
 b. [x CAUSE [z GO TO y]] (change-of-location; recipient is oblique)

Since prominence in the template determines morphosyntactic prominence, (23a) yields the FO/dative realization of the recipient and (23b) yields the allative realization. Such analyses generally assume that all ditransitives have both meanings available and thus predict the alternation (see e.g. Pinker 1989). But this does not account for Croft et al.'s generalizations that *give* does not always alternate and that there is a predictive relationship between *give* alternating and *send* alternating. RH&L argue instead that *give*-verbs unambiguously encode caused possession, while *send*-verbs are polysemous. The monosemy of *give* is evidenced e.g. in the fact that its recipient argument must be interpretable as a possessor in both the FO and the oblique realization for the sentence to be felicitous (Green 1974), unlike *send*, for which this only holds of the FO variant:

- (24) a. #John sent/gave London a letter. (must be "London office")
 b. John sent/#gave a letter to London. (must be "London office" for *give*)

The monosemy of *give* and the polysemy of *send* explains why in many languages *give*-verbs do not alternate while *send*-verbs do (cf. German, Hebrew; see Francez to appear). However, this does not explain why *give* alternates in English. RH&L argue that *give* alternates in English for information structural and heaviness reasons (among other things; see Wasow 2002), not because of a semantic ambiguity.

This analysis, however, leaves several issues open which are problematic for decomposition approaches. First, why is the allative the relevant oblique marker for *give* when it alternates? If the alternation with *give* is unrelated to the directed motion template in (23b), there is no reason to expect the oblique frame *give* shows up in when it alternates to be the allative one. Yet in all languages we are aware of in which *give* allows an oblique recipient the marker is the allative. Moreover, in Finnish, which lacks a dative case and a double object construction, the allative is the *only* way to realize a recipient (Karlsson 1999). RH&L (2005:11) note that "[r]ecipients can be expressed either as a first object or as the object of the preposition *to*, since they are semantically compatible with both realizations," suggesting a common semantics to allative and FO realization that predicts the correct alternation for *give*. However, no semantic commonality is encoded anywhere in (23), and thus such representations miss an important generalization.

Several Problems for Predicate Decompositions

An entailment-based approach captures these generalizations fairly naturally in terms of shared entailments. We posit the following sets of entailments constituting the roles POSSESSOR and GOAL, which again fall in a subset relation as in (13):

$$(25) \quad \begin{array}{ccc} & \text{POSSESSOR} & \text{GOAL} \\ \left\{ \begin{array}{l} \text{g is the endpoint of a path} \\ \text{g comes to possess a theme x} \end{array} \right\} & \supset & \left\{ \text{g is the endpoint of a path} \right\} \end{array}$$

Both roles share the entailment of denoting the endpoint of some abstract motion of the theme towards the recipient, where a POSSESSOR additionally comes to possess the theme at the end of the event, i.e. POSSESSORS are affected GOALS (as discussed in Jackendoff 1990:267). This notion of path is necessarily abstract (à la Krifka 1998, Beavers to appear): it refers to a scale of the theme coming to be at or with the goal, i.e. a relation of “central coincidence” following Hale and Keyser (2002:208), a necessary precondition on coming to be possessed. The alternation can be captured in terms of the thematic roles *give* and *send* assign to their non-theme arguments and the participants that FO and allative realize, as outlined in (26), while maintaining RH&L’s analysis of *give* as monosemous.

(26)	Verbs	Realization Options
	<i>give</i> : POSSESSOR	FO : POSSESSOR
	<i>send</i> : GOAL	<i>to</i> : GOAL

The alternation follows straightforwardly. The role assigned by *send* is compatible with that realized by *to*, predicting allative realizations with *send*. FO realization is possible as well since it is not incompatible with the role assigned by *send*, but FO realization monotonically adds the entailment of possession (since what FO realizes is a superset of what *send* selects for). Likewise, the role assigned by *give* is compatible with FO realization, predicting that *give* shows this realization option. Crucially, since the role assigned by *give* subsumes that of *to*, allative realization is trivially also possible for *give*. But since *give* inherently determines a stronger semantics the resultant alternation is semantically vacuous (as in (24)). Thus, from the shared entailments in the semantics of the verbs and the realization options we predict that the relevant oblique marker for *give* is the allative, as it is for other dative verbs, something the templates in (23) do not capture.

A second, related issue is the motivation for the alternation with *give*. Assuming that *give* is monosemous, and given that monosemous verbs can nevertheless alternate for reasons of information structure and heaviness, why does *give* not alternate in all languages with an allative marker? Predicate decompositions provide no way of addressing this question. The entailments we posit determine a unique interaction which explains this. *Give* is compatible with oblique realization but always determines a stronger meaning, which interacts with the semantics of FO and *to* to yield a blocking effect: the stronger realization is preferred for expressing the stronger meaning. The allative realization is hence expected to be heavily dispreferred (a preference that may be grammaticalized in some languages). However,

blocking can be overridden if there is some independent need for the alternation. Due to the relative rigidity of English word order, alternations are commonly exploited for various information structural, grammatical, and processing purposes (Givón 1984). Thus, despite its semantic vacuity, the alternation with *give* is motivated functionally in English, overriding the blocking effect. Our explanation of Croft et al.'s generalization is therefore that oblique variants with both *give* and *send* are always possible, but vacuous alternations as with *give* are only exploited in a language in which they are functionally motivated. This predicts the lower frequency of alternations with *give*, and the implicational relationship to *send*.

5. Conclusions

We discussed three properties of argument/oblique alternations, **implicational contrasts**, **root dependency**, and **verb hierarchies**, which a theory of argument realization should capture. We argued that entailment-based approaches provide a language for capturing such generalizations, whereas decomposition based approaches do not, due to their structural nature. In principal, decompositional approaches can be made to capture at least some of these properties, e.g. by augmenting the structures with semantic information that determines argument realization (as in Jackendoff 1990) or else relating decompositions via meaning postulates in a way that predicts the participant-based contrasts discussed above. Yet such augmentations would themselves constitute a semantic structure upon which linking constraints could be stated, obviating the need for the decompositions themselves. Whether this is a desired research program is a matter for future work, but the questions raised here pose challenges for such theories.

6. Acknowledgments

We would like to thank Mark Gawron, Beth Levin, Tanya Nikitina, and Malka Rappaport Hovav for their discussion and comments.

References

- Ackerman, Farrell and John Moore. 2001. *Proto-Properties and Grammatical Encoding: A Correspondence Theory of Argument Selection*. Stanford, CA: CSLI Publications.
- Anderson, Stephen R. 1971. On the Role of Deep Structure in Semantic Interpretation. *Foundations of Language* 7(3):387–396.
- Beavers, John. 2005. A Semantic Analysis of Argument/Oblique Alternations in HPSG. In S. Müller, ed., *Proceedings of the 2005 HPSG Conference*, 28-48. Stanford, CA: CSLI Publications.
- Beavers, John. 2006. Thematic Role Specificity and Argument/Oblique Alternations in English. In *Proceedings of WECOL 2004*. University of Southern California, Los Angeles.

Several Problems for Predicate Decompositions

- Beavers, John. In prep. *Argument/Oblique Alternations and the Structure of Lexical Meaning*. Ph.D. diss., Stanford University.
- Beavers, John. To appear. Scalar Complexity and the Structure of Events. In J. Dölling and T. Heyde-Zybatow, eds., *Event Structures in Linguistic Form and Interpretation*. Berlin: Mouton de Gruyter.
- Croft, William. 1991. *Syntactic Categories and Grammatical Relations: The Cognitive Organization of Information*. Chicago: University of Chicago Press.
- Croft, William, Jóhanna Barðdal, William Hollmann, Maike Nielsen, Violeta Sotirova, and Chiaki Taoka. 2001. Discriminating Verb Meanings: The Case of Transfer Verbs. Handout, LAGB Autumn Meeting, Reading.
- Davis, Anthony. 2001. *Linking by Types in the Hierarchical Lexicon*. Stanford, CA: CSLI Publications.
- Dowty, David. 1979. *Word Meaning and Montague Grammar*. Dordrecht: Reidel.
- Dowty, David. 1989. On the Semantic Content of the Notion ‘Thematic Role’. In G. Chierchia, B. H. Partee, and R. Turner, eds., *Properties, Types, and Meaning*, 69-129. Dordrecht: Kluwer Academic Publishers.
- Dowty, David. 1991. Thematic Proto-roles and Argument Selection. *Language* 67(3):547–619.
- Fillmore, Charles J. 1968. The Case for Case. In E. Bach and R. T. Harms, eds., *Universals in Linguistic Theory*, 1-90. New York: Holt.
- Fillmore, Charles J. 1977. The Case for Case Reopened. In P. Cole and J. M. Sadock, eds., *Grammatical Relations*, 59–82. New York: Academic Press.
- Francez, Itamar. To appear. Possessors, Goals and the Classification of Ditransitive Predicates: Evidence from Hebrew. In *Empirical Issues in Syntax and Semantics 6*.
- Gawron, Jean Mark. 1986. Situations and Prepositions. *Linguistics and Philosophy* 9:327–382.
- Givón, Talmy. 1984. Direct Object and Dative Shifting: Semantic and Pragmatic Case. In F. Plank, ed., *Objects: Towards a Theory of Grammatical Relations*, 151–182. London: Academic Press.
- Green, Georgia. 1974. *Semantic and Syntactic Regularity*. Bloomington, IN: Indiana University Press.
- Gropen, Jess, Steven Pinker, Michelle Hollander, and Richard Goldberg. 1991. Affectedness and Direct Objects: The Role of Lexical Semantics in the Acquisition of Verb Argument Structure. *Cognition* 41:153–195.
- Guerssel, Mohamed, Kenneth Hale, Mary Laughren, Beth Levin, and Josie White Eagle. 1985. A Cross-linguistic Study of Transitivity Alternations. In W. H. Eilfort, P. D. Kroeber, and K. L. Peterson, eds., *CLS 21, Part 2: Papers from the Parasession on Causatives and Agentivity*, 48–63. Chicago Linguistic Society.
- Hale, Kenneth L. and Samuel Jay Keyser. 2002. *Prolegomenon to a Theory of Argument Structure*. Cambridge, MA: MIT Press.
- Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: MIT Press.
- Jeffries, Lesley and Penny Willis. 1984. A Return to the Spray Paint Issue. *Journal*

- of Pragmatics* 8:715–729.
- Karlssohn, Fred. 1999. *Finnish: An Essential Grammar*. New York: Routledge.
- Koenig, Jean-Pierre and Anthony Davis. 2004. The KEY To Lexical Semantic Representations. Ms., University at Buffalo, the State University of New York.
- Krifka, Manfred. 1998. The Origins of Telicity. In S. Rothstein, ed., *Events and Grammar*, 197–235. Dordrecht: Kluwer Academic Publishers.
- Ladusaw, William and David R. Dowty. 1988. Toward a Non-grammatical Account of Thematic Roles. In W. Wilkins, ed., *Thematic Relations*, 62–72. San Diego, CA: Academic Press.
- Laughren, Mary. 1988. Toward a Lexical Representation of Warlpiri Verbs. In W. Wilkins, ed., *Thematic Relations*, 215-242. San Diego, CA: Academic Press.
- Levin, Beth and Malka Rappaport. 1988. What to do with θ -Roles. In W. Wilkins, ed., *Thematic Relations*, 7-36. San Diego, CA: Academic Press.
- Levin, Beth and Malka Rappaport Hovav. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge, MA: MIT Press.
- Pinker, Stephen. 1989. *Learnability and Cognition*. Cambridge, MA: MIT Press.
- Primus, Beatrice. 1999. *Case and Thematic Roles: Ergative, Accusative and Active*. Tübingen: Max Niewmeyer Verlag.
- Rappaport Hovav, Malka and Beth Levin. 1998. Building Verb Meanings. In M. Butt and W. Geuder, eds., *The Projection of Arguments: Lexical and Compositional Factors*, 97-133. Stanford, CA: CSLI Publications.
- Rappaport Hovav, Malka and Beth Levin. 2005. All Dative Verbs are Not Created Equal. Ms., Hebrew University of Jerusalem.
- Van Valin, Robert D. and Randy J. LaPolla. 1997. *Syntax: Structure, Meaning, and Function*. Cambridge, UK: Cambridge University Press.
- Verkuyl, Henk J. 1972. *On the Compositional Nature of the Aspects*. Dordrecht: Reidel.
- Wasow, Thomas. 2002. *Postverbal Behavior*. Stanford, CA: CSLI Publications.
- Wunderlich, Dieter. 1997. Cause and the Structure of Verbs. *Linguistic Inquiry* 28(1):27–68.

John Beavers
Itamar Francez
Stanford University
Department of Linguistics
Margaret Jacks Hall
Stanford, CA 94305-2150

jbeavers@csli.stanford.edu
ifrancez@stanford.edu

Wh-Conditionals in Vietnamese and Chinese: Against Unselective Binding

BENJAMIN BRUENING and THUAN TRAN
University of Delaware

0. Introduction

This paper examines a type of conditional construction in which wh-words appear in pairs, one in each clause of the conditional, as illustrated in Mandarin Chinese in (1), from Cheng and Huang (1996):

- (1) **Shei** xian lai, **shei** jiu xian chi.
who first come who then first eat
'If X comes first, X eats first.'

Cheng and Huang (1996) refer to these conditionals as 'bare conditionals' because they usually lack the word 'if'. However, this is not a general property of these conditionals crosslinguistically (or even in Chinese; see Lin 1996); we therefore refer to them as *wh-conditionals*. The defining property of these conditionals is that they must contain a matched pair of wh-phrases, one in the antecedent and one in the consequent, as illustrated in (1). The two wh-phrases are interpreted as the same variable, as indicated in the English translation.

0.1. The Unselective Binding Analysis

Cheng and Huang (1996) argue that this type of conditional requires an analysis in which the wh-words are open predicates with a variable that comes to be bound by a null (or sometimes overt) adverb of quantification, as illustrated below. If there is no overt adverb of quantification, the variables are bound by a covert necessity operator (NEC), which is essentially a universal quantifier:

- (2) a.
-
- ```
graph TD
 IP1[IP] --- CP[CP]
 IP1 --- IP2[IP]
 CP --- Triangle1[]
 Triangle1 --- CP_text[ni xihuan shei1]
 NEC1[NEC1] --- Triangle1
 IP2 --- Triangle2[]
 Triangle2 --- IP2_text[wo jiu piping shei1]
```

- b.  $\forall x$  [ you like person(x) ]  $\rightarrow$  [ I criticize person(x) ]

The binding of the conditional operator is unselective. It is possible to have multiple pairs of wh-phrases:

- (3) **Shei** yan **shei**, **shei** jiu xiang **shei**.  
 who play who who then resemble who  
 ‘If X plays the role of Y, then X will resemble Y.’  
 (Cheng and Huang 1996)

Cheng and Huang (1996) argue that because wh-conditionals must be analyzed as unselective binding, recent attempts to do without unselective binding (e.g. Heim 1990, von Stechow 1995) are doomed to failure. If Cheng and Huang are right, unselective binding must be available in the grammars of natural languages.

## 0.2 Our Claim

We argue that the unselective binding theory is actually not the best account of wh-conditionals. First, we outline several insurmountable problems for the unselective binding theory. Then we bring in data from Vietnamese which point to an alternative account, one that involves sideward movement (Nunes 2004). Basically, the two wh-phrases form a chain, with both copies pronounced due to a lack of c-command. This theory solves the problems that beset the unselective binding account; it also means that wh-phrases as indefinites are quantifiers, not open predicates, and there is no need for unselective binding.

### 1. Against Unselective Binding

#### 1.1 A Problem with Licensing

In Chinese, wh-phrases can be used as indefinites; however, in this use they are like negative polarity items and require some kind of licenser. Licensers in Chinese include non-factive verbs like ‘think’ (4a), modals (4b), negation (5a), conditional operators (5b), and yes/no question operators (5c):

- (4) a. Wo yiwei ni fandui/kandao **shenme (dongxi)**.  
 I think you oppose/see what thing  
 ‘I thought you were opposed to/saw something.’ (Li 1992)
- b. Wo mingtian hui qu mai ge **shenme dongxi** song ta de.  
 I tomorrow will go buy Cl what thing give him Prt  
 ‘I will go to buy something for him.’ (Lin 1998)
- (5) a. Ta bu xihuan **shenme**.  
 he not like what  
 ‘He doesn’t like anything.’ (Li 1992)

- b. Ruguo ni kandao **shei**, qing jiao ta lai jian wo.  
if you see who please tell him come see me  
'If you see someone, please tell him/her to come see me.'  
(Cheng and Huang 1996)
- c. Ta xihuan **shenme** ma?  
he like what Q  
'Does he like anything?'  
(Li 1992)

In the unselective binding theory, the two wh-phrases in a wh-conditional are indefinites. As such, they must be licensed in Chinese. The problem is that the second clause of a conditional is not a licensing environment. The first wh-phrase is licensed, as the antecedent clause of a conditional is a licensing environment (see 5b), but the consequent clause of a conditional is *not* a licensing environment:

- (6) \*Ruguo ni lai (tongchang) **shei** jiu hui hen gaoting.  
if you come (usually) who then will very happy  
'If you come, someone will (usually) be very happy.'  
(Lin 1998)

A wh-phrase is ungrammatical here as an indefinite, even when there is an adverb of quantification that could bind it as a variable. It is therefore completely mysterious on the unselective binding approach how a wh-indefinite could appear in the second clause of a conditional.

## 1.2. A Contrast between Lexical and Wh-Indefinites

In the unselective binding theory, wh-phrases used as indefinites are open predicates. They are just like lexical indefinites in the classical Kamp/Heim analysis of quantificational variability (Kamp 1981, Heim 1982). Therefore, on the unselective binding theory, one would expect that any indefinite could appear in pairs in a wh-conditional. This is not correct, however; only wh-phrases can:<sup>1</sup>

- (7) a. \*You **ren** xian jinlai, you **ren** xian chi.  
there's person first come there's person first eat  
'If a person<sub>1</sub> first comes, a person<sub>1</sub> first eats.'
- b. \*Ni xihuan **ren**, wo jiu piping **ren**.  
you like person I then criticize person  
'If you like a person<sub>1</sub>, I criticize a person<sub>1</sub>.'

---

<sup>1</sup> Chinese examples without a citation come from informants consulted in the writing of this paper: Yaping Tsai, Chun-chieh Hsu, Perng Wang Adams, and Elenna Tseng—all from Taiwan.

On Cheng and Huang's assumptions, this disparity is completely unexpected. The sentence in (7b), for instance, should permit unselective binding as  $\forall x [ \textit{you like person } (x) ] \rightarrow [ \textit{I criticize person } (x) ]$ .

### 1.3. The Novelty Condition and Condition C

Chierchia (2000), citing Satoshi Tomioka, points out that Cheng and Huang's theory also runs into a problem with the *Novelty Condition* of Heim (1982), which says that an indefinite NP must not have the same index as any NP preceding it. The problem is that wh-phrases in Chinese are indefinites, and in every context but wh-conditionals they must introduce a new discourse referent. Just in wh-conditionals, however, the second wh-phrase does not introduce a new referent, and in fact *must* refer back to the same referent as the first wh-phrase.

Chierchia attempts to fix this problem by adopting a Dynamic Semantics theory of reference, in which indefinites are existential quantifiers. For unselective binding to work, the existential quantifier must be stripped off through the operation of Existential Disclosure (Dekker 1993). The details of this theory are unimportant here; the point to note is that in this theory there is no Novelty Condition. Its effects derive from the fact that indefinites are usually existential quantifiers, which by definition introduce new discourse referents. When the existential quantifier has been removed, however, they do not need to, explaining the co-variation in wh-conditionals.

Chierchia's theory does explain the lack of Novelty Condition effects in wh-conditionals, but it runs into the same problem with the contrast between lexical and wh-indefinites as Cheng and Huang's. In fact, this problem is a general one for any theory that invokes unselective binding.

Chierchia does attempt to solve this problem by hypothesizing that wh-indefinites can occur in pairs in conditionals because they are pronouns. Lexical indefinites are ruled out by Condition C, being R-expressions. Because neither lexical indefinite in a wh-conditional c-commands the other, Chierchia argues that coindexing them would violate Condition C on a revised definition of binding:

- (8) An argument A binds B iff A and B are coindexed and either (i) A c-commands B, or (ii) A is coindexed with a Q-adverb that c-commands B. (Chierchia 2000:27)

In order to rule out lexical indefinites and permit wh-indefinites in wh-conditionals, then, Chierchia has to make two non-standard hypotheses: he has to revise the definition of binding to include binding mediated by a quantificational adverb, and he has to claim that wh-words are pronouns, not R-expressions.

The problem with this theory is that wh-phrases in Chinese *are* subject to Condition C and hence must be R-expressions. This is illustrated in (9), where *shei* is in a Strong Crossover configuration (actually, its wh-in-situ counterpart):

- (9) \***Ta**<sub>1</sub> shuo **shei**<sub>1</sub> xihuan wo meimei?  
he say who like my sister  
'Who<sub>1</sub> did he<sub>1</sub> say likes my sister?'

Chierchia could argue that wh-phrases in questions are R-expressions, but as indefinites are pronouns. This will not work either, though, since wh-indefinites may not be c-commanded even in wh-conditionals:

- (10) a. **Shei** yaoshi shuo **ta**/\***shei** xihuan wo meimei, wo jiu zou **shei**.  
who if say he/\*who like my sister I then hit who  
'If X says that he likes my sister, I hit X.'
- b. **Shei** yaoshi jinlai bu qiaomen, wo jiu gaosu **shei ta**/\***shei**  
who if enter Neg knock I then tell who he/\*who  
hen luman.  
very rude  
'If X enters without knocking, I tell X that he's very rude.'

These facts clearly show that wh-phrases generally, and wh-indefinites in wh-conditionals in particular, are in fact subject to Condition C. They are therefore R-expressions, not pronouns.<sup>2</sup>

Chierchia's suggestion, then, is certainly not correct, and thus he has no way to distinguish between lexical indefinites and wh-indefinites. In fact, this is a problem that will beset any account of wh-conditionals involving unselective binding.

## 2. Wh-Conditionals in Vietnamese

The data we are about to introduce from Vietnamese become particularly important given a related problem for the unselective binding account. This is that a wh-phrase can only take another wh-phrase as its antecedent in a wh-conditional. The indefinite 'a person' is semantically identical to 'who' in the unselective binding theory, so one would expect the following example to be grammatical, contrary to fact:

- (11) \*You **ren** xian jinlai, **shei** xian chi.  
there's person first come who first eat  
'If a person<sub>1</sub> comes first, who<sub>1</sub> eats first.'

Cheng and Huang (1996) attempt to account for this restriction with the constraint below:

---

<sup>2</sup> Compare English *one*, which Chierchia argues to be similar to repeated wh-indefinites in Chinese. This element most certainly is a pronoun, and it can be c-commanded:

(i) If *one* wants to be happy, *one* should tell *one*'s parents to leave *one* alone.

- (12) Cheng and Huang (1996): In a tripartite structure of quantification Q [A] [B], [X<sub>1</sub>, X<sub>2</sub>, ... X<sub>n</sub>] (where n ≥ 1) are variables in A. For every variable in A, there must be an identical variable in B.

That is, a wh-phrase can only be bound by an adverb of quantification that binds an identical wh-phrase. (Note that this does not rule out identical lexical indefinites; also note that it cannot account for the grammatical examples involving pronouns in 10a-b.) However, in Vietnamese wh-conditionals, the anaphoric element in the consequent clause is not a matching wh-phrase:

- (13) a. **Ai** làm, **náy** chịu.  
who do NAY bear  
'If X does (something), X bears responsibility (for it).'
- b. \***Ai** làm, **ai** chịu.  
who do who bear  
'If X does (something), X bears responsibility (for it).'

One could of course claim that the Vietnamese conditional in (13a) is not equivalent to the Chinese wh-conditional. However, this type of conditional in Vietnamese has all of the properties of wh-conditionals in Chinese. In particular, it is impossible to analyze the element *náy* as some type of e-type pronoun; this is the same argument Cheng and Huang gave to show that unselective binding is necessary for Chinese wh-conditionals. Following the logic that Cheng and Huang use to argue that wh-conditionals in Chinese must involve unselective binding, we must conclude that these conditionals in Vietnamese also involve unselective binding, directly contradicting the principle in (12).

First, the element *náy* has a very limited distribution. It only appears in this one context, in the consequent clause of a conditional that contains a wh-phrase in the antecedent (and one other context, illustrated below). E-type pronouns typically have the form and distribution of pronouns or definite descriptions. The element *náy* cannot appear by itself, unlike a pronoun or definite description:

- (14) \***Náy/người ấy** mới đến lúc tám giờ.  
NAY/person that just arrive at eight hour  
'That person just arrived at 8 o'clock.'

E-type pronouns do exist in Vietnamese and can be used in conditionals, as shown in the following examples:

*Wh-Conditionals: Against Unselective Binding*

- (15) **Ai** làm xong bài tập **người ấy**/[e] có thể về trước giờ  
who do finish exercise person that/[e] can go home before hour  
qui định.  
rule  
'Anyone who finishes the exercise can leave earlier than they should.'
- (16) Nếu anh thấy **đứa nào** ném đá anh phạt **nó** cho tôi.  
if you see Cl which throw stone you punish he/she give I  
'If you see any kid throw stones, please punish him/her for me.'

As shown in the data above, e-type pronouns in Vietnamese can be definite descriptions, null pronouns, or overt pronouns. E-type pronouns can also be used to pick up reference cross-sententially, but *nấy* cannot:

- (17) A: **Ai** nộp bài sớm [e] được thêm năm điểm.  
who hand.in paper early [e] receive addition five mark  
'Whoever hands in their paper early will get five more marks.'
- B: Nhưng nếu **\*nấy/người ấy** làm sai thì sao?  
but if NAY/person that do wrong then how  
'But what happens if they do it wrong?'
- A: Nếu **\*nấy/người ấy** làm sai thì bị bớt sáu điểm.  
if NAY/person that do wrong then suffer extract six mark  
'If they do it wrong, they will have six marks taken out of the total.'

If *nấy* were an e-type pronoun, we would expect it to be able to appear in such a context. Instead, it shows the much more limited distribution of the second wh-phrase in a Chinese wh-conditional.

In addition, *nấy* acts just like the wh-phrases in Chinese wh-conditionals in that it cannot occur more than once:

- (18) Anh thích **ai**, tôi nói với **nấy/người ấy** là anh ghét  
you like who, I say with NAY/person that you hate  
**\*nấy/người ấy/họ**.  
NAY/person that/they  
'If you like X, then I tell X that you hate X.'

Above this was used to argue that wh-phrases are subject to Condition C, but it also means that *nấy*, like the second wh-phrase in a Chinese wh-conditional, could not be an e-type pronoun, since e-type pronouns (including those that have the form of definite descriptions) are not subject to Condition C.

Cheng and Huang argued that, because the second element in a wh-conditional could not be analyzed as an e-type pronoun, the only alternative is an

unselective binding analysis. That seems to be the only alternative for Vietnamese, too, but in the preceding section we saw numerous problems with the unselective binding analysis as well.

We suggest that Vietnamese holds a clue to the proper analysis of wh-conditionals. In particular, it cannot be crucial to the interpretation of wh-conditionals that the two clauses of the conditional contain matching NPs that are independently open predicates suitable for unselective binding. The element *náy* is not such an indefinite, and it does not match its antecedent. Above we mentioned that *náy* does appear in one other environment. In subject position, it appears as a constituent with a wh-phrase. The two together are interpreted (apparently) as a universal quantifier:

- (19) **Ai náy** vui vẻ.  
 who NAY happy  
 ‘Everyone is happy.’

Tran (2005) analyzes *náy* in this construction as a demonstrative with the role of a universal quantifier. In order to unify this use with wh-conditionals, however, and because this element can only appear in subject position, we suggest that it is actually an existential quantifier. Universal quantification comes from a null adverb of quantification quantifying over situations, exactly as in a wh-conditional (see below). Just when *ai náy* appears in subject position, it can be parsed as the restrictive clause of the adverb of quantification:

- (20)  $\forall s [\exists x . x \text{ is a person in } s]$   
 $\rightarrow [\exists s' . s \leq s' \ \& \ \text{the person identical to } x \text{ is happy in } s']$

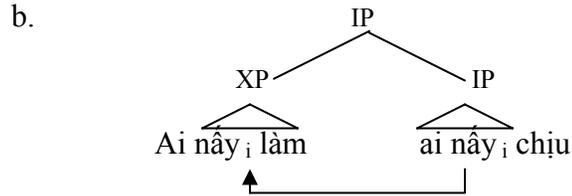
(We assume that subjects are generated internal to VP, so that the trace of the subject serves as the variable in the matrix; see below for the interpretation of traces.) To paraphrase, the sentence in (19) actually means, ‘Every situation where there is a person is a situation where that person is happy.’

In this analysis, *ai náy* is an existential quantifier, and the apparent universal quantification comes from a null operator quantifying over situations.

### 2.1 A Sideward Movement Analysis of Wh-Conditionals

We suggest that, contrary to appearances, *náy* forms a constituent with the wh-phrase in a wh-conditional, too, and the two together have the interpretation given above, as an existential quantifier. The reason they appear to be separate is that this constituent moves from one clause of the conditional to the other; because neither link in the chain c-commands the other, both links have to be spelled out, one as *ai* and the other as *náy*. Thus, we suggest the syntactic representation in (21b) for the wh-conditional in (21a):

- (21) a. Ai làm, ~~nây~~ chịu.  
 who do NAY suffer  
 ‘You are responsible for what you do.’



The type of movement that we are suggesting here is Nunes’s (2004) *Sideward Movement*: the computational system copies a given constituent of a syntactic object K and merges it with a syntactic object L, independently assembled and unconnected to K at the time of movement.

How this theory applies to the sentence in (21) is as follows, assuming that the Numeration of (22a) is that in (22b).

- (22) a. ai làm, ~~nây~~ chịu.  
 b.  $N = \{ \text{làm}_1 \text{ ‘do’}, \text{ai-nây}_1 \text{ ‘everyone’}, \text{chịu}_1 \text{ ‘bear’} \}$

First, we derive the matrix clause by merging the quantified expression with the verb *chịu* ‘bear’: [<sub>IP</sub> ai-nây chịu]. Second, we construct the adjoined clause by making a copy of [ai-nây] and merging that copy as the argument of the verb ‘do’: [<sub>XP</sub> ai-nây làm]. Third, we merge this clause with the main clause previously formed: [<sub>IP</sub> [<sub>XP</sub> ai-nây làm] [<sub>IP</sub> ai-nây chịu]].

We suggest that in such cases of sideward movement, where some link of a chain is not c-commanded by another link in the chain, that link must be spelled out. This is why the first link is spelled out as *ai* and the second link is spelled out as ~~nây~~ (strikeouts indicate lack of pronunciation):

- (23) [~~ai-nây~~]<sub>i</sub> làm [~~ai-nây~~]<sub>i</sub> chịu.  
 who do NAY bear

## 2.2 The Interpretation of Wh-Conditionals

In our analysis, ~~nây~~ in the consequent clause is the trace of the full phrase (which is only partially pronounced) in the antecedent clause. In order to interpret this, we adopt Fox’s (1999, 2002) rule for interpreting traces:

- (24) a. Variable Insertion (Det) Pred  $\rightarrow$  (Det) [Pred  $\lambda y(y=x)$ ]  
 b. Determiner Replacement: (Det) [Pred  $\lambda y(y=x)$ ]  $\rightarrow$  the [Pred  $\lambda y(y=x)$ ]

For instance, after wh-movement applies to a question like *Which boy did Mary visit which boy?* (where strikeouts indicate lack of pronunciation again), the lower

copy (the trace) is converted to *Which boy*  $\lambda x$  [*Mary visited the boy x*].

We also adopt Kratzer's (1989) and Heim's (1990) situation semantics for conditionals. Accordingly, the Vietnamese wh-conditional in (21), repeated below, is interpreted as in (25):

- (21) Ai làm, náy chịu.  
 who do NAY suffer  
 'If X does (it), X suffers (for it).'

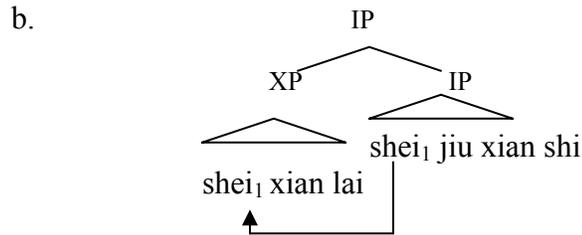
- (25)  $\forall s [\exists x . x \text{ is a person \& } x \text{ does in } s]$   
 $\rightarrow [\exists s' . s \leq s' \text{ \& the person } x \text{ suffers in } s']$

The representation in (25) is exactly what sentence (21) means.

### 3. Chinese Wh-Conditionals from the Vietnamese Perspective

We propose that Chinese wh-conditionals employ sideward movement just like in our analysis of Vietnamese above. However, Chinese is unlike Vietnamese in that each copy is fully pronounced:

- (27) a. Shei xian lai, shei jiu xian chi.  
 who first come who then first eat  
 'If X comes first, X eats first.'



We suggest that this follows from the fact that the Chinese existential quantifier is morphologically simplex, unlike the Vietnamese existential quantifier, which is complex.

Chinese wh-conditionals in our theory are interpreted the same way as Vietnamese wh-conditionals—that is, through situation semantics and the Trace Conversion Rule. The sentence in (27) is then interpreted as in (28).

- (28)  $\forall s [\exists x . x \text{ is a person \& } x \text{ comes first in } s]$   
 $\rightarrow [\exists s' . s \leq s' \text{ \& the person } x \text{ eats first in } s']$

This theory captures the semantics of wh-conditionals, but it does so without unselective binding and without e-type pronouns. The second wh-phrase is the trace of the first.

#### **4. Advantages of the Theory and Conclusion**

The movement theory outlined above resolves the problems that beset the unselective binding theory. First, the licensing conditions on wh-indefinites are met in Chinese, because one member of the chain (the one in the antecedent clause) does occur in a licensing environment. Second, there is no issue with the novelty condition, again because the two wh-phrases are related via movement: they are the same syntactic element. Traces do not introduce new discourse referents.

As for the contrast between wh-indefinites and lexical indefinites like ‘a person’, we suggest that lexical indefinites are unable to undergo sideward movement. Unfortunately, we do not have a complete explanation for this restriction yet, but it is true crosslinguistically that only wh-phrases occur in wh-conditionals (besides Chinese and Vietnamese, Indonesian and Passamaquoddy, that we know of, have wh-conditionals). It seems to be the case that sideward movement is limited to specific kinds of quantifiers, specifically wh-quantifiers. We admit that our explanation here is incomplete, but we believe a natural explanation is much more likely to be found in restrictions on movement than in ad hoc restrictions on unselective binding as were proposed by Cheng and Huang (1996) and Chierchia (2000). We know that wh-phrases undergo special kinds of movement that other phrases do not; in the unselective binding theory, however, all indefinites are treated identically, and they behave the same as far as quantificational variability is concerned.

Finally, the broader implication of this theory is that unselective binding is unnecessary. There is no need to posit unselective binding in the grammars of natural languages; indefinites are always existential quantifiers, and the apparent effects of quantificational variability can be captured through situation semantics and other mechanisms (see Heim 1990, von Stechow 1995).

#### **References**

- Cheng, Lisa L.-S., and C.-T. James Huang. 1996. Two Types of Donkey Sentences. *Natural Language Semantics* 4:121-163.
- Chierchia, Gennaro. 2000. Chinese Conditionals and the Theory of Conditionals. *Journal of East Asian Linguistics* 9:1-54.
- Dekker, Paul. 1993. Existential Disclosure. *Linguistics and Philosophy* 16:561-587.
- Fox, Danny. 1999. Reconstruction, Binding Theory, and the Interpretation of Chains. *Linguistic Inquiry* 30:157-196.
- Fox, Danny. 2002. Antecedent Contained Deletion and the Copy Theory of Movement. *Linguistic Inquiry* 33:63-96.
- Heim, Irene. 1982. The Semantics of Definite and Indefinite Noun Phrases. Ph.D. diss., University of Massachusetts, Amherst.
- Heim, Irene. 1990. E-Type Pronouns and Donkey Anaphora. *Linguistics and Philosophy* 13:137-177.

Benjamin Bruening and Thuan Tran

- Kratzer, Angelika. 1989. An Investigation of the Lumps of Thought. *Linguistics and Philosophy* 12:607-653.
- Li, Yen-Hui Audrey. 1992. Indefinite *Wh* in Mandarin Chinese. *Journal of East Asian Linguistics* 1:125-155.
- Li, Yen-Hui Audrey. 1996. Definite and Indefinite Existential Constructions. *Studies in the Linguistic Sciences* 26:175-191.
- Lin, Jo-Wang. 1996. Polarity Licensing and *Wh*-Phrase Quantification in Chinese. Ph.D. diss., University of Massachusetts, Amherst.
- Lin, Jo-Wang. 1998. Distributivity in Chinese and Its Implications. *Natural Language Semantics* 6:201-243.
- Nunes, Jairo. 2004. *Linearization of Chains and Sideward Movement*. Cambridge, MA: MIT Press.
- Thuan, Tran. 2005. *Wh*-Conditionals in Vietnamese. Paper presented at Theoretical East Asian Linguistics, Harvard University.
- Von Stechow, Kai. 1995. A Minimal Theory of Adverbial Quantification. In Barbara Partee and Hans Kamp, eds., *Context Dependence in the Analysis of Linguistic Meaning: Proceedings of the Workshops in Prague*. IMS Stuttgart Working Papers, 153-193.

Benjamin Bruening  
Department of Linguistics  
University of Delaware  
42 E. Delaware Avenue  
Newark, DE 19716

bruening@udel.edu

Thuan Tran  
Department of Linguistics  
University of Delaware  
42 E. Delaware Avenue  
Newark, DE 19716

tthuan@udel.edu

# **An Analysis of the Use of Cognitive Verbs in American English Conversation**

SUSAN BUESCHER<sup>1</sup>

*University of New Mexico*

## **0. Introduction**

This paper presents an analysis of the interactive functions of the frequent collocations *I know*, *I think*, and *I guess*, all of which involve a first person singular subject and a present tense verb of cognition and are used by participants to negotiate the floor during conversation. Previous studies have demonstrated that these collocations exhibit a high degree of fusion, are syntactically independent, and also have specific discourse functions as epistemic devices (cf. Thompson 2002; Scheibman 2000; Thompson and Mulac 1991a,b; Kärkkäinen 2003). However, little attention has been given to determining the different interactional roles played by these three collocations. Although all of the collocations discussed here involve verbs from the same semantic class that can occur in similar syntactic frames, the actual usage patterns of the collocations within conversation are very different. By combining a quantitative analysis of the characteristics of each collocation in regards to prosody and placement within a speaker turn with a qualitative analysis of the ways in which the collocations function within discourse contexts, this work seeks to show that there are concrete differences in the interactive functions of the collocations *I know*, *I think*, and *I guess*. Furthermore, it is proposed that the functional differences of the collocations are a direct result of the ways in which speakers have adapted certain collocations to meet their interactional needs during talk-in-interaction.

The layout of this paper is as follows: in the next section I discuss the previous research on cognitive verb collocations; in section two I briefly describe the corpus and outline the methodology; in section three I discuss intonation units and their theoretical framework; in section four I provide an analysis of each of the collocations and examine their varying roles as interactive devices in discourse; and finally, I conclude with an explanation of how these results provide evidence of the ways in which speakers manipulate language structure in order to meet

---

<sup>1</sup> I would like to thank Catherine Travis for her insightful comments and suggestions on this analysis.

their interactional needs.

### 1. Corpus-Based Research on Cognitive Verbs

Recent studies based on corpora of naturally occurring discourse have shown that the high-frequency members of the class of cognitive verbs behave differently from low-frequency members and that frequent co-occurrence in certain grammatical constructions (such as with first person singular subjects) can lead to the development of collocations with special pragmatic functions.

In their work on verbs and subjects that occurred with ‘*that-less*’ complements, Thompson and Mulac (1991a,b) found that *I think* and *I guess* are the most frequent collocations to occur without the complementizer *that*, accounting for 65% of the 1287 instances in their data. They propose that these highly frequent complement-taking predicates have been reanalyzed by speakers as epistemic parentheticals, which are syntactically free to occur in various positions. The frequent use of these constructions as epistemic parentheticals illustrates how they have grammaticized from clausal heads to independent elements within discourse.

Related to this, but from a slightly different perspective, Diessel and Tomasello (2001) examined children’s acquisition of complement clauses and found that when children use the verbs *think*, *guess*, *bet*, *mean*, and *know* in a main clause frame, the clause does not actually express a full proposition and instead functions as an epistemic parenthetical. They propose that this is evidence that the formulaic use of mental verbs such as *think*, *know*, and *remember* is acquired prior to the use of these verbs as performative complement-taking verbs.

Phonological reduction also commonly occurs within frequent collocations. Scheibman (2000) demonstrates that the most reduced variants of the auxiliary *don’t* occur in the highly frequent constructions *I don’t know* and *I don’t think*, which she presents as evidence that these constructions behave more like phonologically fused words that are stored as single units. Furthermore, she notes that these single chunks have pragmatic roles in conversation, namely those of epistemic and face-saving devices, and are repeatedly used within specialized discourse environments.

The importance of examining discourse environments as a sign of function is acknowledged by Tao (2001, 2003), who presents analyses of the verbs *remember* and *forget* and suggests that despite their semantic similarities, in actual language use they have very different distributions and discourse functions. While *forget* is used almost exclusively with first person subjects, it frequently occurs in past tense constructions, unlike *remember*, which occurs almost exclusively in the present tense. Tao argues that this restricted range of use of *remember* is evidence that it primarily functions as a metalinguistic device that focuses on the interaction between the participants. He also proposes that the difference in the distribution of these two verbs is directly related to the degree of grammaticization of the constructions in which they occur.

Along similar lines, but by also including the effect of interaction, Kärkkäinen (2003) discusses the role of *I think* as a stance marker and finds that the colloca-

tion occurs most often at the beginning or the middle of a turn, and not at the end. She proposes that having a position near the beginning of the multi-clause turn allows the collocation to have scope over a larger sequence of discourse. Furthermore, she notes that *I think* is not often prosodically independent. When it does occur in its own intonation unit, she proposes that it has a specialized discourse role and is involved in the online planning of utterances, often co-occurring with hesitation devices and pauses.

Finally, Travis (in press) presents an analysis of a set of cognitive verbs in Spanish conversation. She finds that three individual verbs, *saber* 'to know', *creer* 'to believe', and *pensar* 'to think', account for 77% of the data, and that these three verbs occur most frequently in the specific constructions *yo no sé* 'I don't know', *yo creo* 'I believe', *yo pienso* 'I think', and *yo pensé* 'I thought'. She found that the most frequent verbs favored the use of expressed subjects, but did not favor the use of complement clauses, demonstrating that the cognitive verbs do not form a homogenous class; certain members of the class exhibit a higher degree of grammaticization and subjectification than others and for this reason have developed specific pragmatic functions within discourse.

These studies examine the functional effect of frequency on language structure and demonstrate that although the cognitive verbs may be categorized into a single verb class based on similarities in their semantics and syntactic frames, certain members are more specialized than others. Evidence of specialization is obtained through an examination of frequent collocations, specifically in terms of the phonological reduction within the collocations, and the freedom from syntactic constraints. The present work acknowledges the importance of syntactic and phonetic characteristics of collocations, but seeks to add to this field by now examining the specific prosodic characteristics of these collocations, as well as their placement within speaker turns, in order to ultimately determine and clarify the different interactional roles of the collocations *I know*, *I think*, and *I guess*.

## **2. Data and Methodology**

The data for this study have been taken from the Santa Barbara Corpus of Spoken American English (cf. Du Bois et al. 2000, 2003, 2004), which has been transcribed following the transcription conventions developed by Du Bois et al. (1993). The corpus contains data from 38 naturally occurring spontaneous conversations between family and friends, as well as data from 8 informal meetings, lectures, and discussion groups. There are approximately 200,000 words in the corpus, representing a total of 57 hours of speech. The speakers who contributed to the corpus were between 17 and 90 years of age and were from various locations in the U.S.

The six most frequent verbs of cognition to occur in the corpus are presented in Table 1. As can be observed, the two verbs *know* and *think* together account for 90% of the uses of cognitive verbs in the corpus.

**Table 1.** Frequency of the cognitive verbs in the corpus

| <b>verb</b>     | <b>number</b> | <b>%</b> |
|-----------------|---------------|----------|
| <i>know</i>     | 1889          | 61       |
| <i>think</i>    | 898           | 29       |
| <i>remember</i> | 111           | 3        |
| <i>guess</i>    | 105           | 3        |
| <i>believe</i>  | 63            | 2        |
| <i>wonder</i>   | 47            | 2        |
| <b>Total</b>    | 3113          | 100      |

Although these verbs are semantically similar, they each tend to be used a little differently in spoken discourse. Table 2 displays the most frequent collocations in which these six verbs occur.

**Table 2.** Most frequent cognitive verb collocations

| <b>verb</b>     | <b>collocation</b>            | <b># of tokens</b> | <b>% of tokens</b> |
|-----------------|-------------------------------|--------------------|--------------------|
| <i>know</i>     | <i>you know</i>               | 1154               | 61                 |
|                 | <i>I don't know</i>           | 238                | 13                 |
|                 | <i>I know</i>                 | 167                | 9                  |
|                 | other                         | 330                | 17                 |
| <i>think</i>    | <i>I think</i>                | 365                | 41                 |
|                 | <i>I thought</i>              | 134                | 15                 |
|                 | other                         | 399                | 44                 |
| <i>remember</i> | <i>I remember</i>             | 34                 | 31                 |
|                 | <i>Remember!</i> (imperative) | 21                 | 19                 |
|                 | other                         | 56                 | 50                 |
| <i>guess</i>    | <i>I guess</i>                | 100                | 95                 |
|                 | <i>guess what</i>             | 5                  | 5                  |
| <i>believe</i>  | <i>I can't believe</i>        | 10                 | 16                 |
|                 | other                         | 53                 | 84                 |
| <i>wonder</i>   | <i>I wonder</i>               | 28                 | 60                 |
|                 | other                         | 19                 | 40                 |
| <b>Total</b>    |                               | 3113               |                    |

As can be seen in Table 2, the three cognitive verb collocations involving first person singular subjects, with affirmative, present tense verbs, and that also occur

at least 100 times in the corpus are the collocations *I know*, *I think*, and *I guess*. As these three collocations have also often been grouped together as ‘epistemic devices’, *I know*, *I think*, and *I guess* are especially interesting to compare. The rest of this paper will examine in more detail the different interactive roles of these three collocations by focusing on their prosodic characteristics, as well as their placement within speaker turns. Before turning to this discussion, however, I will first review the theoretical framework behind intonation units.

### **3. Intonation Units**

Central to the analysis presented in this paper is the notion of the Intonation Unit (IU), which as described by Chafe (1994:60) is a functionally relevant segment of spoken discourse marked and bounded by several prosodic cues, such as pausing, a pattern of acceleration-deceleration, an overall decline in pitch level, a falling pitch contour at the end, and a change in voice quality. Because spoken discourse is not a continuous flow of sound, but tends to be produced in spurts, it easily lends itself to a division into intonation units.

IUs have several different types of pitch contours, which have different functions within discourse. There are four specific types of IUs described by Du Bois et al. (1993). IUs with final contours are marked by a decrease in pitch; IUs with continuing contours are marked by a rise in pitch; IUs with appealing contours are marked by a high rise in pitch, while truncated IUs have incomplete or unfinished contours. Functionally, a final contour is more likely to be used to mark the end of a turn-taking sequence; a continuing contour usually occurs within a single turn and indicates that the speaker has something more to say; and an appealing contour is likely to be used to engage another participant and elicit a response (Du Bois et al. 1993).

IUs can also be classified according to their lexical content. Chafe (1994) has proposed the following three types of IUs: regulatory IUs, which are used to regulate the interactional flow of discourse and frequently correspond to discourse markers; substantive IUs, which express informational substance and tend to have more words and more complex syntax, often corresponding to complete clauses; and finally, fragmented IUs, which are truncated or unfinished IUs.

The notion of the IU, the type of pitch contour, and the role of regulatory IUs will be applied in the following section in order to better understand the role of the cognitive verb collocations under consideration.

### **4. Cognitive Verb Collocations and Their Role in Interaction**

One aspect of determining the different interactive functions of the collocations *I know*, *I think*, and *I guess* involves determining how often each collocation is prosodically independent from the surrounding material—that is, how often it appears in an IU on its own. As mentioned above, the work presented by Chafe (1994) has discussed how items such as epistemic parentheticals and discourse markers, which frequently occur in their own IUs, have a regulatory role in discourse.

A second variable that can provide evidence about the function of a collocation is related to where it occurs in a speaker's turn. In an ongoing discourse, collocations that occur at the beginning of a speaker's turn tend to be directly related to what the previous speaker has just said, and they perform a function of responding to and acknowledging the other speaker's turn, or serve to align the current speaker's turn with what has previously occurred in the discourse. Collocations that occur in the middle of a speaker's turn or at the end, just before they turn the floor over to another speaker, usually have a function of indicating what the speaker's stance is regarding what is being said within their own turn, and, as discussed by Kärkkäinen (2003), in these cases the collocation may have a larger, more global scope over the speaker's entire turn.

Both of these variables will now be taken into account in the discussion of each collocation, and it will be seen that they are largely dependent upon each other in the management of discourse.

#### 4.1. *I know*

The collocation *I know* has a very unique function in comparison to the other collocations considered here, as it is frequently used by speakers not only as an epistemic stance-marker, but as a response token to acknowledge and agree with what another participant has just said. The distribution of the collocation in terms of prosodic independence and placement in a turn can be seen in Table 3.

**Table 3.** Distribution of *I know*

|                     | prosodically independent |     | not prosodically independent |     | Total |     |
|---------------------|--------------------------|-----|------------------------------|-----|-------|-----|
|                     | N                        | %   | N                            | %   | N     | %   |
| <b>backchannel</b>  | 38                       | 44  | --                           | --  | 38    | 23  |
| <b>turn initial</b> | 40                       | 47  | 6                            | 7   | 46    | 27  |
| <b>turn medial</b>  | 6                        | 7   | 75                           | 93  | 81    | 49  |
| <b>turn final</b>   | 2                        | 2   | --                           | --  | 2     | 1   |
| <b>Total</b>        | 86                       | 100 | 81                           | 100 | 167   | 100 |

As is indicated in Table 3, 86 of the 167 tokens of *I know* (or 51%) occur in an intonation unit on their own. Meanwhile, the combined total of the instances of *I know* as a backchannel or in turn-initial position accounts for 84 of the 167 tokens (or 50%). All of the 46 turn-initial tokens of *I know* are also cases where the collocation occurred in its own IU, except for 6 tokens which consist of fixed phrases such as *I know what you mean*. Both of these characteristics are important aspects of the function of *I know* and demonstrate that speakers use this collocation as a regulatory IU, attending and managing interaction rather than contributing substantive content. Specifically, the fact that approximately half of the uses of the collocation *I know* occur in turn-initial position and also occur within their

## *The Use of Cognitive Verbs in American English*

own IU is strong supporting evidence that this collocation is used as a response token to an interlocutor's turn and indicates acknowledgement.

An example of *I know* as a backchannel can be seen in Kathy's reply to Nathan in example (1).

- (1) Nathan: .. I'm sitting here st- worrying about this one right here,  
and there probably won't even be l- one like this on the test.  
Kathy: ... **I know.**  
Nathan: .. There'll be a different one. (Zero Equals Zero, 579-82)

In this example, Kathy uses *I know* to both acknowledge and agree with what Nathan has just said, without giving any further indication of what it is she knows. When functioning as a backchannel, the collocation *I know* has moved furthest from its meaning of encoding speaker conviction and knowledge and has developed instead intersubjective meaning as an interactional device to attend to the speaker-hearer relationship during talk-in-interaction.

Related to its use as a backchannel for acknowledging another participant's contribution is the use of the collocation *I know* as a response token in turn-initial position. An example of *I know* in this context can be seen in example (2) below, where Marilyn responds to Roy's comment.

- (2) Roy: My but it's hot.  
Marilyn: ... **I know.**  
.. In here you mean?  
Roy: .. Yes. (Conceptual Pesticides, 1481-84)

What is interesting about this example is that Marilyn acknowledges Roy's comment about the heat, and then after doing so asks for clarification. Therefore, it is clear that for Marilyn, the use of the collocation in this context does not refer to her actual knowledge of the topic, but rather acknowledgement of Roy's contribution. Acknowledgement and agreement are very important aspects of negotiating the floor during an ongoing discourse, and the use of *I know* in this environment shows that speakers have adapted this collocation to meet this interactional need.

### **4.2. *I think***

The collocation *I think* is used by speakers to assert their own opinions about a topic. Although *I think* may sometimes serve to hedge, or soften one's assertion, it does not always have a weakening effect and in fact seems to be the standard collocation used in American English conversation for introducing a speaker's own stance. The distribution of *I think* can be seen below in Table 4.

**Table 4.** Distribution of *I think*

|                     | prosodically independent |     | not prosodically independent |     | Total |     |
|---------------------|--------------------------|-----|------------------------------|-----|-------|-----|
|                     | N                        | %   | N                            | %   | N     | %   |
| <b>backchannel</b>  | 1                        | 6   | --                           | --  | 1     | < 1 |
| <b>turn initial</b> | 12                       | 75  | 115                          | 33  | 127   | 35  |
| <b>turn medial</b>  | 2                        | 13  | 223                          | 64  | 225   | 62  |
| <b>turn final</b>   | 1                        | 6   | 11                           | 3   | 12    | 3   |
| <b>Total</b>        | 16                       | 100 | 349                          | 100 | 365   | 100 |

As can be observed in Table 4, *I think* rarely occurs in its own IU; instead, 349 of the 365 instances (or 96%) occur in an IU with other material. The fact that it occurs so often with other material, lacking prosodic independence, is an indication that it has a close relationship with the rest of the speaker's utterance. In addition to this, of the 16 cases involving *I think* in its own IU, 63% occurred with a non-final intonation contour, indicating that the collocation is tightly connected to what follows it.

In 225 of the 365 occurrences of *I think* (or 62%), the collocation is used in turn-medial position, where it often functions to assert an individual's opinion or stance toward the other material uttered in their turn. An instance of *I think* occurring in this position can be seen in example (3), where Lajuan indicates his opinion about why football players are attracted to him.

- (3) Lajuan: .. And .. and what really gets me is th- % that,  
 ... (TSK) (H) **I think**,  
 .. the reason I always attra=cted,  
 like I attracted a lot of football players,  
 (H) is people always .. got the impression .. I was gay=  
 (He Knows, 1354-58)

Another example of *I think* functioning to assert a speaker's stance can be seen in example (4), in which Ken shares his opinion about a slide show with Joanne. In this example, *I think* occurs twice, once in turn-initial position and once in turn-medial position, in both cases with the same function.

- (4) Joanne: But,  
 so these slides <X should X> be real interesting.  
 Ken: ... Yeah.  
**I think** it'll be real interesting,  
**I think** it'll be a real,  
 (H) a good slide show. (Deadly, 1-6)

*The Use of Cognitive Verbs in American English*

In both examples (3) and (4), the speakers use the collocation *I think* to assert their stance on the following utterances. In example (4), Ken even uses the collocation *I think* twice, as if to make sure that his opinion on the slide show is noticed by Joanne. Furthermore, in neither of the examples is there any evidence that the use of *I think* serves to make the statement weaker. On the contrary, in (4), Ken uses the emphatic *real* to emphasize how interesting the slide show will be. These examples show that the specialized function of *I think* is very different from either *I know* or *I guess*, as it used primarily by speakers to make their own assertions and positions known.

**4.3. *I guess***

The collocation *I guess* has a specialized function of acting as an evidential type of marker (cf. Chafe 1986) and is used to mark a statement that is the result of drawing a conclusion based on evidence given, or is expressing knowledge that was obtained from another source. In order to encode the statement they are making as the result of some kind of circumstantial evidence, speakers commonly use the collocation *I guess*. This function is evidenced by the distribution of the collocation which is shown in Table 5.

**Table 5.** Distribution of *I guess*

|                     | prosodically independent |     | not prosodically independent |     | Total |     |
|---------------------|--------------------------|-----|------------------------------|-----|-------|-----|
|                     | N                        | %   | N                            | %   | N     | %   |
| <b>backchannel</b>  | --                       | --  | --                           | --  | --    | --  |
| <b>turn initial</b> | 8                        | 35  | 27                           | 35  | 35    | 35  |
| <b>turn medial</b>  | 10                       | 43  | 45                           | 58  | 55    | 55  |
| <b>turn final</b>   | 5                        | 22  | 5                            | 7   | 10    | 10  |
| <b>Total</b>        | 23                       | 100 | 77                           | 100 | 100   | 100 |

Unlike *I know*, the collocation *I guess* never occurs as a backchannel, and only 23 of the 100 tokens (or 35%) occur in prosodically independent IUs. The position that it occurs in most frequently is turn-medial, which accounts for 55% of the instances found in the corpus. The fact that it occurs so often in the midst of a speaker's own turn is evidence that *I guess* is used to modify what the current speaker is saying, rather than as a response to what was said by the speaker of the preceding turn. This is demonstrated in example (5), in which Seth makes a statement about his brother's research.

- (5) Seth: ... Yeah,  
my brother is uh,  
... teaches linguistics,  
and **I guess** he's doing this study,

- Larry: Oh=,  
<X okay X>,  
Seth: ... and they just want ... business conversations.  
Larry: ... alright. (Ancient Furnace, 127-134)

In this example, Seth has clearly been informed about his brother's research, and can therefore be said to have some knowledge of the subject. Nevertheless, when describing the project to someone else, he uses the collocation *I guess* to distance himself from what is being said and indicate that he is not the one responsible and may therefore not know all of the details. His choice to use *I guess* in this context is directly related to the fact that he is threatening Larry's face in asking him to be recorded for the project. Because he risks receiving a dispreferred response with this request, the distance provided by the evidential marker helps to attend to this face-threatening situation.

Further evidence supporting the claim that *I guess* is used as an evidential marker is its frequent co-occurrence with other evidentials and markers of hearsay. Example (6) below demonstrates the use of *I guess* in co-occurrence with the words *apparently* and *they say*, which also serve to imply that the statement is based upon some kind of hearsay. In this example, Frank is relating to some friends the news of another friend's recent death while in Africa.

- (6) Frank: (H) But apparently it was either a heart attack or an aneurysm,  
Ron: Hm.  
Frank: and they suspect an aneurysm,  
it was extremely quick,  
I guess. (Doesn't Work in This Household, 870-74)

Frank makes use of both the collocation *I guess* and the words *apparently* and *they say* to distance himself from the statements he is making regarding this event. The discourse context which gives rise to this situation is the discussion of a death which occurred overseas and is therefore somewhat unknown. In this context, Frank feels the need to remain partially removed from the information he is sharing with his friends. Furthermore, by placing *I guess* at the end of his turn Frank ensures that the collocation has scope over everything he has just said.

The use of *I guess* with this evidential meaning is a result of the interactional need between discourse participants for marking secondhand information and maintaining distance. Although English lacks a grammatical evidential system, speakers have adapted the collocation *I guess* to meet this interactional need. The fact that *guess* is the verb with the most highly restricted distribution and is used 95% of the time in conversational discourse in the specific collocation *I guess*, as was observed earlier in Table 2, is further evidence to support the claim that this collocation has developed the discourse function of an evidential marker.

## 5. Conclusion

This paper has examined the three semantically and syntactically similar collocations *I know*, *I think*, and *I guess*. Through consideration of prosodic characteristics and placement within the turn, it has been shown that in fact these three collocations serve very different interactional roles. *I know* is used primarily to attend to the speaker-hearer relationship, showing acknowledgement and agreement of what has been said in a prior turn, as reflected in its frequent use in an IU on its own as a backchannel or at the beginning of a turn. The collocation *I think* is used to present a speaker's stance toward their utterance. The tight connection between *I think* and the other utterances in a speaker's turn is reflected in the fact that it occurs almost exclusively in an IU with other material. *I guess* occurs most often in turn-medial position, and is used mainly as an evidential device encoding a speaker's statement as based on hearsay and secondhand knowledge. This study demonstrates that the specialization of the collocations is a direct result of how they are used by conversationalists to accomplish the work they have during talk-in-interaction.

### Transcription Conventions (Du Bois et al. 1993)

|       |                               |      |                          |
|-------|-------------------------------|------|--------------------------|
| .     | final intonation contour      | ...  | medium pause (~ 0.7 sec) |
| ,     | continuing intonation contour | ..   | short pause (< 0.7 sec.) |
| ?     | appealing intonation contour  | %    | glottal stop             |
| --    | truncated intonation contour  | =    | lengthened syllable      |
| (TSK) | alveolar click                | (H)  | audible inhalation       |
| <X X> | uncertain hearing             | (Hx) | audible exhalation       |

## References

- Chafe, Wallace. 1986. Evidentiality in English Conversation and Academic Writing. In W. Chafe and J. Nichols, eds., *Evidentiality: The Linguistic Encoding of Epistemology*, 261-272. Norwood, NJ: Ablex Publishing Corporation.
- Chafe, Wallace. 1994. *Discourse, Consciousness and Time: The Flow and Displacement of Conscious Experience in Speaking and Writing*. Chicago: University of Chicago Press.
- Diessel, Holger, and Michael Tomasello. 2001. The Acquisition of Finite Complement Clauses in English: A Corpus-Based Analysis. *Cognitive Linguistics* 12(2):97-141.
- Du Bois, John W. 2000. *Santa Barbara Corpus of Spoken American English, Part I* [3 CD-ROMs]. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.
- Du Bois, John W., Wallace L. Chafe, Charles Meyer, Sandra A. Thompson, and Nii Martev. 2003. *Santa Barbara Corpus of Spoken American English, Part II*

Susan Buescher

- [1 DVD]. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.
- Du Bois, John W., and Robert Englebretson. 2004. *Santa Barbara Corpus of Spoken American English, Part III* [1 DVD]. Philadelphia: Linguistic Data Consortium, University of Pennsylvania.
- Du Bois, John W., Stephan Schuetze-Coburn, Susanna Cumming, and Danae Paolino. 1993. Outline of Discourse Transcription. In Jane Edwards and Martin Lampert, eds., *Talking Data: Transcription and Coding in Discourse*, 45-89. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Kärkkäinen, Elise. 2003. Epistemic Stance in English Conversation: A Description of Its Interactional Functions with a Focus on *I think*. Amsterdam: John Benjamins.
- Scheibman, Joanne. 2000. *I dunno*: A Usage-Based Account of the Phonological Reduction of *don't* in American English Conversation. *Journal of Pragmatics* 32(1):105-124.
- Tao, Hongyin. 2003. A Usage-Based Approach to Argument Structure: *remember* and *forget* in Spoken English. *International Journal of Corpus Linguistics* 8(1):75-95.
- Tao, Hongyin. 2001. Discovering the Usual with Corpora: The Case of *remember*. In Rita C. Simpson and John M. Swales, eds., *Corpus Linguistics in North America*, 116-144. Ann Arbor: University of Michigan Press.
- Thompson, Sandra A. 2002. 'Object Complements' and Conversation: Towards a Realistic Account. *Studies in Language* 26(1):125-163.
- Thompson, Sandra A., and Anthony Mulac. 1991a. The Discourse Conditions for the Use of the Complementizer 'that' in Conversational English. *Journal of Pragmatics* 15:237-251.
- Thompson, Sandra A., and Anthony Mulac. 1991b. A Quantitative Perspective on the Grammaticization of Epistemic Parentheticals in English. In Elizabeth Closs Traugott and Bernd Heine, eds., *Approaches to Grammaticalization, Vol. 1*, 313-329. Amsterdam: John Benjamins.
- Travis, Catherine E. In press. Subjetivización de construcciones: Los verbos 'cognitivos' en el español conversacional. *Serie Memorias del VIII Encuentro Internacional de Lingüística en el Noroeste*.

Susan Buescher  
University of New Mexico  
Department of Linguistics  
Humanities Building, Room 526  
Albuquerque, NM 87131-1196

suesmb@unm.edu

# Methods for the Study of the Social Structure of Linguistic Variation

KATHRYN CAMPBELL-KIBLER  
*Stanford University*

## 0. Introduction

Sociolinguists have long observed that linguistic variation correlates with a variety of social structures. In recent years, variation research has devoted increasing attention to social meaning, the idea that speakers use linguistic structures to build their identities and shape the situations and larger societal structures in which they participate. Although it is not usually presented in such terms, the concept of social meaning embodies a claim about cognition: linguistic variation and social practice not only correlate, but are linked, consciously or unconsciously, in speaker awareness.

To test this claim, I used the Matched Guise Technique (MGT), a tool developed by William Lambert and his colleagues in the 1960s (Lambert et al. 1960) to examine the English variable (ING) (e.g. *working* vs. *workin'*). In designing my study, I included a number of unusual and important features: using digitally manipulated speech, creating stimuli from spontaneous as opposed to read speech, and conducting both open-ended group interviews and a controlled experiment. The aim of these techniques is to uncover the social meaning of a single linguistic variable from the listener's point of view in a nuanced and rigorous manner. The next section will discuss the MGT literature, while Section 3 describes the key features I have incorporated into my study. I will then step through the details of the methods, describing in detail the procedures followed for generating the stimulus materials, manipulating the recordings, and collecting both the qualitative and quantitative data. Finally, I will briefly touch on the nature of the insights provided by these techniques.

## 1. The Matched Guise Technique

The study of language attitudes encompasses a range of approaches, including overt questioning, media analysis, and perceptual dialectology. The MGT was developed in the 1960s by William Lambert and his colleagues to covertly elicit individuals' attitudes towards members of different ethnolinguistic groups (Lambert et al. 1960). The technique involves having a single speaker produce

two (or more) utterances in different languages or varieties. Participants listen to the recordings and evaluate them on a range of qualities, such as how intelligent, educated, friendly, or trustworthy the speakers sound. Because listeners are not told that the alternate recordings have been produced by the same person, they evaluate each guise (language or accent performance) as an individual speaker. However, because the recordings have been produced by the same person, many of the paralinguistic cues are (hopefully) held constant, for example speech rate, pitch contours, and various aspects of voice quality. The content of the utterance is also usually held constant, so that any differences between the evaluations can be (in theory) assigned to different perceptions of the languages or varieties under study.

Research using the MGT has been carried out on a range of linguistic situations comparing multiple languages, such as French and English in Canada (Genesee and Holobow 1989), and language varieties, such as regional accents in England (Dixon et al. 2002). There has also been research into smaller units of difference, such as speech rate (Giles et al. 1992). Other work has employed the MGT to investigate evaluative reactions to specific sociolinguistic variables (Plichta and Preston 2005).

As the linguistic units of analysis become more detailed, we begin to stretch the notion of “attitude” to its limit. It may seem natural to talk of a listener’s attitude towards French or a Southern accent. It is somewhat less so to speak of their attitude towards the length of /s/ in an utterance. If we are to successfully marry the fields of language attitudes and variation, a better understanding of the construct attitude is needed. Sociolinguists not only must understand the psychosocial significance of a listener’s overall “attitude” towards a speaker, but also merge this understanding into our existing models of social meaning. This study documents a connection between the use of a given variant of (ING) in a specific situation and a change in the rating of a listener on a list of labeled scales. In social psychology terms, we are establishing information about the relative attitudes of the listener(s) to the two linguistic styles presented. This opens the question of how to translate that information into knowledge about the specific variables themselves and what the theoretical relationship is between the behavior changes registered by the measure and the concepts of “social meaning” or “indexing”. This bridge is not yet built, but its construction represents the central theoretical work of the research program of which this project is a part.

## **2. Methodological Choices**

The current study draws on a range of methodological techniques including the use of digitally manipulated stimuli, the use of speech from interviews rather than reading passages, the inclusion of multiple samples from each speaker, and the use of both open-ended interviews and a survey. Before going over the methods of my study in detail, I will touch on each of these tools to mention its previous uses and discuss its importance.

As advances in digital technology make it easier and less expensive to create

natural-sounding manipulated tokens, sociolinguists have become increasingly interested in creating MGT studies which explore specific variables. Thirty years ago, it was possible to use technology to change the rate, pitch, and pitch variation of a sample of speech (Brown et al. 1973). Today, we can use available software to alter the formants of a vowel (Graff et al. 1986, Fridland et al. 2004, Plichta and Preston 2005). While the current technology cannot yet directly alter a nasal, it does allow a “cut and paste” approach to produce a natural-sounding token, as in this project as well as Labov et al. (2005).

The benefit of digital manipulation is the precise control it gives. Without it, to construct matched stimuli one must have speakers perform each version, consciously shifting the variables as they speak. This can be straightforward when investigating attitudes towards whole languages or varieties, given access to perfectly bilingual or bidialectal speakers. When exploring more “molecular” variables (Scherer 1979), it becomes difficult to ensure that only the variable in question is affected. We understand very little about how different variables interact in the perception process, so it is unclear how far we can trust our judgments regarding whether other aspects of the performance have changed. We can still gather interesting and relevant information regarding the larger perceptual consequences of, say, fast or slow speech. What we cannot do is be sure what the precise linguistic triggers of this perceptual change are, something which is possible with more precise alteration.

Another advantage of digital manipulation is that by eliminating the need for conscious control on the part of the speaker it allows a wider range of speakers and speaking situations. It is possible to use naïve speakers, monolingual speakers and even, as here, samples from spontaneous speech. Much of the literature on the MGT has used read speech, although there have been exceptions (e.g. Wölck 1973, Apple et al. 1979, Graff et al. 1986). A significant body of work documents the differences between read and spontaneous speech with respect to prosody in particular (Hirose and Kawanami 2002). Further, listeners easily read these cues to recognize read speech (Levin et al. 1994). A few studies have shown that listener evaluations differ based on the reading/speaking distinction (Giles et al. 1980, Smith and Bailey 1980). This evidence makes it problematic to assume the results for read speech will reflect percepts in real, spontaneous interactions.

One of the potential drawbacks to using spontaneous speech is that it is difficult to control the content of the recordings. Unsurprisingly, the content of what speakers say impacts the judgments others make about them. Despite the control over the contrasting guises from the manipulation, the different speakers are presented saying different things. The effects of context are not eliminated, of course, in using read speech. Content and factors like word choice and sentence structure influence the interpretation of the speaker and may influence the role of other variables, including the ones of interest in a given study (see Giles et al. 1990). I included four recordings from each speaker, in order to begin to explore the role of content as well as provide some variation within the data from each speaker. Nonetheless, the content of the recordings varied widely across speakers,

and this variation had an impact on the results.

The final key methodological choice is the combination of qualitative data from group interviews with quantitative data from a survey-based experiment. Using multiple types of data helps to guard against the drawbacks characteristic of each while capitalizing on their strengths. Qualitative data is rich in nuance and provides insight into the ideologies and conscious thought processes involved in the evaluative process. The drawbacks are that these conscious processes may play a relatively minor role in the evaluative system, and the very richness of the data makes it difficult to be sure of the generalizability of the patterns found. Incorporating experimental data addresses both of these issues by collecting a larger and more easily quantified set of responses from listeners unaware of the linguistic features under study. The primary drawback of this data type, namely the difficulty of interpreting the reasoning behind the results, is countered by the interview data (Giles et al. 1990). Finally, by conducting interviews first, I was able to use them as a pilot to ensure a useful survey instrument (Williams et al. 1976).

The next section will be devoted to describing the methods of the study in detail, beginning with the creation and manipulation of the recordings, then describing the methods for data collection and finally the statistical analyses.

### 3. The Study

The existing literature and an early pilot for the current study suggested that there may be regional differences in the use and interpretation of (ING). Accordingly, I sought participants from two distinct areas in the U.S., one in the South (North Carolina) and one outside the South (California). Both speakers and listeners were university students. (1) gives the names (pseudonyms) of the speakers, divided by region and sex.

(1) Speakers, by region and sex

|                | Women                | Men            |
|----------------|----------------------|----------------|
| North Carolina | Bonnie<br>Tricia     | Robert<br>Ivan |
| California     | Elizabeth<br>Valerie | Sam<br>Jason   |

The speakers were all attending school in the state specified and had been raised in state, with the exception of the California speaker Elizabeth, who was originally from Seattle. All eight speakers were white.

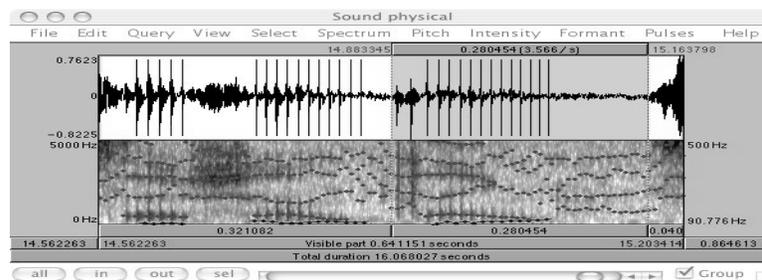
#### 3.1. Creating the Stimuli

To make the recordings, I met with each speaker twice, first for a sociolinguistic interview and again to generate (ING) tokens for splicing. The interview focused on schoolwork or other work experiences and their recreational activities and/or families. After each interview, I transcribed the resulting tape, then met again

with the speaker, explaining in more detail the point of the study, including the variable to be manipulated. I asked them to produce alternate tokens for each instance of (ING) from the original interview, both *-in* and *-ing* tokens in the same phrase used in the original.

Once the raw material was available, the next step was to select short clips to use in the study. I chose four passages from each speaker, two about school or work and two on recreational or family topics. Each excerpt was a single uninterrupted turn, with only the speaker's voice audible on the tape. In a handful of cases, I used adjacent turns of speech and clipped out an intervening prompt. The clips ranged from 10 to 20 seconds in length and contained two to six tokens of (ING) each. I used the software package Praat to digitally manipulate the selections, splicing in both *-in* and *-ing* variants, to minimize confounding differences introduced by the manipulation. (2) shows an image of the window used to select exactly the phonetic material to be cut and pasted.

(2) Selecting the appropriate material: thing out of something

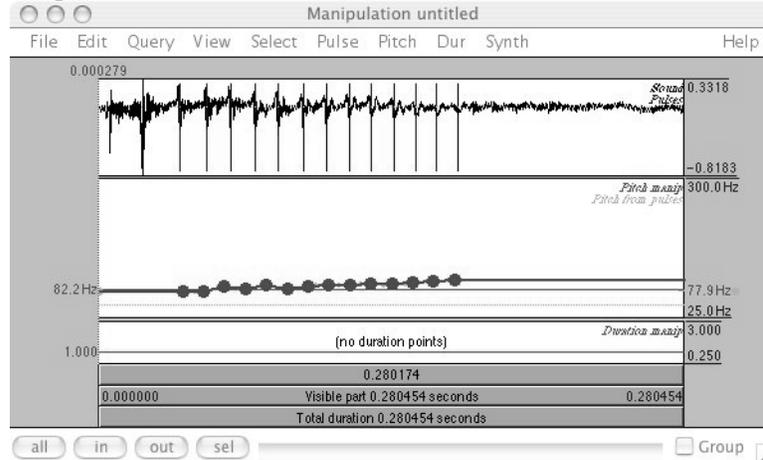


In selecting the points for splicing, I looked for either a pause, a stop closure, or a point within a stable sonorant. If it was necessary to make the change point in the middle of a sonorant, I used Praat's formant tracking feature to find points in each alternate and the original which were similarly located in time and matching roughly in their formant values. Once the boundaries of the three tokens were selected, I adjusted the tokens to be spliced in with respect to pitch, intensity, and length. I used Praat's facilities for examining and altering these qualities to match the alternates to the original as much as possible. I excerpted the pitch track from the original and used it to resynthesize the alternate tokens. I also altered the length of the alternates, usually to match the length of the original. In some cases, it was necessary to adjust the lengths of the vowel and nasal separately to match across tokens.

In other cases, the length or pitch of the two alternate tokens diverged so remarkably from the original that altering them both to match it resulted in a bizarre or impossible utterance. When this happened I placed priority on matching the manipulated alternates to each other and on obtaining a natural sound. The result often was that the newly manipulated recordings featured (ING) in a more promi-

ment and easily heard setting than the original token from the interview, meaning the process changed the social content of the recording in a very real way.

(3) The manipulation window



The issue of how similar the two members of the minimal pair needed to be was a tricky one. (ING) has been well studied as a sociolinguistic variable, but little work has been done concerning the specific phonetic attributes of the variants and how they differ, if at all. Under normal circumstances there may be regular differences between the two variants with respect to, for example, length. If there are such differences, it is not immediately clear what would constitute a minimal pair. On one hand, using the same lengths and pitches would create the most strictly similar tokens. On the other, if the normative lengths for the two variants differ, using identical lengths shifts the comparison to one between a typical token of one variant and an atypical token of another.

Once all of the recordings had been created, I ran a short pilot to confirm that the tokens were identifiable as the variants intended, using excerpts from the manipulated recordings, including a couple of words on each side of each token. Listeners were asked to identify whether each token was *-in* or *-ing* and to indicate whether the recording sounded strange. Each token was heard by at least five listeners, and tokens with more than two misclassifications or reports of strange sound were remanipulated and repiloted.

**4. Gathering Data**

Once the manipulated recordings were finished and tested, the next step was to collect open-ended responses. In conducting the group interviews I had two goals: to determine the general reactions to the speakers in each recording and the words used spontaneously to describe them, and to gather native speaker intuitions regarding (ING) and its effect on these particular utterances. In order to keep the

task a reasonable length, I divided the recordings by gender and content. One group heard only recordings of men discussing work-related topics, another heard men discussing recreational topics, and so on. The groups ranged in number from one-on-one interviews up to groups with six participants. The bulk of the interviews were with two or three participants.

I began by explaining the purpose of the study, that I was trying to learn about how small differences in the way we speak influence how we are perceived. For the first portion of the interview, I went through each of the four speakers, asking general questions: What can you tell me about Jason? Does he sound competent or good at what he does? Is he someone you would be likely to be friends with? Who do you think he's talking to? What is the context of the conversation? Where do you think he is from?

After going through the four speakers once, we listened to a second recording from each speaker in which they said different things on the same kind of topic, either work or recreation. The second recording for each speaker contained a different variant of (ING) than the first, but this was not brought to the attention of the participants. I asked participants to discuss if and how the second recording changed their impression of the speaker and whether the context seemed to be the same as the first recording.

Transitioning to the second half of the interview, I explained the goal of my study in more detail, introducing the variable (ING). I played each of eight recordings once more, this time with their opposing (ING) guise, explicitly identifying which guise we were hearing at each step. For each pair, I asked how the change in (ING) influenced their perception of the speaker, if at all. The whole interview took approximately one hour. In all, 20 groups consisting of 55 participants were analyzed, one group having been eliminated due to problems with the recording and another due to a preponderance of non-native speakers.

After completing and transcribing the interviews, I moved on to the experimental phase of the study. The interviews and the survey collected very different kinds of information. The interviews elicited explicit ideologies involving (ING) and reactions to the recordings overall. The goal of the survey was to investigate covert reactions to (ING), testing which meanings are actually influenced in online interpretation of speakers. The first step in developing the experimental design for the survey was analyzing the interview data for the descriptions to use in the survey. In selecting terms used in the interviews, I used two primary criteria. I sought the most central characterizations of the speakers, on the basis of which characterizations were most frequently mentioned, mentioned early on in the interviews, and frequently presupposed. I also selected terms which were frequently referenced in the discussions of (ING). Although I drew primarily on the interview data, I also combined these with concepts drawn from the production literature on (ING) and in the language attitudes literature.

Listeners in the survey heard one recording each from all eight speakers, in one of two possible orders, one randomly generated and the other its reverse. At the beginning of the survey, participants filled out a brief demographic question-

naire asking for their age, the school they attended, the countries or states they had lived in, and their racial or ethnic identity. After this preliminary page, listeners responded to eight survey pages, one for each recording. The survey form had six sections. The first was a set of adjective scales ranging from 1 to 6, shown in (4). Note that the last item was labeled either masculine or feminine according to the gender of the speaker. Although these qualities are by no means mirror images of each other, time constraints necessitated that I limit myself to only one per speaker.

(4) Adjective scales

Survey

He sounds:

Casual       Formal

Intelligent       Not Intelligent

Educated       Not Educated

Very Accented       Not At All Accented

Very Shy       Very Outgoing

Talking Very Slow       Talking Very Fast

Not At All Masculine       Very Masculine

In the second section, listeners were asked to indicate how old the speaker sounded, given the choice of five checkboxes labeled with different age ranges: teenager, college-age, under 30, in his/her 30s, and over 40. Listeners were required to select at least one age description, but could select as many as they chose in any combination. The next section contained an adjective checklist listing a range of personal qualities, such as lazy and religious, and social categories or professions, such as redneck and artist. After these personal descriptions came questions relating to the context. There was another six-point scale asking how well the speaker knew the addressee, ranging from best friend to stranger. Another set of checkboxes asked about speech activities, such as joking and chatting, and stances, such as bored and polite.

Lastly, the listeners were asked to guess the background of the speaker. Eight options for region were provided: the South, New England, the Midwest, the West Coast, the East Coast, the Southwest, the North, and anywhere. There were also options referring to community type: whether the speaker was from the city, the country, or the suburbs. The last set of boxes asked about class background: whether the speaker was from a working class background, a middle class background, or a wealthy background. In each of the checkbox sections except for age, one of the boxes labeled 'other' provided listeners with the opportunity to add their own descriptors. At the end of the page, an open-ended question invited them to add any remaining thoughts they had about the speaker. After listening to

all eight speakers, listeners were presented with a page giving options involving incentives and giving them an opportunity to send comments or feedback.

The survey itself was administered over the World Wide Web, allowing for a wider geographic distribution on a smaller budget. The length of the survey was adjusted to allow listeners to complete the entire process in approximately 15 minutes. This included reading over the consent form, filling out the demographic questionnaire and completing eight individual web forms, one for each speaker. A total of 124 participants completed the study. An additional 36 began it but failed to finish, and their data were removed from the analyses.

## **5. Structure of the Data**

These procedures created a data set of such richness that, with the number of participants I had, I was able to only scratch the surface of the interactions and connections present. Different statistical techniques were needed for examining the three different categories of variables involved: independent variables, checkbox variables and rating variables. The independent variables gave information about which recording was being evaluated (the speaker, the recording itself, and the (ING) variant) and about the listener (school, gender, regional background, and race). The checkbox variables were binary (or nominal) variables indicating which yes/no attributes the listener had selected (e.g. articulate, artist). The ratings variables were numerical (or interval level) variables, ranging in number from 1 to 6 (e.g. not at all educated/very educated), indicating the listeners' selections on these scales.

I used the Chi Square test to investigate the influence of the independent variables on the checkbox variables, as well as levels of co-occurrence between the checkbox variables. To analyze the ratings variables, I used analysis of variance (ANOVA). These analyses examined both the influence of the independent variables on ratings and the relationship between checkbox variables and rating variables. I accomplished this latter task by temporarily treating a checkbox variable as an "independent" variable and using it as a term in an ANOVA run. Because of this, I used a hierarchical approach to the analysis of variance in which the order of the independent variables (or those being treated as independent for the purposes of the ANOVA) are considered in an order specified by the analyst. Thus, if the variable indicating which recording is being evaluated is listed first, it will be considered first; then its effects will be subtracted out of the analysis for the next term listed.

The bulk of the variables used in my analysis of variance fell into a clear logical hierarchy. The speaker in the recording or the choice of recording itself clearly accounted for the lion's share of variance in nearly all the responses, since listeners were most influenced in their judgments by which speaker they heard talking and what the person said. These two variables were the first terms. The next term in every round was (ING), then the listener characteristics: gender, race, school and regional background. These variables are much more difficult to rank in a theoretically justifiable way. However, the size of the data set made it difficult to

explore interactions between more than one of these in any case, so only one was included in each round of ANOVA.

The last possible category of terms is the checkbox variables discussed above. Although these variables are, strictly speaking, dependent variables, it is useful to treat them statistically as independent variables in some cases to explore the relationship between them and the ratings. In such cases, it is important to avoid assuming that one of these variables causes changes in the other. Because both are dependent variables, it is impossible to determine what causal relationship, if any, exists between them. Also, it is necessary for the checkbox terms to be considered last in the ANOVA run so as to avoid attributing a direct connection in a case where the two descriptions are merely correlated by being used to refer to the same speaker.

## 6. New Insights

The results of this study have been reported elsewhere, and the goal here is to present merely the methods. I will, however, touch on the general form of results in order to illustrate the ways that this technique has allowed us to answer previously unasked questions. In particular, it allows us to look not only at the effect of (ING) on single responses, but on interactions between multiple perceptions.

These interactions reveal a phenomenon I call “peak points”, which occur when (ING) and one or more perceptions combine to create peaks with respect to another perception. An example of this may be seen in (5), which shows an interaction between (ING), intelligence, and the age category “in his/her 30s”: speakers were rated significantly more intelligent when they used *-ing* and also were perceived as being in their 30s. When one element was missing, the other had no effect on intelligence. Listeners described age by selecting five checkboxes, and although overall age selections showed some normal curves for most qualities, the interaction was special to this one category. I believe this relates to the perception of the thirties by college students in terms of life and career path, particularly once the category of working class is introduced. (6) shows that the three primary choices—(ING), “working class”, and “in his/her 30s”—combine to create a peak and a trough that are greater than the sum of each effect individually.

### (5) Intelligence ratings by (ING) and “in his/her 30s”

|            | <i>-in</i> | <i>-ing</i> |
|------------|------------|-------------|
| not in 30s | 3.75       | 3.73        |
| in 30s     | 3.88       | 4.24        |

(p = 0.006)

*Methods for the Study of Linguistic Variation*

(6) Intelligence ratings by (ING), “in his/her 30s”, and “working class”

|                    |                   | <i>-in</i> | <i>-ing</i> |
|--------------------|-------------------|------------|-------------|
| not in his/her 30s | not working class | 3.86       | 3.73        |
|                    | working class     | 3.22       | 3.74        |
| in his/her 30s     | not working class | 4.00       | 4.45        |
|                    | working class     | 3.50       | 3.65        |

(p = 0.023)

This pattern and others like it suggest that we need to think about the relationship between language and social perceptions in an entirely new way and to start asking questions which can only be answered by using methods like these, which combine attention to social detail with experimental techniques.

**References**

Apple, William, Lynn A. Streeter, and Robert M. Krauss. 1979. Effects of Pitch and Speech Rate on Personal Attributions. *Journal of Personality and Social Psychology* 37:715-727.

Brown, B. L., W. J. Strong, and A. C. Rencher. 1973. Perception of Acoustical Parameters. *Journal of the Acoustical Society of America* 54:29-35.

Campbell-Kibler, Kathryn. Forthcoming. Variation and the Listener: The Contextual Meanings of (ING). In *Penn Working Papers in Linguistics: Selected Papers from NWAV 34*, Volume 12.2.

Dixon, John A., Berenice Mahoney, and Roger Cocks. 2002. Accents of Guilt? Effects of Regional Accent, Race, and Crime Type on Attributions of Guilt. *Journal of Language and Social Psychology* 21:162-168.

Fridland, Valerie, Kathryn Bartlett, and Roger Kreuz. 2004. Do You Hear What I Hear? *Language Variation and Change* 16:1-16.

Genesee, Fred, and Naomi Holobow. 1989. Change and Stability in Intergroup Perceptions. *Journal of Language and Social Psychology* 8:17-38.

Giles, Howard, Nikolas Coupland, Karen Henwood, Jim Harriman, and Justine Coupland. 1990. The Social Meaning of RP: An Intergenerational Perspective. In S. Ramgaran, ed., *Studies in the Pronunciation of English: A Commemorative Volume in Honor of A. C. Gimson*, 191-211. New York: Routledge.

Giles, Howard, Karen Henwood, Nikolas Coupland, Jim Harriman, and Justine Coupland. 1992. Language Attitudes and Cognitive Mediation. *Human Communication Research* 18:500-527.

Giles, Howard, Philip Smith, Caroline Browne, Sarah Whiteman, and Jennifer Williams. 1980. Women’s Speech: The Voice of Feminism. In S. McConnell-Ginet, R. Borker, and N. Furman, eds., *Women and Language in Literature and Society*, 150-156. New York: Praeger.

Kathryn Campbell-Kibler

- Giles, Howard, and Robert N. St. Clair, eds. 1979. *Language and Social Psychology*. Oxford: Basil Blackwell.
- Graff, David, William Labov, and Wendell A. Harris. 1986. Testing Listeners' Reactions to Phonological Markers of Ethnic Identity: A New Method For Sociolinguistic Research. In D. Sankoff, ed., *Diversity and Diachrony*, 45-58. Philadelphia: John Benjamins.
- Hirose, Keikichi, and Hiromichi Kawanami. 2002. Temporal Rate Change of Dialogue Speech in Prosodic Units as Compared to Read Speech. *Speech Communication* 36:97-111.
- Labov, William, Sharon Ash, Maciej Baranowski, Maya Ravindranath, and Tracy Weldon. 2005. Listeners' Sensitivity to the Frequency of Sociolinguistic Variables. Paper presented at New Ways of Analyzing Variation 34.
- Lambert, Wallace E., R. C. Hodgson, R. C. Gardner, and S. Fillenbaum. 1960. Evaluational Reactions to Spoken Languages. *Journal of Abnormal and Social Psychology* 60.
- Levin, Harry, Howard Giles, and Peter Garrett. 1994. The Effects of Lexical Formality and Accent on Trait Attributions. *Language and Communication* 14:211-236.
- Plichta, Bartek, and Dennis R. Preston. 2005. The /ay/s Have It: The Perception of /ay/ as a North-South Stereotype in US English. *Acta Linguistica Hafniensia*, 243-285.
- Scherer, Klaus R. 1979. Voice and Speech Correlates of Perceived Social Influence in Simulated Juries. In H. Giles and R. N. St. Clair, eds., *Language and Social Psychology*, 88-120.
- Shuy, Roger W., and Ralph W. Fasold, eds. 1973. *Language Attitudes: Current Trends and Prospects*. Washington, DC: Georgetown University Press.
- Smith, M. K., and G. H. Bailey. 1980. Attitude and Activity: Contextual Constraints on Subjective Judgments. In H. Giles, W. Robinson, and P. Smith, eds., *Language: Social Psychological Perspectives*, 209-226. Oxford: Pergamon Press.
- Williams, Frederick, Nancy Hewett, Robert Hopper, Leslie M. Miller, Rita C. Naremore, and Jack L. Whitehead. 1976. *Explorations of the Linguistic Attitudes of Teachers*. Rowley, MA: Newbury House.
- Wölck, Wolfgang. 1973. Attitudes toward Spanish and Quechua in Bilingual Peru. In R. W. Shuy and R. W. Fasold, eds., *Language Attitudes: Current Trends and Prospects*, 129-147.

Kathryn Campbell-Kibler  
Department of Linguistics  
Stanford University  
Stanford, CA 94305-2150

kcat@csl.stanford.edu

## “The thing is, is” Is No Mere Disfluency

ELIZABETH COPPOCK<sup>1</sup>, JASON BRENIER<sup>2,3</sup>, LAURA STAUM<sup>4</sup>,  
and LAURA MICHAELIS<sup>3</sup>

<sup>1</sup>Heinrich Heine University, <sup>2</sup>Stanford University,

<sup>3</sup>University of Colorado, Boulder, <sup>4</sup>Stony Brook University

### 1. Introduction

One of the most robust and exceptionless rules of English grammar is that there can only be one tensed verb per clause. When an English speaker utters two tensed verbs in succession following a sentence-initial noun phrase, he or she is generally not speaking fluently; the second verb can be interpreted as a repair of the first, and the first can be interpreted as a false start.

A possible exception to this rule concerns the present tense form *is*. It seems that when English speakers use *is* twice in a row in examples like the following, they are speaking perfectly fluently.

(1) But the thing *is is* that I'm naturally thin...

Although this conclusion is intuitively clear to native speakers who have encountered the phenomenon, it is challenging to rule out the possibility that these examples are mere repetition disfluencies. In this paper, our goal will be to empirically support the intuition that spoken examples of this putative exception, which we will refer to as “ISIS”, following Zwicky (2002), don't “sound” disfluent, i.e., they don't have the acoustic properties of disfluencies.

The first person to publish an observation of this special property of *is* was Dwight Bolinger, in his 1987 article entitled “The remarkable double IS.” He thought that the phenomenon was “not more than two or three decades old,” despite an isolated example from a letter written by Charles Darwin that he cites:

(2) My excuse and reason is, is the different way all the Wedgwoods view the subject from what you and my sister do.

McConvell (1988) says: As I heard more and more examples in natural conversation in different places from English speakers with widely differing dialect backgrounds, I became aware that something systematic was going on. Once I had

‘tuned in’ to the phenomenon, I began hearing politicians and businessmen on TV and radio, and journalists in prepared (and presumably scripted) TV commentary doing it... when I finally received reports of high school and college students in Australia and New Zealand writing double copulas, I realised that the construction was becoming well-established in some speakers. (p. 287)

Andersen (2002) agrees that what she calls the “double copula construction” “seems to be a recent phenomenon”, and argues explicitly for its legitimacy as a part of English syntax: “Although this may look like a mere spelling mistake, or in the case of speech, a hesitational feature, several facts suggest that it is neither” (p. 43). She adds, “the repeated instance of *is* is not as haphazard and random as spelling mistakes or hesitational features” (p. 45). Her first argument is that the double copula occurs not only in speech but also in writing. Examples of written tokens are in (3) and (4).

(3) “The really sad thing is,” she finally said, “is that no one believed you back then, did they?” [<http://journals.aol.com/delela1/Metamorphosis>]

(4) And the best part is, is that whoever believes in him is his child. [<http://anointedyouth.org/info/wijesus.htm>]

Her second argument is that it tends to occur in particular constructions. This argument, interpreted literally, depends on its conclusion, but what she seems to mean is that the copula is “systematically” repeated after certain nouns, such as *issue* and *point* (p. 46).

We can add to Andersen’s points that we often find *is*-doubling before short, easy-to-process clauses where we wouldn’t expect disfluencies. Consider example (1), repeated below, which is from the Fisher corpus. The constituent that follows contains a first person pronoun (highly accessible) subject, and very little else:

(5) But the thing *is is* that I’m naturally thin...

It has been shown in work on sentence comprehension that low grammatical weight makes constituents easier to plan and process (Gibson 2002, Arnold et al. 2000). We would not expect this environment to produce an unusually large number of disfluencies, so the large number of *is is* sequences in this environment requires some other explanation.

McConvell (2005) argues, as we do in this paper, that ISIS lacks the acoustic trappings of a disfluency. One of his arguments is based on prominence: the first *is* (BE1) is more prominent than the second (BE2), whereas neither of Levelt and Cutler’s (1983) repair types, *marked* or *unmarked*, would be expected to have that prominence distribution. In a marked repair, BE2 tends to be more prominent than BE1; in an unmarked repair, BE1 and BE2 would be equally prominent. He also suggests that ISIS lacks some of the phonetic effects in the reparandum that Shriberg (2001) found in disfluencies.

Other authors have taken this conclusion for granted. Some analyses propose

“The thing is, is” Is No Mere Disfluency

that ISIS is licensed indirectly through other constructions (McConvell 1988, Tuggy 1996, Brenier and Michaelis 2005). Others attempt to derive ISIS directly from grammatical principles, with only historical connections to other constructions (Andersen 2002, Shapiro and Haley 2002, Massam 1999). What all of these accounts have in common is that they presuppose that ISIS is a grammatical construction of English.

The only disfluency analysis of this phenomenon that we have encountered is in the Penn Treebank (Marcus et al. 1994), where it is annotated using the disfluency tag `-DFL-`, and BE1 is treated as an “edited” portion, as shown in Figure (6).

(6) Treebank analysis of ISIS

```
(TOP (S (INTJ (UH Well))
 (, ,)
 (NP-SBJ (DT the)
 (NN thing))
 (EDITED (RM (-DFL- \[]))
 (VP-UNF (VBZ is))
 (, ,)
 (IP (-DFL- \+)))
 (VP (VBZ is)
 (RS (-DFL- \]]))
 (SBAR-PRD (IN that)
 (S (NP-SBJ (PRP I))
 (VP (VBP live)
 (PP-LOC (IN in)
 (NP (DT a)
 (NN dorm))))))))
 (. .)
 (-DFL- E_S)))
```

Perhaps we find this analysis in the Treebank only because the annotators are faced with the difficult task of giving these examples a syntactic analysis, and the disfluency analysis is simpler. Since the disfluency analysis is simpler, it is challenging to rule out.

**2. Fisher Study**

The intuition that we seek to support empirically in the current study is that ISIS doesn’t sound like a disfluency. Our main prediction is that *is is* sequences in the syntactic environments where ISIS is found will not exhibit the acoustic properties of disfluencies.

In order to test our prediction, we must know where to locate ISIS. While many syntactic analyses of ISIS have been proposed, there is no definitive analysis that enumerates the environments that license a double *is*. In the literature, practically the only environment where authors present examples as ISIS is in the

introduction of assertions. For example, *you're always late* is being asserted in *The problem is (is) that you're always late*. In fact, the only exception to this rule is when the following constituent is a question, as in, *The question is, is do we have enough time?* Authors never present ISIS in predicative sentences (e.g. *John is (is) happy* or *John is (is) in Paris*). Our intuitions suggest that this is not an accidental gap; we would go so far as to star the following sentence, pronounced with typical ISIS prosody:

(7) \*The thing IS, is downstairs.

Nor is it found in environments where *is* functions as an auxiliary:

(8) \*The thing IS, is going to fall apart.

Thus our more specific hypothesis is that *is is* sequences that introduce assertions will sound more fluent than those in other environments.

## 2.1. General Methods

Our sample consisted of *is is* sequences in Part 1 of the Fisher English Training Speech corpus (Cieri et al. 2004). This corpus consists of conversational telephone speech from a diverse set of speakers, with full conversations up to 10 minutes long. 60% of the *is is* sequences were randomly selected for coding.

We coded each *is is* sequence using Praat, with a textgrid for each token. An example textgrid is shown in (9). The waveform and spectrograph of the utterance are shown on the first two tiers, and a transcript of the utterance is shown on the third tier. The following tiers contain our hand annotations:

RATING: a subjective rating 1-7 of how fluent the example sounds, with 1 meaning “definitely a disfluency”, 7 meaning “definitely not a disfluency”

LABEL: syntactic properties of the NP preceding BE1 (usually the subject of the sentence.<sup>1</sup>) We recorded whether this NP was headed by a *wh*-word (+/-*wh*), and what its syntactic function was in the surrounding clause.

COUNTERWEIGHT: the syntactic type of the largest constituent following BE2. Example values on this tier were: ‘cl’ (finite clause), ‘np’, ‘ap’, and ‘pp’

On the lower two tiers are word and phone alignments, obtained by time-aligning the transcripts using the Sonic continuous speech recognizer.<sup>2</sup> This enabled us to extract phonetic properties of specific phones.

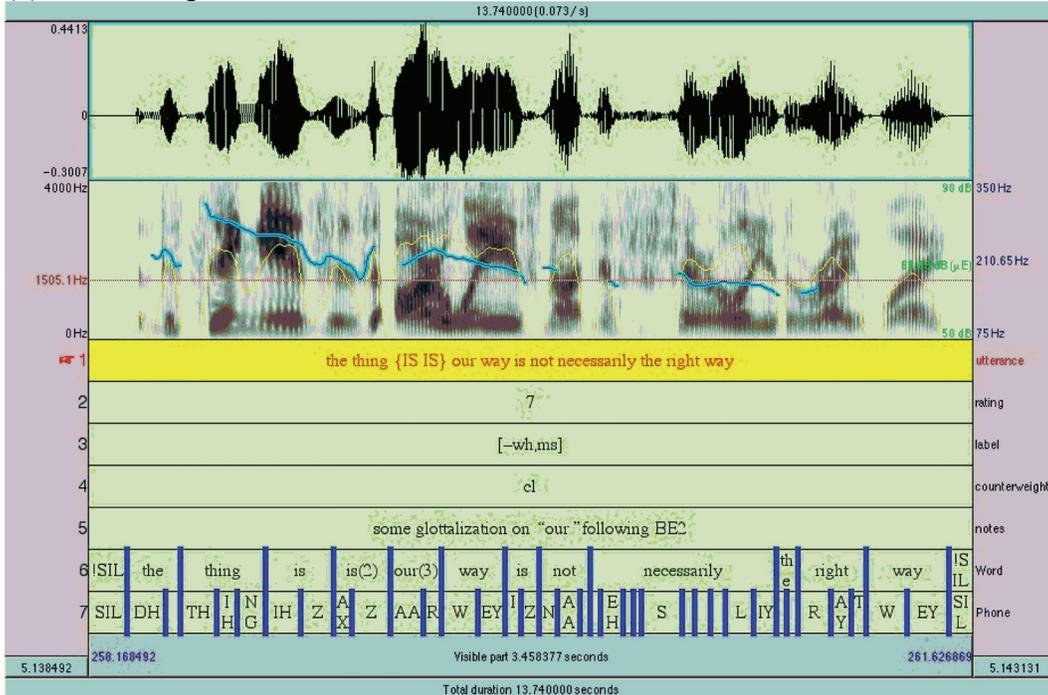
---

<sup>1</sup> To be precise, the Label tier contains syntactic properties of the NP preceding or including BE1; the relevant NP includes BE1 in the case of pseudoclefts whose subject NP ends in *is*, as in [*What it is*], *is a computer program*.

<sup>2</sup> These alignments were made possible by help from Bryan Pellom.

“The thing is, is” Is No Mere Disfluency

(9) Praat Textgrid



In the analyses that we will present in the following sections, we only included those examples that have a subject NP directly preceding the *is is* sequence; we will call these *post-subject doubles*. Included in this category are the following examples, which do have a subject NP right before the *is is* (the subject NP is shown in brackets):

- (10) [the bad thing] is is that I smoke
- (11) [one of them] is is really uh overweight

We *excluded* examples that have inversion as in (12), along with pseudocleft examples as in (13) and examples such as (14), called “hypotactic apposition” by Brenier and Michaelis (2005):

- (12) [ ]is is it spring there?
- (13) [what that is] is we gotta...
- (14) that’s [what smoking is] is it puts...

We also defined several functional environments, based on the syntactic category of the phrase following BE2:

**ASSERTIVE:** the *is is* sequence precedes a declarative clause, for example, *The problem is is that you’re always late*. The Assertive environment is where we expect to find tokens of ISIS, primarily.

**AUXILIARY:** the *is is* sequence functions as an auxiliary verb, as in, for example, *John is is singing*.

**EQUATIVE\*:** the *is is* sequence equates the subject and a following referential expression. Due to a lack of foresight on our part during the coding process, this category does include some predicative sentences, because it includes all examples in which the following constituent is an NP, whether the NP is definite (in which case the example is equative) or indefinite (in which case the example would probably be predicative).

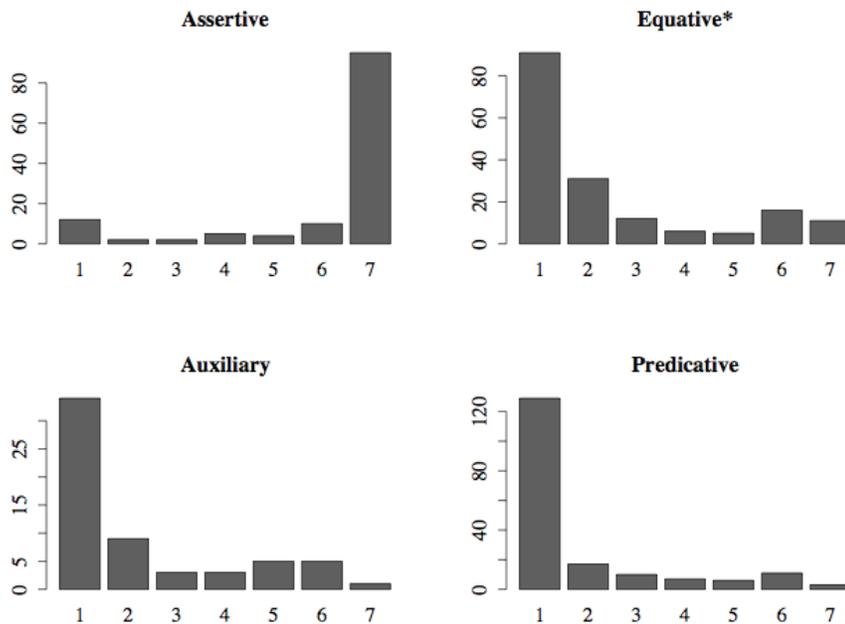
**PREDICATIVE:** the *is is* sequence is followed by a predicate, either an adjective phrase or a prepositional phrase.

We used these environments as levels of the independent variable in the analyses that follow, expecting the Assertive environment to pattern against the others.

## 2.2. Subjective Fluency Ratings

Indeed, when we subjectively rated each example for fluency on a 1-7 scale, and then analyzed our ratings by their environment, in all but the Assertive environment, our subjective fluency ratings tended to be quite low; histograms are shown in (15). This suggests that *is is* sequences preceding a declarative clause (in the Assertive environment) sound more fluent to the naked ear.

(15) Histogram of ratings across environments



These ratings provide additional motivation for our choice of environments to compare; they suggest that the Assertive environment contains a disproportionate number of grammatical tokens, i.e., tokens of ISIS. If it is true that sequences that

sound fluent perceptually will be acoustically distinguishable from disfluent sequences, then the Assertive environment should contain a disproportionate number of *is is* sequences that have the acoustic properties of fluent speech.

### **2.3. Pauses**

A more objective measure of fluency is the presence of planning pauses between the repeated words. To the extent that repetition disfluencies signal difficulty in processes of linguistic production such as sentence planning and word retrieval, we expect to find speakers slowing down when they utter them, in order to give themselves time to overcome the difficulty.

Researchers on disfluencies have always found that pauses are associated with repetition disfluencies, although the location of the pause can vary. Shriberg (1995), following Hieke (1981), defines two different types of repetition disfluencies, both of which have pauses. *Prospective* repetition disfluencies are ones which anticipate an upcoming pause, and function as a way of stalling for time. *Retrospective* ones come after a pause, functioning to “smooth over the break,” providing a transition to fluent speech (Dickerson 1971). In both types, pauses surround the repeated word by definition. Clark and Wasow’s (1998) “Commit-and-Restore” model of disfluency production also motivates repetitions on the basis of pauses: the reparandum (e.g., BE1) makes a preliminary commitment to an upcoming constituent, and the repair (e.g. BE2) restores continuity to the delivery of the constituent, after a suspension in the flow of speech. Shriberg (2001) notes that “disfluency is often indicated by unfilled pauses in the editing phrase” as predicted by Levelt’s (1989) model (p. 164).

If examples of what we believe to be the ISIS construction were really examples of repetition disfluencies, then repeated *is* before assertions should be just as likely to exhibit pauses as repeated *is* elsewhere. To the contrary, we predict that we will find fewer planning pauses where ISIS is licensed and more pauses where it is not. We therefore investigated the number of pauses in *is is* sequences in assertive environments, and we compared these with pauses in *is is* sequences in predicative, equative, and auxiliary environments.

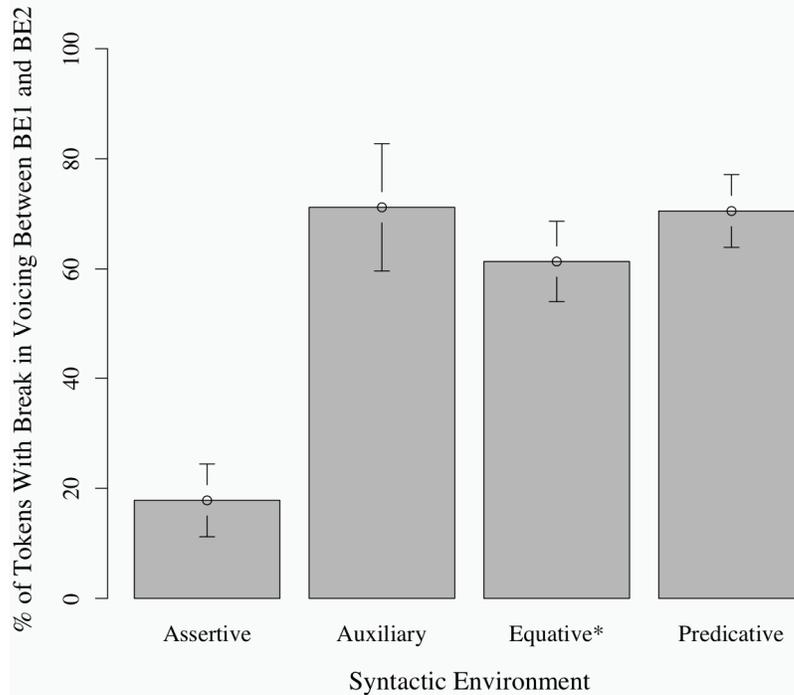
To our surprise, the speech recognizer that was used in time-aligning the word and phone transcripts identified very few pauses surrounding BE2 anywhere; less than 20% of the examples in any environment had a pause either preceding or following BE2. This is unexpected under the assumption that most of these *is is* sequences are disfluent, and that disfluencies contain planning pauses.

In order to determine whether these low numbers were due to errors made by the speech recognizer, we listened to some examples that we judged disfluent, in which no pauses were detected. Our first impression was that the speech recognizer was indeed failing to detect pauses, because to our ears, there *was* silence between BE1 and BE2. But upon closer inspection, we found that what we heard as silence was actually a voiceless portion of the final segment (/z/) of BE1. In other words, we heard a break in voicing between BE1 and BE2 as a pause.

With this in mind, we set out to measure breaks in voicing longer than Sonic’s

cutoff for identifying a pause, which is 175 milliseconds. This is below the 200 ms that are generally considered necessary for planning (Goldman-Eisler 1968; cited in Shriberg 2001). With this as the measure, *is is* sequences in the Assertive environment stood out dramatically from the others, as shown in (16).

(16) Distribution of Breaks in Voicing > 175 ms between BE1 and BE2



The percentage of breaks in voicing in the Assertive environment is clearly well below the number of breaks in voicing in the other environments, as we hypothesized.

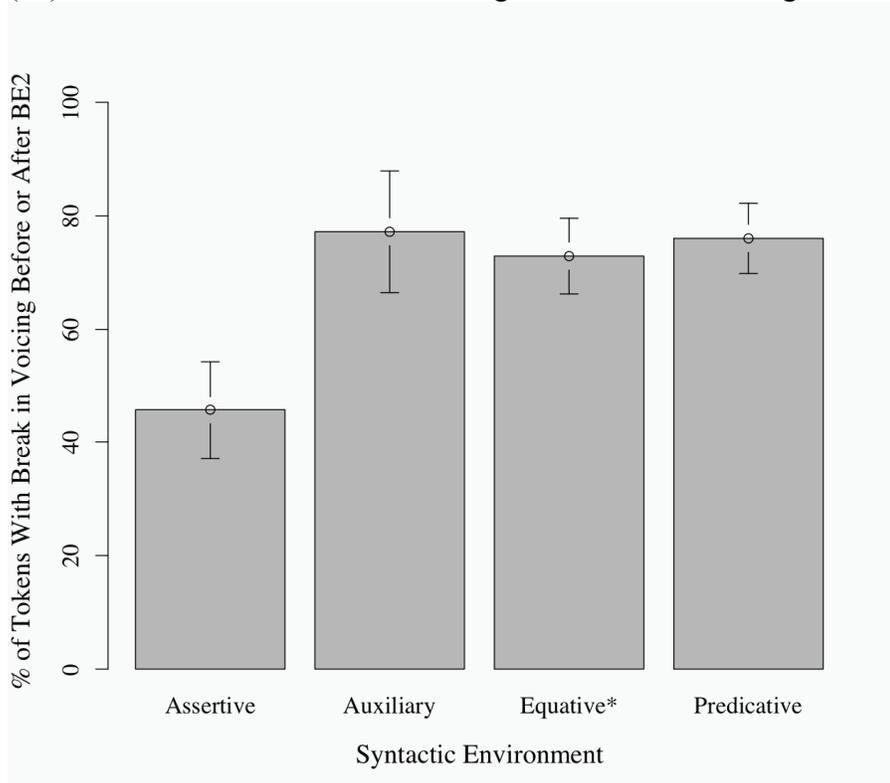
This cannot be explained on the basis of differences between the environments in the grammatical complexity of the following constituent, because declarative clauses tend to be longer than the types of phrases represented in the other three categories; if grammatical complexity were playing a role, we would expect an effect in the opposite direction: more complex planning units such as assertive clauses should be more likely to be preceded by a break.

Nor can it be explained on the basis of the presence of a disproportionate number of “prospective” repetition disfluencies in the Assertive environment. Recall Hieke’s (1981) categorization of repetition disfluencies into “prospective” and “retrospective”: the latter have a pause between the reparandum and the repair, but the former have a pause after the repair. One could possibly imagine that there happens to be a large number of prospective-type repetition disfluencies in the Assertive environment, for some reason. This idea is not supported by the number of pauses directly following BE2, of which there are very few in any of

*“The thing is, is” Is No Mere Disfluency*

the environments, nor is it supported by the number of breaks in voicing greater than 175 ms. Only around 30% of the tokens in any environment have a break in voicing greater than 175 ms, and there is no significant difference between the environments with respect to this variable. When we look at the total number of pauses surrounding BE2, either before or after it, we find that the Assertive environment remains clearly distinct from the others, as shown in (17).

(17) Distribution of Breaks in Voicing > 175 ms surrounding BE2



Thus, the Assertive environment contains significantly fewer breaks overall. This supports our hypothesis that *is is* sequences in the Assertive environment sound more fluent.

### 3. Conclusion

This study has provided quantitative support for the observation that the ISIS construction doesn't sound like a disfluency. Sequences of double *is* that are followed by assertions have fewer breaks in voicing than double *is* sequences in other environments. This can be explained by the idea that both instances of *is* tend to be grammatically licensed in the Assertive environment, but not elsewhere. This in turn can be explained by the idea that there is such a construction as ISIS, licensed primarily in the introduction of assertions, and that it makes up a sizeable portion of the tokens in the Assertive environment.

This result confirms a subjective impression given by Andersen (2002):

“According to my observations, the two copulas are generally produced in a rapid sequence, and there is usually no pause between them or any other sign of hesitation on the part of the speaker, although there may be a pause immediately following the double copula, or after the complementiser *that*” (p. 45). She goes so far as to deny that the comma typically inserted between BE1 and BE2 signals a prosodic break: “Internet users commonly insert a comma between the two tokens of *is* in the double copula construction. In fact, this is more common than not, as it happens in more than 70 per cent of the cases. However, it seems unlikely that this is done in order to represent a pause; rather, a more plausible explanation may be that the writer uses the comma as a way of preventing the erroneous interpretation that the double copula is a spelling mistake” (p. 56).

This lack of break is also interesting in light of Brenier & Michaelis's prosodic optimization theory of ISIS's origin. According to that theory, ISIS is a way of satisfying multiple constraints: that there be a prosodic break after BE1, and that the the VP be uninterrupted. If ISIS satisfies both of these constraints, then there is a prosodic break after BE1; this would lead us to expect a fair number of pauses there. The fact that we don't find them there doesn't mean that prosodic optimization wasn't one of the initial motivations for the development of this construction, but it suggests that the prosodic boundary is eroding. Bolinger (1987) suggested this with regard to the use of the comma; he writes that “the disjunction (signaled by the comma ...) has tended to disappear” (p. 39).

One of the lessons we can draw from this is that when speech recognizers do not find pauses as heard by humans, a break in voicing might be a good way to automatically capture the percept of a pause. This is a technique that could be applied more generally in order to identify disfluencies. Distinguishing ISIS tokens from disfluency tokens is a very important task for engineering applications and scientific studies that require estimating speakers' disfluency rates.

This study sets the stage for investigating quite a few remaining questions, such as the historical origin, social distribution and social meaning of this construction; the way that ISIS is related to other constructions of English (e.g. Hypotactic Apposition and Pseudocleft); and the grammatical principles from which ISIS is derived. It remains to be understood what could license two finite verbs in a row, how many arguments BE1 and BE2 are taking, and whether BE1 and BE2 are even verbs. An alternative hypothesis, which is mentioned by both Massam and McConvell, and one for which there is a certain amount of evidence, is that BE2 is a focus marker grammaticalized from the copula, hence some kind of adjunct taking no arguments. A monovalent analysis for BE1 is explored in Brenier and Michaelis (2005). The jury is still out on what is going on syntactically, but such investigations may proceed on firmer ground, given our investigations here.

Another question that we have not answered is whether ISIS is an “amalgam.” The relationship between speech errors and conventionalized amalgams is one that Michaelis (this volume) addresses, and resolving this question would constitute an important contribution to this line of inquiry. It is important to note that

“The thing is, is” Is No Mere Disfluency

the question of whether ISIS examples are fluent or disfluent is different from the question of whether ISIS is a conventionalized amalgam. Non-conventionalized amalgams do not always sound disfluent; consider *How soon before midnight will they meet?* which has been discussed on LanguageLog.com, a possible amalgam between *How soon will they meet?* and *How long before midnight will they meet?* It is easy to imagine this being delivered perfectly fluently. Thus, even though we have given evidence that ISIS tokens do not sound disfluent, it is an open question whether they are conventionalized, if amalgams.

## References

- Andersen, Gisle. 2002. Corpora and the Double Copula. In L. E. Breivik and A. Hasselgren, eds., *From the COLT's Mouth... and Others': Language Corpora Studies: In Honour of Anna-Brita Stenstrom*, 43-58. Amsterdam: Rodopi.
- Ariel, Mira. 1990. Accessing Noun Phrase Antecedents. London: Routledge.
- Ariel, Mira. 2001. Accessibility Theory: An Overview. In T. Sanders et al., eds., *Text Representation: Linguistic and Psycholinguistic Aspects*. Amsterdam: Benjamins.
- Brenier, Jason and Laura Michaelis. 2005. Optimization via Syntactic Amalgam: Syntax-Prosody Mismatch and Copula Doubling. *Corpus Linguistics and Linguistic Theory* 11:45-88.
- Bolinger, Dwight L. 1987. The Remarkable Double *Is*. *English Today* 9:39-40.
- Cieri, C., Graff, D., Kimball, O., Miller, D., and Walker, K. 2004. Fisher English Training Speech Part 1 Transcripts. Philadelphia: Linguistic Data Consortium.
- Clark, Herbert H. and Wasow, Thomas. 1998. Repeating Words in Spontaneous Speech. *Cognitive Psychology* 37:201-242.
- Gibson, Edward. 2002. Linguistic Complexity in Sentence Comprehension. *The Encyclopedia of Cognitive Science*. MacMillan.
- Goldman-Eisler, F. 1968. *Psycholinguistics: Experiments in Spontaneous Speech*. New York: Academic Press.
- Hieke, A. 1981. A Content-Processing View of Hesitation Phenomena. *Language and Speech* 24(2):147-160.
- Jaeger, T. Florian and Thomas Wasow. 2005. Processing as a Source of Accessibility Effects on Variation. In *Proceedings of the 31st Meeting of the Berkeley Linguistics Society*.
- Jehn, Richard Douglas. 1979. That's Something That I Wouldn't Want to Account For, Is a Sentence Like This. *Calgary WPL* 5:51-62.

- Levelt, Willem and Anne Cutler. 1983. Prosodic marking in speech repair. *Journal of Semantics* 2(2):205-217.
- Markus, M., Kim, G., Marcinkiewicz, M.A., MacIntyre, R., Bies, A., Ferguson, M., Katz, K. and Schasberger, B. 1994. The Penn Treebank: Annotating Predicate Argument Structure. *ARPA Human Language Technology Workshop* 114-119.
- Massam, Diane. 1999. Thing Is Constructions: The Thing Is, Is What's The Right Analysis? *English Language and Linguistics* 3(2):335-52.
- McConvell, Patrick. 1988. To *Be* or Double *Be*? Current Changes in the English Copula. *Australian Journal of Linguistics* 8:287-305.
- McConvell, Patrick. 2004. Catastrophic Change in Current English: Emergent Double-Be's and Free-Be's.
- Ross-Hagebaum, Sebastian. 2004. "And That's My Big Area of Interest in Linguistics Is Discourse" – The Forms and Functions of the English *That's X is Y*-Construction. Paper presented at the 30th Meeting of the Berkeley Linguistics Society.
- Shapiro, Michael & Michael C. Haley. 2002. The Reduplicative Copula *Is Is*. *American Speech* 77(3):305-312.
- Shriberg, Elizabeth. 1995. Acoustic Properties of Disfluent Repetitions. *Proceedings of the International Congress of Phonetic Sciences* .
- Shriberg, Elizabeth. 2001. To 'errrr' Is Human: Ecology and Acoustics of Speech Disfluencies. *Journal of the International Phonetic Association* 31(1):153-169.
- Tuggy, David. 1996. The Thing Is Is That People Talk That Way. In E. Casad, ed., *Cognitive Linguistics in the Redwoods: The Expansion of a New Paradigm in Linguistics*, 713-52. Berlin: Mouton de Gruyter.
- Zwicky, Arnold. 2002. Seeds of Variation and Change. Handout from NWAV 31.

Elizabeth Coppock, Laura Staum, Jason Brenier  
Department of Linguistics  
Margaret Jacks Hall, Building 460  
Stanford, CA 94305

Laura Michaelis  
Department of Linguistics  
295 UCB  
Boulder, CO 80309

coppock@phil-fak.hhu.de,  
{lstaum,brenier}@stanford.edu,  
Laura.Michaelis@colorado.edu

## On Non-Optimal Laryngeal Timing: The Case of Trique

CHRISTIAN DICANIO

*University of California, Berkeley*

### 1. Introduction

A central issue in linguistics has been the degree of independence and interdependence between phonetics and phonology. Recent phonological research has looked at the phonetic domain for answers to phonological questions and vice-versa. Out of this research two main perspectives have arisen: the integrated approach and the modular approach (Howe and Pulleyblank 2001). The former view assumes that phonological units are arranged in such a way so as to take advantage of positions in the word which are *perceptually salient* (Silverman 1997a, Steriade 2001, Hayes and Steriade 2004). This view assumes that phonetic details like articulatory timing and perception are encoded directly into the phonology of a language. The phonology chooses the phonetically optimal environment where the contrast appears. By contrast, the modular view (Howe and Pulleyblank 2001) proposes that the distribution of segments is governed only by the language's phonology, while the details of articulatory timing and perception are controlled by the language-particular phonetics. The phonology is therefore insensitive to optimal phonetic environments. Research on laryngealization and laryngeal timing has characterized the work supporting the integrated view (Silverman 1997a, 1997b, Blankenship 2002). Research on languages with laryngealization and laryngeal contrasts, therefore, are strong candidates for supporting one approach over the other. Trique is one such language.

San Martín Itunyoso Trique (henceforth Itunyoso Trique) is a Mixtecan (Otomanguean) language spoken by approximately 2,500 people in Oaxaca, Mexico and the topic of this author's fieldwork. The language contains a large tonal inventory and set of laryngeal contrasts. In this paper I will argue that these contrasts are best understood along the modular approach outlined above. The distribution of tone and laryngeals as well as their phonetics are non-optimizing, given claims made by Silverman (1997a) and Steriade (2001). The non-optimality of these contrasts coincides with the account given by Howe and Pulleyblank (2001) where the exceptional phonological distribution of laryngeal segments is prosodically-licensed.

## 2. On Optimal Contexts for Laryngealization

In his dissertation, Silverman (1997a) argues that laryngeals tend to occur in environments where they may be optimally perceived. For instance, the optimal environment for both [h] and [ʔ] is at the release of an onset stop.<sup>1</sup> He states that “when the (nonmodal phonation) [h, ʔ] stand in isolation prevocally, or especially if aspiration/creak is realized at prevocalic stop release, this sudden onset of energy helps to better cue the noise associated with glottal spreading” (Silverman 1997b:251). This initial context is preferable to final contexts, where the cues to glottal spreading are not as robust. Thus, he observes that onset glottalization and aspiration are preferable to coda glottalization and aspiration. This observation is confirmed within a typology of languages. For instance, it is much more common to find ejectives in word-initial position or intervocalically than to find them at word-final position or pre-consonantly. It is also much more common to find languages with post-aspirated stops than with pre-aspirated stops. In both these contexts, laryngealization is timed with the onset release.

In tone languages, laryngeals are also timed to occur in initial position. Silverman states that “prevocalic nonmodal phonation followed by modal phonation is the optimal timing pattern, cueing vocalism, voicelessness, glottal closure, and tone” (Silverman 1997b:256). In other words, if we have a tone language with laryngeals, the laryngeal ideally occurs pre-vocalically. The explanation for this laryngeal-tone phasing is that tonal contrasts are optimally perceived during periods of modal phonation. Since laryngeals alter F<sub>0</sub>, the primary correlate of tonal contrasts, they are timed so that they precede the tonal contrast which occurs on the modal portion of the vowel. Laryngeals are sequenced so that there is a maximum perceptibility of tone. Tone is *recoverable* in the environment of a laryngeal only when it can be staggered. Such constraints on the distribution and timing of laryngeals are encoded directly into the language’s phonology. Such a model of tonal-laryngeal timing is only valid, though, if it can be tested against solid empirical data.

## 3. Trique Phonology

Itunyoso Trique has a complex set of tone and laryngeal contrasts, including 9 tones, glottal consonants [h, ʔ], and pre-glottalized sonorants. As a language which contains both laryngeals and many tones, it serves as a fertile testing ground for Silverman’s hypothesis. In particular, the distribution of laryngeals and their phonetic realization in Itunyoso Trique do not support a perspective where laryngeal segments are phased so as to avoid tonal overlap. Rather, they are best understood via the language’s prosody, which determines a large set of the phonological contrasts that surface.

Many of the phonological contrasts in Itunyoso are *only* realized in root-final position. Therefore, it is not possible to talk about the distribution of phonemes or

---

<sup>1</sup> The optimal context for laryngealization with sonorants is for them to be pre-glottalized (Silverman 1997a, Howe and Pulleyblank 2001).

*On Non-Optimal Laryngeal Timing: The Case of Trique*

tone in Trique without first regarding the prosodic structure of roots in the language.<sup>2</sup> There is some debate on the prosodic units of words in Mixtecan languages (Hinton 1992, Macaulay and Salmons 1995). This debate revolves around the question of where to place glottalization in the phonology of the language: as a feature of the root, the foot, or the syllable. In Itunyoso Trique, all laryngeals are restricted to the final syllable of the root, which may contain up to two laryngeal segments, a fact which is mirrored in Copala Trique (Hollenbach 1984). With the exception of laryngeal codas, syllables are always open. Final syllables without a laryngeal have a longer duration than non-final syllables. A table with most of the possible syllable types is given in (1).

(1) *Itunyoso Trique Syllable Type Inventory*

|    |                                  |                |             |                                            |
|----|----------------------------------|----------------|-------------|--------------------------------------------|
| a. | <i>Non-final Syllable</i>        | <i>Example</i> | <i>Tone</i> | <i>Gloss</i>                               |
|    | V                                | [a.ŋgo]        | 3-32        | ‘another, whole’                           |
|    | CV                               | [na.na]        | 4-4         | ‘shortly, in a little bit’                 |
|    | C <sub>x</sub> C <sub>z</sub> V  | [sta.re]       | 2-3         | ‘spider’                                   |
| b. | <i>Final Syllable</i>            | <i>Example</i> | <i>Tone</i> | <i>Gloss</i>                               |
|    | V                                | [tʃa.ĩ]        | 3-3         | ‘mosquito’                                 |
|    | Vʔ                               | [li.aʔ]        | 3-3         | ‘sister’ (fem. vocative)                   |
|    | Vh                               | [ri.ə]         | 3-32        | ‘my face, above, to (recip.)’ <sup>3</sup> |
|    | CV                               | [tʃu.tõ]       | 3-3         | ‘bee’                                      |
|    | CVʔ                              | [tʃa.taʔ]      | 2-2         | ‘sky, heaven’                              |
|    | CVh                              | [la.kah]       | 2-2         | ‘skinny’                                   |
|    | ʔV                               | [ja.ʔa]        | 3-3         | ‘plate’                                    |
|    | ʔVʔ                              | [ro.ʔoʔ]       | 3-5         | ‘our (1 du.) hand’                         |
|    | ʔVh                              | [ja.ʔah]       | 3-3         | ‘chile’                                    |
|    | ʔCV                              | [tʃu.ʔβa]      | 3-3         | ‘flea’                                     |
|    | ʔCVʔ                             | [tʃu.ʔβiʔ]     | 3-3         | ‘to be afraid/nervous’                     |
|    | ʔCVh                             | [tʃu.ʔβah]     | 3-3         | ‘mole (animal)’                            |
|    | C <sub>x</sub> C <sub>z</sub> V  | [si.sno]       | 4-43        | ‘man’                                      |
|    | C <sub>x</sub> C <sub>z</sub> Vʔ | [skeʔ]         | 2           | ‘mud’                                      |
|    | C <sub>x</sub> C <sub>x</sub> V  | [tʃu.kkwa]     | 3-3         | ‘ant’                                      |
|    | C <sub>x</sub> C <sub>x</sub> Vʔ | [si.kkoʔ]      | 2-2         | ‘hard’                                     |
|    | C <sub>x</sub> C <sub>x</sub> Vh | [tʃu.kkwah]    | 3-3         | ‘fish’                                     |

<sup>2</sup> All nominal or verbal roots may take one of 22 person-marking enclitics as a suffix to mark either possession or argument structure. The phonological licensing restrictions applying to roots do not apply to morphologically complex words.

<sup>3</sup> All two vowel sequences are realized as separate monophthongal vowels. This is shown by syllable-final lengthening, which affects only the final vowel of the sequence, not a larger, diphthongal unit.

As we can see from the table above, the syllable-type inventory is unevenly distributed in Itunyoso Trique. The geminate-singleton (“fortis-lenis”) consonant contrast and all laryngeals are restricted to root-final syllables. Laryngealized sonorants occur intervocalically, but only occur in initial position on monosyllabic words. Glottal stops occur intervocalically as root-final syllable onsets and as final-syllable codas. The glottal fricative occurs only as a coda in root-final syllables.

At first glance, the distribution of glottal stops and glottalized sonorants seems to fit within Silverman’s predictions. He correctly predicts that the presence of final glottalization implicates initial glottalization. Since initial position is the best locus for non-modal phonation, languages favor glottalized onsets over glottalized codas, for reasons described in §2. However, the restriction of /h/ to root-final coda position is unusual, as languages with coda [h] almost always have an onset [h]. This distribution does not seem to correspond to Silverman’s prediction on the distribution of laryngeal segments.

In addition to laryngeals, Itunyoso Trique contrasts 9 tones.<sup>4</sup> Similar to the syllable distribution shown in (1), all of these tones occur on root-final open syllables, but only three (/2/, /3/, /4/) occur contrastively in non-final syllables.<sup>5</sup> The distribution of tone in the language is given in (2).

(2) *Itunyoso Trique Tonal Distribution*

*Non-final Syllable Tones (/2/, /3/, /4/)*

|    |                |             |                            |
|----|----------------|-------------|----------------------------|
| a. | <i>Example</i> | <i>Tone</i> | <i>Gloss</i>               |
|    | [kiʔyah-ne]    | 2-3-3       | ‘they will do’ (Potential) |
|    | [kiʔyah-ne]    | 3-3-3       | ‘they did’ (Completive)    |
|    | [nika]         | 3-43        | ‘my husband/wife’          |
|    | [nika]         | 4-43        | ‘I carry’                  |

*Final Syllable Tones (/1/, /2/, /3/, /4/, /5/, /43/, /32/, /31/, /13/)*

|    |                |             |                              |                |             |                  |
|----|----------------|-------------|------------------------------|----------------|-------------|------------------|
| b. | <i>Example</i> | <i>Tone</i> | <i>Gloss</i>                 | <i>Example</i> | <i>Tone</i> | <i>Gloss</i>     |
|    | [nne]          | 1           | ‘naked’                      | [nne]          | 2           | ‘to lie (intr.)’ |
|    | [nne]          | 3           | ‘plough’                     | [nnõh]         | 4           | ‘mother (voc)’   |
|    | [nneh]         | 5           | ‘I am sitting’               | [nne]          | 31          | ‘meat’           |
|    | [runne]        | 4-43        | ‘avocado’                    | [runne]        | 3-32        | ‘bean’           |
|    | [jeh]          | 13          | ‘yes (affirmation particle)’ |                |             |                  |

Many of the tones in (2) occur freely with laryngeal segments, but there are a few

<sup>4</sup> /1/ is low, /5/ is high

<sup>5</sup> Tones /1/, /5/, /43/, /32/, /31/, and /13/ are assigned to the root-final syllable and then spread leftward via a process of tonal association, yielding disyllabic patterns like /1.1/ or /4.43/. For a similar account of this process in Copala Trique, see Hollenbach (1984).

*On Non-Optimal Laryngeal Timing: The Case of Trique*

exceptions. First, contour tones do not occur with coda [ʔ]. This restriction probably has to do with the vowel shortening that occurs before laryngeal codas, as contour tones tend to occur on vowels of longer duration (Zhang 2001). Second, tone /5/ occurs only with a coda [h]. This fact has to do with the origin of the 5<sup>th</sup> tone in Trique, arising from \*/4/+h (Longacre 1957, Hollenbach 1984). However, in Itunyoso Trique there are contexts where /4/ surfaces with a coda /h/ synchronically, which is not the case in Copala Trique. Finally, no falling tone occurs with a coda [h]. A table showing these restrictions is given in (3).

(3) *Tone-Laryngeal Co-occurrence Restrictions in Itunyoso Trique*

|              |                                            |       |         |
|--------------|--------------------------------------------|-------|---------|
| <i>Tones</i> | /1/, /2/, /3/, /4/                         | + /ʔ/ | Coda    |
|              | /1/, /2/, /3/, /4/, /5/, /13/              | + /h/ | Coda    |
|              | /1/, /2/, /3/, /4/, /13/, /43/, /32/, /31/ |       | No Coda |

In Itunyoso Trique, many different tonal combinations may occur across an intervocalic glottal stop, without many exceptions. The only exception seems to be that tone /3.5/ must occur with a coda /h/, as mentioned previously. This distribution is shown in (4).

(4) *Intervocalic Glottal Stop with Tonal Combinations*

|                 |             |                |                    |  |             |                |              |
|-----------------|-------------|----------------|--------------------|--|-------------|----------------|--------------|
| a. <i>V.ʔVh</i> |             |                |                    |  |             |                |              |
|                 | <i>Tone</i> | <i>Example</i> | <i>Gloss</i>       |  | <i>Tone</i> | <i>Example</i> | <i>Gloss</i> |
|                 | 1.1         | [na.ʔah]       | ‘shame’            |  | 2.2         | [snǎ.ʔǎh]      | ‘liar’       |
|                 | 3.3         | [snǎ.ʔǎh]      | ‘language’         |  | 3.2         | [ju.ʔuh]       | ‘hole’       |
|                 | 4.4         | [jǎ.ʔǎh]       | ‘guitar’           |  | 1.3         | [ũ.ʔũh]        | ‘five’       |
|                 | 4.3         | [ne.ʔeh]       | ‘hiccups’          |  | 3.5         | [jo.ʔoh]       | ‘land’       |
| b. <i>V.ʔV</i>  |             |                |                    |  |             |                |              |
|                 | <i>Tone</i> | <i>Example</i> | <i>Gloss</i>       |  | <i>Tone</i> | <i>Example</i> | <i>Gloss</i> |
|                 | 1.1         | [kano.ʔo]      | ‘to wait’          |  | 2.2         | [kǎ.ʔǎ]        | ‘I go’       |
|                 | 2.3         | [tʃe.ʔe]       | ‘long’             |  | 3.32        | [jǎ.ʔǎ]        | ‘light’      |
|                 | 3.3         | [jǎ.ʔǎ]        | ‘god’              |  | 3.1         | [kǎ.ʔǎ]        | ‘flu’        |
|                 | 3.4         | [kǎ.ʔǎ]        | ‘went (3sg)’       |  | 4.43        | [kǎ.ʔǎ]        | ‘I went’     |
|                 | 4.4         | [kano.ʔo]      | ‘medicine, remedy’ |  |             |                |              |
|                 | 1.3         | [kǎ.ʔǎ]        | ‘four’             |  |             |                |              |

The fact that there are few restrictions on the distribution of tone with glottalization in Trique suggests that their distribution is not governed by any principles involving perceptual adequacy. What then is governing the distribution of tone and laryngeals? The distribution of these two phenomena is properly accounted given the phonotactic restrictions in the language, where root-final syllables are prominent. We have observed that a large set of tonal contrasts and laryngeal

contrasts (among other things) are limited to root-final syllables. Howe and Pulleyblank (2001) argue that the distribution of glottalized sonorants in Kashaya is governed in the same way. In Kashaya, glottalized sonorants only occur in coda position and are post-glottalized. The timing of glottalization and its distribution in the language is non-optimal given Steriade's (2001) and Silverman's (1997a) predictions, as the ideal location for glottalized sonorants is intervocalic, where they should be pre-glottalized. While these glottalized sonorants appear exceptional, they are easily explained by the fact that Kashaya has weight-by-position, demonstrated by stress patterns, closed-syllable shortening, and compensatory lengthening (Buckley 1994, 1995; cited in Howe and Pulleyblank 2001). The glottalized sonorants in Kashaya are moraic-licensed. In Itunyoso Trique, the restriction of laryngeals to word-final syllables, and the quirky distribution of /h/ to root-final coda position are easily explained given a root-final prosodic prominence that can license them.

While the phonological distribution of laryngeals and tone seem exceptional in Itunyoso Trique, Silverman hypothesizes that the *phonetic* sequencing of the laryngeals, [ʔ] and [h] in such contexts is still preserved so that tone may be recoverable. Since so many tones contrast in an environment where tone could easily be perturbed and non-recoverable, speakers will phase the two so that they do not overlap phonetically. An investigation into the realization of laryngeals in tonal environments, therefore, is pertinent to test this prediction.

#### **4. Trique Phonetics**

##### **4.1 Hypothesis and Method**

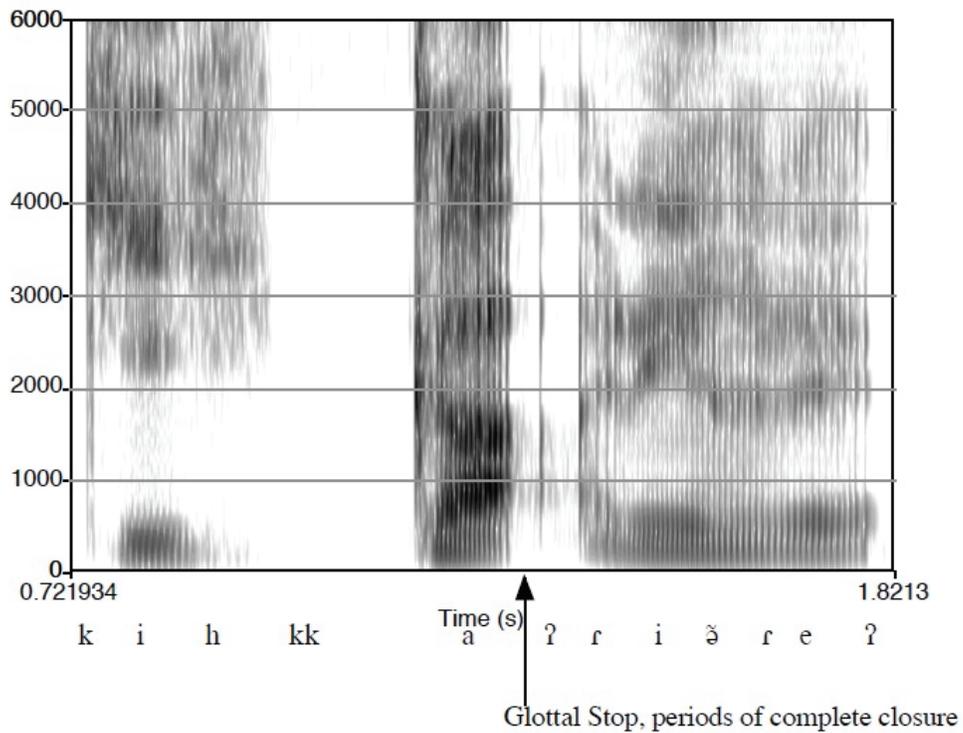
To determine the degree of tonal overlap that laryngeals show, I examined the pitch perturbation effect of different laryngeals on tone. The prediction a la Silverman is that if tone and laryngeals are staggered, then speakers may still recover the tone on a particular syllable. Such staggering will show a minimal, or very local pitch effect. If however, tone and laryngeals are not phased in this fashion, then there will be a greater pitch effect of the laryngeal on the tone. Furthermore, the realization of /ʔ/ and /h/ as a true glottal stop and voiceless fricative is pertinent to their degree of phasing. When /ʔ/ is realized with periods of complete closure and /h/ with voicelessness, the vocal folds have ceased to vibrate and no pitch can be obtained. Time periods without pitch are evidence of phonetic phasing with respect to vowels carrying pitch for contrastive tone.

Acoustic recordings were obtained from 3-4 native speakers of Itunyoso Trique, where each speaker was asked to repeat words in a carrier sentence: *I give X to you*; [rikih 1.1 X riõreʔ 32.1]. Elicited words had different tone and laryngeal combinations. All recordings were made during fieldwork visits to Oaxaca and California in summer-fall, 2005. F<sub>0</sub> was calculated as a dynamic curve across /V/, /Vh/, /Vʔ/, /VʔV/, and /VʔVh/ environments, with 12 pitch points calculated across each of these contexts but 6 pitch points on the vowel preceding [ʔ] (adjusting for shorter duration). Acoustic analysis was done using Praat 4.3 (Boersma and Weenink, 2006) and the R-statistical computing software.

#### 4.2 Observations and Analysis

Three contexts were analyzed in this study: the realization of coda /ʔ/, the realization of coda /h/, and the realization of /VʔV(h)/ sequences. For the purposes of this talk, we will limit our investigation to the context of tone /3/. We first consider the realization of root-final coda [ʔ]. Coda glottal stops are usually realized with periods of complete glottal closure, lasting approximately between 80 - 110 msec. A spectrogram showing the realization of the word [kkaʔ] ʔ ‘candle’ in context is given in (5).

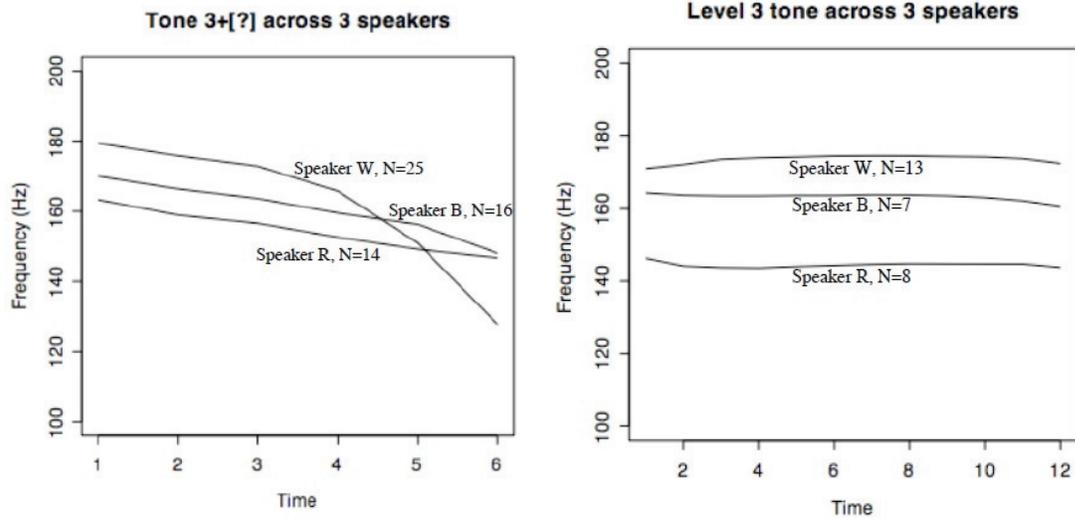
(5) Realization of Coda [ʔ] in Context



(6) Coda Glottal Stop Pitch Perturbation

a. Tone /3/ + Coda [ʔ]

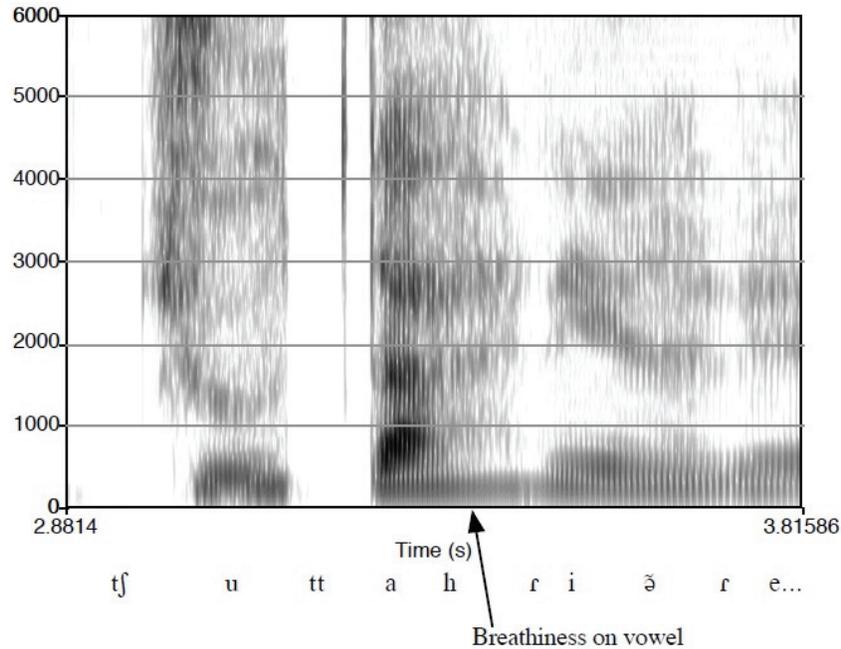
b. Tone /3/ without [ʔ] Coda



In (5), we notice that there is a duration of complete glottal closure, with one (irregular) glottal pulse in the middle. There are a few irregular glottal pulses preceding the complete closure of the vocal folds (creak). Otherwise, it appears that the glottal stop is realized with almost complete voicelessness, which is typical for Itunyoso Trique. The glottal stop is staggered relative to the modal vowel portion which carries tone. However, there is a noticeable effect of the glottal stop on the pitch of the preceding vowel, shown in (6). While some of the pitch perturbation (especially the fall from time index 1-2) shown in (6a) can be attributed to the presence of voiceless consonant onsets, pitch continues to fall for all speakers across the vowel duration preceding the glottal stop. By contrast, a tone /3/ without a [ʔ] coda is very level, as shown in (6b). The magnitude of the pitch perturbation in (6a) varies by speaker, but is between 16 - 50 Hz. For speaker W, a large magnitude fall in F0 occurs across approximately 40 msec preceding the glottal stop. Despite its phasing, coda [ʔ] affects pitch across a large duration of the preceding, albeit short, vowel.

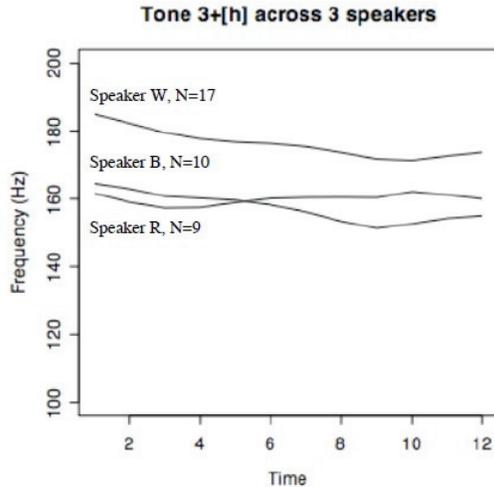
In contrast to coda [ʔ], coda /h/ rarely involves voicelessness. It is regularly realized with breathy phonation, concentrated toward the end of the rime on which it occurs. This is indicated in the spectrogram in (7) by broadband spectral energy after the more modally-phonated vowel. In the example below, the word [tʃuttah] 3.3 ‘deer’ appears.

(7) Realization of Coda /h/ in Context

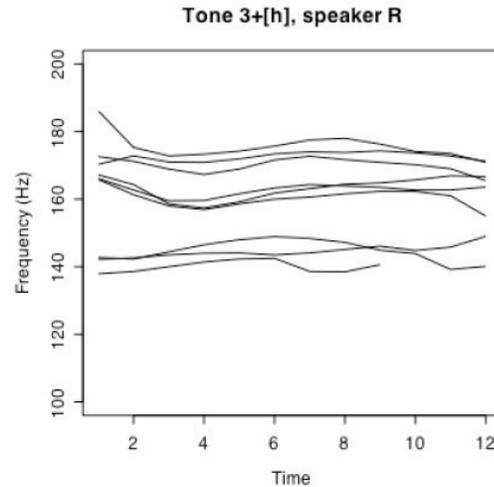


We notice in (7) that there is voicing throughout the rime /ah/. The formants in the latter part of the rime have a largely reduced amplitude though, consisting of increased aperiodic energy occupying the higher frequencies of the spectrum. This is typical for breathy phonation (Ní Chasaide and Gobl 1997, Gordon and Ladefoged 2001). In the data above, it is not possible to distinguish a moment where breathiness is phased relative to the modal portion of the vowel. Rather, it seems to increase gradually throughout the rime duration, where pitch also gradually falls. Plots of the pitch perturbation are shown in (8).

- (8) Coda /h/ Pitch Perturbation  
 a. Tone /3/ + Coda [h]



- b. Speaker R's Data

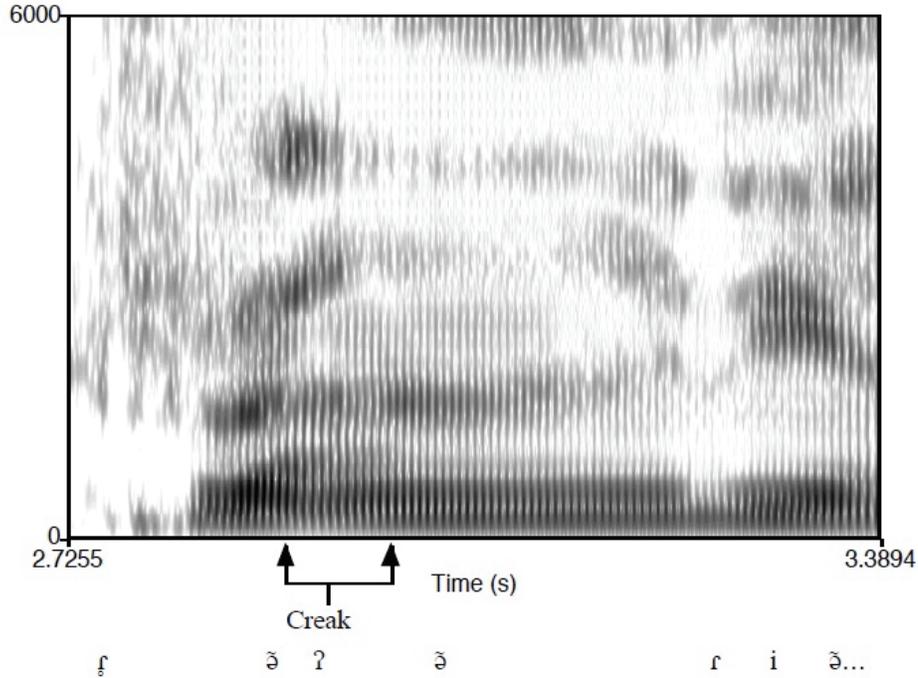


In (8a), for two of the speakers there is a gradual pitch fall across the entire rime duration. For one speaker (R), there is a slight pitch raising. This behavior, however, reflects pitch-raising that occurred on 3 repetitions. In (8b) we notice that the trend appears to be a falling pitch for this speaker, which is timed later for speaker R than for the other speakers; toward the end of the rime. There is less pitch declination with coda [h] than with coda [ʔ] in Itunyoso Trique. The magnitude of the pitch declination in coda [h] contexts was between 2 - 13 Hz., where speakers W and B both showed a pitch declination of around 13 Hz. The important finding here is the timing of the pitch declination, as it occurs throughout the duration of the rime. It is not timed toward the endpoint for all speakers. Even if we adjust for the increased pitch in the first few time indices in (8a), due to the presence of a voiceless onset, we still observe pitch declination across the vowel. Coda /h/ is not phased to avoid tonal overlap, but seems to affect pitch across the preceding “modal” vowel.

Finally, we turn our attention to the phonetic manifestation of intervocalic [ʔ], which is normally realized with very slight creak, pitch declination, and amplitude perturbation. There is no complete glottal closure, like we observed for coda [ʔ], a fact which corresponds to findings on Coatzospan Mixtec, a related language (Gerfen and Baker 2005). A spectrogram of the intervocalic glottal stop is given in (9), with the word [rɔʔə] 3.3 ‘mushroom.’ We notice longer glottal pulses which are associated with the realization of [ʔ]. This is a typical realization of /ʔ/ in intervocalic position.

*On Non-Optimal Laryngeal Timing: The Case of Trique*

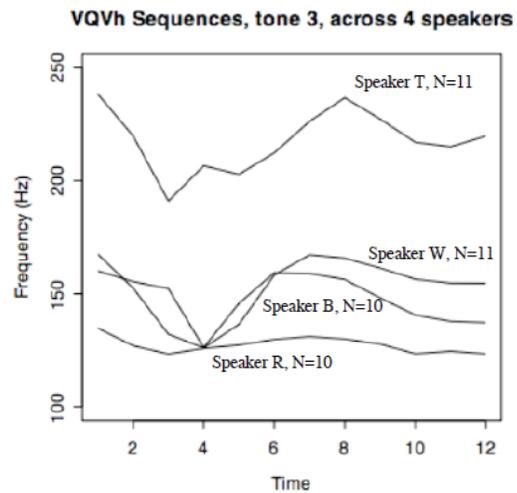
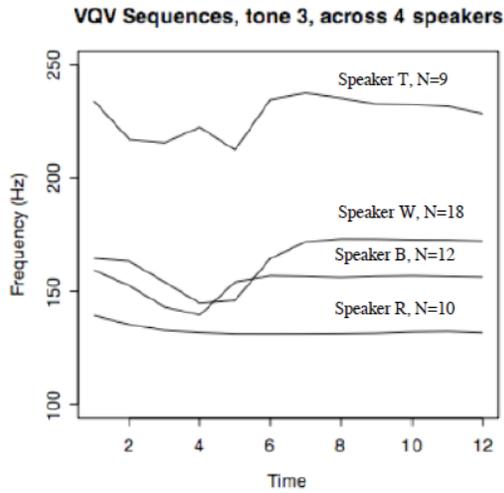
(9) Realization of Intervocalic [ʔ] in Context



(10) Intervocalic [ʔ] Pitch Perturbation

a. Tone /3/, /VʔV/

b. Tone /3/, /VʔVh/



The period of slight creak and pitch perturbation lasts for 1/4-1/3 on the duration of *VʔV* / *VʔVh* sequences (between 40-80 msec.). In (9), we see that the vowel

following the glottalization has a longer duration than the one preceding it, which is attributed to root-final vowel lengthening. If the /ʔ/ were phased to avoid overlap with the tone on the word, we would not expect it to surface as slight creak, but with periods of complete glottal closure. In (10) we observe the glottal stop perturbing pitch on the surrounding vowels. In (10a) and (10b), the vowel preceding the glottalization has substantially lowered pitch. The vowel following the [ʔ] is level on *VʔV* sequences, but falls again on *VʔVh* sequences due to the presence of coda breathiness. The pitch declination observed from the intervocalic glottal stop has a magnitude between 8-47 Hz. Speaker R realizes *VʔV* sequences with overall lower pitch than observed with the non-laryngealized tone /3/.

From this data, it appears that intervocalic glottalization is not timed so as to avoid pitch overlap. In many cases the pitch perturbation is the main acoustic correlate of the laryngeal, where creak is slight or absent. Furthermore, both coda [h] and [ʔ] are normally realized with some degree of pitch perturbation on the preceding vowel, regardless of whether or not they are realized discretely by long periods of voicelessness. For a coda [ʔ], there is a long period of complete glottal closure while for a coda [h], there is breathy phonation on the vowel.

Pitch modification due to laryngeals overlaps pitch indicating syllabic tone in Itunyoso Trique. Since it is apparent that speakers do not time laryngeals to avoid such overlap, then how do speakers distinguish the tone on these laryngeally-modified vowels? I suggest that speakers may be sensitive to distinguishing global pitch contours and levels from pitch perturbations that are correlated with laryngeals. For instance, as we observed in (10), the presence of a pitch perturbation for 1/3 of the *VʔV* duration is distinct from the global pitch level found in these sequences. Additionally, the presence of non-modal phonation-induced pitch declination is distinct from pitch declination with modal phonation. Modal falling tones are distinct from tones that have perturbation due to laryngeals. The phonetic manifestation of laryngeally-perturbed pitch is different in global pitch level and slope from both level and contour tones.

## 5. Discussion and Conclusion

Itunyoso Trique has a large set of tonal and laryngeal contrasts, which are best understood via the language's system of root-final syllable prominence. This position in the word licenses a large set of laryngeal, segmental, and tonal contrasts and is the locus of vowel-lengthening. Prosodic licensing explains the distinct phonological patterning of laryngeals in Itunyoso Trique. This finding jibes well with research on laryngeal patterning in other languages, like Kashaya and Yowlumne (Howe and Pulleyblank 2001). With respect to phonetics, coda glottal stops regularly have long periods of complete glottal closure, making them distinct from intervocalic glottal stops, which are realized with slight creak and pitch perturbations. Coda /h/ is regularly realized with voicing [h], which overlaps as breathy phonation on the preceding vowel. The phonetic realization of all these contrasts involves pitch perturbations which extend onto the surrounding vowels. Laryngeally-induced pitch perturbation in complex tone languages is problematic

*On Non-Optimal Laryngeal Timing: The Case of Trique*

for a theory of the phonetics-phonology interface where perceptually-optimal positions for laryngeals are directly encoded into the language's phonology. Rather, such patterns suggest that the phonetic manifestation of laryngeals is best understood via language-particular phonetics, where speakers distinguish local and laryngeally-derived pitch perturbations from lexical tone.

**References**

- Blankenship, Barbara. 2002. The Timing of Nonmodal Phonation in Vowels. *Journal of Phonetics*, 30:163-191.
- Buckley, Eugene. 1994. *Theoretical Aspects of Kashaya Phonology and Morphology*. Stanford, CSLI.
- Buckley, Eugene. 1995. *Optimal Imbs in Kashaya*. ms. University of Pennsylvania.
- Gerfen, Chip, and Kirk Baker. 2005 The Production and Perception of Laryngealized Vowels in Coatzospan Mixtec. *Journal of Phonetics* 33: 311-334.
- Gordon, Matthew, and Peter Ladefoged. 2001. Phonation Types: A Cross-Linguistic Overview. *Journal of Phonetics* 29:383-406.
- Hayes, Bruce and Donca Steriade. 2004. Introduction: the phonetic bases of phonological markedness. In Hayes, B., Kirchner, R. and Steriade, D. (eds.) *Phonetically based phonology*. Cambridge: Cambridge University Press. 1-33.
- Hinton, Leanne. 1992. An Accentual Analysis of tone in Chalcatongo Mixtec. *Occasional Papers in Linguistics* 16, James E. Redden (ed.) 173-82. Carbondale. Southern Illinois University.
- Hollenbach, Barbara. 1984. *The Phonology and Morphology of tone and laryngeals in Copala Trique*. Phd Dissertation. University of Arizona.
- Howe, Darin, and Douglas Pulleyblank. 2001. Patterns and Timing of Glottalization. *Phonology* 18: 45-80.
- Longacre, Robert. 1952. Five Phonemic Pitch Levels in Trique. *Acta Linguistica* 7: 62-81.
- Longacre, Robert. 1957. Proto-Mixtecan. *Folklore and Linguistics Memoir* 5, vii. Indiana University Research Center in Anthropology, Bloomington. Indiana University.
- Macaulay, Monica and Joseph C. Salmons. 1995. The Phonology of Glottalization in Mixtec, *International Journal of American Linguistics* 61(1): 38-61.
- Ní Chasaide, A, and Gobl, C. 1997. Voice Source Variation. In *The Handbook of Phonetic Sciences*:427-461. William Hardcastle, and John Laver (eds.). Cambridge, MA. Blackwell
- Silverman, Daniel. 1997a. *Phasing and Recoverability*, Phd Dissertation, Garland.
- Silverman, Daniel. 1997b. Laryngeal Complexity in Otomanguean Vowels. *Phonology* 14: 235-261.

Christian DiCanio

Steriade, Donca. 2001. Directional Asymmetries in Place Assimilation. In *The Role of Speech Perception in Phonology*. Elizabeth Hume and Keith Johnson (eds). Academic Press.

Zhang, Jie. 2001. *The Effects of Duration and Sonority on Contour Tone Distribution: Typological Survey and Formal Analysis*, PhD Dissertation, UCLA.

Christian DiCanio  
Dynamique du Langage  
Université Lyon 2 (Lumière)  
214C, L'institut de sciences de l'homme  
Lyon, France 69363

cdicanio@gmail.com

## Non-Canonical Uses of the Article in Basque<sup>1</sup>

LUIS EGUREN

*Universidad Autónoma de Madrid*

### 0. Introduction

As it is shown in (1), the Basque article is a suffix taking the phonetic forms *-a* and *-ak* for singular and plural, respectively.

- (1) a. Irakasle-**a** etorri da.  
teacher-**DET**come aux  
'The teacher has come.'  
b. Irakasle-**a-k** hemen daude.  
teacher-**DET-PL** here are  
'The teachers are here.'

In this paper we deal with Basque data of the sort illustrated in (2) and (3). As the English glosses indicate, such sentences are ambiguous. On the one hand, the nominals in (2) may have a specific reading and can also convey an existentially quantified meaning; the sentences in (3), on the other hand, can be interpreted either as identifying or as predicative statements.

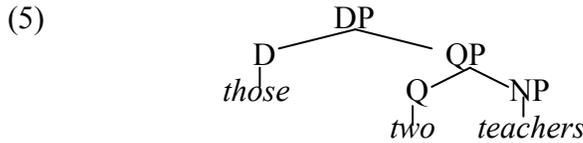
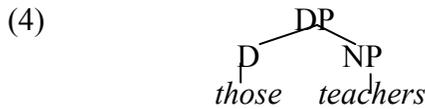
- (2) a. Ardo-**a** edan dut.  
wine-**SUF** drink AUX  
'I have drunk (the) wine.'  
b. Sagarr-**a-k** jan ditut.  
apple-**SUF-PL** eat AUX  
'I have eaten (the) apples.'
- (3) a. Jon irakasle-**a** da.  
Jon teacher-**SUF** is  
'Jon is {the/a} teacher.'  
b. Jon eta Miren txiki-**a-k** dira.  
Jon and Miren small-**SUF-PL** are  
'Jon and Miren are {the small ones/small}.'

---

<sup>1</sup> The research underlying this work has been supported by a grant to the project BFF2003-06053.

In both the specific nominals in (2) and the identifying copulative sentences in (3) the suffix *-a* corresponds to the Basque (definite) article. However, this certainly cannot be the case in existentially quantified nominals and predicative statements. How can this homophonous suffix be characterized then? This is the question we will try to answer.

In what follows we will assume the so called “Split-DP Hypothesis”, represented in (5), which assigns a different projection to strong and weak determiners within an extended Determiner Phrase.<sup>2</sup>

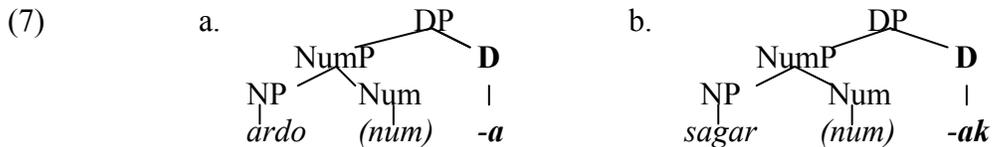


### 1. The Basque Suffix *-a* as an Existential Quantifier

As just mentioned, the nominals in (2) (repeated here for convenience) may have a specific interpretation and can also convey a quantificational meaning.

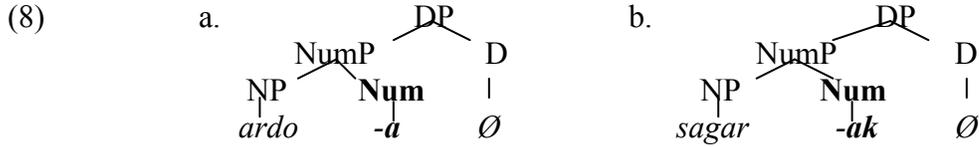
- (6)
- a. Ardo-**a** edan dut.  
 wine-SUF drink AUX  
 ‘I have drunk (the) wine.’
  - b. Sagarr-**a-k** jan ditut.  
 apple-SUF-PL eat AUX  
 ‘I have eaten (the) apples.’

In order to account for this ambiguity, Artiagoitia (2002, 2004) puts forward two different analyses for the suffix *-a(k)* that goes with nominals with a specific reading and for the homophonous morpheme that obligatorily appears in existentially quantified bare nouns. His proposal is depicted in the trees in (7) and (8).



<sup>2</sup> On the (Split) DP Hypothesis see, e.g., Bernstein (2001), Borer (2005), Longobardi (2001), Vangsnes (2001) and Zamparelli (2000). On the DP Hypothesis in Basque see Artiagoitia (1997, 1998, 2000, 2002, 2004).

*Non-Canonical Uses of the Article in Basque*

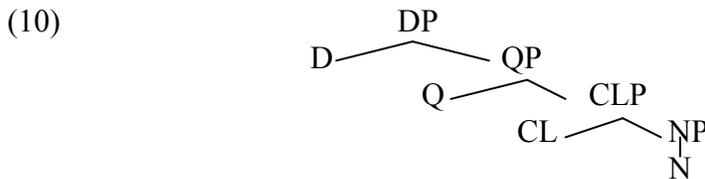


In Artiagoitia’s view, in nominals with a specific interpretation the suffix is a strong determiner heading the uppermost DP projection (cf. (7)). However, in nominals with a quantificational meaning, the suffix *-a(k)* is not a true determiner, so this linguist argues, and it is inserted in the intermediate NumP layer as a last resort device to mark number in DPs with no overt determiner (cf. (8)), given the fact that nouns do not inflect for number in Basque (cf. (9)).

- (9)
- a. hiru gizon  
three man  
‘three men’
  - a. gizon hori-ek  
man that-PL  
‘those men’

Artiagoitia’s insight unfortunately results in the number paradigm of Basque being oversized; besides the canonical number markers *-∅(sg.)/-k(pl.)*, the suffixes *-a(sg.)/-ak(pl.)* would also signal the distinction between singular and plural in particular contexts. Therefore, an alternative analysis for the suffix *-a(k)* that surfaces in existentially quantified nominals will now be developed, which limits the Basque number paradigm to its canonical forms.

In our proposal a more articulated structure for split DPs will be adopted. As represented in (10), Borer (2005) argues for the existence of an extra functional projection between the Quantifier Phrase (QP) and the Noun Phrase (NP), a so called Classifier Phrase (CLP), in which the affixes and lexical items that express the count/mass distinction across languages are generated.

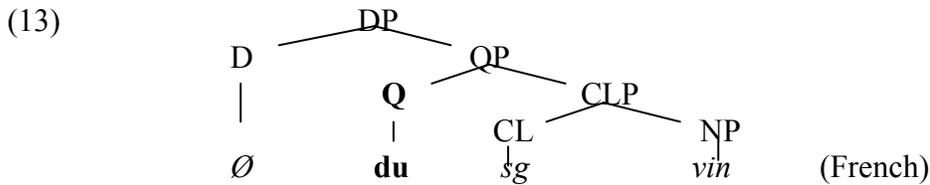
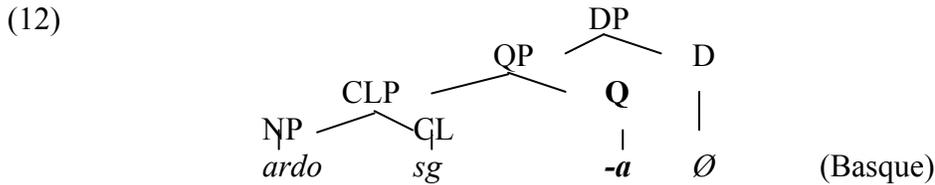


The Classifier Phrase is the structural locus, so Borer says, not only for classifier morphemes in languages with a classifier system, but also for number markers. As the Armenian data in (11) show, evidence for this idea comes from the fact that plural morphology and classifier morphology do not co-occur in languages that make use of both devices to assign nouns to the count class.

- (11) a. Yergu **had** hovanoc uni-m.  
 two CL umbrella have-1SG  
 ‘I have two umbrellas.’  
 b. Yergu hovanoc-**ner** uni-m.  
 two umbrella-**PL** have-1SG  
 ‘I have two umbrellas.’  
 c. \*Yergu **had** hovanoc-**ner** uni-m.  
 two CL umbrella-**PL** have-1SG  
 ‘I have two umbrellas.’ (Armenian)

Notice that within Borer’s architecture for DPs number morphology and weak determiners are generated in two different structural positions. We will extend this idea to the Basque DP.

Our proposal then goes as follows. As shown in (12), in our view, the number morpheme (singular  $\emptyset$ , plural  $-k$ ) is generated within the CLP. The suffix  $-a$  that attaches to existentially quantified nominals is, on its part, a true (indefinite) determiner—an existential quantifier to be more precise, that corresponds to the so called French partitive article *du*,<sup>3</sup> and heads the QP projection.<sup>4</sup>



The analysis of the suffix  $-a$  that surfaces in existentially quantified nominals

<sup>3</sup> Most significantly, existentially quantified bare nominals take the partitive case marker  $-(r)ik$  (instead of the suffix  $-a$ ) in negative and interrogative sentences in Basque.

- (i) a. Ez dut ardo-**rik** edan.  
 NEG AUX wine-**PART** drink  
 ‘I have not drunk wine’.  
 b. Sagar-**rik** jan duzu?  
 apple-**PART** eat AUX  
 ‘Have you eaten apples?’

<sup>4</sup> Notice that the uppermost DP is also projected in the existentially quantified nominals in (12) and (13) in order to capture the fact that these nominals are arguments (see, e.g., Zamparelli 2000). A rule of the post-syntactic Morphological Component (see Halle and Marantz 1993) would finally rearrange the terminal nodes CL and Q in the structure in (12), so that the correct linear order N+Q+Num is obtained: *sagarr-a-k*.

as an indefinite determiner, and not as a number marker, clearly simplifies the Basque number paradigm. But it also agrees with a most relevant fact which has not been mentioned so far: the Basque article *-a* does not always have a definite or specific interpretation. As illustrated in (14a), this suffix is also present in non-specific nominals, corresponding to the English or Spanish indefinite article in these cases. And, as can be seen in (14b), the same affix *-a* can also occur in stereotype characterizing predicates, which contain an indefinite article in English and have no article at all in Spanish (e.g., *I have a girlfriend/Tengo Ø novia, Have you got a car?/¿Tienes Ø coche?*).<sup>5</sup>

- (14) a. Zigarro-**a** nahi dut.  
cigarette-**DET** want AUX  
'I want a cigarette.'  
b. Emazte-**a** daukat.  
wife-**DET** have  
'I have a wife.'

In conclusion, when the data in (14) are put up for discussion, the occurrence of the suffix *-a* in existentially quantified nominals could then be seen as just one of the various uses the Basque article can have.<sup>6</sup> We will now look into the homophonous suffix *-a(k)* that shows up in predicative statements.

## 2. The Basque Suffix *-a* as a Pronominal Copula

As mentioned in the introduction, the Basque sentences in (15) are ambiguous, i.e., they can be interpreted either as identifying or predicative statements.

- (15) a. Jon irakasle-**a** da.  
Jon teacher-**SUF** is  
'Jon is {the/a} teacher.'  
b. Jon eta Miren txiki-**a-k** dira.  
Jon and Miren small-**SUF-PL** are  
'Jon and Miren are {the small ones/small}.'

---

<sup>5</sup> On the different meanings and roles of the Basque article see Euskaltzaindia (1985), Trask (2003) and Txillardegi (1978). As an influence from Spanish and French, the affix *-a* in nominals such as those in (14a,b) is increasingly being replaced by the numeral *bat* 'one' in spoken Basque: *Zigarro bat nahi dut*.

<sup>6</sup> After this paper had already been presented at BLS 32, I discovered that an analysis of the suffix *-a(k)* in existentially quantified nominals very similar in spirit to the one I develop here is independently proposed in Etxeberria's (2005) dissertation on quantification in Basque. Etxeberria holds that mass terms are number neutral. If mass terms do not bear number morphology, there is no need to postulate the NumP in mass terms, and Artiagoitia's analysis is therefore untenable. Etxeberria argues then that the problem of existential quantification can be solved assuming "that the Basque article is always definite, and always base-generated in [Head, DP], but it is very flexible in its ability to type-shift."

Notice, however, and this is a most relevant fact, that not all nominal predicates in Basque combine with the suffix  $-a(k)$ . As the contrasts in (16) and (17) show, the presence or absence of this suffix in nominal predicates is closely related to the individual/stage-level distinction, so that the suffix only occurs in individual-level predicates (cf. (16a, 17a)), but is excluded in stage-level predicates (cf. (16b, 17b)).<sup>7</sup>

- (16) a. Miren irakasle\*(-a) da.  
 Miren teacher(-SUF) is.izan  
 ‘Miren is a teacher.’  
 b. Miren irakasle(\*-a) dago.  
 Miren teacher(-SUF) is.egon  
 ‘Miren is working as a teacher.’
- (17) a. Garazi lasai\*(-a) da.  
 Garazi serene(-SUF) is.izan  
 ‘Garazi is serene.’  
 b. Garazi lasai(\*-a) dago.  
 Garazi calm(-SUF) is.egon  
 ‘Garazi is calm.’

In this paper we will hold that the suffix  $-a(k)$  that adjoins to individual-level nominal predicates in Basque is a pronominal-like predicative particle. But prior to unfolding this idea, we will first critically examine two previous proposals on this issue: the analyses by Zabala (1993) and Artiagoitia (1997).

As indicated by the category labels in the structures in (18), Zabala (1993) argues that temporal or episodic adjectival predicates must project an Aspect Phrase for their eventive argument to be realized syntactically. Furthermore, she takes the suffix  $-a(k)$  that goes with permanent adjectival predicates to be a number morpheme that heads a Number Phrase.

- (18) a. Ane<sub>i</sub> [ t<sub>i</sub> [ t<sub>i</sub> haurdun ]<sub>AspP</sub> ]<sub>AspP</sub> dago.  
 ‘Ann is pregnant.’  
 b. Jon<sub>i</sub> [ t<sub>i</sub> [ t<sub>i</sub> baxuegi ]<sub>AP</sub> -a ]<sub>NumP</sub> da.  
 ‘Jon is too short.’

This proposal has two main drawbacks. On the one hand, it again complicates the Basque number paradigm, and on the other hand, as Artiagoitia (1997) correctly points out, it can not explain in a principled way why stage-level nominal

<sup>7</sup> On this generalization see Zabala (1993, 2003), Artiagoitia (1997), and the references there in. The correlation between the presence or absence of the suffix  $-a(k)$  and the individual/stage-level distinction does not only hold in copulative sentences with the individual-level verb *izan* or the stage-level verb *egon*, as in (16) and (17) in the text. It extends to all nominal predicates, e.g., predicates selected by raising verbs, nominal predicates in small clauses and secondary predicates (see Zabala 2003, Artiagoitia 1997).

predicates do not inflect for number in Basque (considering that in many other languages, such as Spanish for instance, both individual-level and stage-level nominal predicates bear number markers).

Artiagoitia (1997) develops a different analysis. He holds that the Basque affix *-a(k)* that occurs in individual-level nominal predicates is a non-referential article that heads a predicative DP. As shown in (19), this determiner will select either a Noun Phrase (cf. (19a)), or an Adjectival Phrase (cf. (19b)), whereas nominal predicates without the affix are just bare NPs or APs (cf. (19c,d)).<sup>8</sup>

- (19) a. [[Irakasle]<sub>NP</sub>-a<sub>D</sub>]<sub>DP</sub> da.  
           ‘She is a teacher.’  
       b. [[Lasai]<sub>AP</sub>-a<sub>D</sub>]<sub>DP</sub> da.  
           ‘She is serene.’  
       c. [Irakasle]<sub>NP</sub> dago.  
           ‘She works as a teacher.’  
       d. [Lasai]<sub>AP</sub> dago.  
           ‘She is calm.’

Moreover, in order to account for the observed correlation between the presence or absence of the affix and the individual/stage-level distinction, Artiagoitia posits that the grammar of Basque contains an interpretative principle along the lines in (20).

- (20) a. Interpret DP predicates as individual-level predicates.  
       b. Interpret NP and AP predicates as stage-level predicates.

Artiagoitia’s proposal also faces two main problems. The first problem has to do with the interpretative principle in (20). Resorting to such a principle is an *ad hoc* solution, as it only applies for Basque. For example, English individual-level nominal predicates with the verb *to be* are DPs (cf. (21a)); whereas the corresponding Spanish nominal predicates are NPs (cf. 21b). On the other hand, in both English and Spanish individual-level adjectival predicates are not DPs, and always belong to the AP category (cf. (21c,d)).

- (21) a. John is [a doctor]<sub>DP</sub>  
       b. Juan es [médico]<sub>NP</sub>  
       c. John is [tall]<sub>AP</sub>  
       d. Juan es [alto]<sub>AP</sub>

---

<sup>8</sup> Both the article *-a* and demonstratives inflect for number in Basque, while nouns and adjectives do not (see section 1). Artiagoitia argues that the occurrence of the number markers *-Ø/-k* in individual-level nominal predicates is just a side effect of the presence of the article in these kinds of predicates. Stage-level nominal predicates, in contrast, will not bear number markers because they lack articles.

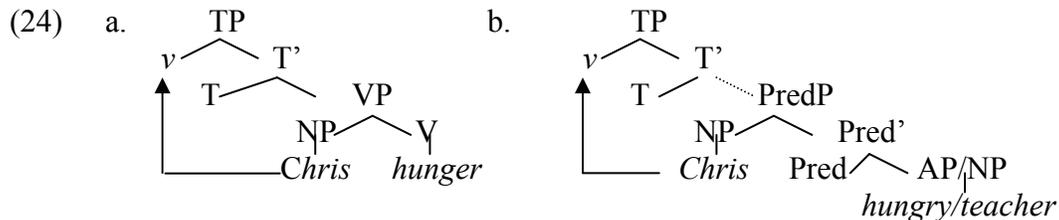
The second problem is even more serious. Artiagiotia's analysis for the suffix *-a(k)* that occurs in Basque nominal predicates as an article forces him to assume, as mentioned above, that this non-referential determiner not only selects NPs, but also APs (cf. (19b)). However, as the Spanish and English examples in (22) illustrate, determiners universally select nouns, and never select adjectives.

- (22) a. \*Juan es un (muy) inteligente.  
 b. \*John is a (very) intelligent.

Therefore, we must come to the conclusion that the suffix *-a(k)* that adjoins to individual-level nominal predicates in Basque can not be an article. In what follows an alternative analysis for this phenomenon will be offered in which we will specifically propose that this affix is a predication marker. But let us first see what predication markers are and how they project syntactically.

In his recent book on lexical categories, Baker (2003) defines verbs as inherent predicates that license a specifier (cf. (24a)) and suggests that predicate nouns and adjectives, unlike verbs, must be supported by a functional head, Pred, in order for the clause to have a subject (cf. (24b)).

- (23) a. Chris hungers.  
 b. Chris is {hungry/a teacher}.



Prima-facie evidence for this idea, so Baker says, comes from the fact that overt Preds (taking the form of copular particles) do appear in predicate nouns and adjectives, but not verbs, in quite a few languages of the world. This happens, for instance, in Edo and Chichewa, as the sentences in (25) and (26) illustrate.

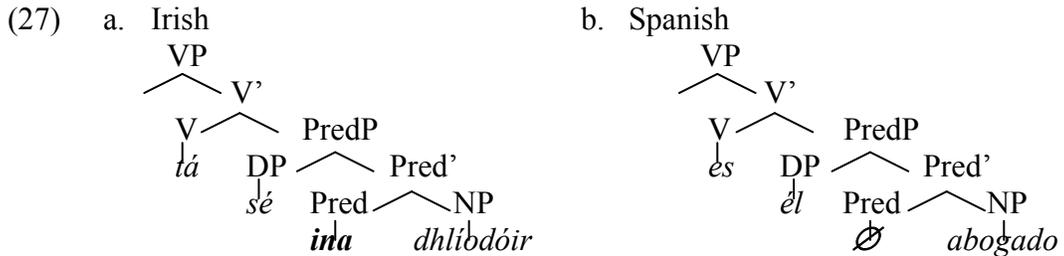
- (25) a. Èmèrí yé mòsèmòsè.  
 Mary **PRED** beautiful<sub>A</sub>  
 'Mary is beautiful.' (Edo)  
 b. M-kango ndì m-lenje.  
 3-lion **PRED** I-hunter  
 'The lion is a hunter.' (Chichewa)

These copular particles (or non-verbal copulas) are non-verbal predication markers that merely act as a link between the subject and the predicate in nominal sentences. Predication markers may be overt, as in Edo or Chichewa, or covert, as

*Non-Canonical Uses of the Article in Basque*

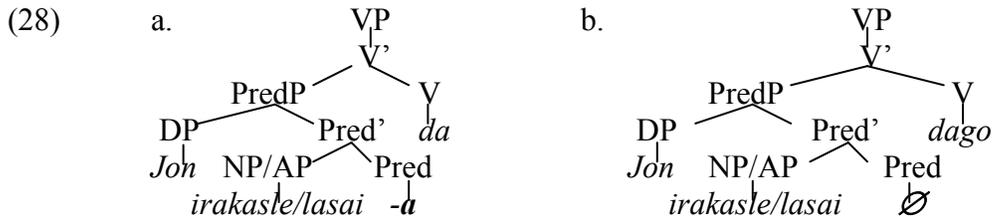
in Spanish or English (cf. (24b), (27b)), and they sometimes co-occur with a verbal copula, as in Irish (cf. (26), (27a)). This combination is to be expected, given the fact that predication markers and verbal copulas are distinct elements that head two different syntactic projections.

- (26) Tá sé *\*(ina)* dhlíodóir.  
 be (PRES) he **PRED** lawyer  
 ‘He is a lawyer.’ (Irish)



Two classes of non verbal copulas have been distinguished in the literature: particles and pronominal copulas.<sup>9</sup> Pronominal copulas are so named because they historically derive from person pronouns or demonstratives and usually retain the person and number categories associated with them. Our proposal fits well with this characterization of pronominal copulas; we consider the suffix *-a(k)* that surfaces in Basque nominal predicates to be a pronominal copula, and this idea matches with the fact that this affix shares its phonetic form with the Basque article, the latter being a lexical item that originates in a distal demonstrative and retains the number morphology demonstratives have in Basque.

Our proposal on the nature of the affix that adjoins to nominal predicates in Basque is represented in (28).



In these representations, Baker’s insights on nominal predicates are adopted, so that nominal and adjectival predicates are dominated by a PredP also in Basque. As shown in (28), the head Pred takes the phonetic form *-a* in individual-level predicates in Basque (cf. (28a)) and is null ( $\emptyset$ ) in stage-level nominal predicates (cf. (28b)).

<sup>9</sup> Hengeveld (1992) and Stassen (1997) offer a detailed cross-linguistic description of non-verbal copulas.

Our analysis has some major advantages over previous proposals, so we believe. On the one hand, it straightforwardly accounts for the fact that Basque number morphology shows up in individual-level predicates and is absent in stage-level nominal predicates. And this is so just because only the former include a (quasi)pronominal lexical item that can serve as a supporter for number in a language such as Basque, in which nouns and adjectives are invariable categories. Therefore, this analysis helps us solve the main problem Zabala's (1993) proposal had to face. Recall that this linguist took the suffix  $-a(k)$  to be simply a number marker, and, therefore, could not explain on any well-founded basis why this affix does not occur in stage-level nominal predicates.

On the other hand, and in contrast with Artiagoitia's (1997) proposal, we do not have to assume that the article selects adjectives in Basque. In our view, the suffix  $-a(k)$  that goes with individual-level nominal predicates in Basque is not an article. As argued above, we consider it to be a predication marker that heads a PredP. If we are on the right track, the fact that the suffix  $-a(k)$  combines with adjectives (in addition to nouns) in individual-level predicates is not an oddity of Basque grammar any longer; as we saw in our review of Baker's (2003) ideas, the head Pred selects, universally and by definition, predicative adjectives (and/or nouns).

Most meaningfully, our proposal can also cast light on the peculiar distribution of the affix  $-a(k)$  in Basque nominal predicates. In languages with pronominal copulas, overt copulas usually alternate with covert copulas. Stassen (1997) points out that such an alternation is often associated with the notion of 'temporal stability.' This is the case of Hebrew, for instance, as argued by Greenberg (1994, 1998). In Hebrew, as the sentences in (29) illustrate, overt pronominal copulas only occur in general or permanent statements (cf. (29a,c)), whereas episodic or temporal statements must have covert copulas (cf. (29b,d)).

- (29) a. ha-kli ha-ze \*(**hu**) patis.  
the-tool the-this **3MSG** hammer  
'This tool is a hammer.'
- b. Rina (**\*hi**) yafa ha boker.  
Rina **3FSG** pretty this morning  
'Rina is pretty this morning.'
- c. Dani **hu** xole (amush).  
Dani **3MSG** sick (terminal)  
'Dani is sick (permanently).'
- d. Dani xole.  
Dani sick  
'Dani is sick (temporarily).'
- (Hebrew)

If this generalization is correct, the distribution of the affix  $-a(k)$  in Basque nominal predicates turns out to be just a particular case of a general tendency amongst languages with pronominal copulas to draw a distinction between stable

and transitory properties by means of the use of overt or covert markers of predication.

### **3. Conclusion**

In this paper we have dealt with two unexpected uses of the Basque suffix  $-a(k)$ . We have first argued that the affix  $-a(k)$  that obligatorily occurs in existentially quantified nominals is an indefinite determiner, i.e. an existential quantifier that plays the same role in Basque the partitive article *du* plays in the corresponding nominals in French. This idea keeps the Basque number paradigm to a minimum and fits with the fact that this affix is not only used as a specificity marker, but also appears in nominals with either a non-specific or a characterizing interpretation. Secondly, we have analyzed the suffix  $-a(k)$  that adjoins to Basque individual-level nominal and adjectival predicates as a predication marker, or pronominal copula. This proposal is exempt from the problems previous proposals had to cope with, i.e. it can easily account for the fact that Basque number morphology does not show up in stage-level nominal predicates, and there is now no need to assume that the article can select adjectives in this language. It also has another major advantage: it helps explain why the Basque suffix  $-a(k)$  combines with individual-level nominal predicates and is excluded in stage-level nominal predicates. As it is often the case across languages with pronominal copulas, in Basque these markers of predication are overt in individual-level predicates only.

### **References**

- Artiagoitia, Xabier. 1997. DP Predicates in Basque. In A. Taff, ed., *University of Washington Working Papers in Linguistics* 15:161-198.
- Artiagoitia, Xabier. 1998. Determinatzaile Sintagmaren Hipotesia Euskal Gramatikan. *Uztaro* 27:33-61.
- Artiagoitia, Xabier. 2000. *Hatsarreak eta Parametroak lantzen*. Vitoria: Diputación foral de Álava.
- Artiagoitia, Xabier. 2002. The Functional Structure of the Basque Noun Phrase. In Xabier Artiagoitia et al., eds., *Erramu Boneta: Festschrift for Rudolf P. G. de Rijk. ASJUren Gehigarriak XLIV*, 73-90. Bilbao: EHU.
- Artiagoitia, Xabier. 2004. Izen Sintagmaren birziklatzea: IS-tik izenaren inguruko funtzio buruetara. In P. Albizu and B. Fernández, eds., *Euskal gramatika XXI. mendearen atarian: arazo zaharrak, azterbide berriak*, 11-38. Vitoria: Diputación Foral de Álava.
- Baker, Mark C. 2003. *Lexical Categories. Verbs, Nouns, and Adjectives*. Cambridge: Cambridge University Press.
- Bernstein, Judith. 2001. The DP Hypothesis: Identifying Clausal Properties in the Nominal Domain. In M. Baltin y C. Collins, eds., *The Handbook of Contemporary Syntactic Theory*, 536-561. Oxford: Blackwell.
- Borer, Hagit. 2005. *Structuring Sense I. In Name Only*. Oxford: Oxford University Press.

Luis Eguren

- Etxeberria Otaegi, Urtzi. 2005. Quantification and Domain Restriction in Basque, Ph.D. diss., University of the Basque Country.
- Euskaltzaindia. 1985. *Euskal Gramatika. Lehen Urratsak-I*. Iruñea: Euskaltzaindia.
- Greenberg, Yael. 1994. Hebrew Nominal Sentences and the Stage/Individual-Level Distinction, Ph.D. diss., Bar-Ilan University.
- Greenberg, Yael. 1998. An Overt Syntactic Marker for Genericity in Hebrew. In S. Rothstein, ed., *Events and Grammar*, 125-143. London: Kluwer.
- Halle, Morris, and Alec Marantz. 1993. Distributed Morphology and The Pieces of Inflection. In K. Hale and S. Keyser, eds., *The View from Building 20*, 111-176. Cambridge, MA: MIT Press.
- Hengeveld, Kees. 1992. *Non-Verbal Predication: Theory, Typology, Diachrony*. Berlin/New York: Mouton de Gruyter.
- Longobardi, Giuseppe. 2001. The Structure of DPs: Some Principles, Parameters and Problems. In M. Baltin and C. Collins, eds., *The Handbook of Contemporary Syntactic Theory*, 562-604. Oxford: Blackwell.
- Stassen, Leon. 1997. *Intransitive Predication*. Oxford: Oxford University Press.
- Trask, R. L. 2003. The Noun Phrase: Nouns, Determiners and Modifiers; Pronouns and Names. In J. Hualde and J. Ortiz de Urbina, eds., *Grammar of Basque*, 113-170. Berlin/New York: Mouton de Gruyter.
- Txillardegui. 1978. *Euskal Gramatika*. Bilbao: Vasco-Libro.
- Vangsnes, Alexander. 2001. On Noun Phrase Architecture, Referentiality, and Article Systems. *Studia Lingüística* 55:249-299.
- Zabala, Igone. 1993. Predikazioaren Teoriak Gramatika Sortzailean (Euskararen Kasua), Ph.D. diss., Universidad del País Vasco.
- Zabala, Igone. 2003. Nominal Predication: Copulative Sentences and Secondary Predication. In J. Hualde and J. Ortiz de Urbina, eds., *A Grammar of Basque*, 426-448. Berlin/New York: Mouton de Gruyter.
- Zamparelli, Roberto. 2000. *Layers in the Determiner Phrase*. New York: Garland.

Luis Eguren  
Departamento de Filología Española  
Facultad de Filosofía y Letras  
Universidad Autónoma  
Cantoblanco, Madrid (España)

[luis.eguren@uam.es](mailto:luis.eguren@uam.es)

# When Gesture Is and Is Not Language<sup>1</sup>

SUSAN GOLDIN-MEADOW

*University of Chicago*

## 0. Introduction

Consider a profoundly deaf child growing up in the United States whose hearing parents have not exposed him to American Sign Language and whose hearing losses have prevented him from acquiring English. You might think that a child in this circumstance would be unable to communicate, but in fact the child communicates quite well. When shown a picture of a shovel stuck in sand, he uses his hands to comment not on the particular shovel in the picture, but on snow shovels in general: he gestures “dig”, points at the picture of the shovel, gestures “pull-on-boots”, points outside, points downstairs, points at the shovel picture, gestures “dig”, and gestures “pull-on-boots”. The child has used gesture to convey several propositions about snow shovels—how they are used (to dig), when they are used (when boots are worn), where they are used (outside), and where they are kept (downstairs).

It is not at all unusual for people to use their hands when communicating; hearing speakers routinely gesture when they talk, no matter what language they speak (Feyereisen and de Lannoy 1991, Kendon 1980, McNeill 1992). What is striking about the deaf child’s gestures, however, is that they are not structured like hearing speakers’ gestures. When gesture is used on its own to communicate, it begins to take on linguistic properties—even when the gesturer is a child who has not been exposed to a conventional language. In contrast, when gesture is used along with speech, it still communicates, but does so in an unsegmented form not found in natural languages.

I begin this paper with a description of the gestures the deaf child produces without speech. These gestures assume the full burden of communication and take on a language-like form: they *are* language. This phenomenon stands in contrast to the gestures hearing speakers produce with speech, which I describe in the

---

<sup>1</sup> This research was supported by grants from the National Science Foundation (BNS 8810879), the National Institute of Deafness and Other Communication Disorders (R01 DC00491), the National Institutes of Child Health and Human Development (R01 HD47450 and P01 HD 40605), and the Spencer Foundation.

second part of the paper. These gestures share the burden of communication with speech and do not take on a language-like form: they are *part of* language and, as such, often reflect speakers' unspoken thoughts (and may even play a role in creating those thoughts).

## **1. Gesture without Speech Takes Over the Forms and Functions of Language**

### **1.1. Background on Deafness and Language-Learning**

When deaf children are exposed to sign language from birth, they learn that language as naturally as hearing children learn spoken language (Newport and Meier 1985). However, 90% of deaf children are not born to deaf parents who could provide early access to sign language. Rather, they are born to hearing parents who, quite naturally, expose their children to speech. Unfortunately, it is extremely uncommon for deaf children with severe to profound hearing losses to acquire spoken language without intensive and specialized instruction. Even with instruction, their acquisition of speech is markedly delayed (Conrad 1979, Mayberry 1992).

The ten children my colleagues and I studied were severely to profoundly deaf (Goldin-Meadow 2003a). Their hearing parents had decided to educate them in oral schools where sign systems are neither taught nor encouraged. At the time of our observations, the children ranged in age from 1;2 to 4;10 (years;months) and had made little progress in oral language, occasionally producing single words but never combining those words into sentences. In addition, they had not been exposed to a conventional sign system of any sort (e.g. American Sign Language or a manual code of English). The children thus knew neither sign nor speech.

Under such inopportune circumstances, these deaf children might be expected to fail to communicate, or perhaps to communicate only in non-symbolic ways. The impetus for symbolic communication might require a language model, which all of these children lacked. However, this turns out not to be the case. Many studies have shown that deaf children will spontaneously use gestures, called "homesigns", to communicate if they are not exposed to a conventional sign language (Fant 1972, Lenneberg 1964, Moores 1974, Tervoort 1961). The child described at the beginning of this paper is an excellent example. Children who use gesture in this way are clearly communicating. But are they communicating in a language-like way? The focus of my work has been to address this question. I do so by identifying linguistic constructions that the deaf children use in their gesture systems. These properties of language, which the children are able to fashion without the benefit of linguistic input, are what I call the "resilient" properties of language (Goldin-Meadow 1982, 2003a).

### **1.2. The Resilient Properties of Language**

Table 1 lists the resilient properties of language that we have found thus far in the ten deaf children's gesture systems (Goldin-Meadow 2003a). There may, of course, be many others; just because we have not found a particular property in a

*When Gesture Is and Is Not Language*

deaf child's homesign gesture system does not mean it is not there. The table lists properties at the word and sentence levels, as well as properties of language use, and details how each property is instantiated in the deaf children's gesture systems.

**Table 1.** The resilient properties of language

| <u>The Resilient Property</u> | <u>As Instantiated in the Deaf Children's Gestures</u>                                                     |
|-------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Words</b>                  |                                                                                                            |
| Stability                     | Gesture forms are stable and do not change capriciously with changing situations.                          |
| Paradigms                     | Gestures consist of smaller parts that can be recombined to produce new gestures with different meanings.  |
| Categories                    | The parts of gestures are composed of a limited set of forms, each associated with a particular meaning.   |
| Arbitrariness                 | Pairings between gesture forms and meanings can have arbitrary aspects, albeit within an iconic framework. |
| Grammatical Functions         | Gestures are differentiated by the noun, verb, and adjective grammatical functions they serve.             |
| <b>Sentences</b>              |                                                                                                            |
| Underlying Frames             | Predicate frames underlie gesture sentences.                                                               |
| Deletion                      | Consistent production and deletion of gestures within a sentence mark particular thematic roles.           |
| Word Order                    | Consistent orderings of gestures within a sentence mark particular thematic roles.                         |
| Inflections                   | Consistent inflections on gestures mark particular thematic roles.                                         |
| Recursion                     | Complex gesture sentences are created by recursion.                                                        |
| Redundancy Reduction          | Redundancy is systematically reduced in the surface of complex gesture sentences.                          |
| <b>Language Use</b>           |                                                                                                            |
| Here-and-Now Talk             | Gesturing is used to make requests, comments, and queries about the present.                               |
| Displaced Talk                | Gesturing is used to communicate about the past, future, and hypothetical.                                 |
| Narrative                     | Gesturing is used to tell stories about self and others.                                                   |
| Self-Talk                     | Gesturing is used to communicate with oneself.                                                             |
| Meta-Language                 | Gesturing is used to refer to one's own and others' gestures.                                              |

**1.2.1. Words**

The deaf children's gesture words have five properties that are found in all natural languages. The gestures are *stable* in form, although they need not be. It would be easy for the children to make up a new gesture to fit every new situation (and, indeed, that appears to be what hearing speakers do when they gesture along with their speech, cf. McNeill 1992). But that is not what the deaf children do. They develop a stable store of forms that they use in a range of situations: they develop a lexicon, an essential component of all languages (Goldin-Meadow, Butcher,

Mylander, and Dodge 1994).

Moreover, the gestures the children develop are composed of parts that form *paradigms*, or systems of contrasts. When the children invent a gesture form, they do so with two goals in mind: the form must not only capture the meaning they intend (a gesture-world relation), but it must also contrast in a systematic way with other forms in their repertoire (a gesture-gesture relation). In addition, the parts that form these paradigms are *categorical*. For example, one child used a *Fist* handshape to represent grasping a balloon string, a drumstick, and handlebars—grasping actions requiring considerable variety in diameter in the real world. The child did not distinguish objects of varying diameters within the *Fist* category, but did use his handshapes to distinguish objects with small diameters as a set from objects with large diameters (e.g. a cup, a guitar neck, the length of a straw), which were represented by a *CLarge* hand. The manual modality can easily support a system of analog representation, with hands and motions reflecting precisely the positions and trajectories used to act on objects in the real world. But the children do not choose this route. They develop categories of meanings that, although essentially iconic, have hints of *arbitrariness* about them. The children do not, for example, all have the same form-meaning pairings for handshapes (Goldin-Meadow, Mylander, and Butcher 1995; Goldin-Meadow, Mylander, and Franklin 2006).

Finally, the gestures the children develop are differentiated by *grammatical function*. Some serve as nouns, some as verbs, some as adjectives. As in natural languages, when the same gesture is used for more than one grammatical function, that gesture is marked (morphologically and syntactically) according to the function it plays in the particular sentence (Goldin-Meadow et al. 1994). For example, if a child were to use a twisting gesture in a verb role, that gesture would likely be produced near the jar to be twisted open (i.e. it would be inflected); it would *not* be abbreviated; and it would be produced *after* a pointing gesture at the jar. In contrast, if the child were to use the twisting gesture in a noun role, the gesture would likely be produced in neutral position near the chest (i.e. it would *not* be inflected); it would be abbreviated (produced with one twist rather than several); and it would occur *before* the pointing gesture at the jar.

### 1.2.2. Sentences

The deaf children's gesture sentences have six properties found in all natural languages. Underlying each sentence is a *predicate frame* that determines how many arguments can appear along with the verb in the surface structure of that sentence (Goldin-Meadow 1985). For example, four slots underlie a gesture sentence about transferring an object, one for the verb and three for the arguments (actor, patient, recipient). In contrast, three slots underlie a gesture sentence about eating an object, one for the verb and two for the arguments (actor, patient).

Moreover, the arguments of each sentence are marked according to the thematic role they play. There are three types of markings that are resilient (Goldin-Meadow and Mylander 1984, Goldin-Meadow et al. 1994):

### *When Gesture Is and Is Not Language*

- (1) *Deletion* – The children consistently produce and delete gestures for arguments as a function of thematic role; for example, they are more likely to delete a gesture for the object or person playing the role of transitive actor (soldier in “soldier beats drum”) than they are to delete a gesture for an object or person playing the role of intransitive actor (soldier in “soldier marches to wall”) or patient (drum in “soldier beats drum”).
- (2) *Word Order* – The children consistently order gestures for arguments as a function of thematic role; for example, they place gestures for intransitive actors and patients in the first position of their two-gesture sentences (soldier-march, drum-beat).
- (3) *Inflection* – The children mark gestures for arguments with inflections as a function of thematic role; for example, they displace a verb gesture in a sentence toward the object that is playing the patient role in that sentence (the “beat” gesture would be articulated near, but not on, a drum).

In addition, *recursion*, which gives natural languages their generative capacity, is a resilient property of language. The children form complex gesture sentences out of simple ones (Goldin-Meadow 1982). For example, one child pointed at me, produced a “wave” gesture, pointed again at me, and then produced a “close” gesture to comment on the fact that I had waved before closing the door—a complex sentence containing two propositions: “Susan waves” (proposition 1) and “Susan closes door” (proposition 2). The children systematically combine the predicate frames underlying each simple sentence following principles of sentential and phrasal conjunction. When there are semantic elements that appear in both propositions of a complex sentence, the children have a systematic way of *reducing redundancy*, as do all natural languages (Goldin-Meadow 1982, 1987).

#### **1.2.3. Language Use**

The deaf children use their gestures for five central functions that all natural languages serve. They use gesture to make requests, comments, and queries about things and events that are happening in the situation—that is, to communicate about the *here-and-now*. Importantly, however, they also use their gestures to communicate about the non-present: *displaced* objects and events that take place in the past, the future, or in a hypothetical world (Butcher, Mylander, and Goldin-Meadow 1991; Morford and Goldin-Meadow 1997).

In addition to these rather obvious functions that language serves, the children use their gestures to communicate with themselves—to *self-talk* (Goldin-Meadow 2003a). They also use their gestures to refer to their own or to others’ gestures—for *metalinguistic* purposes (Singleton, Morford, and Goldin-Meadow 1993). And finally, the children use their gestures to tell stories about themselves and others—to *narrate* (Phillips, Goldin-Meadow, and Miller 2001). They tell stories about events they or others have experienced in the past, events they hope will

occur in the future, and events that are flights of imagination. For example, in response to a picture of a car, one child produced a “break” gesture, an “away” gesture, a pointing gesture at his father, a “car-goes-onto-truck” gesture. He paused and produced a “crash” gesture and repeated the “away” gesture. The child was telling us that his father’s car had crashed, broken, and gone onto a tow truck. Note that, in addition to producing gestures to describe the event itself, the child produced what we have called a narrative marker, the “away” gesture, which marks a piece of gestural discourse as a narrative in the same way that “once upon a time” is often used to signal a story in spoken discourse.

### **1.3. Using the Spontaneous Gestures of Speakers as Input**

The deaf children we study are not exposed to a conventional sign language and thus cannot be fashioning their gestures after such a system. They are, however, exposed to the gestures that their hearing parents use when they speak. These gestures are likely to serve as relevant input to the gesture systems that the deaf children construct. The question is what does this input look like and how do the children use it?

We first ask whether the gestures that the hearing parents use with their deaf children exhibit the same structure as their children’s gestures. If so, these gestures could serve as a model for the deaf children’s system. If not, we have an opportunity to observe how the children transform the input they do receive into a system of communication that has many of the properties of language.

#### **1.3.1. The Hearing Parents’ Gestures Are Not Structured Like Their Deaf Children’s**

Hearing parents gesture when they talk to young children (Bekken 1989; Shatz 1982; Iverson, Capirci, Longobardi, and Caselli 1999), and the hearing parents of our deaf children are no exception. The deaf children’s parents were committed to teaching them to talk and therefore talked to their children as often as they could. And when they talked, they gestured.

We looked at the gestures that the hearing mothers produced when talking to their deaf children. However, we looked at them not as they were meant to be looked at, but as a deaf child might look at them. We turned off the sound and analyzed the gestures using the same analytic tools that we used to describe the deaf children’s gestures (Goldin-Meadow and Mylander 1983, 1984). We found that the hearing mothers’ gestures do not have structure when looked at from a deaf child’s point of view.

Going down the list of resilient properties displayed in Table 1, we find no evidence of structure at any point in the mothers’ gestures. With respect to gestural “words”, the mothers did not have a *stable* lexicon of gestures (Goldin-Meadow et al. 1994), nor were their gestures composed of *categorical* parts that either formed *paradigms* (Goldin-Meadow et al. 1995) or varied with *grammatical function* (Goldin-Meadow et al. 1994). With respect to gestural “sentences”, the mothers rarely concatenated their gestures into strings and thus provided little

data from which we (or their deaf children, for that matter) could abstract *predicate frames* or *deletion*, *word order*, and *inflectional* marking patterns (Goldin-Meadow and Mylander 1984). Whereas all of the children produce complex sentences displaying *recursion*, only some of the mothers did, and they first produced these sentence types after their children (Goldin-Meadow 1982). With respect to gestural use, the mothers did not make *displaced reference* with their gestures (Butcher et al. 1991), nor did we find evidence of any of the other uses to which the children put their gestures, including *story-telling* (e.g. Phillips et al. 2001).

Of course, it may be necessary for the deaf children to see hearing people gesturing in communicative situations in order to get the idea that gesture can be appropriated for the purposes of communication. However, in terms of how the children *structure* their gestured communications, there is no evidence that this structure comes from the children's hearing mothers. Thus, although the deaf children may be using hearing people's gestures as a starting point, they go well beyond that point, transforming the gestures they see into a system that looks very much like language.

### **1.3.2. How to Study the Deaf Child's Transformation of Gesture into Home-sign: A Cross-Cultural Approach**

How can we learn more about this process of transformation? The fact that hearing speakers across the globe gesture differently when they speak affords us an excellent opportunity to explore if, and how, deaf children make use of the gestural input that their hearing parents provide. For example, the gestures that accompany Spanish and Turkish look very different from those that accompany English and Mandarin. As described by Talmy (1985), Spanish and Turkish are verb-framed languages, whereas English and Mandarin are satellite-framed languages. This distinction depends primarily on the way in which the path of a motion is packaged. In a satellite-framed language, path is encoded outside of the verb (e.g. *down* in the sentence *He flew down*), and manner is encoded in the verb itself (*flew*). In contrast, in a verb-framed language, path is bundled into the verb (e.g. *sale* in the Spanish sentence *Sale volando* 'exits flying'), and manner is outside of the verb (*volando*). One effect of this typological difference is that manner is often omitted from Spanish sentences (Slobin 1996).

However, McNeill (1998) has observed an interesting compensation: although manner is omitted from Spanish speakers' *talk*, it frequently crops up in their *gestures*. Moreover, and likely because Spanish speakers' manner gestures do not co-occur with a particular manner word, their gestures tend to spread through multiple clauses (McNeill 1998). As a result, Spanish speakers' manner gestures are longer and may be more salient to a deaf child than the manner gestures of English or Mandarin speakers. Turkish speakers also produce gestures for manner relatively frequently. In fact, Turkish speakers commonly produce gestures that convey *only* manner (e.g. fingers wiggling in place = manner alone vs. fingers wiggling as the hand moves forward = manner + path; cf. Ozyurek and Kita 1999,

Kita 2000). Manner-only gestures are rare in English and Mandarin speakers.

These four cultures—Spanish, Turkish, American, and Chinese—thus offer an excellent opportunity to examine the effects of hearing speakers' gestures on the gesture systems developed by deaf children. Our plan in future work is to take advantage of this opportunity. If deaf children in all four cultures develop gesture systems with the same structure despite wide differences in the gestures they see, we will have strong evidence of the biases children themselves must bring to a communication situation. If, however, the children differ in the gesture systems they construct, we will be able to explore how a child's construction of a language-like gesture system can be influenced by the gestures he or she sees. We have already found that American deaf children exposed only to the gestures of their hearing English-speaking parents create gesture systems that are very similar in structure to the gesture systems constructed by Chinese deaf children exposed to the gestures of their hearing Mandarin-speaking parents (Goldin-Meadow and Mylander 1998). The question now is whether these children's gesture systems are different from those of Spanish and Turkish deaf children of hearing parents.

#### **1.4. An Experimental Manipulation of Gesture with and without Speech**

The hearing mothers of each of the deaf children in our studies were committed to teaching their children to speak. As a result, they never gestured without talking. And, like all speakers' gestures, the gestures that the hearing mothers produced formed an integrated system with the speech they accompanied (McNeill 1992). The mothers' gestures were thus constrained by speech and were not "free" to take on the resilient properties of language found in their children's gestures. The obvious question is what would happen if we forced the mothers to keep their mouths shut.

We did just that, although the participants in our study were undergraduates at the University of Chicago, not the deaf children's hearing mothers (Goldin-Meadow, McNeill, and Singleton 1996). We asked English speakers who had no previous experience with sign language to describe a series of videotaped scenes using their hands and not their mouths. We then compared the resulting gestures to the gestures these same adults produced when asked to describe the scenes using speech.

We found that when using gesture on its own, the adults frequently combined their gestures into strings, and those strings were reliably ordered, with gestures for certain semantic elements occurring in particular positions in the string; that is, there was structure across the gestures at the sentence level. In addition, the verb-like action gestures that the adults produced when using gesture on its own could be divided into handshape and motion parts, with the handshape of the action frequently conveying information about the objects in its semantic frame; that is, there was structure within the gesture at the word level. Neither of these properties appeared in the gestures that these same adults produced along with speech. Thus, only when asked to use gesture on its own did the adults produce gestures characterized by segmentation and combination. Moreover, they constructed these

gesture combinations with essentially no time for reflection on what might be fundamental to language-like communication.

The adults might have gotten the inspiration to order their gestures from their own English language. However, the particular order that they used in their gestures did *not* follow canonical English word order. For example, adults were asked to describe a doughnut-shaped object that arcs out of an ashtray. When using gesture without speech, the adults produced a gesture for the ashtray first, followed by a gesture for the doughnut, and finally a gesture for the arcing-out action (Goldin-Meadow et al. 1996, Gershkoff-Stowe and Goldin-Meadow 2002). Note that a typical description of this scene in English would follow a different order: *The doughnut arcs out of the ashtray*. The adults not only displayed a non-English ordering pattern, but they also displayed a non-English deletion pattern when using gesture on its own. Moreover, the deletion pattern resembled the pattern found in the deaf children's gestures (Goldin-Meadow, Yalabik, and Gershkoff-Stowe 2000).

Although the adults incorporated many linguistic properties into the gestures they produced when using gesture on its own, they did not develop all of the properties found in natural language or even all of the properties found in the gesture systems of the deaf children. In particular, they failed to develop a system of internal contrasts in their gestures. When incorporating handshape information into their action gestures, they rarely used the same handshape to represent an object, unlike the deaf child whose handshapes for the same objects were consistent in form and in meaning (Singleton, Morford, and Goldin-Meadow 1993). Thus, a system of contrasts in which the form of a symbol is constrained by its relationship to other symbols in the system (as well as by its relationship to its intended referent) is *not* an immediate consequence of symbolically communicating information to another. The continued experience that the deaf children had with a stable set of gestures (cf. Goldin-Meadow et al. 1994) may be required for a system of contrasts to emerge in those gestures.

In sum, when gesture is called upon to fulfill the communicative functions of speech, it immediately takes on the properties of segmentation and combination that are characteristic of speech. The appearance of these properties in the adults' gestures is particularly striking given that these properties were *not* found in the gestures that these same adults produced when asked to describe the scenes in speech. When the adults produced gestures along with speech, they rarely combined those gestures into strings and rarely used the shape of the hand to convey any object information at all (Goldin-Meadow et al. 1996). In other words, they did not use their gestures as building blocks for larger units, either sentence or word units. Rather, they used their gestures to holistically and mimetically depict the scenes in the videotapes, as speakers typically do when they spontaneously gesture along with their talk, a topic to which we now turn.

## **2. Gesture with Speech Reflects Thoughts that Do Not Fit into Speech**

### **2.1. The Relation Between Gesture and Speech Predicts Readiness to Learn**

Gesture and speech encode meaning differently (Goldin-Meadow 2003b, Kendon 1980, McNeill 1992). Gesture conveys meaning globally, relying on visual and mimetic imagery. Speech conveys meaning discretely, relying on codified words and grammatical devices. Because gesture and speech employ such different forms of representation, it is difficult for the two modalities to contribute identical information to a message.

Nonetheless, the information conveyed in gesture and in speech can overlap a great deal. For example, consider a child asked first whether the amount of water in two identical glasses is the same, and then whether the amount of water in one of the glasses changes after it is poured into a low wide dish. The child says that the amounts of water in the two glasses are the same at the beginning, but different after the pouring transformation. When asked to explain this answer, the child focuses on the height of the water in the containers in both speech and gesture; he says *It's different because this one's low and that one's tall* while gesturing the height of the water first on the dish and then on the glass. The child is thus conveying a justification in gesture that overlaps a great deal with the justification in speech—a gesture-speech match (Church and Goldin-Meadow 1986).

However, there are instances when gesture conveys information that overlaps very little with the information conveyed in the accompanying speech. Consider, for example, a child who gives the same explanation as the first child in speech, but conveys different information in gesture. She produces a wide “C” hand representing the width of the water in the dish, followed by a narrow “C” hand representing the width of the water in the glass. This child is focusing on the height of the water in speech, but on its width in gesture. She has produced a gesture-speech mismatch (Church and Goldin-Meadow 1986).

Children who produce mismatches in their explanations of a task have information relevant to solving the task at their fingertips and could, as a result, be on the cusp of learning the task. If so, they ought to be particularly receptive to instruction on the task, and indeed they are. Children who produce gesture-speech mismatches prior to instruction on conservation problems of this sort are more likely to profit from that instruction than children who produce matches (Church and Goldin-Meadow 1986). This phenomenon is robust, found in learners of all ages on a wide variety of tasks taught by an experimenter: 5- to 9-year-olds learning a balance task (Pine, Lufkin, and Messer 2004); 9- to 10-year-olds learning a math task (Perry, Church, and Goldin-Meadow 1988; Alibali and Goldin-Meadow 1993); and adults learning a gears task (Perry and Elder 1996). The phenomenon is also found in naturalistic learning situations: toddlers learning their first word combinations (Goldin-Meadow and Butcher 2003, Iverson and Goldin-Meadow 2005, Ozcaliskan and Goldin-Meadow 2005); and school-aged children learning a mathematical concept from a teacher (Goldin-Meadow and Singer 2003).

### **2.1.1. Why Do Gesture-Speech Mismatches Predict Openness to Instruction?**

A speaker who produces a mismatch is expressing two ideas, one in speech and another in gesture. The fact that the speaker is entertaining two ideas on a single problem may lead to cognitive instability, which in turn can lead to change. If so, a task known to encourage the activation of two ideas ought to evoke mismatches. Tower of Hanoi is a well-studied puzzle that is most efficiently solved by activating subroutines at theoretically defined choice points. There is a great deal of evidence that adults and children do indeed activate two ideas (the subroutine and an alternative path) at particular choice points on the Tower of Hanoi problem (Anzai and Simon 1979, Bidell and Fischer 1994, Klahr and Robinson 1981). We might therefore expect mismatches to occur at just these moments, and they do. When asked to explain how they solved the Tower of Hanoi puzzle, both adults and children produce significantly more gesture-speech mismatches—explanations in which speech conveys one path and gesture another—at the theoretically defined choice points than at non-choice points (Garber and Goldin-Meadow 2002). Mismatches thus tend to occur at points known to activate two strategies.

We can also test this idea from the opposite direction: we can select a situation known to elicit gesture-speech mismatches and explore whether two ideas are activated simultaneously in this situation. Consider a group of children selected because they produced either gesture-speech mismatches or matches when explaining a math problem. These children were then asked to remember a list of words while at the same time solving the math problem. All of the children solved the problem incorrectly, but children known to be mismatchers worked harder to arrive at their incorrect answers than children known to be matchers: they remembered fewer words when solving the problems, suggesting that they were indeed activating more than one strategy (Goldin-Meadow, Nusbaum, Garber, and Church 1993). Producing mismatches appears to reflect the activation of two ideas at the same time (see also Thurnham and Pine 2006).

### **2.1.2. Is the Information Found in Gesture in a Mismatch Unique to Gesture?**

When speakers produce a mismatch, the information conveyed in gesture in that mismatch is, by definition, not found in the accompanying speech. For example, the child in the conservation task described earlier conveyed width information in gesture but not in her accompanying speech. However, it is possible that, on the very next problem, this child might describe the widths of the containers in speech. Alternatively, the information found in the gesture component of a mismatch might be accessible *only* to gesture; if so, the child would not be able to talk about the widths of the containers on any of the problems.

The second alternative turns out to be the case, at least for children in the process of learning mathematical equivalence with respect to addition: children who convey a particular strategy in the gesture half of a mismatch on a math

problem do *not* convey that strategy in speech on any of the math problems in the set (Goldin-Meadow, Alibali, and Church 1993). What this means is that children who produce mismatches have information in their repertoires that they know implicitly but cannot articulate. It also means that, as listeners, if we want to know that a child has this information in her repertoire, we need to watch the child as well as listen to her.

Thus, the gestures people produce as they explain a task reflect what they know about the task. But gesture may do more than reflect knowledge; it may play a role in changing that knowledge. Gesture has the potential to change knowledge in two non-mutually exclusive ways, explored in the next two sections.

## **2.2. Gesture as a Mechanism of Change through Its Communicative Effects**

Gesture has the potential to function as a mechanism of change through its communicative effects. If gestures reflect the state of the speaker's knowledge, they could serve as a signal to others that the speaker is at a transitional point. If listeners are then sensitive to this signal, they may, as a consequence, change the way they interact with the speaker. In this way, speakers can play a role in shaping their learning environments just by moving their hands. The hypothesis here is simple: (i) speakers reveal information about their cognitive status through their gestures; (ii) people pay attention to those gestures and alter their input to the speaker accordingly; and (iii) speakers profit from this altered input. We have just reviewed evidence for point (i). The next question is whether people pay attention to the gestures speakers produce and modify their instruction in response. We explore this question in a one-on-one tutorial involving a teacher and an individual child.

### **2.2.1. Do Teachers Alter Their Instruction in Response to Their Students' Gestures?**

In order for gesture to play an important role in learning, listeners must not only pay attention to gesture, but must be able to do so in naturalistic teaching situations. We therefore observed teachers spontaneously interacting with their students. Teachers were asked to observe children explaining how they solved a series of math problems to an experimenter. The teachers then gave the children individual instruction in mathematical equivalence. Each of the teachers, at times, picked up on information that their students produced uniquely in gesture, often translating that information into their own words (Goldin-Meadow, Singer, and Kim 1999).

Teachers do pay attention to their students' gestures. But do they alter their instruction in response to those gestures? Interestingly, the teachers did give different types of instruction to children who produced mismatches than to children who produced only matches. They used more different types of spoken strategies and more of their own gesture-speech mismatches when teaching children who produced mismatches (Goldin-Meadow and Singer 2003), and the

children who produced mismatches learned. But why? The children may have learned because their teachers gave them just the right instruction. Alternatively, they may have learned because they were ready to learn.

### **2.2.2. Are the Adjustments Teachers Make in Response to Children's Gestures Good for Learning?**

We know that including gesture in instruction is, in general, good for learning (Church, Ayman-Nolley, and Mahootian 2004; Perry, Berch, and Singleton 1995; Valenzeno, Alibali, and Klatzky 2003). But to find out whether the particular adjustments that the teachers made in their math tutorials actually promote learning, we need to experimentally manipulate the numbers and types of strategies children are taught in speech and in gesture. Following a script, an experimenter taught children one or two strategies in speech and, at the same time, varied the relation between her speech and gestures: some children received no gesture at all, some received gestures that conveyed the same strategy as speech (matching gesture), and some received gestures that conveyed different strategies from speech (mismatching gesture). Children who were taught one spoken strategy were far more successful after instruction than children taught two; the teachers' spontaneous adjustments in the tutorials were wrong on this count. But the teachers were right about mismatches: children who were taught with mismatching gestures were far more successful after instruction than children taught with matching gestures or no gestures (Singer and Goldin-Meadow 2005). Getting two strategies in instruction was effective, but *only* when those two strategies were produced across modalities, one in speech and the other in gesture.

A conversation thus appears to take place in gesture alongside the conversation taking place in speech. Speakers use their hands to reveal their cognitive state to their listeners, who in turn use their hands to provide instruction that promotes learning.

### **2.3. Gesture as a Mechanism of Change through Its Cognitive Effects**

Gesture has the potential to function as a mechanism of change through its cognitive effects. When faced with a difficult problem to solve, we often find it helpful to use a cognitive prop. For example, writing a problem down can reduce cognitive effort, thereby freeing up resources that can then be used to solve the problem. In other words, externalizing our thoughts can save cognitive effort that can then be put to more effective use. Gesture can externalize ideas and thus has the potential to affect learning by influencing learners directly.

Indeed, including gesture in instruction might be effective because it encourages learners to produce gestures of their own. Adults mimic nonverbal behaviors that their conversational partners produce (Chartrand and Bargh 1999), and even very young infants imitate nonverbal behaviors modeled by an experimenter (Meltzoff and Moore 1977). It would therefore not be at all surprising if school-aged children were to imitate the gestures that their teachers produce, and indeed they do. More relevant to the point here is the fact that children who produce

these gestures are more likely to succeed after instruction than children who do not (Cook and Goldin-Meadow 2006). Gesturing during instruction encourages children to produce gestures of their own, which in turn leads to learning. Children may be able to use their hands to change their minds.

But why? One reason may be because gesturing lightens our cognitive load. Adults and children were asked to explain how they solved a math problem while at the same time remembering a list of words or letters. Both groups were found to remember more items when they gestured during their math explanations than when they did not gesture (Goldin-Meadow, Nusbaum, Kelly, and Wagner 2001). Gesturing appears to save speakers cognitive resources on the explanation task, permitting the speakers to allocate more resources elsewhere—in this case, to the memory task.

But gesture might not be lightening the speaker's load. It might merely be shifting the load away from a verbal store, perhaps to a visuo-spatial store. The idea here is that gesturing allows speakers to convey in gesture information that might otherwise have gone into a verbal store. Lightening the burden on the verbal store should make it easier to do a simultaneously performed *verbal* task. If, however, the burden has really been shifted to a visuo-spatial store, it should be harder to perform a *spatial* task (recalling the location of dots on a grid) when simultaneously gesturing than when not gesturing. But gesturing continues to lighten the speaker's load even if the second task is a spatial one (Wagner, Nusbaum, and Goldin-Meadow 2004).

Perhaps gesturing lightens a speaker's load because it is a motor activity that energizes the system (Butterworth and Hadar 1989). If so, the type of gesture produced should not matter; it should only matter *that* a speaker gestures, not *what* the speaker gestures. But the number of items that speakers remember does depend on the meaning conveyed by gesture: speakers remember more items when their gestures convey the same information as their speech (one message) than when their gestures convey different information (two messages). Gesture's content thus determines demands on working memory, suggesting that gesture confers its benefits, at least in part, through its representational properties.

### **3. Conclusion**

Gesture is chameleon-like in its form, and that form is tied to the function the gesture is serving. When gesture assumes the full burden of communication, acting on its own without speech, it takes on a language-like form, even when the gesturer is a young child who has not had access to a usable model of a conventional language. As such, gesture can reveal the linguistic biases that children bring to the task of communication. Interestingly, however, when gesture shares the burden of communication with speech, it loses its language-like structure, assuming instead a holistic and unsegmented form. Although not language-like in structure when it accompanies speech, gesture still forms an important part of language. It conveys information imagistically and, as such, has access to different information than does the verbal system. Gesture thus allows speakers to

## *When Gesture Is and Is Not Language*

convey thoughts that may not easily fit into the categorical system that their conventional language offers (Goldin-Meadow and McNeill 1999). Moreover, gesture has the potential to go beyond reflecting thought to play a role in shaping it. Gesture can be *part of* language or can itself *be* language and thus sheds light on what it means to be a language.

### **References**

- Alibali, Martha Wagner, and Susan Goldin-Meadow. 1993. Gesture-Speech Mismatch and Mechanisms of Learning: What the Hands Reveal about a Child's State of Mind. *Cognitive Psychology* 25:468-523.
- Anzai, Y., and Herbert A. Simon. 1979. The Theory of Learning by Doing. *Psychological Review* 86(3):124-140.
- Bekken, Kaaren. 1989. Is There "Motherese" in Gesture? Ph.D. diss., University of Chicago.
- Bidell, Thomas R., and Kurt W. Fischer. 1995. Developmental Transitions in Children's Early On-Line Planning. In M. M. Haith, J. B. Benson, R. J. Roberts, Jr., and B. F. Pennington, eds., *The Development of Future-Oriented Processes*. Chicago: University of Chicago Press.
- Butcher, Cynthia, Carolyn Mylander, and Susan Goldin-Meadow. 1991. Displaced Communication in a Self-Styled Gesture System: Pointing at the Non-Present. *Cognitive Development* 6:315-342.
- Butterworth, Brian, and Uri Hadar. 1989. Gesture, Speech, and Computational Stages: A Reply to McNeill. *Psychological Review* 96:168-174.
- Chartrand, Tanya L., and John A. Bargh. 1999. The Chameleon Effect: The Perception-Behavior Link and Social Interaction. *Journal of Personality and Social Psychology* 76:893-910.
- Church, Ruth Breckinridge, Saba Ayman-Nolley, and Shahrzard Mahootian. 2004. The Role of Gesture in Bilingual Education: Does Gesture Enhance Learning? *International Journal of Bilingual Education and Bilingualism* 7:303-319.
- Church, Ruth Breckinridge, and Susan Goldin-Meadow. 1986. The Mismatch Between Gesture and Speech as an Index of Transitional Knowledge. *Cognition* 23:43-71.
- Conrad, R. 1979. *The Deaf Child*. London: Harper and Row.
- Cook, Susan Wagner, and Susan Goldin-Meadow. 2006. The Role of Gesture in Learning: Do Children Use Their Hands to Change Their Minds? *Journal of Cognition and Development* 7:211-232.
- Fant, Louis J. 1972. *Ameslan: An Introduction to American Sign Language*. Silver Springs, MD: National Association of the Deaf.
- Feyereisen, Pierre, and J.-D. de Lannoy. 1991. *Gestures and Speech: Psychological Investigations*. Cambridge University Press.
- Garber, Phillip, and Susan Goldin-Meadow. 2002. Gesture Offers Insight into

Susan Goldin-Meadow

- Problem-Solving in Children and Adults. *Cognitive Science* 26:817-831.
- Gershkoff-Stowe, Lisa, and Susan Goldin-Meadow. 2002. Is There a Natural Order for Expressing Semantic Relations? *Cognitive Psychology* 45(3):375-412.
- Goldin-Meadow, Susan. 1982. The Resilience of Recursion: A Study of a Communication System Developed Without a Conventional Language Model. In Eric Wanner and Lila R. Gleitman, eds., *Language Acquisition: The State of the Art*. New York: Cambridge University Press.
- Goldin-Meadow, Susan. 1985. Language Development under Atypical Learning Conditions: Replication and Implications of a Study of Deaf Children of Hearing Parents. In K. Nelson, ed., *Children's Language, Vol. 5*, 197-245. Hillsdale, NJ: Erlbaum.
- Goldin-Meadow, Susan. 1987. Underlying Redundancy and Its Reduction in a Language Developed Without a Language Model: The Importance of Conventional Linguistic Input. In Barbara Lust, ed., *Studies in the Acquisition of Anaphora: Applying the Constraints, Vol. II*, 105-133. Boston, MA: D. Reidel Publishing Company.
- Goldin-Meadow, Susan. 2003a. *The Resilience of Language: What Gesture Creation in Deaf Children Can Tell Us about Language-Learning in General*. New York: Psychology Press.
- Goldin-Meadow, Susan. 2003b. *Hearing Gesture: How Our Hands Help Us Think*. Cambridge, MA: Harvard University Press.
- Goldin-Meadow, Susan, Martha W. Alibali, and Ruth Breckinridge Church. 1993. Transitions in Concept Acquisition: Using the Hand to Read the Mind. *Psychological Review* 100:279-297.
- Goldin-Meadow, Susan, and Cynthia Butcher. 2003. Pointing Toward Two-Word Speech in Young Children. In Sotaro Kita, ed., *Pointing: Where Language, Culture, and Cognition Meet*. NJ: Erlbaum.
- Goldin-Meadow, Susan, Cynthia Butcher, Carolyn Mylander, and Mark Dodge. 1994. Nouns and Verbs in a Self-Styled Gesture System: What's in a Name? *Cognitive Psychology* 27:259-319.
- Goldin-Meadow, Susan, San Kim, and Melissa Singer. 1999. What the Teacher's Hands Tell the Student's Mind about Math. *Journal of Educational Psychology* 91:720-730.
- Goldin-Meadow, Susan, and David McNeill. 1999. The Role of Gesture and Mimetic Representation in Making Language the Province of Speech. In Michael C. Corballis and Stephen Lea, eds., *The Descent of Mind*, 155-172. Oxford: Oxford University Press.
- Goldin-Meadow, Susan, David McNeill, and Jenny Singleton. 1996. Silence Is Liberating: Removing the Handcuffs on Grammatical Expression in the Manual Modality. *Psychological Review* 103:34-55.
- Goldin-Meadow, Susan, and Carolyn Mylander. 1983. Gestural Communication in Deaf Children: The Non-Effects of Parental Input on Language Development. *Science* 221:372-374.

*When Gesture Is and Is Not Language*

- Goldin-Meadow, Susan, and Carolyn Mylander. 1984. Gestural Communication in Deaf Children: The Effects and Non-Effects of Parental Input on Early Language Development. *Monographs of the Society for Research in Child Development* 49:1-121.
- Goldin-Meadow, Susan, and Carolyn Mylander. 1998. Spontaneous Sign Systems Created by Deaf Children in Two Cultures. *Nature* 91:279-281.
- Goldin-Meadow, Susan, Carolyn Mylander, and Cynthia Butcher. 1995. The Resilience of Combinatorial Structure at the Word Level: Morphology in Self-Styled Gesture Systems. *Cognition* 56:195-262.
- Goldin-Meadow, Susan, Carolyn Mylander, and Amy Franklin. 2006. How Children Make Language out of Gesture: Morphological Structure in Gesture Systems Developed by American and Chinese Deaf Children. *Cognitive Psychology* [in press].
- Goldin-Meadow, Susan, Howard Nusbaum, Phillip Garber, and Ruth Breckinridge Church. 1993. Transitions in Learning: Evidence for Simultaneously Activated Strategies. *Journal of Experimental Psychology: Human Perception and Performance* 19:92-107.
- Goldin-Meadow, Susan, Howard Nusbaum, Spencer D. Kelly, and Susan Wagner. 2001. Explaining Math: Gesturing Lightens the Load. *Psychological Science* 12:516-522.
- Goldin-Meadow, Susan, and Melissa A. Singer. 2003. From Children's Hands to Adults' Ears: Gesture's Role in Teaching and Learning. *Developmental Psychology* 39:509-520.
- Goldin-Meadow, Susan, Elif Yalabik, and Lisa Gershkoff-Stowe. 2000. The Resilience of Ergative Structure in Language Created by Children and by Adults. *Proceedings of Boston University Conference on Language Development* 24:343-353.
- Iverson, Jana M., and Susan Goldin-Meadow. 2005. Gesture Paves the Way for Language Development. *Psychological Science* 16:368-371.
- Iverson, Jana M., O. Capirci, E. Longobardi, and M. C. Caselli. 1999. Gesturing in Mother-Child Interaction. *Cognitive Development* 14:57-75.
- Kendon, Adam. 1980. Gesticulation and Speech: Two Aspects of the Process of Utterance. In M. R. Key, ed., *Relationship of Verbal and Nonverbal Communication*, 207-228. The Hague: Mouton.
- Kita, Sotaro. 2000. How Representational Gestures Help Speaking. In David McNeill, ed., *Language and Gesture*, 162-185. Cambridge, MA: MIT Press.
- Klahr, David, and M. Robinson. 1981. Formal Assessment of Problem Solving and Planning Processes in Preschool Children. *Cognitive Psychology* 13:113-148.
- Lenneberg, Eric H. 1964. Capacity for Language Acquisition. In J. A. Fodor and J. J. Katz, eds., *The Structure of Language: Readings in the Philosophy of Language*. NJ: Prentice-Hall.
- Mayberry, Rachel I. 1992. The Cognitive Development of Deaf Children: Recent Insights. In S. Segalowitz and I. Rapin, eds., *Child Neuropsychology*, 51-68.

- Handbook of Neuropsychology, Vol. 7.* Ed. F. Boller and J. Grafman. Amsterdam: Elsevier.
- McNeill, David. 1992. *Hand and Mind: What Gestures Reveal about Thought.* Chicago: The University of Chicago Press.
- Meltzoff, Andrew N., and M. K. Moore. 1977. Imitation of Facial and Manual Gestures by Human Neonates. *Science* 198:75-78.
- Moore, Donald F. 1974. Nonvocal Systems of Verbal Behavior. In R. L. Schiefelbusch and L. L. Lloyd, eds., *Language Perspectives: Acquisition, Retardation, and Intervention.* Baltimore: University Park Press.
- Morford, Jill P., and Susan Goldin-Meadow. 1997. From Here to There and Now to Then: The Development of Displaced Reference in Homesign and English. *Child Development* 68:420-435.
- Newport, Elissa L., and Richard Meier. 1985. The Acquisition of American Sign Language. In Dan I. Slobin, ed., *The Cross-Linguistic Study of Language Acquisition, Vol. 1.* Hillsdale, NJ: Erlbaum.
- Ozcaliskan, Seyda, and Susan Goldin-Meadow. 2005. Gesture Is at the Cutting Edge of Early Language Development. *Cognition* 96:B01-113.
- Ozyurek, Asli, and Sotaro Kita. 1999. Expressing Manner and Path in English and Turkish: Differences in Speech, Gesture, and Conceptualization. *Proceedings of the Cognitive Science Society* 21:507-512.
- Perry, Michelle, and Anastasia D. Elder. 1997. Knowledge in Transition: Adults' Developing Understanding of a Principle of Physical Causality. *Cognitive Development* 12:131-157.
- Perry, M., D. B. Berch, and J. L. Singleton. 1995. Constructing Shared Understanding: The Role of Nonverbal Input in Learning Contexts. *Journal of Contemporary Legal Issues*, Spring, 213-236.
- Perry, Michelle, Ruth Breckinridge Church, and Susan Goldin-Meadow. 1988. Transitional Knowledge in the Acquisition of Concepts. *Cognitive Development* 3:359-400.
- Phillips, Sarah, Susan Goldin-Meadow, and Peggy Miller. 2001. Enacting Stories, Seeing Worlds: Similarities and Differences in the Cross-Cultural Narrative Development of Linguistically Isolated Deaf Children. *Human Development* 44:311-336.
- Pine, Karen, Nicola Lufkin, and Daniel Messer. 2004. More Gestures than Answers: Children Learning about Balance. *Developmental Psychology* 40:1059-1067.
- Shatz, Marilyn. 1982. On Mechanisms of Language Acquisition: Can Features of the Communicative Environment Account for Development? In Eric Wanner and Lila R. Gleitman, eds., *Language Acquisition: The state of the Art*, 102-127. New York: Cambridge University Press.
- Singer, Melissa A., and Susan Goldin-Meadow. 2005. Children Learn When Their Teachers' Gestures and Speech Differ. *Psychological Science* 16:85-89.
- Singleton, Jenny, Jill Morford, and Susan Goldin-Meadow. 1993. Once Is Not Enough: Standards of Well-Formedness in Manual Communication Created

*When Gesture Is and Is Not Language*

- over Three Different Timespans. *Language* 69:683-715.
- Slobin, Dan I. 1996. From “Thought and Language” to “Thinking for Speaking”. In J. J. Gumperz and S. C. Levinson, eds., *Rethinking Linguistic Relativity*, 97-114. Cambridge: Cambridge University Press.
- Talmy, Leonard. 1985. Lexicalization Patterns: Semantic Structure in Lexical Forms. In T. Shopen, ed., *Language Typology and Syntactic Description, Vol. III: Grammatical Categories and the Lexicon*, 57-149. Cambridge: Cambridge University Press.
- Tervoort, Bernard T. 1961. Esoteric Symbolism in the Communication Behavior of Young Deaf Children. *American Annals of the Deaf* 106:436-480.
- Thurnham, Angela, and Karen Pine. 2006. The Effects of Single and Dual Representations on Children’s Gesture Production. *Cognitive Development* 21:46-59.
- Valenzeno, L., Martha Alibali, and Roberta Klatzky. 2003. Teachers’ Gestures Facilitate Students’ Learning: A Lesson in Symmetry. *Contemporary Educational Psychology* 28:187-204.
- Wagner, Susan, Howard Nusbaum, and Susan Goldin-Meadow. 2004. Probing the Mental Representation of Gesture: Is Handwaving Spatial? *Journal of Memory and Language* 50:395-407.

Susan Goldin-Meadow  
University of Chicago  
Departments of Psychology and Comparative Human Development  
5730 South Woodlawn Avenue  
Chicago, IL 60637

sgm@uchicago.edu



## Re-binding and the Derivation of Parallelism Domains

DANIEL HARDT

*Copenhagen Business School*

### 0. The Re-binding Puzzle

How can it be that meaning arises in the absence of overt linguistic structure? This is the puzzle of ellipsis—a puzzle that has been a major preoccupation in theoretical linguistics for several decades. One intriguing aspect of the puzzle concerns the phenomenon of *sloppy identity*, illustrated with VP ellipsis (VPE) in (1):

- (1) John said Mary hit him. Bill did too. (*said Mary hit John/Bill*)

Here, the antecedent VP is *said Mary hit him*, with *him* referring to *John*. The elided VP is ambiguous between a *strict* reading, *Bill said Mary hit John* and a *sloppy* reading, *Bill said Mary hit Bill*. Surprisingly, this ambiguity seems to disappear in the following variant of (1):

- (2) John said Mary hit him. Bill said she did too. (*hit John/\*Bill*)

Here, there emerges a clear preference for the strict reading *hit John*. What might account for this remarkable fact? In this paper, I will suggest that this *re-binding puzzle* reflects a fundamental fact about the computational system which links syntactic structure with meaning. I will propose that this system operates in a *monotonic* fashion: that is, meaning representations are constructed as early as possible during a bottom-up derivation, and the resulting meaning representations cannot be revised later.

In what follows, I begin with the original account of the re-binding puzzle, due to Sag (1976), who first observed the phenomenon. I argue that Sag's account is unsuccessful, and I continue with a proposed *Re-binding Generalization*: namely that re-binding is possible only when necessary to satisfy parallelism. I next show that this generalization follows if the syntax-semantics interface operates monotonically. At this point, I describe a survey I performed which supports Sag's original observations concerning re-binding—this is important, because the observations are subtle, and have been questioned in the literature. Next, I turn to a puzzle concerning focused pronouns. I argue that the Monotonic Derivation system makes available a

simpler, and more empirically successful account than has previously been available. Finally, I compare the proposed account with an alternative account, based on a constraint called MaxElide.

### 0.1. Sag's Explanation: No Re-binding

In Sag's account of VP ellipsis, the VP is represented as a *lambda abstract*, so that the elided VP in (1) is:  $\lambda x. x$  said Mary hit  $x$ . On this representation, this pronoun is represented as a lambda-bound variable, giving rise to the sloppy reading. Note that the sloppy pronoun is bound *within* the elided VP. The sloppy pronoun in (2) must be bound *outside* the elided VP.

Following Takahashi and Fox (2005), I will use the term *re-binding* to describe cases where a pronoun is bound outside the elided material. According to Sag, re-binding is not permitted. Any variables in the logical representation of the elided VP must be bound within it.

### 0.2. But—Re-binding IS Possible

Sag's explanation, while admirably simple, cannot be maintained. It has become widely accepted that re-binding is possible under certain conditions, as illustrated by (3):

- (3) Nearly EVERY boy<sub>1</sub> said Mary<sub>2</sub> hit him<sub>1</sub>. But BILL<sub>3</sub> didn't say she did. (*hit him<sub>3</sub>*)

Here, the sloppy pronoun *him<sub>3</sub>* is bound outside the elided VP, but the sloppy reading is acceptable. This shows that an alternative generalization is needed concerning re-binding.

## 1. The Re-binding Generalization

We have now seen three examples: for (1), there is no re-binding, since the pronoun is bound within the elided VP. Here strict and sloppy are thus equally possible. For (2) the sloppy reading requires re-binding—it would require the pronoun to be bound outside the VP. Since the strict reading is available to satisfy parallelism, the sloppy reading is blocked. Finally, with (3), the strict reading is not available, since the pronoun in the first sentence is bound by the quantified NP *Nearly every boy*. The only possibility is the sloppy reading, which is therefore permitted even though it involves re-binding. Based on these observations, I propose the following generalization:

*Re-binding Generalization: Re-binding is possible only when necessary to satisfy parallelism.*

### 1.1. Additional Evidence

In the following example, re-binding is not possible, as observed by Bach and Partee (1980):

- (4) Bill<sub>1</sub> BELIEVES that Sally<sub>2</sub> will marry him<sub>1</sub>, but everyone<sub>3</sub> KNOWS that she<sub>2</sub> WON'T. (*marry him<sub>1</sub>/\* him<sub>3</sub>*)

Here, the strict reading is available, thus blocking the sloppy re-binding reading. In the following variant of (4), the strict reading is made unavailable, and the re-binding reading emerges as acceptable.

- (5) Everyone<sub>1</sub> HOPES that Sally<sub>2</sub> will marry him<sub>1</sub>, but Bill<sub>3</sub> KNOWS that she will. (*marry \*him<sub>1</sub>/him<sub>3</sub>*)

This supports the proposed re-binding generalization.

## 2. Proposal: Monotonic Derivation of Parallelism Domains

I propose that the re-binding generalization reflects a monotonicity constraint on the derivation of semantic representations, as follows:

*Monotonic Derivations:* As soon as a Parallelism Domain can be identified during a bottom-up derivation, indexation takes place, and cannot be modified later in the derivation.

My claim is that the relevant effects all follow from this monotonicity property. To see this, it is necessary to first clarify several related notions. We begin with two definitions:

- *Parallelism Domain (PD):* A constituent E is a Parallelism Domain if there is an antecedent A such that there is a *valid indexing* E' of E such that E' is Parallel to A.
- *Valid indexing:* a pronoun (or other variable) must have an index *i*, such that  $i \in \text{Dom}(F)$ , where *F* is the File representing the current state of the discourse. (*Familiarity (Heim (1982))*/*Accessibility (Kamp and Reyle (1993))*)

I now give an account of parallelism.

### 2.1. Determining Parallelism

To determine if two constituents A and B are parallel, lambda-abstract over Parallel Elements, P<sub>A</sub> and P<sub>B</sub>, giving [P<sub>A</sub>, λ x.A'], [P<sub>B</sub>,λ y.B']. If A' is identical to B', Parallelism is satisfied.

It is standard to permit two “exceptions” to the identity condition: focused elements need not be identical, and lambda-bound variable indices need not be identical (“alphabetic variance” condition). Finally, the lambda abstraction step works as follows: substitute lambda-bound variable *x* for P<sub>A</sub> in A. If A contains an element *p* coindexed with P<sub>A</sub>, *x* may also be substituted for *p* (Dalrymple et al. (1991)). Thus lambda abstraction permits an option with respect to coindexed pronouns—they are optionally replaced with a lambda-bound variable.

We illustrate with example (1). Here, constituents A and B are as follows:

A = *John*<sub>1</sub> said *Mary*<sub>2</sub> hit *him*<sub>1</sub>     B = *BILL*<sub>3</sub> did too. (*said Mary*<sub>2</sub> hit *him*<sub>3</sub>)

We determine parallel elements and perform lambda-abstraction:

*Parallel Elements:* John, Bill

*Lambda-Abstract:*

*John*<sub>1</sub>,  $\lambda x.x$  said *Mary*<sub>2</sub> hit *x*     *BILL*<sub>3</sub>,  $\lambda y.y$  said *Mary*<sub>2</sub> hit *y*

We can see that parallelism is satisfied: John and BILL are non-identical, but BILL is focused. Also there are different variables, but this is permitted by the alphabetic variance condition.

## 2.2. Illustrating the Proposal

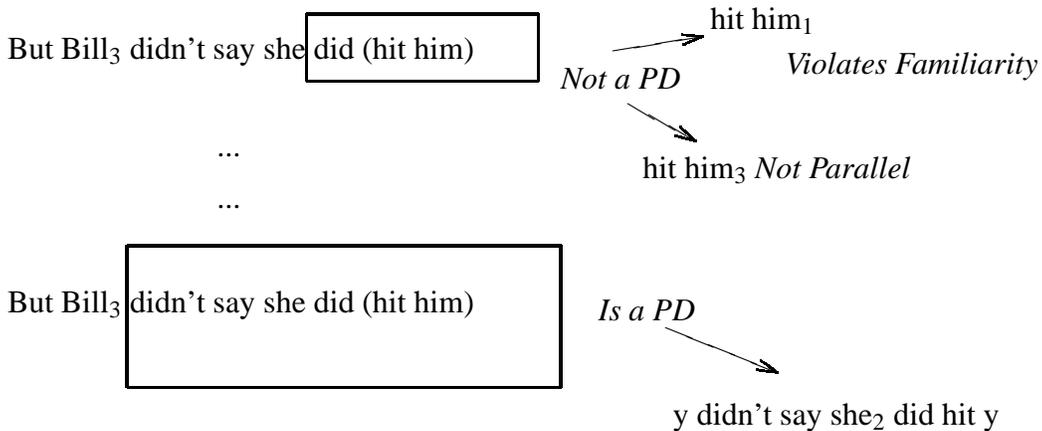
We now see how the re-binding generalization follows from the Monotonic Derivations proposal. We begin with (2), where re-binding is not permitted.

(2) *John*<sub>1</sub> said *Mary*<sub>2</sub> hit *him*<sub>1</sub>. Bill said she did too. (*hit him*)

Here, the smallest potential PD is [*did hit him*]. This is indeed a PD, with valid indexing [*did hit him*<sub>1</sub>]. The strict reading results, and re-binding is not possible.

We turn now to (3), where rebinding *is* permitted:

(3) Nearly every *boy*<sub>1</sub> said *Mary*<sub>2</sub> hit *him*<sub>1</sub>.



We begin again with the smallest possible PD [*did hit him*]. In this case, there is no valid indexing which allows it to be a PD: *him*<sub>1</sub> violates Familiarity, since the index 1 is associated with the binder *every boy*<sub>1</sub>, which only had scope over the previous sentence. The index 3 is available, but this causes parallelism to fail. The first stage at which parallelism is satisfied is where the maxtrix VP has been constructed. At this point it is clear that parallelism is satisfied (we ignore the negation for simplicity):

Nearly EVERY *boy*<sub>1</sub>, [ $\lambda x.x$  said *Mary*<sub>2</sub> hit *x*]  
*BILL*<sub>3</sub>, [ $\lambda y.y$  said *Mary*<sub>2</sub> hit *y*]

Here, we derive the sloppy reading.

### 2.3. Pragmatics and Strict/Sloppy Blocking

We have seen that re-binding becomes possible when the strict reading is structurally ruled out (because of quantifier scope), as in (3). The strict reading can also be ruled out by factors that are not purely structural, such as pragmatic preferences. This is supported by the following example:

- (6) MARY might admit that the criminals had been in contact with her, but SUSAN wouldn't admit that they had (been in contact with Susan/?Mary).

Here, the strict reading is not structurally ruled out, since the binder is a name (*Mary*), not a quantifier. Instead, the strict reading is problematic for pragmatic readings, more specifically the verb *admit* suggests that if A admits P, P reflects negatively on A. Thus the strict reading is pragmatically degraded—why should it be an *admission* for Susan that the criminals had been in contact with Mary?

This pragmatic factor allows the derivation to continue to the point at which the rebinding reading is established. Example (6) was included in a recent survey, which supported the judgment that the re-binding reading is preferred. I now turn to the results of this survey.

### 3. What are the Facts?

The contrast between (1) and (2), first observed by Sag (1976) was the point of departure for this paper. This judgment, if correct, contradicts many recent accounts, such as Dalrymple et al. (1991), Fiengo and May (1994), Hardt (1999). However, the judgment has been called into question by many theorists (Hardt (1993), Asher (1993)).

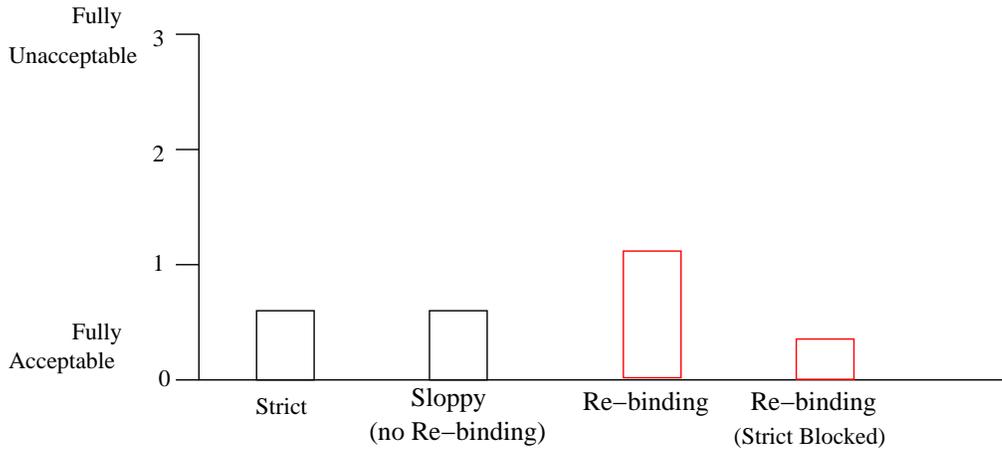
To shed some light on this, I performed a survey to test re-binding judgments, using **Linguist-GRID**—a web-based tool for interactive linguistic surveys, developed by Matthias Kromann at Copenhagen Business School. The survey was advertised on the LINGUIST List and elsewhere in Nov/Dec 2004. It involved 29 subjects, who rated 30 examples of VP ellipsis. Each example was presented together with the reading to be evaluated (parenthesized in italics). Examples were rated on the following Four-point scale: [0] Fully Acceptable [1] Closer to Acceptable [2] Closer to Unacceptable [3] Fully Unacceptable.

Overall, the results support Sag's claim that there is a difference between (1) and (2). But they also show that the "bad" rebinding examples receive a mildly degraded status, rather than fully unacceptable.

### 3.1. Linguist-GRID Survey Results

| Example Type                                                                                                                  | Mean Judgment |
|-------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>Strict</b><br>John said Mary hit him.<br>Harry did too. ( <i>said Mary hit John</i> )                                      | .66           |
| <b>Sloppy (no re-binding)</b><br>John said Mary hit him.<br>Harry did too. ( <i>said Mary hit Harry</i> )                     | .61           |
| <b>Re-binding</b><br>John said Mary hit him.<br>Harry said she did too. ( <i>hit Harry</i> )                                  | 1.16          |
| <b>Re-binding (Strict Blocked)</b><br>Nearly EVERY boy said Mary hit him.<br>But BILL didn't say she did. ( <i>hit Bill</i> ) | <b>.39</b>    |

As might be expected, *strict* and *sloppy (no re-binding)* receive similar scores of around .6. The third category receives a somewhat degraded status, consistent with Sag's observation that re-binding in such cases is degraded, although not fully unacceptable, as Sag had originally claimed. The fourth category contradicts Sag's claim, and supports the proposed approach: here the strict reading is unavailable, and the sloppy re-binding reading is even more acceptable on average than the non-re-binding categories.



Complete results of the survey can be found on the [Linguist-GRID.org](http://Linguist-GRID.org) web site.

### 4. Pronouns and Focus

I turn now to a puzzle concerning focus and bound pronouns, discussed in recent papers by Sauerland (to appear) and Jacobson (2000). Consider (7):

- (7) Every boy likes his father, and every TEACHER likes HIS father.

Focus is possible on HIS if it is interpreted as bound by *every TEACHER*. As pointed out by both Sauerland and Jacobson, this is surprising, in view of the widespread assumption that a focused expression must contrast with some other expression. Sauerland and Jacobson propose that these pronouns do contrast, in terms of what might be called *Hidden Content*: for Sauerland, bound pronouns contain a *silent property*, while for Jacobson they are associated with contrasting domains.

Both Sauerland and Jacobson consider and reject an explanation in terms of *Focus Agreement*: a bound pronoun can be focused if its binder is focused. However, I will show that the apparent problems with Focus Agreement disappear when the Monotonic Derivations approach is adopted. Furthermore, I will point out problems that arise for the Hidden Content proposal, which do not arise for the Focus Agreement approach. The Monotonic Derivations account plays a key role in this argument; thus, to the extent that this argument is successful, it provides additional support for the Monotonic Derivations proposal.

The proposed *Agreement Condition* can be stated as follows:

*Agreement Condition*: Given a PD  $A$  containing a pronoun  $x$  with a binder  $B$ , focus on  $x$  is licensed if focus on  $B$  is licensed.

Furthermore, I will follow Sauerland and Jacobson in assuming the following *Contrast Condition*: given a PD  $A$  containing a focused constituent  $\alpha$ , we require that  $A$  would not be a PD without focus on  $\alpha$  (Sauerland (to appear), Schwarzschild (1999)).

Here is Sauerland's representation of (7):

- (8) Every boy likes [the BOY's] father, and every TEACHER likes [the TEACHER's] father.

The bound pronouns *his* receive hidden content from their binders—the nominals *boy* and *teacher*. Now, contrast between *TEACHER* and *BOY* is licensed in the normal way.

#### **4.1. The Apparent Problem with Focus Agreement**

Sauerland and Jacobson consider and reject the Focus Agreement account, because of examples like (9):

- (9) Every BOY<sub>1</sub> called his<sub>1</sub> mother before every TEACHER<sub>2</sub> called \*HIS<sub>1</sub> mother. (Sauerland (to appear))

As Sauerland points out, focus on the pronoun *HIS*<sub>1</sub> is impossible, despite the fact that it has a focused binder (Every BOY<sub>1</sub>). However, on the proposed Monotonic Derivations account the index <sub>1</sub> is not permitted on focused HIS. To see this, we examine the derivation, under the assumption that HIS is focused. We begin with

[HIS<sub>1</sub> mother]: this fails to be a PD, because it violates the Contrast Condition—it would be a PD without focus on *his*. The derivation continues until we construct [every TEACHER<sub>2</sub> called HIS mother]—this is a PD, with the indexing HIS<sub>2</sub>. At this point, HIS<sub>1</sub> would again violate the Contrast Condition. Since a PD is identified at this point, this is the only indexing permitted.

As both Sauerland and Jacobson acknowledge, the Agreement Condition is the simplest account of these facts. With Monotonic Derivations, the apparent problem with Focus Agreement is shown to be illusory. Next, I show that the Hidden Content account encounters serious empirical problems.

#### 4.2. What is the Hidden Content?

One possible view, which I will call the *Conservative Hidden Content View*, is that the Hidden Content is the nominal restrictor of the binder. The *Liberal Hidden Content View*, which both Sauerland and Jacobson appear to end up with, is that Hidden Content can be any property presupposed to be true of the relevant individual. Regardless of which view one adopts, the Hidden Content view encounters important empirical problems involving strict and sloppy pronouns.

The following examples illustrate that focus is *never* permitted when a pronoun receives a strict reading.

- (10) John<sub>1</sub> likes his<sub>1</sub> father, and BILL<sub>2</sub> likes his<sub>1</sub>/\*HIS<sub>1</sub>/HIS<sub>2</sub> father too.
- (11) A man<sub>1</sub> likes his<sub>1</sub> father, and ANOTHER man<sub>2</sub> likes his<sub>1</sub>/\*HIS<sub>1</sub>/HIS<sub>2</sub> father too.
- (12) THIS man<sub>1</sub> likes his<sub>1</sub> father, and THIS man<sub>2</sub> likes his<sub>1</sub>/\*HIS<sub>1</sub>/HIS<sub>2</sub> father too.

In (10) and (11), if the second *his* is focused, it cannot be interpreted strictly. Let's look at (11): we start with [*likes HIS father*]. This is not a PD—[*likes HIS<sub>1</sub> father*] violates Contrast Condition (ie., focus wasn't needed), and [*likes HIS<sub>2</sub> father*] violates Familiarity (index 2 not yet available). We continue until we construct [*ANOTHER man<sub>2</sub> likes HIS father*]. With HIS<sub>1</sub>, this is not a PD – it violates the Contrast Condition. But [*ANOTHER man<sub>2</sub> likes HIS<sub>2</sub> father*] is a PD, with focus on HIS licensed by Agreement.

All the facts in (10)–(12) are captured by the Focus Agreement/Monotonic Derivations proposal. As we will see, these facts are problematic for the Hidden Content view.

#### 4.3. Hidden Content: Problems with Strict and Sloppy Pronouns

Can the facts in (10)–(12) be accounted for with Hidden Content? Let's start with the Conservative View—in this case, we can argue that focus is not permitted for the strict reading in examples like (10), since the strict pronoun would presumably inherit the same restrictor as the antecedent pronoun. But this is far too restrictive—we are left with no means to tell the strict and sloppy readings apart for examples

like (11) and (12). In (12) the two antecedent have exactly the same lexical material (“this man”).

What about the Liberal View? Here, we allow the hidden content to be any presupposed property. But then nothing ensures, for example (10), that the strict pronoun has the same hidden content as the antecedent pronoun. To illustrate this, consider a context in which it is known that John is both a lawyer and a doctor. Then we could have a strict reading where the representation is:

(13) John<sub>1</sub> likes [the<sub>1</sub> doctor’s] father, and BILL<sub>2</sub> likes [the<sub>1</sub> lawyer’s] father.

For the strict reading, the Hidden Content account would incorrectly permit focus here. Finally, consider (11), where the two men are completely indistinguishable. The sloppy reading still permits stress—but there is no contrastive Hidden Content, so stress is incorrectly ruled out on the Hidden Content view.

These problems simply don’t arise for the Focus Agreement/Monotonic Derivations approach, which simply permits focus agreement for bound pronouns. This account crucially relies on the Monotonic Derivations approach.

## 5. Comparison with MaxElide

To my knowledge there is only one other account that attempts to capture Sag’s observations concerning re-binding: this is the account of Takahashi and Fox (2005), based on a condition termed MaxElide, originally due to Merchant (to appear). After presenting the MaxElide account, I will argue that the Monotonic Derivations proposal is simpler and appears to be more successful empirically. However, there are additional differences between the two proposals, which deserve further investigation.

### 5.1. The Account

The MaxElide account consists of the following requirement on ellipsis: *Elide the biggest elidable constituent reflexively dominated by PD*. In other words, ellipsis must be maximal within some *Parallelism Domain*. To see if a given elided constituent C satisfies MaxElide, one must find the smallest PD containing C. If PD contains an *elidable* constituent C’ that contains C, the ellipsis violates MaxElide. This means that if C contains a sloppy pronoun *p*, the minimal PD must contain the binder for *p*. Furthermore, for strict readings, MaxElide is always trivially satisfied, because elided constituent C itself is always a PD.

MaxElide correctly rules out the sloppy reading for (2), repeated below:

(14) John<sub>1</sub> said Mary<sub>2</sub> hit him<sub>1</sub>. Bill said she did too. (*hit him*)

Here, the smallest containing PD is [*Bill said she did too. (hit him)*]. But this PD contains a larger constituent—the containing VP *said she hit him*, that could have been elided. Thus the sloppy reading for (2) violates MaxElide.

However, MaxElide does not capture the other main effect discussed in this paper: when strict is blocked, the re-binding reading is acceptable, as in (3), repeated here:

- (15) Nearly EVERY boy<sub>1</sub> said Mary<sub>2</sub> hit him<sub>1</sub>. But BILL<sub>3</sub> didn't say she did. (hit him<sub>3</sub>)

Here, the sloppy reading is incorrectly ruled out by MaxElide, since a larger ellipsis was possible within the smallest PD containing ellipsis—namely the entire sentence. Furthermore, MaxElide incorrectly permits a sloppy reading in (4), repeated below:

- (16) Bill<sub>1</sub> BELIEVES that Sally<sub>2</sub> will marry him<sub>1</sub>, but everyone<sub>3</sub> KNOWS that she<sub>2</sub> WON'T.

This is because the Intervening Focus on *WON'T* makes it impossible to elide anything bigger.

## 5.2. Derivational Perspective

The MaxElide constraint makes no reference to derivations; however, in a footnote Takahashi and Fox consider a derivational formulation:

One attractive implementation of our idea relies on the assumption that deletion can apply at the course of the derivation. . . In the Re-binding context, deletion cannot apply until a re-binder is introduced into the derivation, since the parallelism condition is not met before that stage of the derivation. (Takahashi and Fox 2005, fn. 7)

In the Monotonic Derivations approach, it is indexation (rather than deletion) which applies derivationally. Furthermore, once this derivational perspective is taken, the relevant facts are captured without any appeal to MaxElide. Indeed, MaxElide fails to capture the strict/sloppy blocking effects. Thus the Monotonic Derivations account would appear to be both simpler and more empirically successful. However, there are other differences between the two proposals which require further study. I consider two of these below: intervening focus, and large vs. small ellipsis.

## 5.3. Intervening Focus

MaxElide requires ellipsis of the biggest *elidable* constituent dominated by PD. A constituent contain a focused element is not elidable; thus Intervening Focus can allow a smaller ellipsis that would otherwise not be permitted.

- (17) John<sub>1</sub> argued that Mary hit him<sub>1</sub>, but BILL<sub>2</sub> DENIED that she did. (*hit him<sub>2</sub>*)

Here, Takahashi and Fox argue that the sloppy reading is acceptable, because of the Intervening Focus, *DENIED*. This is what is predicted by MaxElide. The Monotonic Derivations proposal does not permit the sloppy reading. To my ear, the sloppy reading remains degraded here, just as it is without the Intervening Focus. This is supported by results from the LinguistGRID survey described above, where sentences of the form of (17) did not have acceptable sloppy readings.

#### **5.4. Large vs. Small Ellipsis**

MaxElide predicts that ellipsis of constituent C will in general block ellipsis of a contained constituent C', if the smallest PD contains C. This applies to cases in which the binding relationship involves a wh-operator, as seen in the contrast between (18)a and (18)b.

- (18) a. John knows which professor we invited, but he is not allowed to reveal which<sub>x</sub> one. (*we invited x*)  
b. \*John knows which professor we invited, but he is not allowed to reveal which<sub>x</sub> one we did. (*invited x*)

Here, the smallest PD contains the sluiced IP (*we invited x*) as well as the contained VP (*invited x*), since the binder for *x* is which<sub>x</sub>. (18)b is ruled out by MaxElide since a larger ellipsis is possible within this PD.

The Monotonic Derivations proposal does not capture this contrast; it permits the re-binding reading in both (18)a and (18)b. However, there is reason to doubt the MaxElide account of this contrast. Consider the following observation:

- (19) John won't say who we should hire, but  
(20) a. Harry will. (*say who<sub>x</sub> we should hire x*)  
b. \*Harry will say who<sub>x</sub>. (*we should hire x*)

While (20)b is degraded just as (18)b is, MaxElide doesn't rule out (20)b. Here, the CP "who<sub>x</sub> we should hire x" is a PD, and the sluice in (20)b is maximal within that PD. There are clearly interesting contrasts involving the large vs. small ellipsis in wh-binding cases. However, it is not clear if these can be captured by an account based on MaxElide.

### **6. Final Thoughts**

The Monotonic Derivations proposal has much the same structure as the syntax-phonology mapping termed *Cyclic Linearization*, which Fox and Pesetsky (2005) describe as follows:

...structure is built from "bottom to top"...mapping between syntax and phonology (Spell-out) takes place at various points in the course of the derivation. ...*information about linearization, once established at the end of a given Spell-out domain, is never deleted in the course of a derivation.*

In a similar way, information about indexation, once established during a derivation, is never changed later. This suggests the possibility of an attractive unification, in which syntax interfaces with both sound and meaning in a simple, monotonic fashion.

Intuitively, monotonicity is an attractive property for a derivation system, at least in the sense that it would appear to simplify the computation required. I have argued that monotonicity in the construction of semantic representations explains several observations concerning re-binding that have not been previously accounted for, and it also accounts for certain puzzles involving focused pronouns. However, many of the key judgments are subtle and controversial. While the informal survey reported above may have clarified this situation, there is no doubt that more systematic and far-reaching empirical investigation is required.

## References

- Asher, Nicholas. 1993. *Reference to Abstract Objects in English*. Dordrecht: Kluwer.
- Bach, E., and B. Partee. 1980. Anaphora and Semantic Structure. In A. Ojeda, ed., *Papers from the Parasession on Pronouns and Anaphora*, 1–28. Chicago: Chicago Linguistic Society.
- Dalrymple, Mary, Stuart Shieber, and Fernando Pereira. 1991. Ellipsis and Higher-Order Unification. *Linguistics and Philosophy* 14(4).
- Fiengo, Robert, and Robert May. 1994. *Indices and Identity*. Cambridge, MA: MIT.
- Fox, Danny, and David Pesetsky. 2005. Cyclic Linearization of Syntactic Structure. *Theoretical Linguistics* 31(1-2).
- Hardt, Daniel. 1993. Verb Phrase Ellipsis: Form, Meaning, and Processing. Ph.D. diss., University of Pennsylvania.
- Hardt, Daniel. 1999. Dynamic Interpretation of Verb Phrase Ellipsis. *Linguistics and Philosophy* 22(2):187–221.
- Heim, Irene. 1982. The Semantics of Definite and Indefinite Noun Phrases, Ph.D. diss., University of Massachusetts, Amherst.
- Jacobson, Pauline. 2000. Paychecks, Stress, and Variable-Free Semantics. In *Proceedings of Semantics and Linguistic Theory XI*.
- Kamp, Hans, and Uwe Reyle. 1993. *From Discourse to Logic*. Dordrecht: Kluwer.
- Merchant, Jason. To appear. Variable Island Repair under Ellipsis. In Kyle Johnson, ed., *Topics in Ellipsis*. Oxford: Oxford University Press.
- Sag, Ivan A. 1976. Deletion and Logical Form, Ph.D. diss., Massachusetts Institute of Technology.
- Sauerland, Uli. To appear. The Content of Pronouns: Evidence from Focus. In Kyle Johnson, ed., *Topics in Ellipsis*. Oxford: Oxford University Press.
- Schwarzschild, Roger. 1999. GIVENness, AvoidF and other Constraints on the Placement of Focus. *Natural Language Semantics* 7(2):141–177.

*Re-binding and the Derivation of Parallelism Domains*

Takahashi, Shoichi, and Danny Fox. 2005. MaxElide and the Re-binding Problem.  
In *Proceedings of Semantics and Linguistic Theory XV*. Los Angeles, CA.

Daniel Hardt  
Copenhagen Business School  
Department of Computational Linguistics  
Denmark

dh.isv@cbs.dk



## Remarks on Word-Prosodic Typology

JOSÉ IGNACIO HUALDE

*University of Illinois at Urbana-Champaign*

### 1. Introduction<sup>1</sup>

In this paper, I take the typology of word-prosodic systems in Hyman (2005) as a point of departure for the classification of word-prosodic systems. Hyman's proposal is an important one which deserves to be considered very carefully by all researchers in the field. I think this is best done by examining those languages for which there is enough available information and which appear to be problematic or difficult to classify. Here I will focus on Western or Bizkaian Basque—where local prosodic systems range from some extraordinarily similar to Tokyo Japanese (TJ) to others that resemble Spanish to a great extent—and on Palenquero, a Spanish-lexicon creole language of Colombia where Spanish prosody has presumably been influenced and restructured by a Bantu tonal substratum.

Hyman's proposal includes the fundamental insight of choosing two independent parameters—related, respectively, to lexical “headedness” or prominence and to lexical tone—for the typological classification of word-prosodic systems. I think this is correct. Nevertheless, I would like to propose some relatively minor modifications (which, however, result in a rather different classification of some languages).

I would like to suggest that, for the purposes of typological classification, metrical prominence and tone should be treated in a parallel fashion. Following Hyman, a language is tonal to the extent that it offers evidence for specification of tone at the lexical level. Similarly, I would suggest, a language is accentual to the extent that headedness is a word-level feature. In the case of both accent and tone, we may have relatively sparse or relatively dense lexical information; that is, both parameters are continuous. A prototypical tone language has lexical tone on every syllable and several contrasting tones (as in Hyman's examples, Yoruba and Cantonese). In the same way, in a prototypical accent language every word has a metrical head, and there is evidence for more than one lexical level of prominence (as in English). A language like TJ is both less prototypically tonal and less

---

<sup>1</sup> For comments to a version of this paper, I am grateful to Larry Hyman and Gorka Elordieta. All errors are mine.

prototypically accentual. Osaka Japanese is more tonal than TJ, but it does not differ from TJ along the accent parameter.

In the Autosegmental-Metrical model (Pierrehumbert 1980, Beckman and Pierrehumbert 1988, Ladd 1996), metrical prominence and pitch contours are also carefully distinguished as two different components of prosody. These two components are, however, frequently related, since an effective way to express prominence either at the lexical or the phrasal level is by pitch modulation. That is, syllables that function as metrical heads of words or phrases tend to anchor pitch contours. But there are also languages that disassociate pitch contours from prominence, such as Wolof (Rialland and Robert 2001).

That headedness and lexical tone are independent properties is demonstrated by the fact that a language may lose or significantly alter one of the two properties, keeping the other intact. For instance, whereas many dialects of both Swedish and Serbian/Croatian have both lexically contrastive stress and a lexical tone contrast so that depending on the word a different melody may be associated with the stressed syllable, some dialects of both languages have lost the tonal contrast, but preserve the contrast in terms of which syllable of the word has stress. The same development appears to have taken place in the evolution from Ancient Greek to the modern language, as well as in part of the Central Franconian German/Dutch area (Gussenhoven 2004:228): an original contrast in lexical tone has been lost, without the stress system being affected. The opposite development, a change in the stress assignment rules without an effect on tonal contours, is the origin of the lexical tone contrast in Neo-Štokavian, which is found only in words with initial stress. The reason for this is to be found in a historical retraction of the stress that did not affect pitch contours, so that now peaks are realized very late on the post-tonic syllable, except in those words that historically had initial stress (Bethin 1998:162-168). Welsh also appears to have undergone a diachronic leftward shift of the stress without concomitant alteration of the melody, producing here too an unusual association of stressed syllables with tonal contours (Dogil and Williams 1999).

## **2. Headedness**

One of the two criteria that Hyman proposes for the typological classification of languages at the highest level is the presence of stress-accent, defined in the following way:

A language with stress-accent is one in which there is an indication of word-level metrical structure meeting the following two central criteria:

OBLIGATORINESS: every lexical word has AT LEAST one syllable marked for the highest degree of metrical prominence (primary stress).

CULMINATIVITY: every lexical word has AT MOST one syllable marked for the highest degree of metrical prominence. (Hyman 2005:168, (5))

Hyman adds that these two features are not equally important: “obligatoriness is the more important” (2005:169), so that presence of stress-accent, [+SA], can

be equated with the constraint OBLHEAD (obligatory head) applied to all lexical words in the language. That is, even though Hyman identifies both obligatoriness and culminativity as important properties of stress-accent systems (and considers them independent parameters of prosodic systems, see his table 25), he uses only culminativity for classificatory purposes at the highest level of the typology.

This is an admirably explicit criterion that allows us to easily classify languages for the feature [ $\pm$ SA]. When combined with the second major binary parameter in Hyman's typology, lexical tone, this criterion allows for the typological classification of word-prosodic systems in four major classes (Hyman 2005:172, (14)): (a) [+SA, -tone], e.g. English, Russian; (b) [+SA, +tone], e.g. Swedish/Norwegian, Serbian/Croatian; (c) [-SA, +tone], e.g. Yoruba; and (d) [-SA, -tone], e.g. French, Tamazight Berber.

Notice that the type "accent language", which for Beckman (1986) would include both languages like English and languages like TJ as subtypes (stress-accent vs. non-stress-accent), is not defined in this typology. The fact that languages like TJ and Bizkaian Basque have lexically unaccented words directly excludes them from the [+SA] class. The correctness of this major typological division should depend on the extent to which languages with a lexical contrast between accented and unaccented words are unlike those in the [+SA] type in other respects, in addition to the presence/absence of a class of unaccented words. In particular, I think an important question is whether or not the accented words in languages with an accented/unaccented contrast have phonological properties that make them fundamentally unlike the accented words of languages without lexically unaccented words. In the next subsection I will argue for retaining a typological class of "accent languages", more inclusive than Hyman's [+SA] class.

### **2.1. Accent in Bizkaian Basque**

In the western Basque region, there is a sort of dialectal prosodic continuum where at one end, in the northern area along the Bizkaian coast (Northern Bizkaian = NB), dialects have prosodic systems remarkably similar to TJ, and at the other end we find dialects that are much more similar to Spanish in their prosody, very likely as a result of prosodic convergence in a situation of widespread bilingualism with Basque as the minority language. The existence of this dialectal continuum was taken in Hualde et al. (2002) as an argument for not making a clear-cut distinction between stress-accent and pitch-accent systems. In particular, the only noticeable prosodic difference between some Southern Bizkaian (SB) and some Western Gipuzkoan varieties is the fact that the former dialect group has a class of lexically unaccented words, whereas the latter has only accented words. If the accented syllable of varieties without lexically unaccented words is taken to be a metrical head, it seems reasonable that the same status should be accorded to the accented syllable of the accented words of SB. In this specific case, the presence vs. absence of unaccented words in the lexicon does not seem to be a predictor of any other differences or similarities. The phonetic realization of accent appears to be essentially identical in SB and in Bergara, with both pitch

and duration (and perhaps also other phonetic cues) as strong correlates (see Etxebarria 1991 for SB). In other words, SB Basque has culminative non-obligatory stress accent.

I believe that even in the most TJ-like NB Basque varieties there are very good reasons for postulating that accented syllables are not simply specified for an invariable tonal contour (H\*L), but are also prosodically prominent. I would like to propose that a lexical indication of pitch on a given syllable should be considered an accent to the extent that:

- a. it follows the criterion of culminativity (only one per word domain);
- b. it is involved in the expression of pragmatic prominence, so that the syllable bearing it receives special enhancement when the word is pragmatically highlighted in discourse;<sup>2</sup> and
- c. its location is determined by metrical rules.

In the absence of cues other than pitch, I take culminativity (property a) to be a necessary but not sufficient condition. It is sufficient if the syllable bearing the tone is also the locus of prominence at higher levels (property b).<sup>3</sup> Its lexical distribution (property c) may provide additional evidence.

In NB Basque, lexical tonal markings (which obey culminativity at the word level: at most one H\*L per word) participate in the expression of relative prominence at the phrase level. If the phrase is in immediately preverbal position (i.e. focus position) contains more than one lexically accented word, the first accent is generally perceived as more prominent than the others (although experimental evidence is not yet available). Phonetically, we find progressive dowstepping of accents. But non-initial accented words can be given narrow focus, in which case downstep is suspended. On the other hand, lexically unaccented words cannot be highlighted in the same manner (Elordieta 1998, 2003). That is, just like in languages like English, phrasal metrical structure (relations of prominence at the phrasal level) is built upon syllables that are prominent at the word level. The crucial difference is that there are many words that lack a lexical head.

---

<sup>2</sup> As Hyman (2005) notes, besides tonal gestures, languages may have other features that obey the culminative constraint (only one specification per domain). Thus, in Quechua, only one consonant per word may bear contrastive aspiration or glottalization. In my opinion, an important reason not to consider that syllables with aspirated or glottalized consonants in Quechua are accented is that those syllables are not the locus of prominence in discourse. Quechua has word-penultimate stress. Presumably, it is the penultimate syllable that is enhanced when the word is pragmatically highlighted (see O'Rourke 2006).

<sup>3</sup> In stress-accent languages, the domain of stress is usually the syllable, but Lithuanian appears to have a contrast between stress on the whole syllable and stress only on the first mora of the syllable (Dogil and Williams 1999:283). In some tonal accent languages like Somali, the domain of the accent is the mora.

Remarks on Word-Prosodic Typology

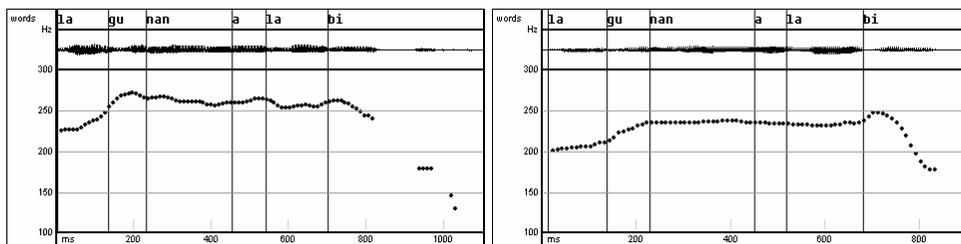
(1) Northern Bizkaian Basque: relations of prominence at the phrasal level

- a.           x  
              x           x           x  
Górkan lagúnen amúma  
'Gorka's friends' grandmother' or  
'GORKA'S friends' (pl.) grandmother'
- b.                           x  
              x           x           x  
Górkan lagúnen amúma  
'Gorka's FRIENDS' grandmother'
- c.                                           x  
              x           x           x  
Górkan lagúnen amúma  
'Gorka's friends' GRANDMOTHER'
- d.                                                           x  
Jonen lagun en amúma  
'Jon's friend's (sg.) grandmother' = 'JON's friend's grandmother'  
= 'Jon's FRIEND'S grandmother' = 'Jon's friend's GRANDMOTHER'

It is not just that the overall pitch contour on the focalized word is increased in range, but rather it is the falling contour on the syllable bearing the accent that is enhanced. Consider, for instance, the example illustrated in Fig. 1a (produced by a speaker of from Ondarroa). The preverbal phrase *lagunan alabi* 'the friend's daughter', whose pitch contour is obligatorily as shown in the figure, could be characterized in purely tonal terms, providing each syllable with one or more tones, as in (2a):

- (2)   a.   la gu nan a la bi                           b.   lagunan alabi  
          L H H H H HL                               %LH-           H\*L

**Figure 1.** Ondarroa Basque: *lagunan alabi* (*etorri da*) 'The friend's daughter (has arrived)'. (a) Neutral broad focus, (b) Narrow focus.



However, if contrastive focus is intended over either the first or the second word of the phrase, it is the pitch contour of the accented syllable that is enhanced, as shown in Figure 1b. That shows that the syllable bearing the HL contour is the locus of prominence. This is not adequately captured by an analysis as in (2a). As just mentioned, words without an accent cannot be highlighted in this way in NB Basque since they lack a prominent syllable (see Hualde et al. 2002:550-551, Elordieta 2003). The emphatic contour in Figure 1b is thus ambiguous between contrastive focus on the first word (i.e. ‘The FRIEND’S daughter has arrived’) or the second word (i.e. ‘The friend’s DAUGHTER has arrived’), or indeed over the whole noun phrase. The accented words of NB Basque thus have the same properties as those of, say, Spanish: when the word is focalized, the accented syllable is made more prominent. The difference is that there are also lexically unaccented words, which do not have a syllable that can be made prominent, such as the word *lagunan* in the figures. The description of these facts requires reference to the notion of accent, as in (2b) above, which follows Pierrehumbert and Beckman’s proposal for TJ (Elordieta 1998, Hualde et al. 2002, etc).

The rules of accent assignment in accented words differ from dialect to dialect, but are always similar to those for stress assignment in stress-accent languages. Thus, in the varieties of the Gernika-Getxo area, only the leftmost accent is realized in polymorphemic words containing more than one accented morpheme, whereas in Markina the general rule is antepenultimate accent (Hualde 2000).<sup>4</sup> Syllables bearing a H\*L contour in Northern Bizkaian Basque thus fulfill the three requirements listed above to be considered prosodic heads.

In summary, both NB and SB Basque have culminative but non-obligatory accent. A relevant difference is that NB is very close to the non-stress-accent end of the continuum defined by Beckman (Elordieta and Hualde 2003), whereas SB can be characterized as a language with non-obligatory stress-accent, as argued above.

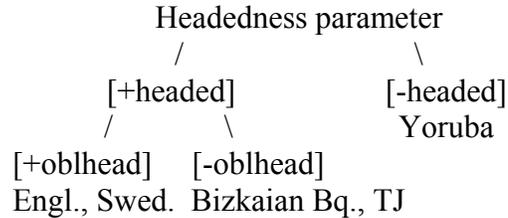
### 2.3. Culminativity with and without Obligatoriness

Clearly, Hyman’s typology could be amended so that it would include a set of accent languages with the two subsets of languages with obligatory (primary) accent and with unaccented words. Still taking the headedness criterion as fundamental, it would be enough to adopt culminativity as the main criterion, with a subdivision according to obligatoriness. In this amended classification, the set of languages with obligatory primary accent on all lexical words, [+oblhead] languages, would be a subset within the larger set of languages with accent in some words, [+headed] languages.

---

<sup>4</sup> When we consider the distribution of accents in TJ as well, we find rules that are not unlike those responsible for stress assignment in stress-accent languages. Thus, in compounds and derived forms at most one accent is preserved (culminativity). Furthermore, Kubozono (2005) demonstrates that in underived words, once syllable structure is taken into account, what emerges is that the main pattern of accent distribution obeys the Latin rule.

(3) Modified classification of languages by headedness



Hyman (2005) considers but rejects the possibility of including obligatory head as a parameter subordinated to culminativity. Instead, he offers a cross-classification of languages with [ $\pm$ culminative] and [ $\pm$ obligatory] as two independent parameters, producing four different types of languages (see his table 25). One problem for subsuming “obligatory head” under “culminativity” that Hyman discusses is Creek, as described by Haas (1977). In Creek, every word has at least one accent (except for light monosyllables), but there are words with more than one accent, e.g. *náfka:kís* ‘they are hitting him’, *atótkíkánk* ‘he didn’t work’. Hyman thus takes Creek as representing the [-culminative, +obligatory] type. It seems to me that more research on Creek is needed in order to determine whether in a word like *náfka:kís*, both accented syllables have the same level of prominence. For instance, what happens when words with more than one accent are pragmatically highlighted? On the other hand, it is perhaps worth noting that, in Spanish too, adverbs in *-mente* ‘-ly’, such as *completamente* ‘completely’ have two stresses whose relative prominence is undetermined.

Whereas the typology in (3), which uses Hyman’s criteria in a modified way (giving primary importance to “culminativity”), contains two classes of accent languages, just like Beckman’s (1986), the resulting classification is different. Both NB and SB are grouped together in the classification above, since they are accent languages with a class of unaccented words. In Beckman’s classification, on the other hand, they would be radically separated along the stress-accent vs. non-stress-accent parameter, since SB uses cues other than pitch for the expression of word-level prominence to a much greater extent than NB.

In the next subsection, I will argue in favor of introducing a further modification to the typological classification in (3). I suggest that languages may vary in the degree to which they employ word-level headedness and that, therefore, a typological classification gains in informativeness if languages are not strictly divided between those that require every word to have a metrical head and those that have unaccented words.

**2.4. “Headedness” as a Non-Binary Parameter**

As Gussenhoven (2006) points out, Beckman’s criterion for distinguishing “stress-accent” from “non-stress-accent” languages is gradient, rather than discrete. Gussenhoven proposes to turn it into a binary parameter for classificatory purposes by focusing on whether or not there is a contrast of prominence

between two types of syllables in contexts where pitch contours are flattened. But the result seems to be that the status of quite a few languages (including Polish, Spanish, Bengali, Turkish, Egyptian Arabic, etc.) becomes undetermined and perhaps undeterminable.<sup>5</sup> A better option may be to recognize that Beckman's parameter is based on phonetic features which are by their very nature gradient.

The presence vs. absence of lexically unaccented words (obligatoriness of word heads), on the other hand, is a phonological parameter that is easy to see as binary. We may, however, turn the table around and see whether we gain in informativeness by recognizing that languages may gradually vary in the extent to which they mark word-level headedness.

Accent languages with a class of unaccented words appear to differ in the lexical importance of the distinction. At one end of a possible typological continuum of accent languages, we would have languages without any unaccented words, and at the other, languages with a lexically robust contrast between accented and unaccented words in all grammatical categories.

Thus, NB Basque varieties have more unaccented words than SB varieties (where only uninflected forms may be unaccented). In some languages the distinction may be restricted to specific categories. If both Somali (Hyman 1981) and TJ are properly viewed as languages with a contrast between accented and unaccented words, this contrast is more important in TJ than in Somali, where only verbs can be lexically unaccented (Somali nouns can also be unaccented or deaccented in subject position).<sup>6</sup> In Nubi, the existence of a class of unaccented words is even more marginal, since only "infinitives" are accentless. In fact, Gussenhoven (2006) argues that these accentless words result from a deaccenting rule that applies in certain syntactic contexts.

What it means for a word to be unaccented may also vary across languages. Although the lexical distinction between accented and unaccented words is as robust and phonologically important in NB Basque as in TJ, there is a sense in which unaccented words are more "weakly" unaccented in Basque. This is because Bizkaian Basque has a sentential accent rule. Unaccented words receive an accent in isolation and in sentences where they occur immediately before a verbal participle (unless the verb is focalized). In Gernika Basque (and most other NB varieties), this sentential accent falls on the last syllable of the phrase that receives it. In other positions, including preceding inflected verbs, these words are unaccented. This is shown in (4) for the unaccented nouns *gizona* 'the man' and *alabie* 'the daughter':

---

<sup>5</sup> One difficulty is establishing criteria for distinguishing pitch-deaccenting from metrical "beheading" as possibly two distinct phonological processes.

<sup>6</sup> Hyman's (2005) main typology (his table 14) produces the same results for Somali as for Bizkaian Basque and TJ: it is a [+T, -SA] language. Instead, I find myself in agreement with Hyman's (1981:177) earlier view: "An explanatory account of tone in Somali, therefore, must reveal not only the surface tonal nature of the H tone, but also its accentual identity with the stress-accent found in English and other languages."

*Remarks on Word-Prosodic Typology*

- (4) Gernika NB Basque: lexically unaccented words and sentential accent
- |    |                          |                              |
|----|--------------------------|------------------------------|
| a. | gizoná                   | ‘the man’                    |
|    | gizoná etorri de         | ‘the man has come’           |
|    | gizona berandú etorri de | ‘the man has come late’      |
|    | gizona dá                | ‘it is the man’              |
|    | gizona datór             | ‘the man is coming’          |
| b. | alabié                   | ‘the daughter’               |
|    | alabié etorri de         | ‘the daughter has come’      |
|    | alabie berandú etorri de | ‘the daughter has come late’ |
|    | alabie dá                | ‘it is the daughter’         |
|    | alabie datór             | ‘the daughter is coming’     |

Notice that the last syllable of unaccented words is prosodically special in that it is the only syllable that may receive an accent, since accent is phrase-final. What this means is that the representation of these words in the mental lexicon of speakers will contain both tokens where words like *gizona* and *alabie* are unaccented and other tokens where their last syllable bears an accent. That is, the last syllable of unaccented words is accentable. This is different from the situation in TJ, where unaccented words never receive an accent.<sup>7</sup>

Consider now the situation in another NB variety, that of Ondarroa. Whereas the accentability under sentential accent of certain syllables (word-final) in lexically unaccented words is predictable in Gernika, in Ondarroa two historical changes have produced a situation where different types of unaccented words actually contrast on the syllable that receives sentential accent. One change, which took place in Ondarroa and other places, was the shift of sentential accents from the final to the penultimate syllable of the phrase (e.g. *gizoná* > *gizóna*, *alabié* > *alabie*, under sentential accent). The second one was the subsequent loss of final vowels in hiatus (*alabie* > *alabi*). The result is illustrated in (5):

- (5) Ondarroa NB Basque
- |    |                          |                              |
|----|--------------------------|------------------------------|
| a. | gizóna                   | ‘the man’                    |
|    | gizóna etorri re         | ‘the man has come’           |
|    | gizona berándu etorri re | ‘the man has come late’      |
|    | gizoná ra                | ‘it is the man’              |
|    | gizona rátor             | ‘the man is coming’          |
| b. | alabí                    | ‘the daughter’               |
|    | alabí etorri re          | ‘the daughter has come’      |
|    | alabi berándu etorri re  | ‘the daughter has come late’ |
|    | alabí re                 | ‘it is the daughter’         |
|    | alabi rátor              | ‘the daughter is coming’     |

---

<sup>7</sup> On the other hand, accented words are more accented in Basque, since their accent is realized even after another word with narrow focus (Elordieta and Hualde 2003), a context where accents are deleted in Japanese.

In Ondarroa, thus, there are two classes of unaccented words (depending on whether or not their final vowel was historically deleted): a word like *gizona* may surface as unaccented in most contexts, or as accented in the context where the sentential accent rule applies. If accented, its accent will be on the penultimate, except in the specific case where only one syllable follows in the accentual phrase, i.e. before the copula *ra*. On the other hand, the also unaccented word *alabi* will always receive the sentential accent on its final syllable, as shown above. Since the unpredictability of the position of the sentential accent was brought about by deletion of final vowels in hiatus, one could, of course, make accent assignment look lexically predictable by restoring those final vowels in “underlying representations” (as in Hualde 1996). At the morphophonological level, *alabi* can indeed be analyzed as /alaba+a/, just like *gizona* is /gizon+a/. But excluding such abstract analyses, we have to conclude that speakers of Ondarroa Basque need to know which syllable of the word may receive sentential accent for words that surface as unaccented in other contexts. This property must be lexically marked.

Given these facts, one could take the position that either Ondarroa Basque or both Ondarroa and Gernika Basque actually lack a class of unaccented words and that, instead, these languages have a rule deleting certain underlying accents everywhere except in the context of the sentential accent rule.<sup>8</sup> But that move would produce a typology where TJ and NB Basque (or some subset thereof) end up with quite different characterizations, missing the striking similarity between these prosodic systems. I believe a better option is to take the parameter “obligatory head” as a continuum instead of as a binary feature. In this continuum, NB Basque is a language located farther towards the positive pole than TJ, and SB Basque is located even farther from TJ than the NB varieties. A discussion of Spanish may also be illustrative in this respect.

## 2.5. Stressed and Unstressed Function Words in Spanish

In Spanish, there are no lexically unaccented words belonging to major lexical categories (nouns, adjectives, verbs, and adverbs). Among function words and expressions, on the other hand, we find a lexical contrast between accented and unaccented (or stressed and unstressed) items (Navarro Tomás 1918/1977:187-194, Quilis 1993:390-395, Hualde 2005:233-235).<sup>9</sup> For instance, among determiners, definite articles and possessives are unstressed, but indefinite articles and demonstratives are stressed in standard Peninsular Spanish (e.g. *el elefante* vs. *un elefante*).

---

<sup>8</sup> From words in isolation, determining which accents are sentential and thus deleted in other contexts is simple enough for Gernika: an accent on the last syllable is always postlexical (with the only exception of some monosyllables from historical contraction). For Ondarroa, it is more difficult without morphophonological analysis of words. Accents on the final, as in *alabí*, are always sentential. Accents on the penultimate, on the other hand, may be sentential, as in *gizóna*, or lexical, as in *arbóli* ‘the tree’.

<sup>9</sup> Navarro Tomás states that there are unstressed adverbs, but he employs a rather broad, traditional definition of “adverb”.

The stressed or unstressed status of specific words or classes of words appears to be unpredictable from semantic considerations. In fact, in some cases near-synonymous expressions differ in stress status:

- (6) Spanish near-synonymous expressions differing in accentability  
*en cuanto llegue Juan vs. apenas llegue Juan,*  
both ‘as soon as Juan arrives’  
*puesto que lo sabes vs. dado que lo sabes,*  
both ‘since you know it’  
*aun cuando se lo dije vs. a pesar de que se lo dije,*  
both ‘even though I told him’

Some unstressed forms minimally contrast with segmentally identical stressed words, as in (7a). There are also words that are stressed or unstressed depending on their syntactic function, as in (7b):

- (7) Spanish: contrast between segmentally identical stressed and unstressed forms  
a. *bajo las sábanas ‘I lower the sheets’ vs. bajó las sábanas ‘s/he lowered the sheets’ vs. bajo las sábanas ‘under the sheets’*  
b. *más ciruelas ‘more prunes’ vs. más cincuenta ‘plus fifty’  
menos dinero ‘less money’ vs. menos dinero ‘except for money’*

I conclude that the stressed/unstressed contrast is an important one in the phonology of Spanish, even if it is not found in words belonging to the four major word classes. As noted, the accentual properties of function words are not generally predictable from other considerations.<sup>10</sup> Compared with Bizkaian Basque, Spanish would be a language with only a very limited accented/unaccented contrast, but certainly it is not a language that utterly lacks this lexical contrast.

## 2.6. Summary on the Headedness Parameter

To conclude this section, as stated at the outset, I believe that Hyman’s insight of employing headedness as one of two main criteria for typologizing word-prosodic systems is correct. In this section I have suggested that, in order to capture the typological similarities between accentual languages with and without a class of lexically unaccented words, the two aspects of headedness discussed by Hyman, “culminativity” and “obligatoriness”, should be considered in a hierarchical relation. Furthermore, I have suggested that the headedness parameter may be more informative if viewed as multivalued rather than as binary. In other words, the proposal is that the relevant typological criterion should be the presence of

---

<sup>10</sup> This fact makes the accented/unaccented contrast particularly difficult in the acquisition of Spanish as a second language, as Navarro Tomás (1918/1977:187) noted. We still do not know how much dialectal variation there is in the accentual status of specific words and word classes.

word-level prominence or headedness on one syllable per word. Among languages with this property, the most prototypical ones are those in which every lexical item contains a prosodic head. The existence of more than two levels of prominence among the syllables of a word (as in English) also increases the metrical prototypicality of a language. A language will be less prototypically accentual to the extent that it allows lexically unaccented words.

The extent to which, in languages obeying culminativity, the strength of obligatoriness correlates with Beckman's phonetic stress-accent/non-stress-accent parameter remains an open question and may be a fruitful line of investigation.

### **3. Tone**

The second major parameter in Hyman's typological system is the presence of lexical tone: "A language with tone is one in which an indication of pitch enters into the lexical realization of at least some morphemes" (Hyman 2005). Hyman notes that among languages with lexical specification, "prototypical" tone languages are languages like Yoruba and Cantonese, with a high density of lexical tones and several contrasting lexical specifications of pitch, and not languages like TJ or Swedish. But this fact is not directly reflected in his typology. Johnson (2005), who applies Hyman's typological criteria in the typological characterization of Cherokee, also finds it necessary to remark on both the presence of lexical tone and on its low density. In fact, he proposes to distinguish between languages with a dense vs. a sparse tone specification. Clearly, however, we cannot take density vs. sparseness of lexical tone as a binary feature, since in practice there would not be any obvious cut-off point. We may obtain a more informative typology if we modify the binary [ $\pm$ tone] parameter to encode relative tonal density in the typology. Lexical tonal density can be seen as a function of both the maximum number of tonal contrasts that are possible per syllable and the maximum number of syllables per word that can bear lexically contrastive tone. At one end of the typological continuum of languages that would be defined as tonal, we would have a language like Yoruba where every syllable in the word can be specified for one of three contrastive tones. Near the other end, we have a language like Neo-Štokavian Serbian/Croatian/Bosnian, where an indication of lexical-level pitch is found only in words with initial stress-accent. In these words the stress-accented syllable may be specified for either an earlier or a later tonal peak (capturable as L\*H vs. LH\*, cf. Smiljanić 2002). Words with non-initial stress-accent lack this contrast.

#### **3.1. Languages with Sparse and Possibly Redundant Tonal Specifications**

In the case of some languages with sparse tonal specification, controversies have often arisen regarding their analysis and proper characterization. In some sparse-tone accent languages like Swedish, Belgrade Serbian, Maastricht Dutch, Osaka Japanese, etc., it seems clear that both tone and accent must enter into the lexical specification of words. In these languages, knowing which syllable is accented or whether the word is accented or unaccented is not enough to determine the

prosody of the word.

On the other hand, languages like Nubi, TJ, and NB Basque could in principle be analyzed as having lexical specification only for tone, only for accent, or redundantly for both. This is because at most one syllable per word needs to be specified per tone, and the tonal specification is, furthermore, the same for all words.

In §2.1, I argued that NB Basque should be considered to be a language with (non-obligatory) lexical accent. At the same time, there are reasons for concluding that the tonal specification of accented words should also be part of the lexical representation of accented words even if its shape is predictably H\*L, since this contour is in fact the only constant and significant cue for the accent. Languages like NB Basque (and TJ) have redundant lexical specification for accent and tone. This is similar to the position taken by Gussenhoven (2004:185): “Northern Bizkaian Basque and Tokyo Japanese are tone languages, with lexically distinctive accent.”

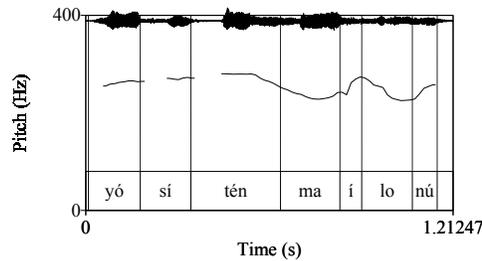
Nubi is clearly an accent language, with many prosodic properties in common with stress-accent languages (Gussenhoven 2006). The single prosodically prominent syllable of every word is located within the same three-syllable window that we find in languages like Spanish and Greek. Furthermore, in Nubi there is a rule of accent retraction similar to those found in other accentual languages. Unlike TJ, Nubi does not have a class of lexically unaccented words. Also, unlike in TJ, tone is not the only correlate of accent. In Nubi, accented syllables, besides bearing an H tone, are also characterized by duration and possibly other acoustic features. Nubi is thus further away from the non-stress-accent prototype of Beckman’s (1986) classification of accent languages than TJ. Even if pitch is the most important cue of accent in Nubi, this is also the case in many other languages that we may want to classify as non-tonal stress-accent languages, such as Turkish and Polish. Whether the invariant (and therefore not paradigmatically contrastive) H tone born by the accented syllable of all words in Nubi is also lexical is less evident. The argument that Gussenhoven offers for considering Nubi a language with lexical tone is that accented syllables in Nubi systematically occur with an H tone. This H tone, being obligatory, cannot be said to be part of the utterance-level intonational component of the language (cf. Hyman 1981 for Somali). To determine this issue, it would be useful to systematically compare Nubi with its lexifier language, Egyptian Arabic, which has also been claimed to mark the head of every word in an utterance with a rise in pitch (Hellmuth 2005). Here, instead, I will consider the comparable case of Palenquero, a Spanish-lexified creole spoken in Colombia.

### **3.2. Palenquero vs. Argentinean Spanish**

Researchers working on Palenquero have often remarked that its prosody is strikingly different from that of the coastal Colombian Spanish varieties with which it is in contact. Several linguists have claimed that Palenquero has lexical tone (Bickerton and Escalante 1970) or a tonal accent (Moñino 2001). Hualde and

Schwegler (to appear) point out several prosodic features in which Palenquero differs from Spanish, including the rather systematic association of accented syllables with level H tones (and other syllables with L tones), the small declination effects, and the frequent absence of final falls in declaratives with an accent on the final syllable. These properties are illustrated in Figure 2 (for further exemplification, see Hualde and Schwegler, to appear). Perhaps not surprisingly, similar facts have been noted for Equatorial Guinea Spanish, whose speakers are almost all native speakers of a Bantu tonal language (Quilis and Casado Fresnillo 1995, Lipski 2005).

**Figure 2.** Palenquero *yó sí tén maí lo nú* ‘I sure don’t have a husband’



Regarding accent, Palenquero shows essentially the same evidence for lexical heads as Spanish, since the patterns of prominence are virtually identical in both languages. The question is whether, in addition, tone should also be taken to be a lexical property in Palenquero. Of the differences between Spanish and Palenquero mentioned above, some are clearly differences in their postlexical or phrasal prosody. The rather systematic association of H tone with accented syllables, however, could in principle be taken as evidence for postulating that accented syllables are (redundantly) specified for an H tone in the lexicon, just as Gussenhoven (2006) claims for Nubi.<sup>11</sup> In this respect, Palenquero differs from most varieties of Spanish where stress-accented syllables may be associated with one of several different pitch contours (although the inventory of pitch-accents is not as rich as in English, see Beckman et al. 2002). However, there are also Spanish dialects where stress-accented syllables almost always show a tonal peak (leaving aside the case of Equatorial Guinea Spanish). In particular, Barjam (2004) analyzes Buenos Aires Spanish as having only two pitch-accents in its inventory, /L+H\*/ and /L+^H\*/. Both are rising pitch accents and differ only in the fact that in /L+^H\*/ the H tone is upstepped. These phonological pitch-accents have several “allotones”, but in all of them there is an H\* associated with the stressed syllable. The only case where a word may lack an H\* tone on its stressed

<sup>11</sup> Lipski (2005:212) also makes the claim that Equatorial Guinea Spanish has lexical tone: “In the case of Spanish as phonologically restructured by speakers of Bantu languages in Equatorial Guinea (all of which use a basic two-tone system), it appears that many instances of lexical stress accent in Spanish have been reinterpreted as lexically preattached High tone.”

syllable is in contexts of pragmatic deaccentuation, but even this is only an optional phenomenon. Barjam's analysis is consistent with other descriptions of Buenos Aires Spanish that have noted that this variety lacks the displacement of peaks to the post-tonic in words in prenuclear position that is typical of most Spanish dialects (Colantoni and Gurlekian 2004). Given the constancy of the H\* tone on the stressed syllable across intonational contexts in Buenos Aires Spanish, one could attribute this tone to the lexical specification of words. That is, both for Palenquero and for Buenos Aires Spanish, we could have an analysis where function words are either H-toned or toneless and lexical words obligatorily bear a single H tone (on one of the last three syllables of the word). I think it is appropriate to wonder, then, why analyses involving a lexical H have been suggested for Palenquero and Nubi (and Equatorial Guinea Spanish), but not for Buenos Aires Spanish. Comparing Palenquero and Buenos Aires Spanish, I would like to suggest that the reason has to do with the relative contribution of the necessarily postlexical intonational component to the overall pitch contours of utterances.

Both Palenquero and Equatorial Guinea Spanish utterances appear to have more "ups and downs" in pitch than equivalent utterances in "standard Spanish" varieties, including Buenos Aires Spanish; that is, between H-toned accented syllables, the tone tends to stay low with more abrupt rises and falls, as can be seen on the contour borne by *maillo* 'husband' in Figure 2. Palenquero may seem more "tonal" because it makes more sparse use of boundary tones (as noted, these may even be absent at the end of declarative utterances accented on their final syllable). In addition, the two rising accents that Barjam (2004) postulates for Buenos Aires Spanish are subject to considerable pragmatically based allotony. In contrast, the pitch patterns of words in Palenquero appear to be relatively constant regardless of pragmatic factors. Other differences may have to do with rules of phonetic implementation. The relative contribution of pitch and other phonetic features to the marking of accented syllables may also determine the overall impression of the language.

It seems reasonable to conclude that in languages without lexical contrasts in tone, pitch specifications may be said to be lexicalized to different degrees. Whether or not the language has a class of unaccented words is an independent fact. The same issues arise in Bizkaian Basque varieties. Thus, for NB Basque, the accentual H\*L is a consistent feature of accented words and is perhaps the only consistent correlate of accent for many speakers. These are good reasons for taking this invariable tonal contour as lexical. For SB Basque, on the other hand, there are less compelling reasons for postulating lexical specification of tones, since accented syllables are also made prominent by increased duration (and it remains to be demonstrated that accents have an invariable contour).

#### **4. Conclusion**

As recognized in the Autosegmental-Metrical model, tonal autosegments and metrical constituency are two independent (but often related) and fundamental aspects of prosody. A typology of word-prosodic systems based on these two

parameters, as in Hyman's (2005) proposal, is particularly appealing. In the modified proposal put forward in this paper, both parameters are treated in a parallel fashion: the presence of word-level marking on either the metrical or the tonal tier (or both) is what determines the basic grouping of languages.

In tone languages, there is lexical marking of pitch, as in Hyman's proposal. Accent languages are also those in which metrical prominence (headedness) is indicated at the word level to some degree. Tonal-accent languages are those with word-level marking on both tiers. Just as there is widespread recognition that tonal density is an important continuous feature in any typology, here it has been proposed that metrical headedness should be treated in the same way, with languages with obligatory lexical marking of heads and evidence for several lexical levels of prominence (such as English) as the prototype that corresponds, along the tonal parameter, to languages like Yoruba and Cantonese, with marking of tone on every syllable and several contrasting lexical tones.

## References

- Azkue, Resurrección M. 1923. *Morfología vasca*. Bilbao: Euskaltzaindia.  
Reprinted 1969 in *Editorial La Gran Enciclopedia Vasca*, Vol. 3, Bilbao.
- Azkue, Resurrección M. 1931-1932. Del acento vasco en algunos de sus dialectos. *Euskera* 4:282-318, 6:3-50.
- Barjam, John Patrick. 2004. The Intonational Phonology of Porteño Spanish. M.A. diss., University of California at Los Angeles.
- Beckman, Mary. 1986. *Stress and Non-Stress Accent*. Dordrecht: Foris.
- Beckman, Mary, Manuel Díaz-Campos, Julia T. McGory, and Terrell Morgan. 2002. Intonation Across Spanish in the Tones and Break Indices Framework. *Probus* 14:9-36.
- Bethin, Christina. 1998. *Slavic Prosody: Language Change and Prosodic Theory*. Cambridge: Cambridge University Press.
- Bickerton, Derek, and A. Escalante. 1970. Palenquero: A Spanish-Based Creole of Northern Colombia. *Lingua* 24:254-267.
- Bruce, Gösta, and Ben Hermans. 1999. Word Tone in Germanic Languages. In Harry van der Hulst, ed., *Word Prosodic Systems in the Languages of Europe*, 605-658. Berlin: Mouton de Gruyter.
- Colantoni, Laura, and Jorge Gurlekian. 2004. Convergence and Intonation: Historical Evidence from Buenos Aires Spanish. *Bilingualism: Language and Cognition* 7(2):107-119.
- Díaz-Campos, Manuel. 2000. The Phonetic Manifestation of Secondary Stress in Spanish. In Héctor Campos, Elena Herberger, Alfonso Morales-Front, and Thomas J. Walsh, eds., *Hispanic Linguistics at the Turn of the Millennium*, 49-65. Somerville, MA: Cascadilla Press.
- Dogil, Grzegorz, and Briony Williams. 1999. The Phonetic Manifestation of Word Stress. In Harry van der Hulst, ed., *Word Prosodic Systems in the Lan-*

*Remarks on Word-Prosodic Typology*

- guages of Europe*, 273-334. Berlin: Mouton de Gruyter.
- Elordieta, Gorka. 1998. Intonation in a Pitch Accent Variety of Basque. *Anuario del Seminario de Filología Vasca 'Julio de Urquijo'* 32:511-669.
- Elordieta, Gorka. 2003. Intonation. In José I. Hualde and Jon Ortiz de Urbina, eds., *A Grammar of Basque*, 72-112. Berlin: Mouton de Gruyter.
- Elordieta, Gorka, and José I. Hualde. 2003. Tonal and Durational Correlates of Accent in Context of Downstep in Lekeitio Basque. *Journal of the International Phonetic Association* 33:195-209.
- Etxebarria Ayesta, Juan Manuel. 1999. *Zeberio haraneko euskararen azterketa etno-linguistikoa*. Zornotza (Euba): I.K.A.
- Gussenhoven, Carlos. 2004. *The Phonology of Tone and Intonation*. Cambridge: Cambridge University Press.
- Gussenhoven, Carlos. 2006. The Prosody of Nubi between Stress and Tone. *Phonology* [to appear].
- Hass, Mary R. 1977. Tonal Accent in Creek. In Larry M. Hyman, ed., *Studies in Stress and Accent (Southern California Occasional Papers in Linguistics 4)*, 195-208. Department of Linguistics, University of Southern California.
- Hellmuth, Sam. 2005. Every Word Has One: Intonational Pitch Accent Distribution in Cairene Arabic. Paper presented at the Between Stress and Tone Conference, Leiden.
- Hualde, José I. 1996. Accentuation and Empty Vowels in Ondarroa Basque: Against the Concept of Phonological Derivation. *Lingua* 99:197-206.
- Hualde, José I. 2000. On System-Driven Sound Change: Accent Shift in Markina Basque. *Lingua* 110:99-129.
- Hualde, José I. 2005. *The Sounds of Spanish*. Cambridge: Cambridge University Press.
- Hualde, José I., Gorka Elordieta, Iñaki Gaminde, and Rajka Smiljanić. 2002. From Pitch-Accent to Stress-Accent in Basque. In Carlos Gussenhoven and Natasha Warner, eds., *Laboratory Phonology VII*, 547-584. Berlin: Mouton de Gruyter.
- Hualde, José I., and Armin Schwegler. To appear. Intonation in Palenquero. *Journal of Pidgin and Creole Languages*.
- Hyman, Larry M. 1981. Tonal Accent in Somali. *Studies in African Linguistics* 12:169-203.
- Hyman, Larry M. 2005. Word-Prosodic Typology. *UC Berkeley Phonology Lab Annual Report 2005*, 165-184. To appear in *Phonology*. [http://linguistics.berkeley.edu/phonlab/annual\\_report\\_2005.html](http://linguistics.berkeley.edu/phonlab/annual_report_2005.html).
- Johnson, Keith. 2005. Tone and Pitch Accent in Cherokee Nouns. *UC Berkeley Phonology Lab Annual Report 2005*, 1-48.
- Kubozono, Haruo. 2005. Where Does Loanword Prosody Come From? A Case Study of Japanese Loanword Accent. *Lingua* [to appear].
- Ladd, D. Robert. 1996. *Intonational Phonology*. Cambridge: Cambridge University Press.
- Levi, Susannah. 2005. Acoustic Correlates of Lexical Accent in Turkish. *Journal*

José Ignacio Hualde

- of the International Phonetic Association* 35(1):73-97.
- Lipski, J. 2005. *A History of Afro-Hispanic Language*. Cambridge: Cambridge University Press.
- Moñino, Yves. 2001. Le palenquero de Colombia: langue accentuelle ou langue tonale? Paper presented at ACPBLE, Coimbra, Portugal.
- Navarro Tomás, Tomás. 1977 [1918]. *Manual de pronunciación española*, 19th edition. Madrid: Consejo Superior de Investigaciones Científicas (Publicaciones de la Revista de Filología Española [4th edition, 1932]).
- O'Rourke, Erin. 2006. An Instrumental Analysis of Quechua Intonation: Statements and Questions. Ms., University of Pittsburgh.
- Pierrehumbert, J. 1980. The Phonology and Phonetics of English Intonation. Ph.D. diss., Massachusetts Institute of Technology.
- Pierrehumbert, Janet, and Mary E. Beckman. 1988. *Japanese Tone Structure*. Cambridge, MA: MIT Press.
- Quilis, Antonio. 1993. *Tratado de fonología y fonética españolas*. Madrid: Gredos.
- Quilis, Antonio, and Celia Casado-Fresnillo. 1995. *La lengua española en Guinea Ecuatorial*. Madrid: Universidad Nacional de Educación a Distancia.
- Rialland, Annie, and Stéphanie Robert. 2001. The Intonational System of Wolof. *Linguistics* 39:893-939.
- Smiljanić, Rajka. 2002. Lexical, Pragmatic and Positional Effects on Prosody in Two Dialects of Croatian and Serbian: An Acoustic Study. Ph.D. diss., University of Illinois at Urbana-Champaign. Published 2004 in *Outstanding Dissertations in Linguistics*, New York, Routledge.

José Ignacio Hualde  
Department of Spanish, Italian and Portuguese, 4080 FLB  
University of Illinois at Urbana-Champaign  
Urbana, IL 61801

[jihualde@uiuc.edu](mailto:jihualde@uiuc.edu)

# Phonological Optimization and Syntactic Variation: The Case of Optional *That*\*

T. FLORIAN JAEGER

*Stanford University*

## 1. Introduction

The principle of Phonology-Free Syntax (see papers in Zwicky 1969) states that syntax should not be influenced by phonological constraints. This predicts that choice in syntactic variation should not be affected by phonological constraints, such as the avoidance of identical adjacent elements (Frisch et al. 2004; Leben 1973). Only a few studies have investigated the extent to which phonological encoding can influence syntactic encoding and they have come to conflicting results (see Bock and Eberhard 1993; Haskell and MacDonald 2003; MacDonald et al. 1993). I investigate the influence of phonological optimization at different levels of linguistic form on so called optional *that*, as in the following complement clauses (CC\*s) and relative clauses (RC\*s):<sup>1</sup>

(1a) You would think [<sub>CC\*</sub> (*that*) there's no place for capital punishment in a civilized western country].

(1b) I heard [<sub>CC\*</sub> (*that*) that's the second happiest day of your life].

(2a) I mean [<sub>NP</sub> any drugs [<sub>RC\*</sub> (*that*) you want \_ ]].

(2b) I mean [<sub>NP</sub> the way [<sub>RC\*</sub> (*that*) it vibrates \_ ]].

---

\* I am grateful for the discussions that lead to this paper. I would like to thank D. Pesetsky, N. Richards, and A. Marantz for raising the question whether optional *that* is allomorphy rather than syntactic variation. I am particularly thankful to A. Antilla and L. Blumenfeld, as well as B. Labov, N. Snider, L. Staum, and D. Jurafsky for productive discussions and advice. None of the above necessarily agrees with the views expressed here. The work presented in this paper comes in parts from a larger study on optional *that* presented in detail in my thesis (Jaeger 2006a, 2010).

<sup>1</sup> Not all CCs and RCs exhibit optional *that* variation (see Huddleston and Pullum 2002). For most speakers of Standard American English, only finite, restrictive, non pied-piped, non-extraposited, non-subject-extracted RCs can occur without optional *that*. Similarly, some CC-embedding verbs have been claimed to require *that*. Here only CCs and RCs compatible with optional *that* are considered (henceforth CC\* and RC\*, respectively). The “[<sub>RC\*/CC\*</sub> ...]” annotation merely highlights the constituent structure. No claims are intended about the constituent type of CCs and RCs.

Earlier studies have not distinguished between phonological constraints at different levels of linguistic form. For example, sentence phonology (prosody) is not the same as segmental phonology (see paper in Inkelas and Zec 1990), and there is evidence from speech errors that prosodic encoding precedes segmental encoding during language production (Cutler 1980). It is possible that the former would influence syntactic production but the latter not. Indeed, Zec and Inkelas (1990) present cross-linguistic evidence that this is the case. They propose that the only phonological information available to syntax is prosodic structure. I discuss three types of form-related OCP effects: (a) the potential avoidance of adjacent identical segments by producing or omitting optional *that* (Section 3); (b) the avoidance of adjacent identical word forms (Section 4); and (c) the avoidance of adjacent stressed/unstressed syllables (Section 5). The studies presented here also differ from earlier work in that they are based on a corpus of spontaneous speech rather than speech elicited in laboratory experiments, where participants (re-)produce sentences out of context (and often without a communicative goal). Before I turn to (a) – (c), I briefly provide an introduction to existing accounts of optional *that*.

## 2. Accounts of Optional *That*

The likelihood of optional *that* is co-determined by processing complexity (Ferreira and Dell 2000; Hawkins 2004; Race and MacDonald 2003).<sup>2</sup> For example, speakers are more likely to produce *that* for CC\*s and RC\*s that begin with complex subject phrases (Jaeger and Wasow 2006; Race and MacDonald 2003; Roland et al. 2005), for CC\*s and RC\*s that are less predictable given the preceding context (Jaeger 2006a; Wasow et al. 2011), and in disfluent environments (the two effects are cumulative, Jaeger 2006a).

In the linguistic literature, there is some controversy as to whether optional *that* is a case of allomorphy (Pesetsky 1991, *inter alia*) or syntactic variation (Doherty 2000; Ferreira and Dell 2000 *inter alia*). If optional *that* is a case of allomorphy, conditioning by phonological constraints would not be surprising. Pesetsky (1991) suggests that zero complementizers (the absence of optional *that* in CC\*s) are affixes that attach to the embedding verb. The evidence given for this view is the apparent ban of zero complementizers in CC\*s that are not adjacent to the embedding verb, as in (3) and (4) (from Richards 1997:297, 299):

- (3) [CC \*(That) the earth is flat] has been *proven* repeatedly.
- (4) He didn't *say* to Imelda [CC \*(that) he ate the mackerel].

This evidence is weaker than it may appear. Zero complementizers do not categorically *require* adjacency to the embedding verb. Examples like (4) *do*

---

<sup>2</sup> Some researchers (e.g. Dor 2005) have proposed that optional *that* correlates with a meaning difference. In Jaeger (2006:Ch. 1) I present arguments against at least the strongest version of such accounts (namely that *all* optional *that* variation is due to semantic differences). Ongoing work by R. Kinsey and T. Wasow investigates the extent to which optional *that* is driven by semantics.

occur without complementizer *that* (albeit rarely, see e.g. Hawkins 2001). Furthermore, both (3) and (4) are already accounted for by processing-based theories of optional *that*. Subject complement clauses, as in (3), are rare and hence low in predictability. Given that CC\* predictability correlates with higher complementizer likelihood, predictability may provide an explanation both for apparently categorical cases like (3) and gradient effects in other environments. Similarly, processing-based accounts of optional *that* predict that CC\*s with intervening material, as in (4), should be more likely to have a complementizer. So (3) and (4) are already captured by processing-based accounts that also capture gradient differences in optional *that* likelihood in other environments. Therefore the examples hardly present evidence for an allomorphy account of optional *that*.<sup>3</sup>

Note also that optional *that* does not exhibit unsystematic lexical gaps (another hallmark of allomorphy though not a necessary condition). While certain CC-embedding verbs have been claimed to require a complementizer, these verbs form systematic groups (defined by their semantics, e.g. manner of speaking verbs, and/or other properties, such as low subcategorization likelihood of a CC). Further potential evidence against an allomorphy account, comes from a phenomenon known as syntactic persistence, the tendency of speakers to re-use syntactic templates. Speakers are more likely to produce a CC\*/RC\* with *that* if they did so in preceding productions (Ferreira 2003; Jaeger 2006b). Crucially, the same holds for CC\*s/RC\*s without *that*. Compared to a baseline without any preceding CC\*/RC\*, speakers are more likely to omit optional *that* if they did so in preceding productions (ibid). Syntactic accounts readily predict the syntactic persistence effect on optional *that*.

I tentatively conclude that available evidence favors syntactic variation accounts of optional *that*. This makes optional *that* an interesting test case for the question to what extent syntactic production is affected by different types of phonological OCP constraints.

### **3. Segmental OCP**

Applied to language production, Phonology-Free Syntax (Zwicky 1969) predicts that syntactic planning is not affected by phonological processing. So, under the assumption that optional *that* is a syntactic variation, no conditioning by phonological factors is expected. Next I describe how I use potential segmental OCP effects to investigate whether optional *that* is affected by segmental optimization.

A preference to avoid adjacent identical elements, the so-called Obligatory Contour Principle (henceforth OCP, Leben 1973, inter alia), has been documented for many levels of linguistic representation (for references and a brief overview, see Walter and Jaeger, 2008). The OCP does not only influence the organization

---

<sup>3</sup> Note that this is not to say that processing-based accounts account for the distribution of complementizers in *all* environments. For example, the fact that subject-extracted RCs seem to require a relativizer (in Standard American English) does not follow from processing-based accounts. Here it only matters that this fact does not follow from an allomorphy account either.

of grammar, it also affects choice in spontaneous speech. For example,  $-\lambda d$  deletion in spontaneous speech is much more *likely* before and after segments that share place and/or manner of articulation with  $-\lambda d$  (Strassel 2001), but it is not *required* in those environments. Frisch, Pierrehumbert, and Broe (2004:221) propose a unified account of gradient and categorical OCP effects, according to which the avoidance of adjacent similar elements eases processing.

As mentioned above optional *that* is correlated with processing complexity. Some researchers have argued that optional *that* serves to *ease* processing (Hawkins 2004; Race and MacDonald 2003). In that case, optional *that* may also be used to avoid adjacent identical segments. Consider the following example:

(5) Um, [<sub>NP</sub> the kinds of jobs [<sub>RC\*</sub> *that* people need to be trained for now]] ...

In (5), the final segment immediately preceding the optional *that* is /s/. It shares its manner of articulation (fricative) with the adjacent segment of the optional *that*. Similarly, the first segment immediately following the optional *that* shares its manner of articulation with the last segment of *that* (plosive). Theoretically, speakers could use optional *that* to avoid segmental OCP effects in two ways. Speakers could *omit* optional *that* whenever including it would lead to shared place and/or manner of articulation with at least one surrounding segment, as in (5). Speakers may also *insert* optional *that* if surrounding segments were to have identical place and/or manner of articulation, as in the following example:

(6) [<sub>NP</sub> The guy [<sub>RC\*</sub> I saw yesterday]] ...

I conducted separate corpus-based studies on the CC\* and RC\* data sets to test both of these hypotheses.

### 3.1 Data and Method

Given that I intend to test the effect of a phonological factor on optional *that*, a speech corpus was chosen as database. The Switchboard portion of the Penn Treebank corpora (release 3, Marcus et al. 1999) consists of 650 telephone dialogues on a variety of topics, yielding approximately 800,000 spoken words in over 100,000 turns. Using TGrep2 (Rohde 2005), 3,081 CC\*s and 3,452 RC\*s from the Switchboard were extracted.<sup>4</sup> All cases were annotated for a variety of factors known to influence optional *that* (for details, see Jaeger, 2006a:Ch. 3 & 4). After removing cases with incomplete variable information, the two databases

---

<sup>4</sup> CC\*s introduced by *I guess, I think, I mean* or *I say* were excluded because these phrases often function as grammaticalized epistemic markers, in which case the “CCs” are not necessarily complement clauses (Cacoullos and Walker submitted; Thompson and Mulac 1991). This step removes over half of the data (analyses presented here return the qualitatively identical results after appropriate controls on the full data set). I also removed all cases for which the embedding verb did not occur often enough to determine whether the verb obligatorily requires a complementizer. Finally, RCs with *wh*-relativizers were excluded (for discussion, see Jaeger 2006a:Ch. 4.1).

*Evidence for Syntactic Variation Accounts of Optional “that”*

contained 3,012 CC\*s and 3,027 RC\*s, respectively. About 32% of the CC\*s and 41% of the RC\*s in the database have optional *that*.

These cases were coded for three types of potential segmental OCP effects on optional *that*. For each case, it was determined (a) whether the immediately preceding segment (usually the embedding verb for CC\*s and the head noun for RC\*s) shared place and/or manner of articulation with the first segment of optional *that* (henceforth SIMILAR PRECEDING SEGMENT); (b) whether the immediately following segment (usually the first word of the CC\*/RC\* subject) shared place and/or manner of articulation with the last segment of optional *that* (henceforth SIMILAR FOLLOWING SEGMENT); and (c) whether the preceding and following segment had identical place and/or manner of articulation (henceforth SIMILAR SURROUNDING SEGMENTS). Since the Treebank Switchboard is not phonetically annotated, the Carnegie Mellon Pronouncing Dictionary (v0.6) was used to map words to their phonological form.<sup>5</sup> The 39 phonemes used by the Carnegie Mellon Pronouncing Dictionary (for a description, see <http://www.speech.cs.cmu.edu/cgi-bin/cmudict>) were divided into seven place categories (‘alveolar’, ‘bilabial’, ‘dental’, ‘labio-dental’, ‘post-alveolar’, ‘velar’, and ‘vowel’) and six manner categories (‘approximant’, ‘lateral’, ‘fricative’, ‘nasal’, ‘plosive’, and ‘vowel’). Next I describe the distribution of the just mentioned phonological environment variables.

Table 1 – 2 (next page) summarize the distribution of SIMILAR PRECEDING SEGMENT in CC\*s and RC\*s, respectively. ‘*Same*’ and ‘*different*’ stands for ‘same/different manner/place of articulation as the adjacent segment of *that*’. For CC\*s, the preceding segment is always different in terms of its place of articulation, but there are 434 cases for which the preceding segment had the same manner of articulation as the first segment of *that*. For RC\*s, identity in terms of the place of articulation is extremely rare, but the preceding segment frequently shares its manner of articulation with the first segment of *that* (869 cases).

Table 3 – 4 summarize the distribution of SIMILAR FOLLOWING SEGMENT in CC\*s and RC\*s, respectively. Absolute identity of preceding or following segments with potentially adjacent segments of optional *that* is extremely rare (see the ‘*same - same*’ cells in Table 1 – 4). This means there are not enough data to test the effect of segmental *identity* on optional *that*. There are, however, enough data to test whether segmental *similarity* affects optional *that*. Frisch et al. (2004) present convincing evidence that OCP effects are gradient. Speakers do not only avoid adjacent identical elements, they also disfavor adjacent *similar* elements. I coded segments as similar if either the place or the manner of articulation or both were identical with the adjacent segment of *that*. This method yields 434 CC\*s and 873 RC\*s with potential OCP effects of the preceding segment, as well as 163 CC\*s and 75 RC\*s with potential OCP effects of the following segment.

---

<sup>5</sup> The caveat of this procedure is that the extracted phonological information only reflects what the phonological environment would look like if all words were fully articulated without being affected by surrounding phonological context, which they hardly ever are in spontaneous speech.

I also determined for each case whether the segment preceding the site of optional *that* shared place or manner of articulation with the segment following the site of optional *that*. Table 5 – 6 summarize the distribution of SIMILAR SURROUNDING SEGMENTS for CC\*s and RC\*s, respectively. Here ‘*same*’ stands for identity in terms manner/place of articulation of the segment preceding *that* and the segment following *that*. As can be seen in Table 5, there are 232 CC\*s for which the segments surrounding the site of optional *that* are identical with regard to *either* place *or* manner of articulation, as well as 359 CC\*s where the surrounding segments are identical with regard to both place *and* manner of articulation. Similarly, there are 253 RC\*s for which the surrounding segments are identical with regard one feature of articulation (see Table 6), and 235 RC\*s for which the surrounding segments are identical with regard to both place and manner of articulation. Given these numbers, it is possible to code potential OCP effects of the surrounding segments as a three-way variable (‘identity of both articulatory features’ vs. ‘identity of one articulatory feature’ vs. ‘no identity’).

**Table 1** Preceding segment (CC\*s)

|        |              | PLACE       |              |
|--------|--------------|-------------|--------------|
|        |              | <i>same</i> | <i>diff.</i> |
| MANNER | <i>same</i>  | 0           | 434          |
|        | <i>diff.</i> | 0           | 2,578        |

**Table 2** Preceding segment (RC\*s)

|        |              | PLACE       |              |
|--------|--------------|-------------|--------------|
|        |              | <i>same</i> | <i>diff.</i> |
| MANNER | <i>same</i>  | 0           | 869          |
|        | <i>diff.</i> | 3           | 2,155        |

**Table 3** Following segment (CC\*s)

|        |              | PLACE       |              |
|--------|--------------|-------------|--------------|
|        |              | <i>same</i> | <i>diff.</i> |
| MANNER | <i>same</i>  | 29          | 56           |
|        | <i>diff.</i> | 78          | 2,849        |

**Table 4** Following segment (RC\*s)

|        |              | PLACE       |              |
|--------|--------------|-------------|--------------|
|        |              | <i>same</i> | <i>diff.</i> |
| MANNER | <i>same</i>  | 8           | 42           |
|        | <i>Diff.</i> | 25          | 2,952        |

**Table 5** Surrounding segments (CC\*s)

|        |              | PLACE       |              |
|--------|--------------|-------------|--------------|
|        |              | <i>same</i> | <i>diff.</i> |
| MANNER | <i>same</i>  | 359         | 201          |
|        | <i>diff.</i> | 31          | 2,421        |

**Table 6** Surrounding segments (RC\*s)

|        |              | PLACE       |              |
|--------|--------------|-------------|--------------|
|        |              | <i>same</i> | <i>diff.</i> |
| MANNER | <i>Same</i>  | 235         | 242          |
|        | <i>Diff.</i> | 11          | 2,539        |

If speakers omit optional *that* to avoid segmental OCP violations with the immediately preceding or following segment, optional *that* should be less likely if the segments was to share some articulatory feature with the adjacent segment of *that*. Also, if speakers insert optional *that* to avoid segmental OCP violations between the otherwise adjacent segments that immediately precede and follow the site of optional *that*, optional *that* should be more likely whenever those surrounding segments share at least one articulatory feature. Optional *that* should be most likely if those segments share both place and manner of articulation.

I present the results for CC\*s and RC\*s separately. In each case I start with simple omnibus tests. Then I present the results of regression analyses that control for other factors co-determining optional *that*.

### 3.2 CC\* Results

Table 7 shows that optional *that* is much less likely (33.6%) if the preceding segment is similar to the first segment of optional *that* than if it is not (27.4% optional *that*). This correlation of SIMILAR PRECEDING SEGMENT and optional *that* likelihood is significant in the direction predicted by segmental optimization (Fisher’s Exact  $p < 0.02$ ). There also is a significant dependencies between optional *that* likelihood and SIMILAR FOLLOWING SEGMENT (see Table 8), but the effect is the opposite of the one expected by segmental optimization ( $p < 0.0001$ ).

|            |            | CC* <i>that</i> |       |           |            | CC* <i>that</i> |       |
|------------|------------|-----------------|-------|-----------|------------|-----------------|-------|
|            |            | N               | %     |           |            | N               | %     |
| Segmental  | <i>no</i>  | 866             | 33.6% | Segmental | <i>no</i>  | 902             | 31.7% |
| Similarity | <i>yes</i> | 119             | 27.4% |           | <i>yes</i> | 83              | 50.9% |

Table 9 Potential OCP of surrounding segments

|            |                         | CC* <i>that</i> |       |
|------------|-------------------------|-----------------|-------|
|            |                         | N               | %     |
| Segmental  | MANNER <i>and</i> PLACE | 119             | 33.1% |
| Similarity | MANNER <i>or</i> PLACE  | 95              | 40.9% |
|            | neither                 | 771             | 31.8% |

Finally, the effect of SIMILAR SURROUNDING SEGMENTS is hard to interpret. Overall, SIMILAR SURROUNDING SEGMENTS are associated with somewhat higher likelihood of optional *that* ( $p < 0.05$ ), but the fact that similarity on only one dimension (MANNER or PLACE) is associated with a higher optional *that* likelihood than similarity on both dimension is unexpected. In sum, the initial Fisher Exact tests suggest a potential effect for SIMILAR PRECEDING SEGMENTS and maybe for SIMILAR SURROUNDING SEGMENTS.

To confirm the results with appropriate controls, SIMILAR PRECEDING SEGMENT, SIMILAR FOLLOWING SEGMENT, SIMILAR SURROUNDING SEGMENTS, and all control factors from Jaeger (2006a:Ch. 3 & 4) were entered into an ordinary logistic regression model of optional *that*.<sup>6</sup> The only segmental OCP effect

<sup>6</sup> To avoid problems due to clusters, the ordinary working model was bootstrapped 10,000 times with random replacement of speaker clusters. This procedure corrects for overly optimistic estimates (i.e. it guards against over-fitting). Stepwise backward factor elimination removed all factors from the bootstrapped model that do not contribute significant information (in terms of the change in data likelihood associated with their removal). For details I refer to Jaeger (2006a: Ch. 2). Another model was bootstrapped using replacement of clusters defined by the word immediately preceding the CC\*. This correction prevents that effects associated with the embedding verb

that remained in the model is an inconsistent effect of SIMILAR SURROUNDING SEGMENTS. While similarity in terms of *either* MANNER *or* PLACE is associated with a 1.9 times increase in optional *that* likelihood (coefficient's  $p < 0.0001$ ), similarity in terms of both features is associated with a 1.2 times decrease in the optional *that* likelihood ( $p < 0.1$ ; against the predictions of a segmental optimization account). The effect associated with SIMILAR SURROUNDING SEGMENTS is therefore likely to be due to confounding. In sum, the CC\* results do not provide evidence for the use of optional *that* for segmental optimization.

### 3.3 RC\* Results

SIMILAR PRECEDING SEGMENTS and SIMILAR FOLLOWING SEGMENTS are associated with *higher* optional *that* likelihood (Fisher's Exact  $ps < 0.0001$ ), contrary to the prediction of segmental optimization). The pattern for SIMILAR SURROUNDING SEGMENTS is again hard to interpret (see Table 12). While similarity of surrounding segments in terms of *either* MANNER *or* PLACE is associated with higher likelihood, similarity in terms of both MANNER and PLACE is associated with lower optional *that* likelihood than cases where the surrounding segments are dissimilar. If a simple measure of similarity (MANNER *or* PLACE identical?) is used, there is no dependency between SIMILAR SURROUNDING SEGMENTS and optional *that* likelihood ( $p > 0.4$ ). In sum, prior to additional controls, the results do not suggest that optional *that* can be used for segmental optimization.

Logistic regression modeling (see footnote 6) revealed that most of the apparent effects are insignificant. The unexpected effect of SIMILAR PRECEDING SEGMENT, however, remains a significant factor in the opposite of the direction predicted by segmental optimization: A SIMILAR PRECEDING SEGMENT increases optional *that* likelihood by a factor of approximately 1.7 ( $p < 0.0001$ ). In sum, again no evidence for the use of optional *that* for segmental optimization is found, but the significant effects in the unexpected direction will require further research before anything can be concluded with certainty. The available evidence, however, supports the Principle of Phonology-Free Syntax. Segmental optimization does not seem to affect (or at least not strongly affect) syntactic production.

---

are erroneously analyzed as segmental effects. Since both models are qualitatively identical, I do not discuss the latter any further (the same analyses, *mutatis mutandis*, were conducted for RC\*s).

**Table 10** Potential OCP with preceding segm.

|            |            | RC* <i>that</i> |       |
|------------|------------|-----------------|-------|
|            |            | N               | %     |
| Segmental  | <i>no</i>  | 771             | 35.8% |
| Similarity | <i>yes</i> | 480             | 55.0% |

**Table 11** Potential OCP with following segm.

|            |            | RC* <i>that</i> |       |
|------------|------------|-----------------|-------|
|            |            | N               | %     |
| Segmental  | <i>no</i>  | 1,193           | 40.4% |
| Similarity | <i>yes</i> | 58              | 77.3% |

**Table 11** Potential OCP of surrounding segments

|            |                         | RC* <i>that</i> |       |
|------------|-------------------------|-----------------|-------|
|            |                         | N               | %     |
| Segmental  | MANNER <i>and</i> PLACE | 59              | 25.1% |
| Similarity | MANNER <i>or</i> PLACE  | 151             | 59.7% |
|            | neither                 | 1,041           | 41.0% |

#### 4. Word Form OCP

In Walter and Jaeger (2008), we presented evidence that optional *that* is affected by a word form OCP effect. Speakers avoid double *that* sequences at the beginning of CC\*s and RC\*s by omitting optional *that* when the following word is a pronoun or determiner *that* (henceforth deictic *that*), as in (1b) above:

(1b) I heard [<sub>CC\*</sub> (*that*) *that*]'s the second happiest day of your life].

If an optional *that* was to directly precede a deictic *that*, speakers are more than twice as likely to omit the optional *that* than if it was followed by the word *the* or *this* (ibid). This word form OCP effect is unlikely to be due to prescriptive rules or editing. In Walter and Jaeger, we found that double *that* sequences are avoided in spontaneous speech as much as in formal writing. However, our studies did not include other control factors known to influence optional *that*. Therefore I included a word form OCP factor in the same regression models also used in the previous section.<sup>7</sup> There was only enough data to test the word form OCP effects for CC\*s: 213 CC\*s in my database (7%) begin with a deictic *that*. After controlling for all other factors, optional *that* is about 1.9 times less likely than expected if producing it would result in a double *that* sequence.

The word form OCP effect may be taken as evidence of phonological conditioning of optional *that*. Given the principle of Phonology-Free Syntax, this would argue against syntactic accounts of optional *that*. However, the word form OCP effect could also be related to lexical retrieval. The variant of a CC\*/RC\* with optional *that* may make retrieval of a following deictic *that* more difficult due to interference at the lemma level (i.e. when retrieving the lemma information for

<sup>7</sup> All results presented in this paper come from the same two models (one for the CC\* data and one for the RC\* data) that contained all OCP factors discussed in Section 3–5. For ease of presentation, I have chosen to present the results in separate sections.

deictic *that*). This slow-down associated with the processing of the variant with *that* may cause the variant without *that* to be chosen (see Ferreira and Dell 2000).

## 5. Rhythmic Optimization

Finally, I tested the effect of rhythmic optimization on optional *that*. For all CC\*s and RC\*s, the syllable immediately preceding and following the site of optional *that* was classified as either carrying primary stress or not.<sup>8</sup> Given that optional *that* is hardly ever stressed (Jurafsky et al. 2001) it is likely that it is usually included into one phonological phrase (e.g. a prosodic word) together with one of the words surrounding it. If speakers can use optional *that* to avoid stress lapses (adjacent unstressed syllables), optional *that* should therefore be dispreferred before and/or after unstressed syllables (depending on in which phrase the unstressed optional *that* would be included). Additionally, optional *that* maybe used to avoid a stress clash (adjacent stressed syllables).

The two stress factors (i.e. whether the preceding and following syllable are stressed) were entered into the regression model described in Section 3 (footnote 6). The results show that, both for CC\*s and RC\*s, only avoidance of lapses with *following* syllables seem to affect optional *that* likelihood. Optional *that* is about 2 times more likely before stressed syllables (coefficient's  $p < 0.0001$  for CC\*s;  $p < 0.012$  for RC\*s). No independent effect for the preceding syllable was found. This may indicate that optional *that* usually falls into the same phonological phrase as the first word following it. Preliminary support for this hypothesis comes from the fact that additional analyses revealed no evidence that speakers insert optional *that* even if this results in two adjacent stressed syllables. In other words, optional *that* seems to be entirely unaffected by the phonological properties of the preceding syllable. This would be expected if optional *that* is usually preceded by a prosodic break. Future research is necessary to determine whether this is the case.

## 6. Conclusions

Optional *that* is affected by avoidance of adjacent identical elements. While no evidence for *segmental* OCP effects on optional *that* were found, the word form OCP effect first reported in Walter and Jaeger (2008) was confirmed after appropriate controls. Since the word form OCP effects may be mediated via the lemma stratum, the evidence is compatible with a syntactic variation account of optional *that* (Doherty 2000; Ferreira and Dell 2000, inter alia) as well as with the

---

<sup>8</sup> Stress information was extracted from the Carnegie Mellon Pronouncing Dictionary (see Section 3.1). Personal pronouns, determiners, existential *there*, and prepositions were labeled as not carrying stress. There are two caveats to this procedure. First, the annotation does not reflect *actual* sentential stress but rather the *potential* of a syllable to receive sentential *stress*. Future work on prosodically annotated corpora is necessary to address this issue. Second, the distribution of stressed syllables is, unfortunately, somewhat correlated with the accessibility of the CC\*/RC\* subject (e.g. pronoun subject are unstressed and correlate with low relativizer likelihood). Although variation inflation factors did not indicate excessive colinearity (VIFs < 2.2), this confound has to be addressed in future work.

*that* (Doherty 2000; Ferreira and Dell 2000, inter alia) as well as with the principle of Phonology-Free Syntax (Zwicky 1969).

Finally, I have presented evidence that speakers also use optional *that* for rhythmic optimization (the avoidance of adjacent stressed or unstressed syllables). This extends earlier results from laboratory experiments that constituent ordering is affected by rhythmic optimization (MacDonald et al. 1993) to optional mentioning of function words in spontaneous speech. This result, too, is compatible with both syntactic variation accounts and the principle of Phonology-Free Syntax as long as the latter is restricted to word-level phonology. As mentioned earlier, there is evidence that prosodic phonology forms an independent level of representation (see paper in Inkelas and Zec 1990). Furthermore, evidence from speech errors suggests that prosodic encoding precedes segmental encoding: segmental errors are often due to confusion of the target word with a rhythmically similar word, but stress assignment errors do not seem to be driven by segmental similarity between words (Cutler 1980). Interestingly, Zec and Inkelas (1990) discuss cross-linguistic evidence that leads them to propose that prosodic structure is the *only* phonological information syntax has access to. The results presented here are consistent with this proposal: syntax is phonology-free except for prosody.

The fact that rhythmic optimization *co*-determines optional *that* along with many other factors (for an overview, see Jaeger 2006a, 2010; Roland et al. 2005) also underscores the fact that speakers' choices in sentence production are affected by constraints from a variety of sources.

## References

- Bock, J. K., and K. M. Eberhard. 1993. Meaning, Sound and syntax in English Number Agreement. *Language and Cognitive Processes* 8:57-99.
- Cacoullos, Rena Torres, and James A. Walker. submitted. On the Persistence of Grammar in Discourse Formulas: A Variationist Study of *that*. *Linguistics*.
- Cutler, Ann. 1980. Errors in Stress and Intonation. In Victoria Fromkin, ed., *Errors in Linguistic Performance: Slips of the Tongue, Ear, Pen, and Hand*, 67-80.
- Doherty, Cathal. 2000. *Clauses Without 'That': The Case for Bare Sentential Complementation in English*. New York: Garland.
- Dor, Daniel. 2005. Toward a semantic account of *that*-deletion in English. *Linguistics* 43:345-382.
- Ferreira, V. S. 2003. The Persistence of Optional Complementizer Production: Why Saying "That" Is Not Saying "That" At All. *Journal of Memory and Language* 48:379-398.
- Ferreira, Victor S., and Gary S. Dell. 2000. Effect of Ambiguity and Lexical Availability on Syntactic and Lexical Production. *Cognitive Psychology* 40:296-340.

- Frisch, S. A., J. A. Pierrehumbert, and M. B. Broe. 2004. Similarity Avoidance and The OCP. *Natural Language and Linguistic Theory* 22:179-228.
- Haskell, T.R., and M. C. MacDonald. 2003. Conflicting Cues and Competition in Subject-Verb Agreement. *Journal of Memory and Language* 48:760-778.
- Hawkins, John A. 2001. Why Are Categories Adjacent? *Journal of Linguistics* 37:1-34.
- Hawkins, John A. 2004. *Efficiency and Complexity in Grammars*. Oxford: Oxford University Press.
- Huddleston, Rodney, and Geoffrey Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge UP.
- Inkelas, Sharon, and Draga Zec, eds. 1990. *The Phonology-Syntax Connection*. Chicago and London: The University of Chicago Press.
- Jaeger, T. Florian, and Thomas Wasow. 2006. Processing as a Source of Accessibility Effects on Variation. In Cover, R.T and Kim Y. (eds.): *Proceedings of the 31<sup>st</sup> Annual Meeting of the Berkeley Linguistics Society*, 169-180. Ann Arbor, MN: Sheridan Books.
- Jaeger, T. Florian. 2006a. Redundancy and Syntactic Reduction in Spontaneous Speech. Ph.D. thesis, Linguistics Department, Stanford University.
- Jaeger, T. Florian. 2006b. Syntactic Persistence in Real Life (Spontaneous Speech). Paper presented at *The 19th Annual CUNY Sentence Processing Conference*.
- Jaeger, T. Florian. 2010. Redundancy and Reduction: Speakers Manage Syntactic Information Density. *Cognitive Psychology*, 61(1), 23-62.
- Jurafsky, Dan, A. Bell, M. Gregory, and W. D. Raymond. 2001. Probabilistic Relations Between Words: Evidence from Reduction in Lexical Production. In Joan Bybee and Paul Hopper, eds., *Frequency and the Emergence of Linguistic Structure*. Amsterdam: Benjamins.
- Kinsey, R., Wasow, T., and Jaeger, T. F. 2007. What does "that" mean? Experimental Evidence against the Principle of No Synonymy. 81st Annual Meeting of the Linguistic Society of America, Anaheim.
- Leben, Will. 1973. Suprasegmental Phonology. Ph.D. diss., MIT.
- MacDonald, M.C., J. K. Bock, and M. H. Kelly. 1993. Word and World Order: Semantic, Phonological, and Metrical Determinants of Serial Position. *Cognitive Psychology* 25:188-230.
- Marcus, Mitchell P., Beatrice Santorini, Mary Ann Marcinkiewicz, and A. Taylor. 1999. *Treebank III*. University of Pennsylvania: Linguistic Data Consortium.
- Pesetsky, David. 1991. Zero Syntax II. Ms. MIT.
- Race, David S., and Maryellen C. MacDonald. 2003. The Use of "That" in the Production and Comprehension of Object Relative Clauses. Paper presented at *26th Annual Meeting of the Cognitive Science Society*.
- Rohde, D. 2005. Tgrep2 Manual. Ms., MIT.
- Roland, Douglas, Jeffrey L. Elman, and Victor S. Ferreira. 2005. Why is That? Structural Prediction and Ambiguity Resolution in a Very Large Corpus of English Sentences. *Cognition*:1-28.

*Evidence for Syntactic Variation Accounts of Optional “that”*

- Strassel, Stephanie. 2001. Corpus-Based Sociolinguistic Research: A -t/d Deletion Case Study. Paper presented at *NWAV 30*.
- Thompson, Sandra A., and Anthony Mulac. 1991. The Discourse Conditions for the Use of Complementizer 'That' in Conversational English. *Journal of Pragmatics* 15:237- 251.
- Walter, Mary Ann, and T. Florian Jaeger. 2008. Constraints on English that-drop: A strong lexical OCP effect. In Edwards, R.L., Midtlyng, P.J., Stensrud, K.G., and Sprague, C.L. (eds.) *Proceedings of the Main Session of the 41st Meeting of the Chicago Linguistic Society*, 505-519. Chicago, IL: CLS.
- Wasow, Thomas, T. Florian Jaeger, and David Orr. 2011. Lexical Variation in Relativizer Frequency. In H. Simon and H. Wiese (eds.): *Proceedings of the 2005 DGfS workshop “Expecting the unexpected: Exceptions in Grammar”*, 175-196. Berlin/New York: De Gruyter Mouton.
- Zec, Draga, and Sharon Inkelas. 1990. Prosodically Constrained Syntax. In Sharon Inkelas and Draga Zec, eds., *The Phonology-Syntax Connection*. Chicago and London: Chicago University Press.
- Zwicky, Arnold M. 1969. Phonological Constraints in Syntactic Descriptions. *Papers in Linguistics* 1:411-463.

T. Florian Jaeger  
University of Rochester  
Human Language Processing Lab  
Brain and Cognitive Sciences  
Computer Science  
Box 270268  
Rochester, NY 14627-0268

fjaeger@bcs.rochester.edu



## Tonal and Morphological Identity in Reduplication

AARON F. KAPLAN\*

*University of California, Santa Cruz*<sup>1</sup>

### 0. Introduction

Chichewa is the only Bantu language in which verbal reduplication copies tones as well as segments (Hyman and Mtenje 1999). Some examples of this are given in (1). All Chichewa data are from Myers and Carleton (1996). Where such information is available, the morpheme that contributes the high tone in each non-reduplicated example is bolded.

- |     |                             |                                     |
|-----|-----------------------------|-------------------------------------|
| (1) | a. <b>tambalal</b> -á       | ‘stretch out your legs!’            |
|     | tambalalá-tambalalá         | ‘stretch out your legs repeatedly!’ |
|     | b. phik- <b>its</b> -á      | ‘really cook!’                      |
|     | phikitsá-phikitsá           | ‘really cook repeatedly!’           |
|     | c. ndíma-sangalátsa         | ‘I please’                          |
|     | ndíma-sangalátsa-sangalátsa | ‘I please repeatedly’               |
|     | d. ti-sangalats- <b>é</b>   | ‘let’s please’                      |
|     | ti-sangalatsé-sangalatsé    | ‘let’s please repeatedly’           |

A successful analysis of Chichewa must produce matching tonal patterns in the two copies. This paper argues that tonal identity in Chichewa is a consequence of the language’s general morphological properties, not reduplication-specific tone-placement constraints. Tone placement in verb stems is morphologically controlled (see below), so if we require morphological identity between bases and reduplicants (cf. Downing 1997a,b,c), the morphology will assign the same tonal patterns to the two copies. As reduplicative patterns in other languages

---

\* Thanks to Carlos Gussenhoven, Larry Hyman, Abby Kaplan, Junko Itô, Anya Lunden, Armin Mester, Jaye Padgett, and participants in the UCSC Phonology Reading Group and the Stanford Phonology Workshop for their valuable comments throughout the development of this paper.

<sup>1</sup> Note: 2006 affiliation. Affiliation as of publication: University of Utah.

demonstrate, the power to produce morphological identity is independently necessary.

The analysis below is couched in BR-Faithfulness (McCarthy and Prince 1995), but the same arguments hold within a theory like Morphological Doubling Theory (MDT; Inkelas and Zoll 2005), where morphological identity between the base and reduplicant follows from the fact that reduplication involves two instances of a set of morphemes. An MDT analysis requires the construction of three cophonologies (one for each copy and a third for the whole form) and is not pursued here because space considerations don't permit an analysis of this complexity. See also Pater (2007) for arguments against cophonologies in general and Urbanczyk (2006) for arguments against MDT specifically.

The paper is organized as follows: section 1 shows the need for morphological identity in Adhola (1.1) and Ndebele (1.2). Section 2 extends the analyses required for these languages to Chichewa. Section 3 summarizes the results.

## 1. Morphological Identity under Reduplication

### 1.1. Adhola

In verbal reduplication in Adhola, a Nilotic language spoken in Uganda, some morphemes copy obligatorily to the exclusion of other morphemes (cf. Kinande (Mutaka and Hyman 1990)). Adhola has two tones, high (H) and low (L), and there is a two-way tonal contrast between high-toned and low-toned verbs. (2) and (3) illustrate the basic reduplicative pattern with maximally disyllabic words. All Adhola data are from my notes from a field methods course taught at UC Berkeley in the fall of 2005. Reduplicants are underlined throughout. L is not marked, and y is a palatal glide.

#### (2) Low-Toned CV, CVC, and CVCV Verbs

| <i>Verb</i>  | <i>3sg Perfect</i> | <i>'he Xed too much'</i> | <i>Future</i> | <i>'he will X too much'</i> |
|--------------|--------------------|--------------------------|---------------|-----------------------------|
| kwot 'swell' | go kwot            | go kwota- <u>kwótâ</u>   | go lâ: kwot   | go lâ: kwota- <u>kwótâ</u>  |
| tho 'die'    | go tho             | go tha- <u>thâ</u>       | go lâ: tho    | go lâ: tha- <u>thâ</u>      |
| yiko 'bury'  | go yiko            | go yika- <u>yíkâ</u>     | go lâ: yiko   | go lâ: yika- <u>yíkâ</u>    |
| tiyu 'work'  | go tiyu            | go tiya- <u>tíyâ</u>     | go lâ: tiyu   | go lâ: tiya- <u>tíyâ</u>    |
| kayo 'bite'  | go kayo            | go kayo- <u>káyâ</u>     | go lâ: kayo   | go lâ: kaya- <u>káyâ</u>    |

#### (3) High-Toned CV, CVC, and CVCV Verbs

| <i>Verb</i>  | <i>3sg Perfect</i> | <i>'he Xed too much'</i>            | <i>Future</i> | <i>'he will X too much'</i>             |
|--------------|--------------------|-------------------------------------|---------------|-----------------------------------------|
| górê 'fight' | go górê            | go góra- <sup>1</sup> <u>górâ</u>   | go lâ: górê   | go lâ: góra- <sup>1</sup> <u>górâ</u>   |
| getó 'build' | ge getó            | go getâ- <sup>1</sup> <u>gétâ</u>   | go lâ: gétó   | go lâ: getâ- <sup>1</sup> <u>gétâ</u>   |
| tʃémó 'eat'  | go tʃémó           | go tʃemá- <sup>1</sup> <u>tʃémâ</u> | go lâ: tʃémó  | go lâ: tʃemá- <sup>1</sup> <u>tʃémâ</u> |

*Tonological and Morphological Identity in Reduplication*

Reduplication is segmentally total, and the reduplicant seems to have a fixed H-HL pattern. A suffix /-a/ whose identity is unclear to me appears in both copies, replacing any stem-final vowel.<sup>2</sup> This suffix appears only in reduplicated forms.

Longer verbs are shown in (4) and (5). Long monomorphemic verbs cannot be reduplicated at all, regardless of the tone pattern. Polymorphemic verbs, though, can be reduplicated. The verbs in (5) contain the reflexive suffix /-*éré*/, and in the reduplicated forms of these verbs, this suffix is eliminated from the second copy.

**(4) Long Monomorphemic Verbs**

| <i>Verb</i>         | <i>3sg Perfect</i> | <i>'he Xed too much'</i>                                                 |
|---------------------|--------------------|--------------------------------------------------------------------------|
| ɲindirok 'beget'    |                    | *ɲindira- <u>ɲindira</u>                                                 |
| kí-siamula 'sneeze' | go yasimulá        | *yasimula-yasimula, *yasimula- <u>mula</u>                               |
| kí-símulá 'wipe'    |                    | *simula- <u>simula</u> , *simula- <u>mula</u> ,<br>* <u>simu</u> -simula |

**(5) Long Polymorphemic Verbs**

| <i>Verb</i>              | <i>3sg Perf.</i> | <i>Perf. Redup.</i> | <i>3sg Future</i> | <i>Fut. Redup.</i> |
|--------------------------|------------------|---------------------|-------------------|--------------------|
| yikéré 'prepare oneself' | go yikéré        | yikéré-!yíkâ        | go lâ: yikéré     | yikérá-!yíkâ       |
| rukéré 'be dressed'      | go rukéré        | rukérá-!rúkâ        |                   |                    |

These data point to two restrictions on reduplication. The entire root must be copied, and the reduplicant is maximally disyllabic. Where these requirements conflict, reduplication is impossible, as in (4) (cf. the Morpheme Integrity Constraint (Mutaka and Hyman 1990), MDep (Downing 1997b,c)). The verbs in (5) can be reduplicated because the stem can be adequately truncated by removing only the suffix, leaving the root intact. Of course, the forms in (2) and (3) can be reduplicated because the stems are short enough to begin with.

The root-copying and disyllabic requirements are enforced with MAX(Root)-BR (6) and RED=FOOT<sub>σσ</sub> (7), respectively. RED=FOOT<sub>σσ</sub> stands in for principled constraints that produce a disyllabic reduplicant; see McCarthy and Prince (1995), Spaelti (1997), Kennedy (2005).

(6) MAX(Root)-BR: Every root segment in the base stands in correspondence with some segment in the reduplicant.

(7) RED=FOOT<sub>σσ</sub>: The reduplicant is a disyllabic foot.

---

<sup>2</sup> The stem-final vowel may be a suffix itself (see discussion of (4) and (5)), or its deletion may be the result of a more general hiatus resolution strategy seen elsewhere in Adhola.

Ranked over MPARSE (Prince and Smolensky 1993), these constraints prevent reduplication of long monomorphemic words (8). The reduplicant in candidate (a) is disyllabic, but MAX(Root)-BR is fatally violated: not all root segments are copied. Candidate (b) copies the entire root but fatally violates RED=FOOT<sub>σσ</sub>. The null parse wins because it violates only the lowest-ranked MPARSE.

(8)

| /ɲindirok RED/             | MAX(Root)-BR | RED=FOOT <sub>σσ</sub> | MPARSE |
|----------------------------|--------------|------------------------|--------|
| a. ɲindira- <u>ɲinda</u>   | *!           |                        |        |
| b. ɲindira- <u>ɲindira</u> |              | *!                     |        |
| ☞ c. ∅                     |              |                        | *      |

Long polymorphemic verbs can be reduplicated (9). The truncation candidate (candidate (a)) avoids a violation of MAX(Root)-BR because the deleted segments belong to the suffix. Only the low-ranked MAX-BR is violated. Candidate (b), with full copying, loses because of a RED=FOOT<sub>σσ</sub> violation, and the null parse is suboptimal because MPARSE outranks MAX-BR.

(9)

| /yik-éré RED/             | MAX(Root)-BR | RED=FOOT <sub>σσ</sub> | MPARSE | MAX-BR |
|---------------------------|--------------|------------------------|--------|--------|
| ☞ a. yikéré-' <u>yíkâ</u> |              |                        |        | *      |
| b. yikérâ-' <u>yikérâ</u> |              | *!                     |        |        |
| c. ∅                      |              |                        | *!     |        |

To my knowledge, there are no roots (that can appear with /-éré/) short enough to show whether suffixes may be copied if there is room for them in the reduplicant's disyllabic window. Likewise, there are no verbal prefixes.

Adhola shows that reduplication can be sensitive to the morphology of its base. Templatic requirements are balanced with morphological requirements so that the disyllabic reduplicant contains all of base's root segments, while suffixes are expendable. MAX(Root)-BR imposes a measure of morphological identity on the two copies by ensuring that they contain identical strings of root segments.

## 1.2. Ndebele

Ndebele (Hyman et al. 2003) also shows morphological influence on reduplication. As a Bantu language, Ndebele has the verbal structure shown in (10), adopting the terminology of Hyman et al. (2003).



- (13) a. casu-casul-a ‘nauseate (tr.)’  
       \*cas-a-casul-a  
       b. nambith-a nambi-nambith-a ‘taste’  
       \*namb-a-nambith-a  
       c. thembuz-a thembu-thembuz-a ‘go from wife to wife’  
       \*themb-a-thembuz-a

The disyllabic template takes precedence over root copying: the root is truncated if it is longer than two syllables. The ranking  $RED=FOOT_{\sigma\sigma} \gg MAX(\text{Root})\text{-BR}$  produces this effect. Like Adhola, root segments must be copied, but here, the inability to copy the entire root does not cause ungrammaticality. The rankings motivated so far are illustrated in (14).<sup>4</sup> Candidate (b) loses because it violates the high-ranking  $RED=FOOT_{\sigma\sigma}$ . The winner satisfies this constraint, violating both MAX constraints but producing a disyllabic reduplicant.

(14)

| /RED nambith-a/                | $RED=FOOT_{\sigma\sigma}$ | $MAX(\text{Root})\text{-BR}$ | $MAX(\text{Non-Rt})\text{-BR}$ |
|--------------------------------|---------------------------|------------------------------|--------------------------------|
| ☞ a. <u>nambi</u> -nambith-a   |                           | *                            | **                             |
| b. <u>nambith-a</u> -nambith-a | *!                        |                              |                                |

The reduplicant is a DStem (Hyman et al. 2003): it can contain roots and extensions, but not IFSs. The constraints below account for this: (15) requires reduplicants to be DStems, and (16) prevents DStems from containing IFSs. As with  $RED=FOOT_{\sigma\sigma}$ ,  $RED=DSTEM$  is a cover for more principled constraints.

(15)  $RED=DSTEM$ : Reduplicants are DStems.

(16) \* $DSTEM$  IFS: DStems may not contain IFSs.

The inability of IFSs to be copied seems to be accounted for. Candidate (b) in (17) violates either  $RED=DSTEM$  or \* $DSTEM$  IFS, depending the morphological bracketing: either the reduplicant is a DStem and \* $DSTEM$  IFS is violated, or it is not a DStem and  $RED=DSTEM$  is violated. Either way, the IFS cannot be copied.

(17)

| /RED lim-i/              | $RED=FOOT_{\sigma\sigma}$ | $RED=DSTEM$ | * $DSTEM$ IFS | $MAX(\text{Non-Rt})$ | DEP |
|--------------------------|---------------------------|-------------|---------------|----------------------|-----|
| ☞ a. <u>lim-a</u> -lim-i |                           |             |               | *                    | *   |
| b. <u>lim-i</u> -lim-i   |                           | (*!)        | (*!)          |                      |     |
| c. <u>lim</u> -lim-i     | *!                        |             |               | *                    |     |

4 The candidate \**nambith+nambith-a* is ruled out by constraints on codas.

*Tonological and Morphological Identity in Reduplication*

But candidate (b) loses only if the copy of the IFS retains the morphological status of the IFS. The problem with *\*lim-i-lim-i* lies in its illicit morphological configuration, but it doesn't violate \*DSTEM IFS if the reduplicant-final *i* is not morphologically an IFS. We therefore need a constraint like the one in (18).

- (18) IDENT(Morphological Affiliation)-BR (IDENT(Morph)): Corresponding segments in the base and reduplicant have identical morphological affiliations. (cf. Downing 1997a,b,c)

This constraint requires corresponding segments to be “marked” as belonging to the same morpheme. Just as we have constraints requiring the reduplicant-final *i* in (17b) to copy the base vowel's [+high] and [-back] features, IDENT(Morph) requires *i* to copy the base vowel's morphological affiliation; both segments must be marked as belonging to an IFS. This constraint lets us rule out the interpretation of (17b) in which the reduplicant is a DStem but the reduplicant-final *i* is not formally an IFS:

(19)

| /RED lim-i/                                           | IDENT<br>(Morph) | RED=<br>FOOT | RED=<br>DSTEM | *DSTEM<br>IFS | MAX(Non-<br>Root) | DEP-<br>BR |
|-------------------------------------------------------|------------------|--------------|---------------|---------------|-------------------|------------|
| ☞ a. <u>lim</u> -a-lim-i                              |                  |              |               |               | *                 | *          |
| b. <u>lim</u> -i <sub>IFS</sub> -lim-i <sub>IFS</sub> |                  |              |               | *!            |                   |            |
| c. <u>lim</u> -i-lim-i <sub>IFS</sub>                 | *!               |              |               |               |                   |            |

Subscripts mark the relevant segments' morphological affiliations. Only candidates that satisfy RED=DSTEM are considered. The copies in candidate (b) are phonologically and morphologically identical. Crucially, the final vowel in each copy is an IFS. This satisfies IDENT(Morph) but fatally violates \*DSTEM IFS because the reduplicant's DStem contains an IFS. In candidate (c), the reduplicant-final vowel is not formally an IFS. \*DSTEM IFS is not violated, but IDENT(Morph) is now violated because the reduplicant-final vowel does not bear the same morphological affiliation as its base counterpart. Candidate (a) avoids the problem by filling out the disyllabic template with an epenthetic vowel instead of a copy of the IFS. Only the low-ranking MAX(Non-Root) and DEP are violated.

A segment's ability to be reduplicated can depend on its morphological status. In both Adhola and Ndebele, roots are preferentially copied over affixes. More importantly, Ndebele shows that in some cases, reduplication must copy segments' morphological affiliations. In the next section, the constraints motivated above are adopted to account for tonal identity in Chichewa reduplication.

## 2. IDENT(Morph) and Tonal Identity

Recall that verbal reduplication in Chichewa is segmentally and tonally total. In non-reduplicated verbs, H that comes from a morpheme in the IStem appears on one of the last two syllables of the IStem (marked below with square brackets): H from the root, an extension, or the subjunctive marker falls on the final syllable, and Hs from other morphemes surface on the penultimate syllable. (20) and (21) account for these tones.<sup>5</sup> (Tones from prefixes can appear on the stem-initial syllable—*ndi-na-sángalats-a* ‘I pleased’—but these tones aren’t analyzed here.)

- (20) ALIGN(H, R, IStem, R) (ALIGN-R): The right edge of every high tone span is aligned with the right edge of some IStem.
- (21) NONFINALITY (NONFIN): H from a non-root, non-extension, and non-subjunctive morpheme does not appear on the final Tone-Bearing Unit (TBU) of a stem.

(22) and (23) show how these constraints produce final and penultimate tone placement, respectively. The morpheme that contributes the high tone is bolded in the input, and tones that are subject to NONFIN are italicized. (23) shows the necessity of the ranking NONFIN >> ALIGN-R.

### (22) H on Final Syllable

| /tambalal-a H/               | NONFIN | ALIGN-R           |
|------------------------------|--------|-------------------|
| a. [tám <sup>!</sup> balala] |        | *! <sup>!</sup> * |
| b. [tambalá <sup>!</sup> la] |        | *!                |
| ☞ c. [tambalalá]             |        |                   |

### (23) H on Penultimate Syllable

| /ndí-ma- <b>H</b> -sangalats-a/       | NONFIN | ALIGN-R           |
|---------------------------------------|--------|-------------------|
| a. ndíma-[sangá <sup>!</sup> latsa]   |        | *! <sup>!</sup> * |
| ☞ b. ndíma-[sangalá <sup>!</sup> tsa] |        | *                 |
| c. ndíma-[sangalatsá]                 | *!     |                   |

Reduplicants in Chichewa are IStems: roots, extensions, and IFSs are copied. With the base and reduplicant each an IStem, there are two boundaries with which tones can align. When the base’s tone is not subject to NONFIN, identical tone placements are produced with the existing constraints (24), as long as MAX(H)-BR forces tone copying. Candidate (b) in (24) loses because the reduplicant’s tone

<sup>5</sup> An analysis that takes penultimate placement to be default and uses a morpheme-specific ALIGN-R (rather than a morpheme-specific NONFIN) is equally plausible.

*Tonological and Morphological Identity in Reduplication*

is misaligned, whereas in candidate (c), both tones are at the right edge of some IStem. In the absence of evidence, I assume the first copy is the reduplicant.

(24)

| /RED <b>tambalal</b> -a H/   | MAX(H)-BR | NONFIN | ALIGN-R |
|------------------------------|-----------|--------|---------|
| a. [tambalala]-[tambalalá]   | *!        |        |         |
| b. [tambalála]-[tambalalá]   |           |        | *!      |
| ☞ c. [tambalalá]-[tambalalá] |           |        |         |

However, (24) produces the right output because right alignment is the default pattern. When the base's tone is penultimate, the constraints still produce final tone placement in the reduplicant:

(25)

| /RED ndí-ma- <b>H</b> -sangalats-a/   | MAX(H)-BR | NONFIN | ALIGN-R |
|---------------------------------------|-----------|--------|---------|
| ●* a. ndíma-[sangalatsá]-[sangalátsa] |           |        | *       |
| ☞ b. ndíma-[sangalátsa]-[sangalátsa]  |           |        | **!     |

Since formally only the base's tone comes from a morpheme that is subject to NONFIN, final placement of the reduplicant's tone does no harm. Alternatively, on the assumption that RED is subject to NONFIN, the wrong result for (24) is predicted: \*[tambalála]-[tambalalá]. In short, the analysis currently has no way to produce anything but the default tone pattern on the reduplicant.

IDENT(Morph) solves this problem. By requiring morphological identity between base and reduplicant tones, we can capture the insight that the reduplicant's tonal configuration is ultimately dependent on the morphological composition of the base. In (26), IDENT(Morph) requires both tones to be marked as belonging to the root (as indicated by subscripts on their host vowels), and consequently they are both exempt from NONFIN. The two tones are at the right edge of their respective IStems in the optimal candidate.

(26)

| /RED <b>tambalal</b> -a H/                                 | IDENT(Morph) | MAX(H) | NONFIN | ALIGN-R |
|------------------------------------------------------------|--------------|--------|--------|---------|
| ☞ a. [tambalalá <sub>Rt</sub> ]-[tambalalá <sub>Rt</sub> ] |              |        |        |         |
| b. [tambalalá]-[tambalalá <sub>Rt</sub> ]                  | *!           |        |        |         |
| c. [tambalala]-[tambalalá <sub>Rt</sub> ]                  |              | *!     |        |         |
| d. [tambalá <sub>Rt</sub> la]-[tambalalá <sub>Rt</sub> ]   |              |        |        | *!      |

The more interesting case is (27); for space, only the IStem from (1c) is shown. IDENT(Morph) ensures that the reduplicant tone copies the morphological affiliation of the base tone. It is therefore subject to NONFIN and appears on the penultimate syllable of its IStem. IDENT(Morph) rules out candidate (b) because the reduplicant's tone doesn't retain the morphological affiliation of the base's tone. Candidate (c) loses because the tone fails to copy. Candidate (d) copies the tone and its morphological affiliation, but NONFIN penalizes the reduplicant tone's placement. Candidate (a) wins: the reduplicant's tone has the same morphological marking as the base's tone, and both tones satisfy NONFIN.

(27)

| /RED <i>H</i> -sangalats-a/                                                          | IDENT(Morph) | MAX(H) | NONFIN | ALIGN-R |
|--------------------------------------------------------------------------------------|--------------|--------|--------|---------|
| ☞ a. [sangalá <sub>M</sub> t <sub>s</sub> a]-[sangalá <sub>M</sub> t <sub>s</sub> a] |              |        |        | **      |
| b. [sangalá <sub>t</sub> s <sub>a</sub> ]-[sangalá <sub>M</sub> t <sub>s</sub> a]    | *!           |        |        | **      |
| c. [sangalats <sub>a</sub> ]-[sangalá <sub>M</sub> t <sub>s</sub> a]                 |              | *!     |        | *       |
| d. [sangalatsá <sub>M</sub> ]-[sangalá <sub>M</sub> t <sub>s</sub> a]                |              |        | *!     | *       |

The morphological faithfulness constraint that was motivated by Ndebele provides an account of tonal identity in Chichewa reduplication. This analysis doesn't compare corresponding tones' placements or require corresponding TBUs to bear identical tones. Tonal identity is instead a consequence of morphological faithfulness and the morphologically driven tone-placement system of Chichewa.

Finally, disyllabic and shorter stems in Chichewa do not show tonal identity:

- (28) a. ndíma-óna 'I see' → ndíma-ona-óna 'I see repeatedly'  
 b. ndíma-dyá 'I eat' → ndíma-dya-dyá 'I eat repeatedly'

I suggest that this reflects IStem minimality requirements. The reduplicant is too short to form its own IStem, so the two copies form an IStem together. With only one IStem, the base and reduplicant tones must both appear on one of the last two syllables of the reduplicant + base unit, depending on the relevance of NONFIN.

### 3. Conclusion

I have argued for a constraint whose effect is to create identical morphological configurations under reduplication. IDENT(Morph) requires corresponding elements to have the same morphological affiliation: if one segment belongs to morpheme M, its correspondent must also be a member of M. This constraint was motivated by Ndebele, building on an investigation of Adhola. Segments in these languages reduplicate or not according to their morphological properties. In Ndebele, IDENT(Morph) prevented copying of IFSs, and in Chichewa it ensured that base and reduplicant tones were treated the same way by the tone-placement constraints. Tonal identity in Chichewa is the product of independently necessary

### *Tonological and Morphological Identity in Reduplication*

morphological constraints. There is no need for a mechanism that keeps track of matching TBUs and their tonal affiliations in the two copies. Interestingly, in Chichewa, IDENT(Morph) promoted similarity between the base and reduplicant, while in Ndebele it inhibited similarity by blocking IFS copying and motivating epenthesis to fill the reduplicant's disyllabic template.

MDT has an advantage over BR-Faithfulness in that IDENT(Morph) is unnecessary in MDT. Reduplication involves two instances of exactly the same set of morphemes in MDT, so identical morphological configurations between the two copies is an automatic, unavoidable consequence (at the cost of requiring several cophologies; see references given above). IDENT(Morph) is superfluous in MDT: "corresponding" (correspondence under reduplication is eliminated in MDT) elements in the two copies belong to the same morphemes from the start.

The analyses above rank IDENT(Morph) highly. The effect of a demoted IDENT(Morph) is illustrated in the predominant reduplication pattern in Bantu. In all languages except Chichewa (but see Downing (2003) for a different view), tones are not copied in verbal reduplication. The tonal pattern from the non-reduplicated form appears on the entire base + reduplicant unit. Tones at one edge of the unreduplicated stem appear at the same edge of the base + reduplicant unit. This is illustrated in (29) with examples from Kikerewe (Odden 1996).

- (29) a. ku-káláanga                    'to fry'  
      ku-káláanga-kalaanga        'to fry any old way'  
      n-kalaangile-kalaangílé      'I fried off and on (yesterday)'
- b. ku-bíba                        'to plant'  
      ku-bíba-biba                    'to plant here and there'
- c. m-bazílé                      'I counted (yesterday)'  
      m-bazile-bazílé                'I counted (yesterday) carelessly'

Tones align with an edge of the IStem, so the base + reduplicant unit must be an IStem, and the reduplicant must therefore be smaller than an IStem; it is maximally a DStem. But IFSs are copied. This means that the copy of the IFS must not be a morphological IFS, or else it would be banned from the reduplicant for the same reason as in Ndebele. Consequently, morphological identity must not hold between these vowels, meaning that IDENT(Morph) must be low-ranked.

### **References**

- Downing, Laura J. 1997a. Correspondence Effects in Siswati Reduplication. *Studies in the Linguistic Sciences* 25:81-95.
- Downing, Laura J. 1997b. Morphological Correspondence in Kinande Reduplication. In *Proceedings of Berkeley Linguistics Society*, vol. 23:83-94.

- Downing, Laura J. 1997c. Morphological Correspondence on Kikerewe Reduplication. In *Proceedings of WCCFL*, vol. 16:161-174.
- Downing, Laura J. 2003. Compounding and Tonal Non-Transfer in Bantu Languages. *Phonology* 20:1-42.
- Hyman, Larry M., Sharon Inkelas, and Galen Sibanda. 2003. Morphosyntactic Correspondence in Bantu Reduplication. In K. Hanson and S. Inkelas, eds., *The Nature of the Word: Essays in Honor of Paul Kiparsky*, Cambridge, MA: MIT Press.
- Hyman, Larry M. and Al Mtenje. 1999. Prosodic Morphology and Tone: The Case of Chichewa. In R. Kager, H. van der Hulst, and W. Zoonneveld, eds., *The Prosody-Morphology Interface*, 90-133, Cambridge: Cambridge University Press.
- Inkelas, Sharon and Cheryl Zoll. 2005. *Reduplication*. Cambridge: Cambridge University Press.
- Kennedy, Robert. 2005 The Binariness Effect in Kosraean Reduplication. *Phonology* 22:145-168.
- McCarthy, John and Alan Prince. 1995. Faithfulness and Reduplicative Identity. In J. Beckman, L. W. Dickey, and S. Urbanczyk, eds., *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, 149-348, Amherst, MA: GLSA Publications.
- Mutaka, Ngessimo and Larry M. Hyman. 1990. Syllables and Morpheme Integrity in Kinande Reduplication. *Phonology* 7:73-120.
- Myers, Scott and Troi Carleton. 1996. Tonal Transfer in Chichewa. *Phonology* 13:39-72.
- Odden, David. 1996. Patterns of Reduplication in Kikerewe. *OSU Working Papers in Linguistics* 48:111-149.
- Pater, Joe. 2007. The Locus of Exceptionality: Morpheme-Specific Phonology as Constraint Indexation. In L. Bateman, A. Werle, M. O'Keefe, and E. Reilly, eds., *University of Massachusetts Occasional Papers in Linguistics 33: Papers in Optimality Theory III*, Amherst, MA: GLSA Publications. 259-296.
- Prince, Alan and Paul Smolensky 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. Ms., Rutgers University & University of Colorado, Boulder Published 2004 Malden, MA and Oxford: Blackwell.
- Spaelti, Philip. 1997. *Dimensions of Variation in Multi-Pattern Reduplication*. Ph.D. diss., University of California, Santa Cruz.
- Urbanczyk, Suzanne. 2006. Reduplicative Form and the Root-Affix Asymmetry. *Natural Language and Linguistic Theory* 24:179-240.

Linguistics

Languages & Communication Bldg.  
255 S. Central Campus Dr. Rm. 2300  
Salt Lake City, UT 84112-0492

aaron.kaplan@utah.edu

## Light Verb Voicing and Japanese Phonological Lexicon

KAZUTAKA KURISU

*Kobe College*

### 0. Introduction

Postnasal voicing is one of the rich voicing phenomena in modern Japanese. It has received extensive attention in a variety of earlier literature, but still understudied is its effect in the light verb construction. The Japanese light verb /suru/ often follows Sino-Japanese items historically borrowed from Chinese. In this paper, I investigate postnasal voicing in the light verb construction and consider its theoretical implications for the phonological organization of Japanese grammar.

An interesting observation is that postnasal voicing in the light verb construction is not merely a matter of all or nothing. Data comprising a Sino-Japanese stem and the light verb reveal that postnasal voicing occurs when it is expected (i.e., after a nasal) and that it is blocked when it should not take place (i.e., after a non-nasal). However, there are abundant cases where postnasal voicing is blocked when it is predicted to occur and those where the initial consonant of the light verb is subject to voicing in the absence of a preceding nasal. Embedding this finding in the core-periphery model (Itô and Mester 1995a, 1995b, 1999, 2003), I claim that some examples behave like native Yamato items phonologically while others exhibit behavior like Sino-Japanese items.

I also argue that the non-uniform behavior of light verb voicing leads to two further theoretically important conclusions regarding the morphology-phonology interface. First, the phono-lexical organization does not necessarily accord with morphological headedness. Second, Japanese phonological lexicon is independent of etymology. These two conclusions are not new. My discussion rather provides independent support for relevant earlier literature.

In addition, two intriguing puzzles exist. First, postnasal voicing is consistently prevented when a Sino-Japanese noun precedes the light verb. Second, postnasal voicing takes place persistently when a native Yamato item is followed by the light verb. There is literally no exception in these environments. In this sense, these two cases are demonstrably different from morphological complexes consisting of a Sino-Japanese stem and the light verb. In order to account for these two cases, I discuss that distinctions of mono/bi-morphemic structures and lexical/postlexical processes need to be taken into consideration.

This paper is organized as follows. Section 1 discusses how the non-uniform pattern of morphological complexes comprising a Sino-Japanese stem and the light verb are to be understood, framing the analysis in Optimality Theory (OT; Prince and Smolensky 2004). In section 2, I examine cases where the light verb follows a Sino-Japanese noun. As stated above, postnasal voicing is consistently blocked in this context. I argue that such examples involve word formation at the postlexical level. The logic of the argument is then that postlexical complexes are not sensitive to lexical postnasal voicing. Section 3 turns to examples with persistent postnasal voicing. I claim that such examples are mono-morphemic although they seem to involve the light verb. Finally, this paper is concluded in section 4.

**1. Sino-Japanese Stems and Light Verb**

This section discusses postnasal voicing attested in morphological complexes of a Sino-Japanese stem (henceforth, SJS) and the light verb. It is beneficial to present some preliminary information regarding the morphological and phonological nature of SJSs before going into the main issue.

A single Chinese character corresponds to one SJS. As illustrated in (1), it is monosyllabic or disyllabic (Itô and Mester 1996, Kurisu 2000). SJSs are usually bound except for a limited number of SJSs (e.g., [gaku] ‘learning’). The minimal word unit in Sino-Japanese is canonically a stem compound, as exemplified in (2).

- |     |                 |                 |              |                   |             |              |
|-----|-----------------|-----------------|--------------|-------------------|-------------|--------------|
| (1) | a.              | <i>SJSs</i>     | <i>Gloss</i> | b.                | <i>SJSs</i> | <i>Gloss</i> |
|     |                 | reN             | sequence     |                   | koku        | country      |
|     |                 | hoo             | report       |                   | atu         | pressure     |
|     |                 |                 |              |                   |             |              |
| (2) | <i>1st SJSs</i> | <i>2nd SJSs</i> | <i>Words</i> | <i>Gloss</i>      |             |              |
|     | reN             | goo             | reN-goo      | union             |             |              |
|     | hoo             | koku            | hoo-koku     | report            |             |              |
|     | koku            | go              | koku-go      | national language |             |              |
|     | atu             | ryoku           | atu-ryoku    | pressure          |             |              |

Equipped with the background above, let us look at (3), where each example consists of a SJS and the light verb. Comparing examples as in (3a) and (3d), Rice (2005) maintains that postnasal voicing takes effect in the light verb construction. She correctly argues that initial voicing of the light verb is not sequential voicing productively observed in nominal compounds since voicing would equally occur in (3a) as well otherwise. But there are many examples as in (3b) and (3c). In (3b), the initial consonant of the light verb is voiced despite the fact that the light verb is preceded by a vowel. By contrast, postnasal voicing simply does not occur in (3c). Rice rather disregards them, but similar examples are too many to be ignored. In addition, notice that minimal pairs exist in terms of voicing (i.e., [koo-suru] ‘resist’ vs. [koo-zuru] ‘give a lecture’, and [saN-suru] ‘calculate’ vs. [saN-

*Light Verb Voicing*

zuru] ‘visit’). This observation suggests that all the four types of examples in (3) call for an analysis as non-exceptional data.

|        |                       |              |    |                       |                |
|--------|-----------------------|--------------|----|-----------------------|----------------|
| (3) a. | <i>SJS+suru forms</i> | <i>Gloss</i> | b. | <i>SJS+suru forms</i> | <i>Gloss</i>   |
|        | kai-suru              | meet         |    | mee-zuru              | command        |
|        | hai-suru              | distribute   |    | too-zuru              | throw          |
|        | soo-suru              | write        |    | syoo-zuru             | give rise to   |
|        | tai-suru              | oppose       |    | hoo-zuru              | report         |
|        | koo-suru              | resist       |    | koo-zuru              | give a lecture |
|        |                       |              |    |                       |                |
| c.     | <i>SJS+suru forms</i> | <i>Gloss</i> | d. | <i>SJS+suru forms</i> | <i>Gloss</i>   |
|        | haN-suru              | oppose       |    | daN-zuru              | assert         |
|        | saN-suru              | calculate    |    | beN-zuru              | speak          |
|        | meN-suru              | face         |    | geN-zuru              | reduce         |
|        | hiN-suru              | become poor  |    | neN-zuru              | pray           |
|        | seN-suru              | declare      |    | saN-zuru              | visit          |

Postnasal voicing is not pervasive, but the relevant constraint is demonstrably \*NC̥ (Pater 1999). This is a markedness constraint militating against a sequence of a nasal and a voiceless obstruent.

As exemplified in (4a), NC̥ clusters are not allowed in Yamato-Japanese, the native vocabulary. This inhibition is attested in productive alternations as well. As illustrated in (4b), a voiceless obstruent after a nasal undergoes voicing across a morpheme boundary in verbal inflectional morphology.

|        |               |              |    |                       |                   |
|--------|---------------|--------------|----|-----------------------|-------------------|
| (4) a. | <i>Yamato</i> | <i>Gloss</i> | b. | <i>Yamato</i>         | <i>Gloss</i>      |
|        | toNbo         | dragonfly    |    | /sin-ta/→[siN-da]     | die (past)        |
|        | uNzari        | disgusted    |    | /sin-te/→[siN-de]     | die (gerundive)   |
|        | syoNbori      | depressed    |    | /sin-tara/→[siN-dara] | die (subjunctive) |

On the other hand, Sino-Japanese items breach the \*NC̥ constraint, as in (5a). There are many items as in (5b), but voiced obstruents after a nasal are not due to postnasal voicing. Rather, they are underlying.

|        |             |              |    |             |                    |
|--------|-------------|--------------|----|-------------|--------------------|
| (5) a. | <i>Sino</i> | <i>Gloss</i> | b. | <i>Sino</i> | <i>Gloss</i>       |
|        | siN-po      | progress     |    | iN-boo      | plot               |
|        | seN-taku    | choice       |    | kaN-daN     | quiet conversation |
|        | reN-kee     | connection   |    | seN-geN     | declaration        |
|        | kaN-satu    | observation  |    | kaN-zeN     | perfection         |

In OT terms, the contrast between (4) and (5) can be captured by the ranking in (6) (Itô and Mester 1995a, 1995b, 1999, 2003). Ident-[voi] crucially outranks \*NC̥ in Sino-Japanese, so NC̥ clusters are ruled in. By contrast, Yamato-specific

Ident-[voi] is dominated by \*NC̥, so they are banned in the native vocabulary. Faithfulness relativization captures distinct behavior of the two lexical classes.

(6) Ident-[voi]<sub>Sino</sub> » \*NC̥ » Ident-[voi]<sub>Yamato</sub>

Now, the question is how the examples in (3) are incorporated in (6). (3c) and (3d) are straightforward. They disobey and respect the \*NC̥ constraint, respectively. This indicates that (3c) is categorized with Sino-Japanese items whereas (3d) is grouped with Yamato-Japanese items.

By contrast, SJSs in (3a) and (3b) do not end in a nasal, so postnasal voicing is of no help for placing them in the constraint hierarchy in (6). To the best of my knowledge, no empirical evidence makes clear whether they are to be classified into Yamato-Japanese or Sino-Japanese. Assuming that markedness constraints are initially all ranked over faithfulness constraints (Smolensky 1996, Davidson et al. 2004), maximally unmarked structure is preferred. In the absence of evidence to the contrary, (3a) and (3b) are reasonably grouped with Yamato-Japanese items.

In summary, the four types of data in (3) can be captured by the constraint ranking in (7).<sup>1</sup>

(7)  $\left\{ \begin{array}{l} \text{Ident-[voi]}_{\text{Sino}} \\ \text{Ident-[voi]} \text{ (3c)} \end{array} \right\} \gg *NC̥ \gg \left\{ \begin{array}{l} \text{Ident-[voi]}_{\text{Yamato}} \\ \text{Ident-[voi]} \text{ (3a, b, d)} \end{array} \right\}$

The discussion so far has two significant corollaries. First, the phono-lexical structure does not always reflect morphological headedness. The morphological complexes in (3) comprise a SJS and the light verb. Their grammatical category is a verb, so the light verb serves as the head. The light verb is undoubtedly affiliated with Yamato-Japanese, but (3c) exhibits behavior parallel to Sino-Japanese.

Second, the Japanese phonological lexicon is independent of etymology, as discussed by Fukazawa et al. (1998), Itô and Mester (1999, 2003), Tateishi (2003), and Fukazawa and Kitahara (2005). This is evident since the forms in (3) consist of two morphemes belonging to two different lexical classes. Independence of the Japanese phonological lexicon and etymology is further demonstrated in (8) (Itô and Mester 2003:150). Sequential voicing (or *rendaku*) applies to

<sup>1</sup> As pointed out by Jaye Padgett, this analysis implies that the initial consonant of the light verb is underlyingly voiced in (3b). This may appear to suggest that one promising move is to adopt the idea of allomorph selection, where all allomorphs are listed in the input and particular choice of the best one depends on a given constraint ranking (Tranel 1998). But there is an obvious problem with this approach that it does not work for (3c) and (3d). By hypothesis, no faithfulness violation is incurred irrespective of which allomorph is chosen, so Ident-[voi] has no room to play a role. Given \*NC̥, it is wrongly predicted that the forms in (3c) and (3d) converge on the voiced variant of the light verb, so the notion of allomorph selection is not easily applicable for the case at hand. But the assumption that the initial consonant of the light verb is voiced in (3b) is admittedly less than satisfactory. I leave this issue open for future research.

*Light Verb Voicing*

Yamato items (Martin 1952:48). In (8), the second compound members are Sino-Japanese items etymology-wise, but they still undergo sequential voicing. As cogently argued by Takayama (1999) and Itô and Mester (2003), the Sino-Japanese words in (8) are presumably nativized in contemporary Japanese, showing that phonology is not necessarily in tandem with etymology (see also Vance 1996). The forms in (8) in turn provide independent support for my claim here.

| (8) <i>Sino words</i> | <i>Gloss</i> | <i>Compounds</i> | <i>Gloss</i>         |
|-----------------------|--------------|------------------|----------------------|
| kaisya                | company      | ryokoo-gaisya    | travel company       |
| keNka                 | quarrel      | oyako-geNka      | parent-child quarrel |
| syasiN                | photography  | kao-zyasiN       | face photo/portrait  |
| kesyoo                | makeup       | usu-gesyoo       | light makeup         |
| toohu                 | tofu         | yu-doohu         | hot tofu             |
| heya                  | room         | sigoto-beya      | work place           |

**2. Puzzle I: Robust Resistance to Voicing**

The data presented in section 1 suggest that light verb voicing does not display a uniform pattern. Two interesting puzzles exist with respect to applicability of light verb voicing. One is seen in cases where the initial consonant of the light verb is never voiced, and the other is those where it is consistently voiced. I discuss these two cases in turn in this section and in section 3, respectively.

Consider the examples in (9), where the light verb does not undergo voicing regardless of the segment immediately before the light verb. As illustrated in (9b), therefore, postnasal voicing is also prevented.

| (9) a. <i>Words</i> | <i>Gloss</i> | b. <i>Words</i> | <i>Gloss</i> |
|---------------------|--------------|-----------------|--------------|
| beNkyoo-suru        | study        | soodaN-suru     | consult      |
| kaiketu-suru        | resolve      | kookaN-suru     | exchange     |
| kokai-suru          | regret       | haNdaN-suru     | judge        |
| kaisyaku-suru       | interpret    | daNpaN-suru     | negotiate    |

The immediate question is why voicing is always blocked in these examples, even after a nasal. The key observation is that a bound stem precedes the light verb in (3) while the light verb follows a Sino-Japanese noun (henceforth, SJN) in (9). The elements before the light verb can stand as independent words in (9).

Building on this observation, I propose that the morphological complexes in (3) are lexical whereas those in (9) are constructed at the postlexical level. There is some evidence to support this proposal. A first indication is drawn from their behavior in accentuation. As shown in (10a), mono-morphemic native verbs are unaccented or attract the accent to the penultimate syllable. Verbal compounds follow the same pattern, as exemplified in (10b) (Akinaga 1985).

Kazutaka Kurisu

|         |                             |              |                           |              |
|---------|-----------------------------|--------------|---------------------------|--------------|
| (10) a. | <i>Unaccented verbs</i>     | <i>Gloss</i> | <i>Accented verbs</i>     | <i>Gloss</i> |
|         | neru                        | sleep        | kúru                      | come         |
|         | agaru                       | go up        | sagáru                    | go down      |
|         | marumeru                    | round        | tabanéru                  | bundle       |
| b.      | <i>Unaccented compounds</i> | <i>Gloss</i> | <i>Accented compounds</i> | <i>Gloss</i> |
|         | mi-ageru                    | look up      | ne-naósu                  | sleep again  |
|         | ake-yoru                    | run up to    | hare-agáru                | swell up     |
|         | de-kakeru                   | go out       | osi-nokéru                | push away    |

Crucial examples are given in (11). As in (11a), the morphological complexes in (3) exhibit exactly the same pattern as (10).<sup>2</sup> The forms in (11b) also can be either unaccented or accented. But their accentuation is different from (10) and (11a). The accent does not fall on the penultimate syllable in (11b). As described by McCawley (1968:144), the examples (11b) retain the accent pattern of SJNs that the light verb is attached to. [beNkyoo] ‘study’ and [soodaN] ‘consultation’ are accentless, but [kóokai] ‘regret’ and [háNdaN] ‘judgment’ are accented.

|         |                            |              |                          |              |
|---------|----------------------------|--------------|--------------------------|--------------|
| (11) a. | <i>Unaccented SJS+suru</i> | <i>Gloss</i> | <i>Accented SJS+suru</i> | <i>Gloss</i> |
|         | mee-zuru                   | command      | kai-súru                 | meet         |
|         | too-zuru                   | throw        | hai-súru                 | distribute   |
|         | daN-zuru                   | assert       | haN-súru                 | oppose       |
|         | beN-zuru                   | speak        | saN-súru                 | calculate    |
| b.      | <i>Unaccented SJN+suru</i> | <i>Gloss</i> | <i>Accented SJN+suru</i> | <i>Gloss</i> |
|         | beNkyoo-suru               | study        | kóokai-suru              | regret       |
|         | soodaN-suru                | consult      | háNdaN-suru              | judge        |

This observation strongly indicates that the examples in (3) are lexical words, but those in (9) are not. McCawley (1968:144) informally states that there is some junctural element between a SJN and the light verb. As I discuss shortly below, my analysis lends support to his intuitive remark.

Because the forms in (9) are not lexical, they are likely to involve postlexical word formation. This is confirmed by positive evidence. Compelling phonological evidence comes from adverbial reduplication. As demonstrated in (12a), a whole base undergoes copying when it is bimoraic or larger. But total reduplication of a subminimal base is accompanied by vowel lengthening, as shown in (12b). This

<sup>2</sup> Light verb voicing and accentedness are in complementary distribution for (3). Given that the voicing phenomenon is surface realization of a linking morpheme (Itô and Mester 1986, 2003) and that the forms in (11a) conform to the accent pattern of lexical verbal compounds, this complementary distribution makes sense. The question is why voicing and an accent cooccur in nominal compounds (e.g., /nise-sakura/→[nise-zákura] ‘fake cherry’). This is maybe attributed to different degrees of compounding. Nominal compounds are more tightly connected than the forms in (3).

*Light Verb Voicing*

reflects word minimality in Japanese (Poser 1990, Itô 1990, Kurisu 2005). (12c) shows that compounds also undergo total reduplication, just like simple verbs.

|      |                        |                            |              |
|------|------------------------|----------------------------|--------------|
| (12) | <i>Adverbial forms</i> | <i>Reduplication forms</i> | <i>Gloss</i> |
| a.   | tabe                   | tabe-tabe                  | eat          |
|      | hasiri                 | hasiri-hasiri              | run          |
| b.   | si                     | sii-sii                    | do           |
|      | mi                     | mii-mii                    | see          |
| c.   | naki-dasi              | nakidasi-nakidasi          | start crying |
|      | tobi-hane              | tobihane-tobihane          | jump         |
|      | kaki-maze              | kakimaze-kakimaze          | stir up      |

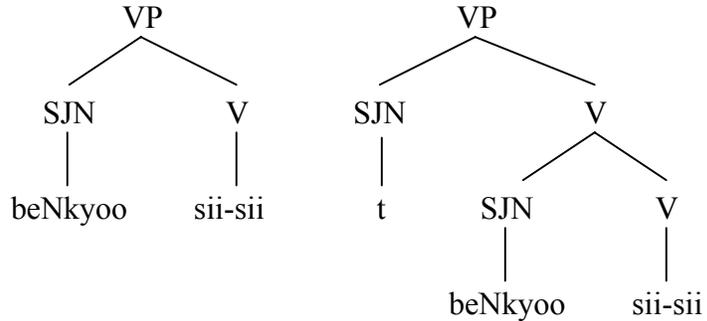
Reduplication patterns of (3) and (9) are exemplified in (13). As in (13a), the morphological complexes in (3) take the same pattern as simple and compounded verbs. But in (9), only the light verb undergoes reduplication, as shown in (13b). Moreover, the vowel of the light verb undergoes prosodic augmentation. Comparison of (12c) and (13b) reveals that the forms in (9) are not compounds either.

|      |                        |                            |              |
|------|------------------------|----------------------------|--------------|
| (13) | <i>Adverbial forms</i> | <i>Reduplication forms</i> | <i>Gloss</i> |
| a.   | kai-si                 | kaisi-kaisi                | meet         |
|      | haN-si                 | haNsi-haNsi                | oppose       |
|      | mee-zi                 | meezi-meezi                | command      |
|      | daN-zi                 | daNzi-daNzi                | assert       |
| b.   | beNkyoo-si             | beNkyoo-sii-sii            | study        |
|      | kookai-si              | kookai-sii-sii             | regret       |
|      | soodaN-si              | soodaN-sii-sii             | consult      |
|      | haNdaN-si              | haNdaN-sii-sii             | judge        |

The difference between (13a) and (13b) makes immediate sense if the forms in (9) are constructed at the postlexical level (Kageyama 1976-7, Kurisu 2001). My proposal is schematically depicted in (14). First, the light verb and preceding SJN are segregated at the lexical level when adverbial reduplication applies. As shown in (14a), therefore, only the light verb is targeted by total reduplication. /si/ is less than bimoraic, so vowel lengthening occurs. The output of reduplication is supplied to the deep structure, and it is base-generated under the V node. A SJN occupies the complement position, as in (14b). The SJN is subsequently incorporated into the light verb (Barker 1988), yielding the surface representation in (14c).

- (14) a. *Reduplication*      b. *Deep structure*      c. *Surface structure*

/si/→[sii-sii]



Based upon the observation that SJNs behave syntactically either as verbs or nouns, Kurisu (2001) argues that the position of SJN is a verb when incorporation takes place. This syntactic incorporation can be then motivated by complementation of semantic and tense requirements imposed on verbs. SJNs are semantically rich with substantial meanings. But they cannot be inflected for tense. By contrast, the light verb has a poor meaning, but it is inflected for tense. Combination of the two syntactic verbs through incorporation yields a full-fledged verb.

Summarizing the discussion so far, the examples in (3) are lexical complexes whereas those in (9) are postlexical complexes. This analysis explains two facts. First, no voicing takes place in (9) because the voicing process is lexical. Second, the reason why (9) exhibits different behavior from lexical and compounded verbs becomes clear with my analysis, where (9) involves postlexical word formation. In a nutshell, postlexical word formation is insensitive to phonological processes occurring at the lexical level.

### 3. Puzzle II: Persistent Application of Voicing

The second puzzle is the fact that there are examples with consistent voicing, the opposite situation of (9). Relevant examples are provided in (15).

|      |                   |                 |                   |                    |
|------|-------------------|-----------------|-------------------|--------------------|
| (15) | <i>zuru forms</i> | <i>Gloss</i>    | <i>zuru forms</i> | <i>Gloss</i>       |
|      | karoNzuru         | think little of | sakiNzuru         | go ahead           |
|      | omoNzuru          | honor/respect   | amaNzuru          | put up with        |
|      | utoNzuru          | neglect         | soraNzuru         | recite from memory |

There are two important generalizations. First, it seems that these examples appear to contain the light verb and that its initial consonant seems to be voiced. Second, the segment immediately preceding the voiced consonant is consistently a nasal. Therefore, it seems that what is going on in (15) is postnasal voicing. In effect, I argue that it is actually postnasal voicing. However, caution is necessary. We already saw in (3) that postnasal voicing is not exceptionless. The question to be addressed is why postnasal voicing takes place in (15) with no exception.

*Light Verb Voicing*

My key proposal is that the examples in (15) are mono-morphemic items, as represented in (16). This proposal is tantamount to saying that the apparent light verb is indeed not an independent morpheme, unlike in (3) and (9).

(16) Morpheme  
  
 [karoNzuru]

Several pieces of evidence indicate that the mono-morphemic representation in (16) is correct. First, the phonological strings preceding [zuru] (e.g., [karoN]) can neither stand as independent words nor cooccur with any other morphemes. In this sense, they are highly bound.

In many cases, the elements before [zuru] are semantically associated with native adjectives, as demonstrated in (17). One might bring up the possibility of deadjectival derivation. But this is turned down for two reasons. First, there is no coherent way to generalize the phonological operation of deadjectivization. The vowel right before [N] in each verb is not always the same as the corresponding vowel in adjectives. It is not a fixed vowel either. Second, not all forms in (15) have a semantically related adjective (e.g., [soraNzuru]), so the deadjectival derivation cannot cover all examples given in (15). These two problems significantly degrade the validity of deadjectivization.

|      |    |                   |                 |    |                   |                |
|------|----|-------------------|-----------------|----|-------------------|----------------|
| (17) | a. | <i>zuru forms</i> | <i>Gloss</i>    | b. | <i>Adjectives</i> | <i>Gloss</i>   |
|      |    | karoNzuru         | think little of |    | karui             | light          |
|      |    | omoNzuru          | honor/respect   |    | omoi              | heavy          |
|      |    | utoNzuru          | neglect         |    | utoi              | ignorant       |
|      |    | amaNzuru          | put up with     |    | amai              | sweet/generous |

More evidence for the representation in (16) comes from adverbial reduplication. As illustrated in (18), reduplication creates total reduplication. This is the same pattern as (12) and (13a). As I already discussed, this pattern of reduplication indicates that the base of reduplication is formed at the lexical level. At the minimum, (18) shows that the examples in (15) do not involve any postlexical word formation. This in turn suggests that the mono-morphemic structure in (16) is not incorrect.

|      |                        |                            |                    |
|------|------------------------|----------------------------|--------------------|
| (18) | <i>Adverbial forms</i> | <i>Reduplication forms</i> | <i>Gloss</i>       |
|      | karoNzi                | karoNzi-karoNzi            | think little of    |
|      | omoNzi                 | omoNzi-omoNzi              | honor/respect      |
|      | utoNzi                 | utoNzi-utoNzi              | neglect            |
|      | sakiNzi                | sakiNzi-sakiNzi            | go ahead           |
|      | amaNzi                 | amaNzi-amaNzi              | put up with        |
|      | soraNzi                | soraNzi-soraNzi            | recite from memory |

Finally, all the examples in (15) contain only one voiced obstruent. No more than one voiced obstruent is permitted per morpheme in native Yamato-Japanese. This is an OCP effect known as Lyman’s Law (Martin 1952, McCawley 1968, Itô and Mester 1986, 2003, Vance 1987). The fact that the forms in (15) respect this phonological restriction is suggestive of the correctness of my proposal that they are affiliated with Yamato-Japanese.

Note that Lyman’s Law is entirely immaterial in (3). For example, the first example in (3d) (i.e., [daN-zuru] ‘assert’) contains two voiced obstruents (i.e., [d] and [z]). As I argued in section 1, the examples in (3) are bi-morphemic. This means that the pertinent voiced obstruents are separated into distinct morphemes. As a result, Lyman’s Law is impeccably satisfied by the forms in (3d) although they behave like Yamato-Japanese items (see (7)).

Summing up this section, accentuation and adverbial reduplication reveal that the entire forms in (15) do not involve any postlexical word formation. But they are clearly different from (3) with respect to Lyman’s Law. This is accounted for by positing the mono-morphemic structure depicted in (16). This morphological factor differentiates (15) from (3) and (9).

Returning to the initial question posed at the beginning of this section, the present analysis offers a straightforward account for why [zuru] always appears in (15). All the examples in (15) behave like morphologically simple native verbs, so \*NC̸ must be satisfied, given the ranking in (6).

**4. Conclusion**

This paper dealt with a rather comprehensive range of data surrounding voicing of the light verb. I demonstrated that the attested three-way pattern is attributed to lexical/postlexical and mono/bi-morphemic distinctions. The finding obtained in this study is summarized in the table in (19).

(19)

|              | Morphological structure | Level of word formation | Lexical class |
|--------------|-------------------------|-------------------------|---------------|
| (3a, 3b, 3d) | complex                 | lexical                 | Yamato        |
| (3c)         | complex                 | lexical                 | Sino          |
| (9)          | complex                 | postlexical             | Sino          |
| (15)         | simplex                 | lexical                 | Yamato        |

This table also makes clear that the examples discussed above are classified with either Yamato-Japanese or Sino-Japanese items. This observation is captured by the ranking in (20). With the disparate rankings of faithfulness constraints with respect to \*NC̸, it follows that the phono-lexical classification of a given item is not contingent upon morphological headedness or etymology.

### Light Verb Voicing

$$(20) \quad \left\{ \begin{array}{l} \text{Ident-[voi]}_{\text{Sino}} \\ \text{Ident-[voi]} (3c) \\ \text{Ident-[voi]} (9) \end{array} \right\} \gg *NC_{\circ} \gg \left\{ \begin{array}{l} \text{Ident-[voi]}_{\text{Yamato}} \\ \text{Ident-[voi]} (3a, b, d) \\ \text{Ident-[voi]} (15) \end{array} \right\}$$

The examples in (9) are produced postlexically, so it automatically follows that lexical voicing does not occur. One may suppose that Ident-[voi](9) may be omitted from (20). But explicit inclusion of Ident-[voi](9) illuminates one important fact. Exploring opacity in German, Itô and Mester (2001) argue for the need of different rankings for lexical and postlexical components. Most importantly, the lexical level is less marked than the postlexical level. This elucidates the effect of structure preservation. The ranking of Ident-[voi](9) » \*NC<sub>◦</sub> can be seen along this line. The forms as in (3) and (15) are lexical, and their phonological markedness differs depending upon the stratum that they belong to. The forms in (9) are postlexical, so structure preservation is turned off. As a result, phonologically marked structure appears. This conjecture is evinced in much earlier literature, but correlations between phonological markedness and lexical/postlexical processes deserve more intensive and extensive scrutiny in the OT enterprise.

#### Acknowledgements

This paper benefited from discussion with the audiences at the annual BLS 32 meeting (February 10, 2006) as well as the participants in the Phonology Reading Group at the University of California, Santa Cruz (February 13, 2006). For many invaluable questions and comments on these occasions, I thank Larry Hyman, Junko Itô, Armin Mester, Jaye Padgett, and Natsuko Tsujimura. I am responsible for any remaining errors and infelicities.

#### References

- Akinaga, Kazue. 1985. Kyootsuugo no Akusento [Accent of Standard Japanese]. In NHK, ed., *Nihongo Hatsuon Akusento Ziten [Dictionary of Japanese Pronunciation and Accent]*. 70-116 (Appendix).
- Barker, Mark. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago: Chicago University Press.
- Davidson, Lisa, Peter Jusczyk, and Paul Smolensky. 2004. The Initial and Final States: Theoretical Implications and Experimental Explorations of Richness of the Base. In R. Kager, J. Pater, and W. Zonneveld, eds., *Constraints in Phonological Acquisition*, 321-368. Cambridge: Cambridge University Press.
- Fukazawa, Haruka, Mafuyu Kitahara, and Mitsuhiro Ota. 1998. Lexical Stratification and Ranking Invariance in Constraint-Based Grammars. *Proceedings of the Chicago Linguistic Society* 34(2):47-62.
- Fukazawa, Haruka, and Mafuyu Kitahara. 2005. Ranking Paradoxes in Consonant Voicing in Japanese. In J. van de Weijer, K. Nanjo, and T. Nishihara, eds., *Voicing in Japanese*, 105-121. Berlin and New York: Mouton de Gruyter.

- Itô, Junko. 1990. Prosodic Minimality in Japanese. *Proceedings of the Chicago Linguistic Society* 26(2):213-239.
- Itô, Junko, and Armin Mester. 1986. The Phonology of Voicing in Japanese: Theoretical Consequences for Morphological Accessibility. *Linguistic Inquiry* 17(1):49-73.
- Itô, Junko, and Armin Mester. 1995a. Japanese Phonology. In J. Goldsmith, ed., *The Handbook of Phonological Theory*, 817-838. Cambridge, Massachusetts, Blackwell Publishers.
- Itô, Junko, and Armin Mester. 1995b. The Core-Periphery Structure of the Lexicon and Constraints on Reranking. In J. Beckman, L. Walsh, and S. Urbanczyk, eds., *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, 181-209.
- Itô, Junko, and Armin Mester. 1996. Stem and Word in Sino-Japanese. In T. Otake and A. Cutler, eds., *Phonological Structure and Language Processing: Cross-Linguistic Studies*, 13-44. Berlin and New York: Mouton de Gruyter.
- Itô, Junko, and Armin Mester. 1999. The Phonological Lexicon. In N. Tsujimura, ed., *The Handbook of Japanese Linguistics*, 62-100. Cambridge, Massachusetts: Blackwell Publishers.
- Itô, Junko, and Armin Mester. 2001. Structure Preservation and Stratal Opacity in German. In L. Lombardi, ed., *Segmental Phonology in Optimality Theory*, 261-295. Cambridge: Cambridge University Press.
- Itô, Junko, and Armin Mester. 2003. *Japanese Morphophonemics: Markedness and Word Structure*. Cambridge, Massachusetts: The MIT Press.
- Kageyama, Taro. 1976-7. Incorporation and Sino-Japanese Verbs. *Papers in Japanese Linguistics* 5:117-155.
- Kurisu, Kazutaka. 2000. Richness of the Base and Root-Fusion in Sino-Japanese. *Journal of East Asian Linguistics* 9(2):147-185.
- Kurisu, Kazutaka. 2001. Case Marking and Incorporation in Sino-Japanese. *Proceedings of the Chicago Linguistic Society* 37(1):363-377.
- Kurisu, Kazutaka. 2005. Gradient Prosody in Japanese. *Journal of East Asian Linguistics* 14(3):175-226.
- Martin, Samuel. 1952. *Morphophonemics of Standard Colloquial Japanese*. Supplement to *Language*. Dissertation No. 47. Baltimore, Maryland: Linguistic Society of America.
- McCawley, James. 1968. *The Phonological Component of a Grammar of Japanese*. The Hague: Mouton.
- Pater, Joe. 1999. Austronesian Nasal Substitution and Other \*NC̥ Effects. In R. Kager, H. van der Hulst, and W. Zonneveld, eds., *The Prosody-Morphology Interface*, 310-343. Cambridge: Cambridge University Press.
- Poser, William. 1990. Evidence for Foot Structure in Japanese. *Language* 66(1):78-105.
- Prince, Alan, and Paul Smolensky. 2004. *Optimality Theory: Constraint Interaction in Generative Grammar*. Malden, Massachusetts: Blackwell.

*Light Verb Voicing*

- Rice, Keren. 2005. Sequential Voicing, Postnasal Voicing, and Lyman's Law Revisited. In J. van de Weijer, K. Nanjo, and T. Nishihara, eds., *Voicing in Japanese*, 25-45. Berlin and New York: Mouton de Gruyter.
- Smolensky, Paul. 1996. The Initial State and 'Richness of the Base' in Optimality Theory. Technical Report. JHU-Cogsci-96-4. John Hopkins University.
- Takayama, Tomoaki. 1999. Syakuyoogo no Rendaku/Koonka ni tsuite. [On Rendaku/Portition in Loanwords]. *Report of the Special Research Project for the Typological Investigation of Languages and Cultures of the East and West* 1, 375-385. Tsukuba, Japan: Tsukuba University.
- Tateishi, Koichi. 2003. Phonological Pattern and Lexical Strata. *Proceedings of the Seventeenth International Congress of Linguistics* (CD-ROM). Prague: Matfyz Press.
- Tranel, Bernard. 1998. Suppletion and OT: On the Issue of Syntax/Phonology Interaction. *Proceedings of the West Coast Conference on Formal Linguistics* 16:415-429.
- Vance, Timothy. 1987. *An Introduction to Japanese Phonology*. New York: State University of New York Press.
- Vance, Timothy. 1996. Sequential Voicing in Sino-Japanese. *Journal of the Association of Teachers of Japanese* 30:22-43.

Kazutaka Kurisu  
Kobe College  
Department of English  
4-1 Okadayama, Nishinomiya  
Hyogo, 662-8505 Japan

kurisu@mail.kobe-c.ac.jp



# Polarity Sensitivity in Inflectional Morphology<sup>\*</sup>

DMITRY LEVINSON  
*Stanford University*

## 1. Introduction

Words and phrases of different grammatical categories exhibit polarity sensitivity behaviour (van der Wouden 1996). Single-word Negative Polarity Items (NPIs) discussed in the literature include indefinites such as *any*, aspectual adverbials such as *still* and *anymore* (Israel 1995), and sentential particles like *either* and *too* (Rullman 2003). Phrases typically include NPs denoting minimal degrees, such as *lift a finger* (Schmerling 1971) or maximal degrees, like *in a million years* (Israel 2001). In all these cases the polarity sensitive items are on the word level or above: the items discussed are words, expressions or phrases.

In this paper I examine polarity sensitivity in a domain that is usually overlooked: *inflectional morphology*. While there have been occasional mentions of polarity sensitivity in some morphological categories, my goal in this paper is to provide a systematic examination of this phenomenon. An account of polarity sensitivity in morphology extends the domain of polarity sensitivity research, and helps provide a unified explanation for different morphosyntactic phenomena.

The structure of this paper is as follows. In Section 2 I derive a prediction for the direction of polarity sensitivity, based on the semantic notion of Transitivity introduced by Hopper and Thompson (1980). In the following sections I check this prediction in a number of categories: partitive/non-partitive object marking (Section 3), verbal aspect (Section 4), and verbal mood (Section 5). Section 6 concludes the paper.

## 2. Where To Look For PSIs in Morphology: Transitivity

Hopper and Thompson (1980) discuss factors affecting the realization of a clause as transitive or not transitive. Some of their factors are shown in Table 1.

---

<sup>\*</sup> I would like to thank Paul Kiparsky, Stanley Peters, Ivan Sag, Tom Wasow, Hana Filip, Barbara Partee, Beth Levin, Itamar Francez, Tanya Nikitina, Rebecca Starr, Elsi Kaiser, Maria Bittner, Chris Barker, Anastasia Giannakidou, Judith Tonnhauser and the audience at the BLS, Stanford 2006 Semantics Fest and the Swarthmore Workshop on Negation and Polarity 2006 for discussions and comments. I am also grateful to Paul Kiparsky and Elsi Kaiser for providing judgments on Finnish sentences.

| <b>Factor</b>              | <b>High transitivity</b> | <b>Low transitivity</b>   |
|----------------------------|--------------------------|---------------------------|
| Kinesis                    | action                   | non-action (state)        |
| Aspect                     | telic                    | atelic                    |
| Punctuality                | punctual                 | non-punctual              |
| Volitionality              | volitional               | non-volitional            |
| Affirmation                | affirmative              | negative                  |
| Mood                       | realis                   | irrealis                  |
| Affectedness of the object | object totally affected  | object partially affected |

Table 1. Factors contributing to transitivity (from Hopper and Thompson 1980)

Discussing the interconnection between the factors, they observe:

...whenever an obligatory pairing of two Transitivity features occurs in the morphosyntax or semantics of a clause, the paired features are always on the same side of the high-low transitivity scale. (Hopper and Thompson 1980:254).

Some of these factors may be encoded in morphology. Partial affectedness of the object is expressed in some languages by partitive case marking (as opposed to the accusative/absolute). Aspect can be expressed by perfective/imperfective forms. Many languages have special morphology for the irrealis mood, usually called “subjunctive” in European languages.

One of the factors affecting transitivity is presence of negation, which contributes to lower transitivity. Therefore, low transitivity morphology can become associated with negation. Assuming that the effect of negation can spread to other NPI-licensing environments, the following prediction can be derived:

**(1) Direction of polarity sensitivity in morphology:**

- Low transitivity morphological markers can become Negative Polarity Items
- High transitivity morphological markers can become Positive Polarity Items

This prediction is supported by the observation (Fauconnier 1975; Israel 1996) that emphatic negative polarity items (NPI) denote low quantities. The predicted possible polarity sensitivity of the morphological categories mentioned above is given in the following table:

| <b>Category</b> | <b>Positive polarity</b> | <b>Negative polarity</b> |
|-----------------|--------------------------|--------------------------|
| Object marking  | Accusative/absolute      | Partitive                |
| Aspect          | Perfective               | Imperfective             |
| Mood            | Realis (Indicative)      | Irrealis (Subjunctive)   |

Table 2. Morphosyntactic categories and their expected polarity sensitivity.

In the rest of the paper I examine the individual categories and show that this

prediction is indeed borne out. It is important to note that the prediction only concerns the direction of *possible* polarity sensitivity. In many cases such sensitivity would never develop in a particular language, but when it does, the direction should be as predicted.

### **3. Partitive/Non-partitive case**

A number of languages exhibit differential object case marking. One of the case-marking options, the partitive, signals partial affectedness of the object, while the other option (accusative or absolutive) is used when the object is fully affected.

According to the prediction in section 2, the low transitivity category is expected to become associated with negation. In this case it is the partitive, signaling partial affectedness of the object, that denotes the lower level of affectedness than the non-partitive. Therefore, the expectation is that the partitive will become associated with negation, and possibly other NPI-licensing environments, thus becoming a negative polarity item.

#### **3.1. Russian**

In Russian, the regular case marking for the direct object is accusative. In negative sentence another case marking is available: the genitive. This phenomenon is known as Genitive of Negation, and it exists, to various extents, in most Slavic and Baltic languages. A common view of the development of Genitive of negation is that it is a result of a reanalysis of partitive as part of negation and the spread of partitive by analogy to nouns that originally could not be used with it (Levinson 2005). This is similar to the mechanism proposed by Fauconnier (1975) and Israel (1996) for the development of negative polarity items, and Pereltsvaig (1999) indeed argued that Russian Genitive of Negation a negative polarity item.

(2) Ja čitaju gazety / \*gazet.  
I read newspapers-ACC / GEN.  
'I read newspapers'

(3) Ja ne čitaju gazety / gazet.  
I NEG read newspapers-ACC / GEN.  
'I don't read newspapers'

#### **3.2. Finnish**

Finnish also uses partitive and accusative for object case marking. Typically, three rules are given to explain the usage of partitive and accusative (Kiparsky 1998). The first concerns aspectual boundedness: if the eventuality denoted by the verb is atelic, the partitive is used (4); the accusative can only be used with a telic eventuality. Secondly, the partitive is used if an NP denotes an indeterminate quantity (5). Finally, the partitive is obligatory with negation.

(4) Ammu-i-n karhu-a / karhu-n

shoot-Pst-1Sg bear-Part / bear-Acc  
'I shot at a/the bear / I shot a/the bear.'

- (5) saa-n karhu-j-a / karhu-t  
get-1Sg bear-Pl-Part / bear-PlAcc  
'I'll get (some) bears / the bears.'

Kaiser (2002) noticed that in some cases the partitive can be used in questions, but not in affirmative sentences.

- (6) Pekka huomasi miehen /\*miestä.  
Pekka-NOM noticed man-ACC/\*man-PRT  
'Pekka noticed a/the man.'
- (7) Huomasi-ko Pekka miehen/miestä?  
Noticed-Q Pekka-NOM man-ACC/man-PRT  
'Did Pekka notice a/the man?'

However, in addition to the environments discussed by Kaiser, there are other NPI-licensing environments allowing the partitive:

- (8) Harva/\*moni huomasi miestä. FEW  
Few/\*many noticed man-PRT  
'Few/many people noticed a/the man.'
- (9) Ennenkuin/\*Senjälkeen Pekka huomasi miestä... BEFORE  
Before /\*after Pekka noticed man-PRT  
'Before/after Pekka noticed a/the man...'

These examples support Kaiser's (2002) conclusion that the Finnish partitive has an NPI behaviour.

### 3.3. Basque

Basque is an ergative language, so the object of a transitive verb and the subject of an intransitive verb have the same case marking: absolutive. In some cases the otherwise absolutive NP can have a partitive marker. The partitive is not available for ergative case NPs (Ortiz de Urbina 1985).

The partitive cannot be used with simple affirmative sentences, but it can be used in many NPI-licensing environments, such as negation, questions and antecedents of conditionals (de Rijk 1972; Laka 1990:37; Hualde and Ortiz de Urbina 2003:124). It can also be used with epistemic modals (Hualde and Ortiz de Urbina 2003:551), similar to the Greek NPIs (Giannakidou 1998).

### 3.4. Partitive in Presentational/Existential Sentences

The partitive-licensing contexts discussed above are known to be NPI-licensors: downward entailing or just nonveridical environments. There is, however, one context that does not fit this characterization. In some cases the partitive can be used for the subject of an existential/presentational sentence. This option in negative sentences in Slavic is known as “subject genitive of negation”. In Croatian it is also available in positive sentences (Menac 1986:191-193). Similar usage is found in Finnish (Kiparsky 1998; Huumo 2003:462) and Basque (Hualde and Ortiz de Urbina 2003:125).

(10) Ima/evo kruh-a. (Croatian)  
There-is/here bread-GEN  
‘There is bread./Here’s bread.’

(11) Piha-lla juokse-e poik-i-a. (Finnish)  
yard-ADESSIVE run-PRES.3SG boy-PL-PART  
‘There are boys running in the yard.’

(12) Ba-da hemen neska eder-rik. (Basque)  
*ba*-is here girl beautiful-PART  
‘There are (some) beautiful girls here.’

Such a usage may be surprising, since existential sentences are not known to be NPI-licensors. However, this usage can be explained by the properties of the partitive itself, unrelated to the issue of polarity sensitivity. Partitive denotes an indeterminate quantity, and is intrinsically an indefinite phrase. Existential sentences favor indefinite subjects, while non-existential sentences favor definite subjects (Beaver, Francez and Levinson 2005). Therefore, partitive phrases are natural candidates to be used in existential sentences.

### 3.5. Conclusion

In all the examined languages, the direction of dependency is as expected: the morphological category that becomes associated with negation is the partitive, denoting partial affectedness. In addition to its regular uses, denoting nominal (and in Finnish also verbal) unboundedness, the partitive is used with negation. In Finnish and in Basque it can also be used in other known NPI-licensing environments.

## 4. Imperfective/perfective aspect

Russian verbs have the category of aspect, that can be imperfective or perfective. Essentially, perfective verbs denote telic eventualities which have a natural limit, while imperfective verbs denote atelic eventualities, lacking such a limit. When referring to an activity leading to a change of state, a telic verb denotes both the activity and the change of state, while an atelic verb denotes just the activity. The

perfective verbs therefore denote more action than the imperfective ones, and contribute to higher transitivity.

According to the prediction introduced in section 2, imperfective, being the low transitivity category, is expected to become a negative polarity item. While most NPI-licensing environments are not known to affect aspect marking, in two cases discussed below such sensitivity has been found.

#### 4.1. Imperatives

While both perfective and imperfective occur freely in positive imperatives, the perfective is dispreferred with negation, to various degrees, in all the Slavic languages (Ivić 1958; Zenčuk 1971; Levinson 2005).

(13) Beri / Voz'mi stakan.  
 Take-IPFV/Take-PFV glass  
 'Take the glass.'

(14) Ne beri /#voz'mi stakan.  
 Neg take-IPFV/take-PFV glass  
 'Don't take the glass.'

#### 4.2. Habitual vs. Specific

In Russian, in the past tense the aspectual choice is affected by whether the action is habitual or not. Perfective can be used with *odin raz* 'once', but not with *často* 'frequently'. This is similar to the choice of indefinite pronouns: *Čto-nibud'* 'something.NON-SPECIFIC' cannot be used with *odin raz* 'once', but can be used with *často* 'frequently'. For habitual as an NPI-licenser, see section 5.3.2.

(15) Ja tuda odin raz prišodil/prišol.  
 I there one time came.IPFV/came.PFV  
 'I came there once.'

(16) Ja tuda često prišodil/\*prišol.  
 I there frequently came.IPFV/\*came.PFV  
 'I frequently came there.'

(17) Ja često čto-nibud' prinosil.  
 I frequently something.NON-SPECIFIC brought.IPFV  
 'I frequently brought something.'

(18) Ja odin raz čto-to/\*čto-nibud' prinosil/prinjos.  
 I one time smth.SPECIFIC/\*smth.NON-SPECIFIC brought.IPFV/brought.PFV.  
 'I brought something once'.

In these cases the perfective exhibits positive polarity sensitivity.

### 4.3. Conclusions

Influence of an NPI-licensing environment on aspectual marking was only found in two cases: negative imperatives and habitual sentences. In both cases, the direction of the dependency is as predicted.

## 5. Realis/Irrealis

The most common manifestation of polarity sensitivity in morphology can be found in the category of *reality status* (Elliott 2000). Reality status is usually marked on the verb, with *realis* and *irrealis* as possible values. The low transitivity marker is *irrealis*, and it is therefore expected to become a negative polarity item.

### 5.1. Indicative vs. subjunctive in subordinate clauses

In European languages, the reality status categories are traditionally called indicative and subjunctive, with subjunctive being used almost exclusively in subordinate clauses.

Nathan and Epro (1984:522) noticed that many of the constructions that trigger NPIs in English also license the subjunctive mood in Romance languages. A similar observation was made by Giannakidou (1995) for Greek and Romanian.

(19) Je crois qu'il est/\*soit intelligente. (French)  
I believe that he is-IND/\*is-SUBJ smart  
'I believe that he is smart.'

(20) Je ne crois pas qu' il soit intelligente.  
I NEG believe that he is-SUBJ smart  
'I don't believe that he is smart.'

(21) Crois-tu qu'il soit intelligente?  
Believe-you that he is-SUBJ smart  
'Do you believe that he is smart?'

(22) Comimos antes / \*después que él llegara. (Spanish)  
Ate-1PL before / after that he arrived-SUBJ  
'We ate before/after he arrived.'

(23) Dudo que sea francés. (Spanish)  
doubt-1SG that is-3SG-SUBJ French  
'I doubt that he/she is French.'

### 5.2. Irrealis/Realis in Main Clauses

Unlike the European languages, many languages of the world have the realis/irrealis distinction in main clauses as well. The exact distribution of the real-

is/irrealis marking varies widely across languages (Mithun 1995; Bybee 1998; Elliott 2000).

Simple past and present are always realis (Palmer 2001:168), while the typical use of irrealis is to denote possible events. Other environments that can license irrealis include negation, questions, future and imperatives. Here are some examples of irrealis marking in Caddo (Caddoan – Oklahoma; Chafe 1995; Melnar 2004):

- (24) sah -yi=bahw-nah      YES-NO QUESTION  
 2ND.AGENT.IRREALIS-see-PERFECT  
 ‘Have you seen him?’
- (25) kúy-t’a-yi=bahw      NEGATION  
 NEG-1ST.AGENT.IRREALIS-see  
 ‘I don’t see him.’
- (26) kas-sa-náy= aw      OBLIGATION  
 OBLIGATIVE-3RD.AGENT.IRREALIS-sing  
 ‘He should/is supposed to sing.’
- (27) hí-t’a-yi=bahw      ANTECEDENT OF A CONDITIONAL  
 CONDITIONAL-1ST.AGENT.IRREALIS-see  
 ‘If I see it.’
- (28) wás-t’a-yi=bahw      INFREQUENTATIVE ADVERB  
 INFREQUENTATIVE-1ST.AGENT.IRREALIS-see  
 ‘I seldom see it.’

### 5.3. Irrealis and Other NPIs: Comparing the Environments

#### 5.3.1. Proposed licensing conditions

The following are the major environments licensing both irrealis and other NPIs: negation, question, antecedent of a conditional, future, imperative, desiderative, obligation, possibility.

Similar to the polarity sensitivity research, much of which is devoted to defining the environments that can license polarity items, the functional-typological research on irrealis has attempted to describe the irrealis environments. Since the connection between the NPIs and the irrealis marking in the main clause has remained unnoticed, these lines of research have been pursued separately. However, the proposed descriptions are very similar.

On the realis/irrealis distinction, Mithun (1999:173) characterizes the realis as denoting actualized situations, and irrealis as denoting situations “within the realm of thought”. A similar characterization is given by Roberts (1990:367): realis refers to the real world, and irrealis refers to possible worlds.

In the polarity sensitivity literature, Giannakidou (1998 etc) proposed the cri-

terion of (*non*)*veridicality*. The NPIs are said to occur only in nonveridical environments. A simplified definition of veridicality is given here:

- (29) F is *veridical* just in case  $Fp \rightarrow p$  is logically valid. Otherwise, F is *nonveridical*. (Giannakidou and Zwarts 1998).

There are apparent similarities between the nonveridicality condition and the formulations given by Mithun and Roberts. Indeed, all the irrealis environments listed above are nonveridical, and do not denote actualized, or real world, situations.

### 5.3.2. Habitual

Some environments are problematic for the definitions above. One such environment is the *habitual*. In some languages, verbs with habitual interpretation can be marked as irrealis<sup>1</sup>. For examples, in Bargam (Papua New Guinea; Roberts 1990:383-384) the realis/irrealis distinction is marked on ‘medial verbs’ (all but the final verb in a verb chain), and habitual clauses are irrealis. The infrequentative suffix in Caddo is also used with irrealis (28).

- (30) Miles-eq leh-id teq anamren aholwaq-ad in didaq tu-ugiaq.  
return-SS.IR go-DS.IR then owner see-SS.SIM 3SG food PFV-give.HAB.PAST.  
‘When (the pig) would return and go, the owner, on seeing it, used to give it food’

Such examples pose a problem for the common definitions of irrealis, since they refer to events happening in the real world. Moreover, habituals can license NPIs. The following example is from Giannakidou (1998:134). As noticed in section 4.2, Russian *-nibud’* indefinites exhibit a similar behavior.

- (31) Otan pijene o Pavlos ja ipno, ksefilize sinithos *kanena* periodhiko.  
when went-3sg the Paul for sleep, browsed-3sg usually *some/any* magazine.  
‘When Paul went to bed, he usually browsed through a magazine’.

This is a counterexample to nonveridicality as a licensing condition<sup>2</sup>. To conclude, we see that habitual sentences can license NPIs and irrealis marking, violating the proposed licensing conditions.

### 5.3.3. Emotive Factives

Another problematic usage occurs in the complements of emotive factive verbs

---

<sup>1</sup> A similar phenomenon exists in English: habitual past can be expressed using the modal verb *would*. For example, *When we were children, we would often play at being grown-ups*. (Roberts 1990:383).

<sup>2</sup> Giannakidou (1998:134), Giannakidou and Zwarts (1998:9) analyse (31) as non-veridical; however, the contrast they show is not exhibited by the Russian *-nibud’* indefinites.



items. These observations extend the domain of polarity sensitivity research and provide a unifying analysis of a variety of morphosyntactic phenomena.

## References

- Beaver, David, Itamar Francez and Dmitry Levinson. 2005. Bad Subject: (Non-)Canonicity and NP Distribution in Existentials. *Semantics and Linguistic Theory XV*.
- Bybee, Joan. 1998. Irrealis as a Grammatical Category. *Anthropological Linguistics* 40, 257-271.
- Chafe, Wallace. 1995. The Realis-Irrealis Distinction in Caddo, the Northern Iroquoian Languages, and English. In J. Bybee and S. Fleischman, eds., *Modality in Grammar and Discourse*.
- Elliott, Jennifer R. 2000. Realis and Irrealis: Forms and Concepts of the Grammaticalisation of Reality. *Linguistic Typology* 4:55-90.
- Fauconnier, Giles. 1975. Polarity and the Scale Principle. *CLS* 11:188-199.
- von Stechow, Kai. 1999. NPI-Licensing, Strawson-Entailment, and Context-Dependency. *Journal of Semantics* 16, 97-148.
- Giannakidou, Anastasia. 1995. Subjunctive, Habituality and Negative Polarity. *Semantics and Linguistic Theory V*, 94-111.
- Giannakidou, Anastasia. 1998. *Polarity Sensitivity as (Non)Veridical Dependency*. Amsterdam: J. Benjamins.
- Giannakidou, Anastasia, and Zwarts, Frans. 1998. *Temporal, aspectual structure and (non)veridicality*. Ms.
- Givón, T. 1994. Irrealis and the Subjunctive. *Studies in Language* 18, 265-337.
- Hopper, Paul J., and Thompson, Sandra A. 1980. Transitivity in Grammar and Discourse. *Language* 56, 251-299.
- Hualde, José Ignacio, and Ortiz de Urbina, Jon. 2003. *A Grammar of Basque*. Mouton de Gruyter.
- Huumo, Tuomas. 2003. Incremental Existence: The World According to the Finnish Existential Sentence. *Linguistics* 41(3), 461-493.
- Israel, Michael. 1996. Polarity Sensitivity as Lexical Semantics. *Linguistics and Philosophy* 19, 619-666.
- Ivić, M. 1958. Upotreba vida v slovenskom imperativu s negacijom (Aspect Usage in Slavic Imperative With Negation. *IV Meždunarodnyj s'ezd slavistov. Slavjanskaja filologija: sbornik statej II*. 96-111.
- Kadmon, Nirit, and Landman, Fred. 1993. Any. *Linguistics and Philosophy* 16 353-422.
- Kaiser, Elsi. 2002. Case Alternation and NPIs in Questions in Finnish. *Proceedings of WCCFL* 21, 194-207.
- Kiparsky, Paul. 1998. Partitive Case and Aspect. In M. Butt and W. Geuder, eds., *The Projection of Arguments*. CSLI.
- Laka, Itziar. 1990. Negation in Syntax: On the Nature of Functional Categories

Dmitry Levinson

- and Projections. Ph.D. diss., MIT. Cambridge, MA.
- Ladusaw, William. 1980. *Polarity Sensitivity as Inherent Scope Relations*. New York: Garland.
- Linebarger, Marcia. 1980. *The Grammar of Negative Polarity*. Ph.D. diss., MIT.
- Levinson, Dmitry. 2005. *Aspect in Negative Imperatives and Genitive of Negation: A Unified Analysis of two Phenomena in Russian*. Ms.
- Melnar, Lynette R. 2004. *Caddo Verb Morphology*. Lincoln, NE: University of Nebraska Press.
- Mithun, Marianne. 1999. *The Languages of Native North America*. Cambridge: Cambridge University Press.
- Nathan, Geoffrey S., and Epro, Margaret W. 1984. Negative Polarity and the Romance Subjunctive. *Papers from the XIIIth Linguistic Symposium on Romance Languages*, ed. Philip Baldi.
- Ortiz de Urbina, Jon. 1985. Partitive Constructions, Unaccusativity and Ergativity. *Studies in the Linguistic Sciences* 15(1), 147-155.
- Palmer, F. R. 2001. *Mood and Modality*. Cambridge: Cambridge University Press.
- Pereltsvaig, Asya. 1999. The Genitive of Negation and Aspect in Russian. In: Y. Rose and J. Steele (eds.), *McGill Working Papers in Linguistics* 14, 111-140.
- de Rijk, Rudolf P. G. 1972. Partitive Assignment in Basque. *Anuario del Seminario de Filología Vasca "Julio de Urquijo"* 6, 130-173.
- Roberts, John R. 1990. Modality in Amele and other Papuan Languages. *Journal of Linguistics* 26, 363-401.
- Rullmann, Hotze. 2003. Additive Particles and Polarity. *Journal of Semantics* 20, 329-401.
- van der Wouden, Ton. 1996. *Negative Contexts*. London: Routledge.
- Zenčuk, V.N. 1971. Otricatel'nye imperativnye konstrukcii v serboxorvatskom i drugix slavjanskix jazykax. *Vestnik LGU, istorija, jazyk, literatura*, no 2(8), 77-83.

Dmitry Levinson  
Department of Linguistics  
Stanford University  
Stanford, CA 94305

dmitryle@stanford.edu

## Semantic Changes in Apparent Time

JEAN-PHILIPPE MAGUÉ  
*Université de Lyon*

### 0. Introduction

Semantic changes have been scientifically studied for more than 150 years (Nerlich 1992). All along this history, successive generations of scholars have adopted at least three different theoretical frameworks (Magué 2005). Chronologically, the first trend focused on the identification of the different kinds of semantic changes a lexeme can undergo. This *taxonomist* trend culminates with Ullman (1962). The second trend adopts a *typologist* point of view and is characterized both by the advocacy of cross-linguistic studies and the focus on semantic field rather than isolated lexemes. A typical work in the trend is Viberg (1983). Finally, a *cognitivist* trend has more recently emerged, which aims at explaining the cognitive mechanisms that underlie semantic change (e.g., Sweetser 1990).

Despite the great variety of theoretical approaches the study of semantic changes has gone through, the methodologies used have surprisingly remained the same: only completed semantic changes are studied, either by the analysis of synchronic manifestations, i.e., polysemy or sets of cognates, or by the analysis of the development of a new meaning from corpus evidences. What makes this fact even more surprising is that, on the other hand, the study of phonological changes has undergone a methodological revolution (which has entailed theoretical breakthroughs) during the last 40 years with the emergence of the Labovian variationist sociolinguistics (Labov 1963, 2001).

Sociolinguistics studies the correlation between linguistic variation and socio-economic factors. Among those factors, age of the speaker is of particular interest. Assuming the *Apparent Time Hypothesis* (Bailey et al. 1991), which holds that speakers acquire their idiolect mainly during a critical period in their childhood, correlation between age and linguistic variation is the synchronic manifestation of a change in progress. Most of ongoing linguistic changes observed that way are phonological changes (Labov 1963), few are morphosyntactic ones (Parrott 2002), but, to our knowledge, semantic changes have remained left aside from variationist sociolinguistics. A possible explanation for this state of affairs lies in methodological difficulty to measure precisely and objectively enough the semantic variation. While phonetic variation is directly observable from speakers'

productions, since sounds are precisely the public part of linguistic communication, meanings are mental entities and are not directly made public during communication. The experimenter who wishes to study the semantic variation faces thus the double challenge of obtaining an objective representation of the private mental meaning and of measuring semantic variation from this representation. The goal of this paper is to present a method to achieve this double challenge.

The method presented here is based on the work in the field of quantitative anthropology of Romney et al. (2000) which addresses the issue of inter-cultural differences in the representation of various cultural domains. The main idea it relies on, is to apply statistical treatment to semantic similarity judgments performed by speakers between words belonging to a same semantic field.

### 1. Materials and Method

The semantic field we analyzed was built with the French word *maison* ‘house’ and 20 of its synonyms<sup>1</sup> chosen for their high frequency variation between the first and the second halves of the 20<sup>th</sup> century (Table 1). Subjects were given a questionnaire, presenting pairs of words followed by a 10cm-long axis. Each of the 210 possible pairs was presented once to each subject, and the order of the words within the pairs was counterbalanced between subjects. The order of the pairs was randomized for each subject. Subjects had to judge the semantic similarity of each pair of words by placing a mark on the corresponding axis: on the left extremity for unrelated words, on the right one for perfect synonyms and on intermediate positions for intermediate semantic similarities. The position of the marks were measured and scaled to lie between 0 and 1. The answers of each subject  $i$  were then represented by a  $21 \times 21$  symmetric matrix  $A_i$ . Few subjects skipped some of the pairs. To deal with the missing values, all the subsequent analyses were performed on the matrices  $M_i = (\text{corr}(A_i) + I) / 2$ , where  $\text{corr}(A_i)$  is the correlation matrix of  $A_i$ . This operation had also the effect of removing noise from the data, since in the matrix  $M_i$ , the similarity between two words is given by the similarity judgment patterns of those two words against all others.

The experiment was performed on two groups of native French speakers, differing only on their mean age. The younger group was composed of 47 subjects (36 females, i.e., 76.6%) with a mean age of 21 years ( $\pm 1.4$ , min = 17, max = 26). The older group was composed of 16 subjects (11 females, i.e., 68.8%) with a mean age of 56 years ( $\pm 3.1$ , min = 49, max = 63). While the two groups differed in terms of age ( $t(61) = 33.98$ ,  $p < 10^{-15}$ ), they were matched in respect to gender ( $\chi^2(1, N=63) = 0.388$ ,  $p > .5$ ). In order to match the groups in their level of competence in French, subjects were asked the number of pages written in French they read per day. In the younger group, subjects read on average 39.1 pages while in the older group subjects read 25.2 pages ( $t(44) = 0.91$ ,  $p > .35$ ).

- (1) The 21 words used in the experiment, their frequencies during the first and second halves of the 20<sup>th</sup> century and the variation of their frequency

---

<sup>1</sup> Obtained from the online synonyms dictionary <http://dico.isc.cnrs.fr>

## Semantic Changes in Apparent Time

between the two periods. Frequencies were obtained from the online dictionary *Le Trésor de la Langue Française Informatisé*.<sup>2</sup>

|                      |                    | Frequency<br>1900 -1950<br>(per million) | Frequency<br>1950 - 1999<br>(per million) | Frequency<br>variation<br>(%) |
|----------------------|--------------------|------------------------------------------|-------------------------------------------|-------------------------------|
| <i>case</i>          | 'hut'              | 982                                      | 1,352                                     | +38                           |
| <i>chalet</i>        | 'chalet'           | 353                                      | 1,106                                     | +213                          |
| <i>château</i>       | 'castle'           | 10,743                                   | 5,802                                     | -46                           |
| <i>chaumière</i>     | 'thatched cottage' | 1,236                                    | 314                                       | -75                           |
| <i>clinique</i>      | 'private clinic'   | 417                                      | 1,038                                     | +149                          |
| <i>construction</i>  | 'construction'     | 3,442                                    | 4,811                                     | +40                           |
| <i>entreprise</i>    | 'enterprise'       | 3,032                                    | 6,104                                     | +101                          |
| <i>établissement</i> | 'establishment'    | 1,930                                    | 2,999                                     | +55                           |
| <i>firme</i>         | 'firm'             | 56                                       | 3,441                                     | +6,045                        |
| <i>habitation</i>    | 'dwelling'         | 1,081                                    | 659                                       | -39                           |
| <i>hôpital</i>       | 'hospital'         | 2,707                                    | 3,922                                     | +45                           |
| <i>immeuble</i>      | 'building'         | 784                                      | 1,135                                     | +45                           |
| <i>intérieur</i>     | 'interior'         | 15,514                                   | 24,662                                    | +59                           |
| <i>logement</i>      | 'accommodation'    | 1,456                                    | 995                                       | -32                           |
| <i>logis</i>         | 'home'             | 3,279                                    | 1,582                                     | -52                           |
| <i>maison</i>        | 'house'            | 63,774                                   | 50,652                                    | +21                           |
| <i>manoir</i>        | 'manor'            | 459                                      | 285                                       | -38                           |
| <i>masure</i>        | 'hovel'            | 749                                      | 399                                       | -47                           |
| <i>propriété</i>     | 'property'         | 8,326                                    | 4,764                                     | -43                           |
| <i>réduit</i>        | 'cubbyhole'        | 381                                      | 531                                       | +39                           |
| <i>résidence</i>     | 'residence'        | 424                                      | 574                                       | +35                           |

## 2. Results

### 2.1. Direct Analyses

When all the judgments are considered together, the older group judged the words significantly more similar, albeit very slightly, than the younger one. Their average scores were respectively 0.58 and 0.56 ( $t(27781) = 4.64, p < 10^{-5}$ ). Considering each pair of words individually, four of them presented this difference: *chalet / chaumière*, *château / clinique*, *château / entreprise*, *château / établissement*, and *château / hôpital* (all  $p$ 's < 0.01). Nevertheless, *château / intérieur* and *immeuble / réduit* were judged more similar by the younger group than by the older one ( $p$ 's < 0.01).

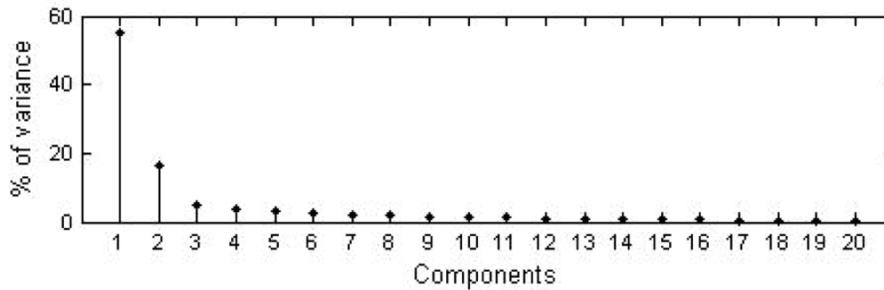
### 2.2. Principal Components Analysis

Following Romney et al. (2000), we have performed a *Principal component analysis* (PCA) in order to obtain for each subject a semantic space in which words

<sup>2</sup> <http://atilf.atilf.fr>

are represented by points, and in order to obtain the semantic similarity between two words by the geometric distance between the points representing them. The percentage of variance explained by each component is given in figure 2. Given those percentages (the first and the second component explaining respectively 55% and 17 % of the variance), only the two first components will be considered in the rest of the paper. Before focusing on inter-generational differences in the semantic spaces, it is worth considering the common semantic space.

- (2) Percentage of variance explained by the components. The two first explain together 72% of the total variance.



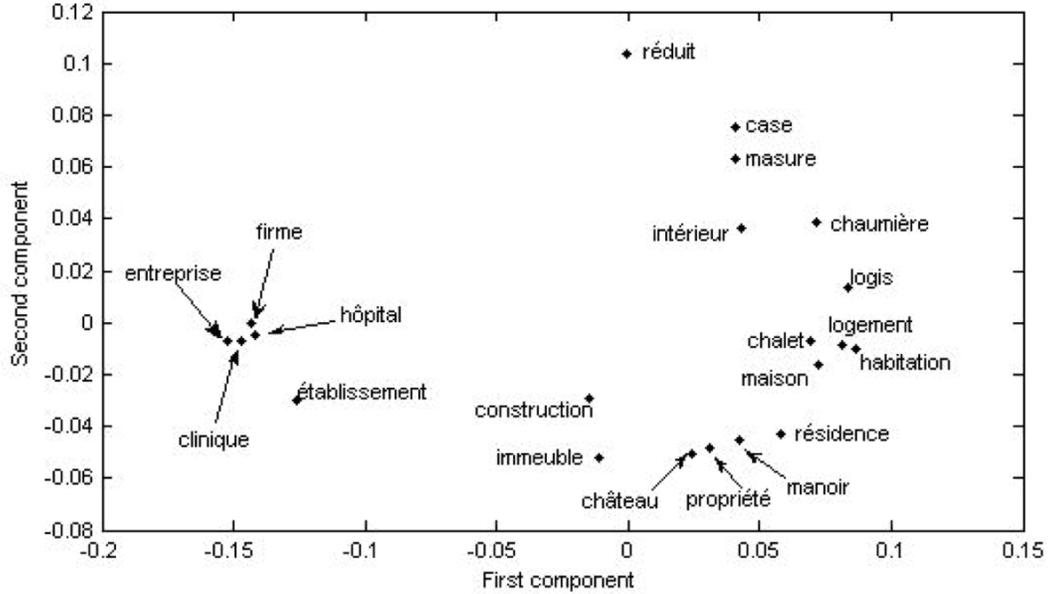
### 2.2.1. Common Semantic Space

In the common semantic space the position of the words is the average position across all the subjects, regardless of their group (figure 3). Along the first component, words spread from *entreprise, firme, hôpital, clinique* to *logis, logement, habitation*. The first component thus discriminates words along the *habitability* of their referents. Along the second component, words spread from *château, propriété, manoir* to *maison, case, réduit*, making this component axis of *quality* of the lodging.

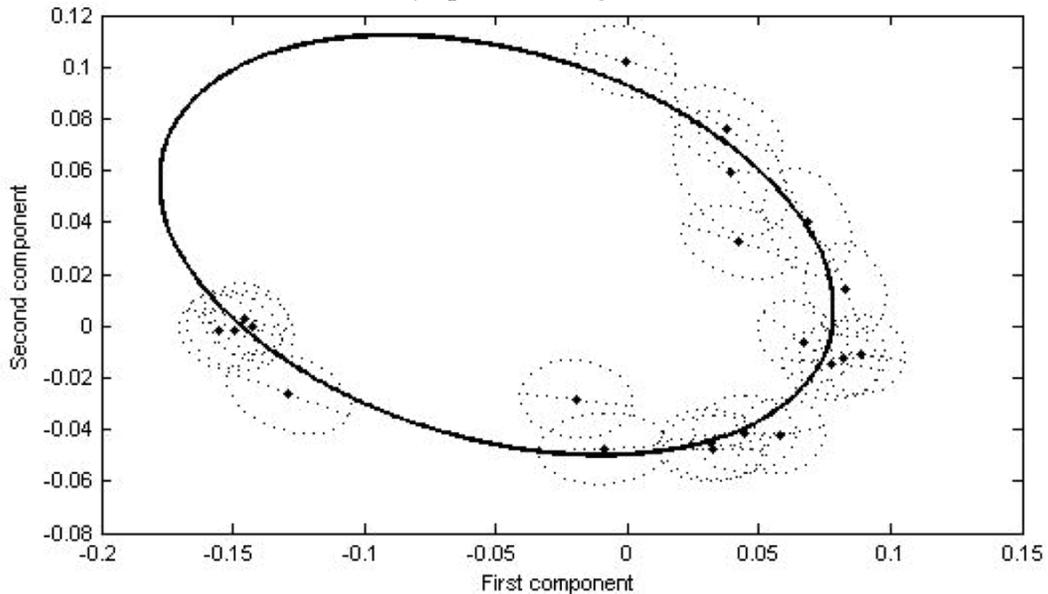
In addition to these axes of habitability and quality, this semantic field is organized by an ellipse (Figure 4, solid line) along which most of the inter-individual variability spreads (Figure 4, dotted lines). As we shall see in the next section, semantic changes occur along this ellipse too.

*Semantic Changes in Apparent Time*

- (3) Common Semantic Space. The first component describes the *habitability* of the referent of the words, and the second one the *quality* of lodging.



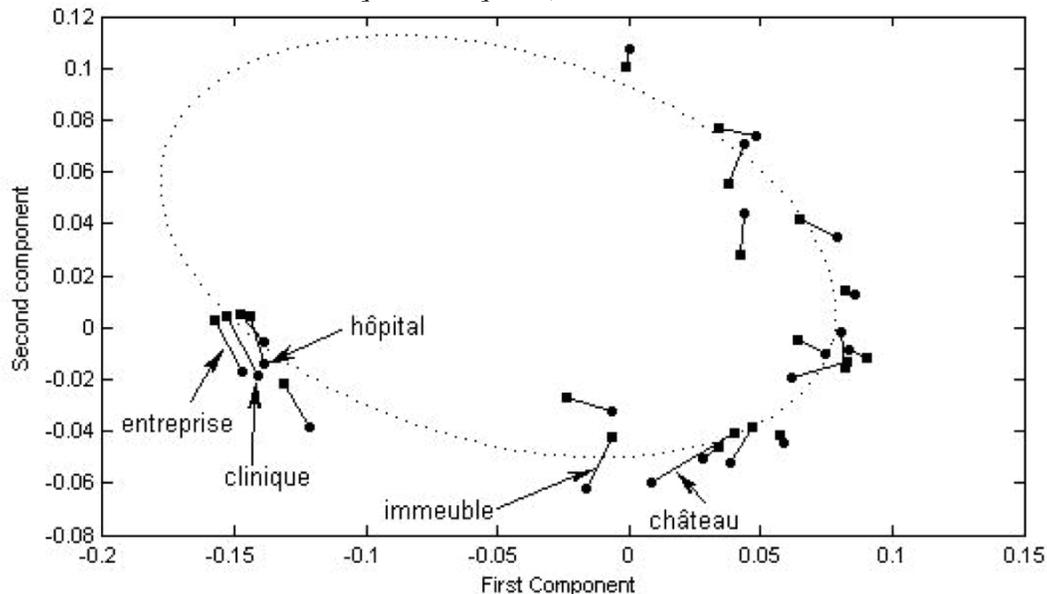
- (4) Elliptical organization of the semantic field (solid line) and confidence ellipses (dotted lines) at  $\sigma/2$  with their main axis. Those axes tend to be tangent to the large ellipse structuring the semantic field, indicating that the inter-individual variability spreads along it.



### 2.2.2. Inter-Generational Differences

A preliminary way to identify inter-generational differences is to compare the mean position of the words between the two groups (figure 5). For most of the words, the change occurs along the ellipse. This change is statistically significant (Hotelling  $T^2$  test) for four of the words: *château* ( $T2(T^2)(2) = 18.88, p < .005$ ), *clinique* ( $T2(2) = 7.45, p < .05$ ), *entreprise* ( $T2(2) = 7.00, p < .05$ ), and *immeuble* ( $T2(2) = 6.69, p < .05$ ). The change for *hospital* also tends to be significant ( $T2(2) = 5.88, p = .063$ ).

- (5) Local inter-generational differences. The mean position of the words is represented for each of the two groups. This position is statistically different for *château*, *clinique*, *entreprise*, and *immeuble*.

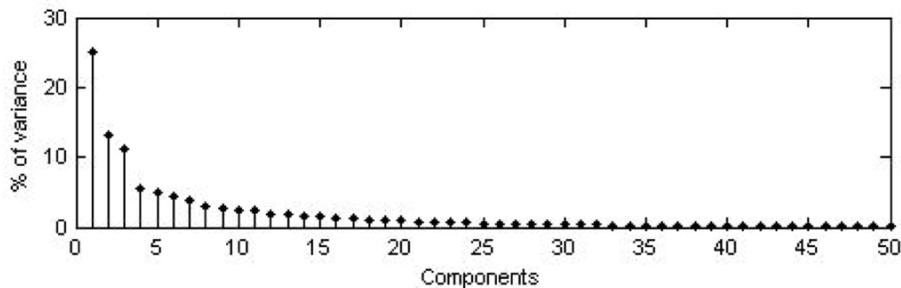


Inter-group differences serve as an alternative to the search for local differences in the semantic spaces of the subjects. To explain the inter-groups differences is to look at differences in the global organization of the semantic field. To address this issue, Romney et al. (2000) proposed that the semantic space of each subject should be represented by the shape of the configuration of the points, which is fully encoded in the set of the 210 distances between all pairs of points. This set of distances is given for each subject  $s$  by a  $21 \times 21$  matrix  $D^s = (D^s_{ij})$ , where  $D^s_{ij}$  is the distance between the points corresponding to the words  $i$  and  $j$  in her semantic space. This matrix being symmetric, each subject  $s$  can be represented by the vector  $d^s$  built with the value above the diagonal of  $D^s$ , *i.e.* a point in a 210 dimensions subject space. In order to extract some information from the repartition of the subjects in this space, its dimensionality can be reduced by performing a second PCA (figure 6). From the results of this PCA, it is then possible to quantify the impact of the socio-economic factors on the semantic variation, by

### Semantic Changes in Apparent Time

identifying the component associated with each of the factors. Figure 6 gives the percentage of variance explained by the first 50 components after the PCA is performed on the subject space. The second component discriminates the two groups of subjects ( $t(61) = 2.02, p < 0.05$ ). The 13% of the variance this component accounts for can thus be attributed to the age of the speakers. We observed that gender and number of French pages read per day has little influence on the semantic variation. Subjects are discriminated according to their gender by the 17<sup>th</sup> component ( $t(61) = 1.95, p = 0.06$ ), which explains 1.23% of the variance, and the number of pages read per day is correlated with the 42<sup>nd</sup> component ( $r(61) = 0.45, p < 0.005$ ), which explains 0.14% of the variance.

- (6) Percentage of variance explained by the first 50 components after a PCA on the subject space.



### 3. Discussion

The method we have exposed in the previous sections allows us to measure semantic variation among speakers. We show a correlation between this variation and the age of the speakers which is, under the apparent time hypothesis, the synchronic manifestation of a change in progress. While most of the literature on semantic change deals with changes of metaphorical or metonymic nature, the change we observe is rather a change in the internal relationship between the lexemes of the semantic field of lodging in French. This change is more closely related to the change described by Trier (1931), who studied (from corpora) the reorganization of the semantic field of knowledge in Middle High German during the 13<sup>th</sup> century. In 1200, this semantic field was organized around three lexemes: *Kunst* ‘courtly, chivalric attainments’, *List* ‘non-courtly attainments’ and *Wisheit* ‘human wisdom in all its respects, theological and mundane’ (English glosses are from Traugott & Dasher (2002)). This organization reflected the feudal structure of the German society at this time. One century later, the society was no longer feudal and the semantic field of knowledge had been reorganized in consequence: *List* had moved out of the field and acquired its modern meaning ‘cunning, trick’ while *Wizzen* had moved in the field. Nevertheless, it was not a mere substitution. *Wisheit* had come specialized in religious knowledge, *Kunst* in artistic knowledge, while *Wizzen* covered technical knowledge. Figure 7 is schematic representation of the change.

- (7) Reorganization of the semantic field of knowledge in Middle High German between 1200 and 1300 (from Lehrer, 1985).

|         |      |
|---------|------|
| Wîsheit |      |
| Kunst   | List |

1200

|         |       |        |
|---------|-------|--------|
| Wîsheit | Kunst | Wizzen |
|---------|-------|--------|

1300

While Trier (1931) analyzed a completed semantic change from corpora, the method we proposed allows observing such an intra-semantic field change during its realization.

This method allows us to quantify the influence of age on semantic variation at 13%. This indicates that factors other than speakers' age determine this variation. The other data we gathered about subjects (i.e., gender and the number of pages read per day), seem to account respectively only for 1.23% and 0.14% of the variation. But given the high number of components (210), random noise can be expected to produce similar results. Thus, we cannot conclude the influence of both factors on the semantic variation. On the other hand, many components, and thus a large part of the variation, remain uninterpreted, in particular the first and the third components which account respectively for 25% and 11% of the variation.

The correlation between semantic variation and age may have another origin other than that of ongoing semantic change. The apparent time hypothesis has never been verified for semantics, and thus we cannot exclude that speakers modify their semantic structure of the semantic field as they get older, such that the younger group would have in 30 years the structure observed today for the older group. Nevertheless, it is not clear why such an age-grading phenomenon would occur. Moreover, the high frequency variations of the lexemes used in our study (Table 1) are clues of a change. It seems then more likely that the semantic variation observed in our study reflects a change in progress rather than an age-grading phenomenon. Ultimately, this would be confirmed by real time studies.

#### 4. Conclusion

Variationist sociolinguistics investigates the relationships between linguistic variation and the many factors that structure a population and relates this linguistic variation with ongoing linguistic change. Yet, sociolinguistics has so far focused almost exclusively on sound changes. In particular, semantic changes and sociolinguistics have remained two disconnected domains. Postulating that one possible reason is the difficulty to observe and measure the semantic variation in the population, this paper has introduced a way to fill this methodological gap. We have applied this method to the semantic field of lodging in French and showed that the variation in the semantic representations of this semantic field mirrors an ongoing internal reorganization, i.e., a semantic change. This study opens new perspectives into the study of semantic changes, which can now be studied through the prism of variationist sociolinguistics and thus benefit from its whole theoretical framework.

## *Semantic Changes in Apparent Time*

### **References**

- Bailey, Guy, Tom Wikle, Jan Tillery and Lori Sand. 1991. The Apparent Time Construct. *Language Variation and Change* 3: 241-164.
- Labov, William. 1963. The Social Motivation of a Sound Change. *Word*, 19, 273–309.
- Labov, William. 2001. *Principles of Linguistic change. Volume II: Social Factors*. Oxford: Blackwell.
- Lehrer, Adrienne. 1985. The Influence of Semantic Fields on Semantic Change. In: Fisiak, J. (ed), *Historical semantics. Historical word-formation*. Berlin: Mouton. 283 - 296.
- Magué, Jean-Philippe. 2005. Changements Sémantiques et Cognition: Différentes Méthodes pour Différentes Échelles Temporelles. Ph.D. diss., Université Lyon 2.
- Nerlich, Brigitte. 1992. *Semantics Theories in Europe 1830–1930. From Etymology to Contextuality*. Amsterdam: John Benjamins Publishing Compagny.
- Parrott, Jeffrey. 2002. Dialect Death and Morpho-Syntactic Change: Smith Island Weak Expletive *it*. In *Papers from NWAV 30*, eds. D.E. Johnson & T. Sanchez. Philadelphia: U. Penn Working Papers in Linguistics.
- Romney, A. K., Moore, C. C., Batchelder, W. H., & Hsia, T. L. 2000. Statistical Methods for Characterizing Similarities and Differences Between Semantic Structures. *Proceedings of the National Academy of Sciences*, 97(1), 518–523.
- Sweetser, Eve. 1990. *From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure*. Cambridge: Cambridge University Press.
- Traugott, Elizabeth, & Dasher, Richard. 2002. *Regularity in Semantic Change*. Cambridge: Cambridge University Press.
- Trier, Jost. 1931. *Der Deutsche Wortschatz im Sinnbezirk des Verstandes*. Heidelberg: Winter.
- Ullmann, Stephen. 1962. *Semantics. An Introduction to the Science of Meaning*. Oxford: Blackwell.
- Viberg, Ake. 1983. The Verbs of Perception: A Typological Study. *Linguistics*, 21, 123–162.

Jean-Philippe Magué  
ENS de Lyon  
15 parvis René Descartes  
BP 7000  
69342 Lyon cedex 07  
France

jean-philippe.mague@ens-lyon.fr



## Spatial Language in Tarascan: Body Parts, Shape, and the Grammar of Location

MARTHA MENDOZA

*Florida Atlantic University/University of California, Berkeley*

### 0. Introduction<sup>1</sup>

Tarascan—also known as P’urhepecha—is a language isolate and one of the approximately 60 indigenous languages still spoken in Mexico. It is the language of the P’urhepecha people, who originally inhabited an area covering large portions of the states of Michoacán, Jalisco, Guerrero, and Guanajuato in Central-Western Mexico. The P’urhepecha were never conquered by their enemies, the Aztecs, and developed quite an advanced civilization. Tarascan is still spoken today by about 105,000 people, or perhaps more, yet it has not been adequately investigated. To this day, only a few studies exist which deal with this most fascinating language. Tarascan speaking communities may be divided into three major areas: the Lake Pátzcuaro region, the Tarascan Plateau, and the Ravine of the Eleven Towns. The Tarascan dialect under consideration here is that of the Tarascan Plateau, or *meseta tarasca*, and more specifically that of the town of Angahuan, Michoacán.

Tarascan is an agglutinative type of language with an extremely rich morphology; it is also an inflectional language and has a system of cases, including the genitive, the locative, and the residential (cf. French *chez*). Where other languages may use adverbs, prepositions or auxiliary verbs, Tarascan employs morphological means to express meanings related to causation, direction, manner, relative orientation, repetition, voice, volition, and many others. As an example of the richness of the system, consider the following example: from the root *piré* ‘sing’ (infinitive: *piréni*), it is possible to derive *pirépani* ‘to go singing’, *pirépuní* ‘to come singing’, *pirépunguani* ‘to return singing’, *pirénchani* ‘to feel like singing’, *pirékuekani* ‘to want to sing’, *pirépanchani* ‘to wish to go singing’, *pirépunchani* ‘to wish to come singing’, and *pirépireni* ‘to sing and sing, to go on singing’, among numerous others.

---

<sup>1</sup> I would like to thank the Division of Sponsored Research at Florida Atlantic University for a grant that supported the work for this paper. Special thanks are due to my consultant, L. Gómez Bravo, for his invaluable insights into the Tarascan language.

### 1. Tarascan Locative Suffixes and their Meanings

Tarascan is specially known for its abundant and complex spatial morphology. In this language, location is expressed mainly through a wide variety of body-part suffixes, which have been grammaticalized into positional-orientational markers, some of which display a high level of semantic complexity. The body-part suffixes involved include head, mouth, back, face, nose, etc. and appear in combination with verbal roots to encode varied and detailed spatial relationships between objects or the locus of affect or experience. In Tarascan there are about thirty two locative suffixes (Friedrich 1971:12)—Totonac, for example, has around thirty (Levy 1999:135); most of them possess some corporeal meaning. The suffixes may refer to a single body part such as *k'u* 'hand', a single non-body part such as *ru* 'road, street', or be rather complex like the extremely productive body-part suffixes that extend into several physical and psycho-social domains, such as *ɲarhi* 'face' or *parha* 'back'. Spatial suffixes in Tarascan constitute a formal class of bound morphemes, i.e. they do not function as independent nouns. They combine with verb roots to form more complex verbal bases; in the verbal complex, they usually appear either immediately after the root, or they appear after the root and some type of adverbial suffix (e.g. *kua* 'downwards', *pi* 'quickly', *rhi* 'suddenly'), if one is employed. As members of a substitution class, these suffixes are restricted to appear only one at a time in this position. After the spatial suffixes, one of several voice morphemes may be present (*ku*, *kurhi*, *ra*, *ta*), possibly followed by an adverbial suffix indicating motion, repetition, direction, and so on (*pa*, *pu*, *ma*, *mu*, *pungua*, *nu*, *nta*). At the end of the morphological chain, there are inflectional suffixes of various kinds (tense, aspect, person, number, and mood, and so forth) (Friedrich 1971).

In this study, I concentrate on the main corporeal suffixes, as these constitute some of the most complex and diversified of all Tarascan morphemes. Also, in the glosses to the examples, the corporeal meaning will be used for simplicity of exposition. We should note that, beyond their corporeal referents, there is an ample range of meanings that these suffixes are able to express.

In the following table, the main body-part suffixes are presented, along with their corporeal signification and, on the second column, some of the other principal meanings they can display:

Table 1. Main body-part suffixes and their meanings

|                                     |                                                                    |
|-------------------------------------|--------------------------------------------------------------------|
| 1. <i>a</i> 'stomach, intestines'   | central area, interior, field, yard, body of fruit or vegetable    |
| 2. <i>ch'a</i> 'neck, throat'       | neck of objects, narrowing, (inner) eaves                          |
| 3. <i>ch'u</i> 'buttocks, genitals' | bottom of objects, underside, underneath, roofed passageway        |
| 4. <i>k'u</i> 'hand'                | hands of objects, tree or plant leaves                             |
| 5. <i>mu</i> 'mouth, lip'           | opening, orifice, edge, entrance, door, window, language, speaking |

### *Spatial Language in Tarascan*

- |                                        |                                                                                                                                                                        |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. <i>ndi</i> ‘ear, top of shoulder’   | ear of objects, handle, inside corner, interior surface of an angle, ground surface, branch, hearing, understanding                                                    |
| 7. <i>ndu</i> ‘foot, leg below knee’   | base of plants or trees, exterior base, field                                                                                                                          |
| 8. <i>ŋa/ŋe</i> ‘chest, thoracic area’ | interior, interior enclosure, cavity                                                                                                                                   |
| 9. <i>ŋarhi</i> ‘face, eye’            | anterior surface of an object, interior surface, interior wall, flat (frontal) surface, flat area of the chest or of the stomach, shin, facade, emotion, mental states |
| 10. <i>parha</i> ‘back’                | posterior surface of objects, exterior surface, outside wall, belly of objects, tree trunk                                                                             |
| 11. <i>rhu</i> ‘nose, forehead’        | point, tip, projection, end of object, edge, fruit, flower, seed                                                                                                       |
| 12. <i>t’a</i> ‘leg, side of body’     | thigh, side of objects, floor, bounded flat surface                                                                                                                    |
| 13. <i>ts’i</i> ‘head’                 | top of objects, above, exterior upper surface                                                                                                                          |

Besides these meanings, as mentioned above, some of these suffixes also participate in numerous extensions into the psycho-social domain, all of which are highly conventionalized. Due to all their extended uses, the productivity of these suffixes is truly remarkable, serving as formatives not only of verbs but of other word classes such as nouns, adverbs, and adjectives, and their combinatorial powers are extensive; as a result, they are found ubiquitously in speech and texts.

The collocational restrictions regarding combinations of verbal bases and locative suffixes are morphotactic as well as semantic and unfortunately cannot be discussed in detail here. Besides the partitive and locational meanings discussed here, body-part suffixes display intricate subtleties of meaning in combination with other morphemes, especially the voice or valence morphemes (*ta*, *ku*, and *ra*). Most complex body-part suffixes occur before both *ku* and *ta* to form transitive verbs based on transitive roots; with intransitive stems *ta* has a causative function while *ku* denotes state, property or location. An example that shows some of the possible combinations involving *ku* and *ta* and a suffix like *ŋarhi* ‘face, eye’ follows: *mi-ŋarhi-ni* ‘to close one’s eyes’; *mi-ŋarhi-ku-ni* ‘to close someone else’s eyes’; *mi-ŋarhi-ta-ni* ‘to close a wall’ (e.g. a hole in a wall).<sup>2</sup>

## **2. Application of Body-Part Suffixes to Other Entities**

Tarascan extends the use of body parts to parts of animals, objects, and locations (that stand in a relation of part to whole with objects). The human body seems to serve as the model upon which Tarascan speakers base their naming of other entities. Animals, in particular, are named as though they were humans on all fours. Also, the canonical vertical orientation and overall configuration of the human body is usually preserved in such transfers. Hence, *ts’i* ‘head’ typically

---

<sup>2</sup> For many more examples of body-part suffixes in derivation, see especially Friedrich 1971.

names the highest area or part of an object, *ch'u* 'buttocks, bottom' its bottom, *parha* 'back' its back, and so on. However, there is no rigid imposition of this model upon a given object. For example, 'face' is not used to name any part of a pot, even though the possibility of doing so may seem to exist; rather, as discussed below, only 'back' is used. This indicates that the system is rather flexible, serving foremost the expressive needs of speakers, given that the parts of an entity do not necessarily preserve the relative location of the analogous human body part with respect to the whole or its specific shape.

As an illustration of how the system works, let us consider some examples of the use of the body-part morphemes as they are applied to an animal, such as a pig, and to different objects. For a pig, the terms used are basically the same as for a human: the pig's main parts are *ts'i* 'head', *mu* 'mouth', *parha* 'back', *a* 'stomach', *ch'u* 'bottom', *t'a* 'leg', *ndu* 'foot', and *k'u* 'hand', all corresponding to analogous human body parts. Something to be noticed is the fact that the front legs are referred to as 'hands', which lends support to the notion that application of the suffixes is based on the overall configuration of the human body. A common object like a table has a *ts'i* 'head' (topmost surface), *ch'u* 'bottom' (underside), *rhu* 'nose, forehead' (edge(s)), *t'a* 'leg' (each of the legs), and *ndu* 'foot' (base of the legs). An object such as a pot has a *mu* 'mouth, lip' (mouth), *parha* 'back' (area all around the main body), *t'a* 'side' (area on side(s) of main body), *ch'u* 'bottom' (bottom), and a *ɲe/ɲa* 'heart, chest' (interior). Here notice that *parha* 'back' is the suffix used for the area all around the body of the pot, where perhaps we could have expected *ɲarhi* 'face' as well; in reality, *ɲarhi* is actually used for the interior wall of the pot. Finally, a fairly featureless object such as a mat, when vertical, has a *ɲarhi* 'face' (front surface), *parha* 'back' (back surface), *rhu* 'nose, forehead' (edge(s)), and *ndi* 'ear' (corner(s)) and, when horizontal, has a *ɲarhi* 'face' (top surface), *ch'u* 'bottom' (underside), *rhu* 'nose, forehead' (edge(s)), and *ndi* 'ear' (corner(s)).

The assignment of part names is object-based in the sense that the orientation of the object or its position does not affect the naming of its parts. However, in the case of a fairly featureless object, such as a mat, or objects with no inherent orientation, part names are instead assigned based on the observer's perspective: *ɲarhi* 'face', for example, would have to be used to designate the flat surface facing the observer or that the observer can readily see.

### 3. The Expression of Location in Tarascan

In contrast to Western-European languages, where spatial location of objects is usually expressed by means of prepositions or case endings, Tarascan makes use of the body-part suffixes we have looked at, incorporating them into verbs. Given space constraints, I will focus mainly on the coding of location where there is contact between objects (the figure and the ground) (the case of 'the book is on the table'), rather than on the expression of location where the objects do not come into direct contact (the case of 'the tree is behind the house'), although a few remarks on this topic will be provided in a later section.



(2) conveys something closer to: “the marker [a longish and rigid object], set in a horizontal position with respect to the plane of the table [a top horizontal surface], is on the edge [the nose] of this surface.” In sentence (2), the body-part term has been changed from *ts’i* to *rhu* to illustrate other possibilities of meaning in the language: *ts’i* refers to the main part of the topmost surface of the table, whereas *rhu* designates its edge(s).

Furthermore, different verbal stems are required by the grammar according to the shape of the object acting as ‘figure’, as exemplified by sentence (3):

- (3) *Atarakua*      *parha-ts’i*-*ku-s-ti*      *mesa-rhu*  
 cup                  container.upright-head-intr-aor/pres-asser.3      table-loc  
 ‘The cup is on the table.’

or, more accurately, “the cup [a non-round container upright], which is vertically oriented with respect to the table [a top horizontal surface], is on the top of this surface.”

As can be appreciated, all the semantic complexity of shape, orientation, location, and dimension combined is coded but in a couple of morphemes.

Further examples follow:

- (4) *Mikua* *kapa-rhu*-*ku-s-ti*      *mesa-rhu*  
 cover      container.upside.down-nose-intr-aor/pres-asser.3      table-loc  
 ‘The lid is upside-down on the edge of the table.’
- (5) *Libru* *echu-ts’i*-*ku-s-ti*      *mesa-rhu*  
 book      flat-head-intr-aor/pres-asser.3      table-loc  
 ‘The book is (lying) flat on the table.’

The location of people can also be described in a similar manner:

- (6) *K’uiripu-echa (sesi)* *sirhi-ɲarhi*-*ku-s-ti-ksi*  
 person-pl      well      row-face-intr-aor/pres-asser.3-3pl  
 ‘The people are (well) lined up on the hillside.’
- (7) *K’uiripu-echa* *icha-ɲarhi*-*ku-s-ti-ksi*  
 person-pl      longish.horizontal-face-intr-aor/pres-asser.3-3pl  
 ‘The people are lying on the hillside.’
- (8) *Ji* *ana-mu*-*ku-s-ka*      *k’umanchikua-rhu*  
 I      longish.vertical-mouth-intr-aor/pres-asser.1/2      house-loc  
 ‘I am standing at the door of the house.’

In all the previous sentences, the semantic information provided in the verbal root relates to the type of object—most crucially with regard to shape—the speaker is

locating and to how the object is oriented, whereas the spatial suffix describes where the object is positioned. To be sure, this type of marking of spatial relationships in the grammatical structure by means of body parts does not appear to be an isolated phenomenon in Tarascan, or to be exclusive to this language. Other languages such as Totonac, Mixtec, or Zapotec behave in similar ways (cf. Brugman 1983, Brugman and Macaulay 1986, Hollenbach 1995, Levy 1999, MacLaury 1989). What is different here is the great extent to which these suffixes are integrated into the grammar of location in Tarascan and their extensive interplay with roots denoting shape, disposition, and orientation, as well as their ample use outside the human-body framework. In contrast, to give but an example, according to MacLaury (1989:135), in Zapotec there are only three body parts (namely, lip or mouth, face, and stomach) which have been extended to name locations outside the human-body framework; as shown in Table 1, in Tarascan, most body-part suffixes do so, among them *ch'a* 'neck', *mu* 'mouth', *ndi* 'ear', *narhi* 'face, eye', *parha* 'back', *rhu* 'nose, forehead', *t'a* 'leg, side', and *ts'i* 'head'.

#### **4. The Issue of Shape**

An important consideration in Tarascan with respect to shape categories is the following: Tarascan possesses verbal roots that classify for arguments of a specific shape, which may also include an orientational or dispositional meaning component. According to Friedrich (1979:345), "the verbal roots are classificatory... in that the speaker must make decisions about the shape of their referents and the shape of the referents of the co-occurring subjects and objects."

Among the most common of these roots we find: *anja* 'longish, rigid object, vertically oriented';<sup>5</sup> *icha* 'longish, rigid object horizontally oriented (i.e. maximal axis oriented horizontally); and, although this information is not provided in the literature, it also refers to a 3D object, such as a thick book, placed on its spine (i.e. secondary axis aligned with the vertical); *echu* 'flattish object horizontally oriented' (maximal axis oriented horizontally); *parha* '(non-round) container or hollow object upright, or facing away from the surface of contact'; *kapa* '(non-round) container or hollow object upside-down, or facing towards surface of contact'; *kirha/irha* 'round or oval object, or container with a round base'; *sirhi* 'objects in a row, aligned'; *chaki* 'flexible object in disarray' (e.g. blankets, clothes, ropes, threads), and *xakui* 'elastic, stretchy object' (e.g. rubber bands, springs). Tarascan is also very rich in this aspect of its grammar, and there are many other such roots. As the glosses provided indicate, the meanings of these items can certainly get quite specific.

In the domain of numeral classifiers, historical extensions to shape are a distinct possibility. And, indeed, in Tarascan these verbal roots appear to be related to the numeral classifiers that at one point were a much more productive area of

---

<sup>5</sup> My semantic characterizations of these roots may differ from those of previous authors. Given the great importance of accurately characterizing these meanings, some existing definitions were refined to reflect my consultant's native speaker intuitions.

the language. In the descriptions of Tarascan made in the middle of the 16<sup>th</sup> century (cf. Maturino Gilberti 1987 [1558]), 18 different numeral classifiers were said to be in use; these referred to shape, dimension, disposition, and other such features of objects. In the modern language, there has been a great reduction in the number and use of numeral classifiers. The only functional ones at this point are the following three: *icha* for long and rigid objects, *echu* for flat objects, and *kira/irha* for round ones. They are only partly obligatory in the counting of nominal expressions, as they are often missing in the noun phrase. The classifiers, if employed, are always accompanied by the nominalizer *kua-* and appear after the numeral, as in the following examples: *ma ichakua k'erhutakua* 'one finger'; *t'amu irhakua enandi* 'four guavas'; *tembini echukua ichuskuta* 'ten tortillas'. Note that in their use as nominal classifiers all three items refer to a definitional property of the objects (their shape), rather than to other more relational characteristics, such as their disposition or orientation with respect to other objects.

The combination of these shape-roots and a body-part suffix marks the existence or presence of an object of that shape at that particular location. Furthermore, by virtue of the semantics of the body-part suffix, the shape of the location is also made explicit. A few of these roots were used in sentences (1-8) above. Let us consider some more examples. Once again, the subject of the sentence represents the figure, and the noun marked by the locative case *rhu* is the ground:

- (9) *Porhechi-cha kirha-ndi-s-ti-ksi*  
 pot-pl round-ear-aor/pres-asser.3-3pl  
 'The pots are on the floor.'
- (10) *Tarheri-ri sindari-cha ekua-rhu chaki-ndi-ku-s-ti-ksi*  
 farmer-gen rope-pl patio-loc flexible+disarray-ear-intr-  
 aor/pres-asser.3-3pl  
 'The farmer's ropes are on the ground (in the patio).'
- (11) *Sindari ma k'umanchikua-rhu chaki-ts'i-ku-s-ti-ksi*  
 rope a house-loc flexible+disarray-head-intr-aor/pres-  
 asser.3-3pl  
 'A rope is on the roof of the house.'
- (12) *Tsitsiki ana-ŋe-s-ti basu-rhu*  
 flower longish.vertical-heart-aor/pres-asser.3 glass-loc  
 'The flower is (standing) inside the glass.'
- (13) *Pisaroni echu-ŋarhi-ku-s-ti saloni-rhu*  
 blackboard flat-face-intr-aor/pres-asser.3 classroom-loc  
 'The blackboard is on the classroom wall.'

- (14) *Tsikiata*            *parha-ɲarhi-ku-s-ti*  
 basket                container.upright-face-intr-aor/pres-asser.3  
 ‘The basket is (hanging) on the wall facing away from it.’

**5. Some Remarks about the Structure of Tarascan Locative Sentences**

Notice that, in all the examples we have looked at, there is no occurrence of any verb meaning ‘stand’, ‘sit’, or ‘lie’, etc., as it is common in other languages in locative sentences. Rather, this information is recovered from the semantics of the shape root in combination with the body part.

In addition, unlike other languages, such as Totonac or Zapotec, where body parts frequently appear outside the verb complex as part of a genitive NP construction of the type Poss-Part + N (e.g. its-top + house, meaning ‘the roof of the house’), in Tarascan body-part morphemes never appear as independent words in the sentence. They may appear outside the verbal complex but only as formatives in derived adjectives, adverbs, or nouns; derived nouns contain a nominalizing suffix and have meanings that are related to that of the part suffix, for example, the nouns that name body parts. The following are some examples (the body-part suffix in question appears in parenthesis): *chukuxukua* ‘elbow’ (*xu* ‘arm’), *kon-durhakua* ‘sole of the foot’ (*ndu* ‘foot’), *koɲekua* ‘chest’ (*ɲe* ‘chest’), *kaɲarhikua* ‘face’ (*ɲarhi* ‘face’), *kok’urhakua* ‘palm of the hand’ (*k’u* ‘hand’), *tsikat’akua* ‘leg’ (*t’a* ‘leg’), and so on. However, some other body part names do not seem to involve body-part suffixes: *aɲaɲastakua* ‘shin’, *jak’i* ‘hand’, *t’etekua* ‘buttocks’.

**6. More on Shape and Location**

Levy (1999:157-8) explains that in Totonac, in some cases, the presence of the body-part suffix implies not a specific sub-area or location on the object but its overall shape. In Tarascan this reading is also possible. Such is the case in a sentence like the following:

- (15) *T’u jupa-parha-ku-siɲa*                            *enandi-ni*  
 you wash-back-tran-hab+asser.1/2    guava-obj  
 ‘You wash (the body of) the guava.’

This strongly implies that the action is performed on an object of a certain shape, in this specific case, an object of the roundish class. The use of another spatial suffix would mean that an object of a different shape is involved, as we see in:

- (16) *Ji*            *jupa-ɲarhi-ta-siɲa*                            *mandani*            *uéxurhini*  
 I                wash-face-tran-hab+asser.1/2    each                year  
 ‘I wash the (inner) wall every year.’

The exact interpretation of such sentences is, of course, also heavily dependent on the context of the speech situation.

Another possibility of meaning brought about by body-part suffixes that should be mentioned is the case where the suffix refers to a part or location on the body of the subject of the sentence; in such case, the action of the verbal root is directed towards or affects the space defined by the body-part suffix. The body part represents the affected entity within a larger location. The part or area of the body may be explicitly stated as a separate noun, in which case it will be again marked by the locative *rhu*, as in the following:

- (17) *Eréndira tsireri ma-k'u-rha-s-ti jak'i-rhu*  
 Eréndira corn.dough be.stuck-hand-intr-aor/pres-asser.3 hand-loc  
 'Eréndira has corn dough stuck on her hand.'
- (18) *Uanochi eni kafe jata-ka porho-ch'u-ti<sup>6</sup>*  
 sack that coffee contain-subj have.a.hole-bottom-asser.3  
 'The sack that contains the coffee has a hole on the bottom.'
- (19) *Ch'uru-k'u-s-ka-ni ma p'ikukua-mbo*  
 poke-hand-aor/perf-asser.1/2-1 a needle-inst  
 'I poked my hand with a needle.'
- (20) *Juchiti piri-mba aparhi-ndira-s-ti penchumekua-rhu*  
 my daughter-poss.3 burn-mouth-aor/perf-asser.3 mouth-loc  
 'My daughter burned her mouth.'
- (21) *Aparhi-ndu-s-ka-ni kondurhakua-rhu*  
 burn-feet-aor/perf-asser.1/2-1 sole.of.foot-loc  
 'I burned the soles of my feet.'

In the case of ambiguous suffixes (with more than one corporeal meaning), the specific location is specified by a noun marked in the locative case:

- (22) *Kiti-ŋarhi-xa-ti eskua-rhu*  
 rub-eyes-prog-asser.3 eyes-loc  
 'He/she is rubbing his/her eyes.'

In order to indicate that the referent of a given suffix is to be found on the body of a second participant, a valence morpheme, like *ku* or *ta*, is needed:

- (23) *Petu jupa-mu-ku-xa-ti*  
 Peter wash-mouth-3obj-prog-asser.3  
 'Peter washes someone's mouth.'

<sup>6</sup> Examples (18-22) adapted from Chamoreau (2003:276-85).

*Spatial Language in Tarascan*

- (24) *I uichu katsa-ndu-ku-s-ti tataka-ni*  
 dem dog bite-foot-3obj-aor/perf-asser.3 boy-obj  
 ‘This dog bit the boy’s foot.’

In these examples, the body part clearly constitutes the locus of affect of the verbal event. Even though the examples shown here favor human subjects, it should be evident by now that Tarascan can express all sorts of locations on both humans and objects.

Although this paper concentrates on locative events where there is direct contact between the entities involved, we need to note that these same body-part suffixes extend their domain of application metonymically from part of an object to reference to the area in space that projects out from that part, associated with that subpart, or to relative location in the space surrounding the object. Again, this is not exclusive to Tarascan but occurs in other Mesoamerican languages (Zapotec, Mixtec, Totonac). This use represents the extension of body-part suffixes as relational elements in the grammar, since the body part delimits the relative location of some object with respect to another, as exemplified in:

- (25) *Libru echu-ch’u-ku-s-ti mesa-rhu*  
 book flat-bottom-intr-aor/pres-asser.3 table-loc  
 ‘The book is lying flat under the table.’
- (26) *Misitu pi-t’a-ku-s-ti porhechi-rhu*  
 cat next.to-side-intr-aor/pres-asser.3 pot-loc  
 ‘The cat is next to (the side of) the pot.’
- (27) *Uaxantsikua pi-rhu-ku-s-ti mesa-rhu*  
 chair next.to-nose-intr-aor/pres-asser.3 table-loc  
 ‘The chair is close to the edge of the table.’

Finally, we should observe that, in Tarascan, location can also be expressed using locative adverbs and the stative verb *jarháni* ‘to be located’. Locative adverbials are also abundant in Tarascan, among them: *karhakua* ‘above’, *ketsekua* ‘below’, *maekandani* ‘to the side’, *orhepani* ‘in front’, *pexu* ‘behind’, *tatsepani* ‘behind’, *t’irek’andani* ‘to the right’, *uikixkandani* ‘to the left’, etc. Nevertheless, body parts are at play even here, given that some of these adverbials actually contain a body-part suffix. Friedrich (1971:66) gives these examples: *jandikutini* (*ndi* ‘ear’) ‘along the surface of an angle on a vertical axis’, *jandukutini* (*ndu* ‘foot’) ‘along the foot or base of’, *jarhukutini* (*rhu* ‘nose’) ‘along a projection’. Sentences (28-30) exemplify the expression of location through locative adverbials:

- (28) *Tasa porhechi-rhu maekandani jarhá-s-ti*  
 cup pot-loc to.the.side be-aor/pres-asser.3  
 ‘The cup is to the side of the pot.’

- (29) *Añatapu*      *k'umanchikua-rhu*      *tatsepani*      *jarhá-s-ti*  
tree              house-loc              behind              be-aor/pres-asser.3  
'The tree is behind the house.'
- (30) *Ireta*      *juata-rhu*      *pexu*      *jarhá-s-ti*  
town      mountain-loc      behind      be-aor/pres-asser.3  
'The town is behind the mountain.'

As the number of participants in the event increases, locative sentences can get quite complex, a matter that is certainly worth of further study.

## 7. Conclusion

Tarascan is a language with no known relatives today, and its careful study should add to the body of work that seeks to provide us with a better understanding of the linguistic strategies used to talk about space and location, both cross-linguistically as well as with respect to individual languages. From this brief survey of such strategies in this particular language, we find that, just as other Mesoamerican languages, Tarascan is thoroughly preoccupied with issues of shape, orientation, and location. Further research will be needed to establish just how idiosyncratic Tarascan is with respect to spatial grammar and how this is reflected in the language. It is interesting to note, for example, the preoccupation of this language with containers and their shapes, which is consistent with the great salience and importance of such artefacts to a culture that has excelled in the domain of pottery. Moreover, we have seen that the use of locative suffixes is pervasive, and Tarascan thoroughly exploits the semantic possibilities associated with part-whole relationships; body-part suffixes have broadly diversified and have gone beyond the mere naming of parts of entities, the lexical realm, to include decidedly spatial-relational uses, in what can very well be characterized as the grammar of location. In such use of body parts, the geometry of events is emphasized and issues of shape, disposition and orientation are paramount. All in all, Tarascan constitutes an excellent example of how space has become grammar.

## References

- Brugman, Claudia. 1983. The Use of Body-Part Terms as Locatives in Chalcatongo Mixtec. *Survey of California and Other Indian Languages* 4:235-290.
- Brugman, Claudia, and Monica Macaulay. 1986. Interacting Semantic Systems: Mixtec Expressions of Location. *Proceedings of the Twelfth Annual Meeting of the Berkeley Linguistics Society*, 315-327.
- Chamoreau, Claudine. 2003. *Grammaire du purépecha*. Munich: Lincom Europa.
- Friedrich, Paul. 1971. *The Tarascan Suffixes of Locative Space*. Bloomington: Indiana University Publications.

*Spatial Language in Tarascan*

- Friedrich, Paul. 1979. *Language, Context, and the Imagination*. Stanford: Stanford University Press.
- Gilberti, Maturino. 1987 [1558]. *Arte de la lengua de Michuacan*. Morelia, Mexico: Fimax.
- Hollenbach, Barbara E. 1995. Semantic and Syntactic Extensions of Body-Part Terms in Mixtecan: The Case of 'Face' and 'Foot'. *International Journal of American Linguistics* 61(2):168-190.
- Levy, Paulette. 1999. From 'Part' to 'Shape': Incorporation in Totonac and the Issue of Classification by Verbs. *International Journal of American Linguistics* 65(2):127-175.
- MacLaury, Robert E. 1989. Zapotec Body-Part Locatives: Prototypes and Metaphoric Extensions. *International Journal of American Linguistics* 55(2):119-154.

Department of Languages, Linguistics, and Comparative Literature  
Florida Atlantic University  
777 Glades Rd.  
Boca Raton, FL 33431

[mmendoza@fau.edu](mailto:mmendoza@fau.edu)/[mmendoza@alum.berkeley.edu](mailto:mmendoza@alum.berkeley.edu)



# A Metaphor of Static Temporal “Location” in Wolof and English: Metonymy, Motivation, and Morphosyntax\*

KEVIN EZRA MOORE  
*San José State University*

## 0.1. Introduction

This paper continues a trend of research that examines the precise conceptual claims made by theories of space-to-time metaphors (e.g. Clark 1973, Engberg-Pedersen 1999, Lakoff & Johnson 1980, Matlock et al. 2005, Moore 2004, 2006; Núñez & Sweetser 2006, Traugott 1975). It will begin by discussing the exact mapping and experiential basis involved in the static temporal metaphor instantiated by expressions like *It gets hot in October*, offering an alternative to the account found in Lakoff & Johnson 1999. Then the discussion will turn to the relations between metaphor, metonymy, and grammar in Wolof (Niger-Congo, Senegal). Wolof seems to use a metaphor of static temporal location in contexts where English would not, as in (1) below,<sup>1</sup> and this is plausibly related to a generally greater use of locative morphosyntax in Wolof than English. (A literal translation of the example is given in double quotes under the Wolof data, followed by a more idiomatic translation in single quotes.)

---

\* I would like to thank Paap Alassane Sow (“APS”) for Wolof data and guidance.

<sup>1</sup> Following is a list of abbreviations used in this paper: 1 ‘first person’ (etc.); AND ‘andative’; att. ‘attested in use’; AV ‘altered valence’; CAUS ‘causative’; COND ‘conditional’; DEF ‘definite’; DIST ‘distal’; FOC ‘focus’; GEN ‘genitive’; IMPF ‘imperfective’; INDEF ‘indefinite’; LOC ‘locative’; LOCPREP ‘locative preposition’; MID ‘middle voice’; NEG ‘negation’; OBJ ‘object’; PD ‘possessed’; PERF ‘perfect’; PL ‘plural’; PRSNTTV ‘presentative’; REL ‘relativizer’; SBJT ‘subject’; SFOC ‘sentence focus’; VC ‘verbal complement’ (a morpheme that marks a construction in which the following verb is a complement of the preceding one).

- (1) *Fajar fekkul* *Musaa ci néeg bi, waaye*  
 dawn become.co-located.with:NEG Musaa LOCPREP room the but  
*laata muy maase jot na fee duggu*  
 before 3.SBJT:IMPF become.even reach PERF.3 here:VC enter:MID  
*ci néeg bi ba tegu*  
 LOCPREP room the to.the.point.of put:MID  
*ci yoonu tool wi.*  
 LOCPREP way:PD fields the  
 “Dawn didn’t find Musaa in the room, but before it evened out, he reached  
 in here to enter the room to the point of getting on the way to the fields.”  
 ‘Musaa wasn’t in the room when dawn broke, but before it ran its course  
 he managed to enter the room and then start off to work.’  
 [APS. Constructed] (Moore 2000)

Scholars sometimes speak of a metaphor called TIME IS SPACE (e.g. Fauconnier & Turner 2008). Stated in this way, the metaphor is a very broad generalization in need of further specification. Does it mean that anything spatial maps onto anything temporal? In this paper I will try to take a step towards understanding how spatial concepts map onto temporal concepts by looking at a specific space-to-time mapping and its presumed motivation.

**0.2. Background: Metaphors That Construe Time as Space**

There is an extensive tradition of research on metaphors that construe “when” relations as “where” relations (see above references). Most of this research has focused the Moving Ego and Moving Time metaphors. The Moving Ego metaphor (i.e. “Moving Observer” in Lakoff & Johnson 1999) construes the experiencer of time (“ego”) as moving forward, and the times themselves as locations relative to which ego moves (Boroditsky 2000; Clark 1973; Fillmore 1997[1971]; Lakoff & Johnson 1980; Moore 2000, 2006; Núñez & Sweetser 2006; etc.). Here are some linguistic expressions that instantiate Moving Ego: *Venezuela is headed for a major political crisis in the months ahead.* [S.F. Bay Guardian; 4 Aug 99, p. 29]. *Let’s set up a time to meet when we get a little farther down the road.* The Moving Time metaphor construes ego as stationary and times as moving relative to her (see above references). Here are some examples: *The time has come/arrived/ passed. By now Mrs. Thompson realized the problem, but Christmas was coming fast.*

**1.1. Beyond Moving Ego and Moving Time**

In previous work on temporal metaphor, Lakoff & Johnson (1999:153) have proposed that “...[E]vents viewed as being instantaneous or as single unextended entities are conceptualized via that part of the Moving Observer [i.e. Moving Ego] metaphor that conceptualizes time as being located *at* time locations, as in a sentence like [2a]” [italics in original]. Lakoff & Johnson cite the examples in (2) below.

*A Static Temporal Metaphor in Wolof and English*

- (2) a. The execution occurred *at* 10:06 p.m. [*Ibid*:153]  
 b. She arrived *on* time. He left *at* 10 o'clock. [*Ibid*:146]

Lakoff & Johnson’s proposal is appealing because there is an abundance of data that clearly point to the existence of the Moving Ego metaphor, and the account of its experiential basis is solid (see below, and e.g. Clark 1973; Lakoff & Johnson 1999 Chapter 10). However, I would like to claim that since expressions such as those in (2) do not involve either a particular point of view or metaphorical movement, a metaphor that does not require movement or a particular point of view would be better motivated by the data. What the expressions in (2) provide evidence for is simply a metaphor in which places map onto times (cf. Grady 1997, Moore 2006).

As an alternative I propose that a metaphor called A TIME IS A PLACE predicts the semantics and syntax of expressions such as those in (2) better than Moving Ego does, if we assume a relatively direct correspondence between source frame, target frame, and linguistic coding.<sup>2</sup> The mapping of A TIME IS A PLACE is summarized in (3) below.

(3) *The Mapping for A TIME IS A PLACE*

| SOURCE FRAME/DOMAIN |   | TARGET FRAME/DOMAIN                                         |
|---------------------|---|-------------------------------------------------------------|
| A physical entity.  | → | An event or state.                                          |
| A place.            | → | A time.                                                     |
| Different places    | → | Different times.                                            |
| Being at a place.   | → | Occurring/obtaining (partially) simultaneously with a time. |

Data that instantiate A TIME IS A PLACE are also available in Wolof, showing that this metaphor is not restricted to a particular language or language family:

- (4) *Dugub, ci lalli lay ñor.*  
 guinea.corn LOCPREP lalli NONSBjt.FOC.3:IMPF be/get.ripe  
 ‘Guinea corn, it gets ripe in lalli.’ (*Lalli* is a season.) [s XW, Ba:62]<sup>3</sup>

Taking it as established that A TIME IS A PLACE motivates data such as those in (2) and (4) better than Moving Ego does, what remains is to show that A TIME IS A PLACE has a plausible experiential basis.

**1.2. The Experiential Basis of A TIME IS A PLACE**

One of the central ideas in the theory of conceptual metaphor is *experiential basis* (Lakoff & Johnson 1980:19). The experiential basis of a metaphor is an experi-

<sup>2</sup> I speak of *frames* instead of *domains* (see Moore 2006), but the difference is not crucial here.

<sup>3</sup> The lowercase *s* included in the bracketed notation below examples means that the speaker is a male from rural Saloum (Senegal) and that the example is not constructed.



- (8) ... Everywhere .. we've been,... in the past several years,.. everybody's talking about how,.. (H) the weather just .. isn't .. normal. [Santa Barbara Corpus of Spoken English. File 003, beginning at 507.66. Transcription conventions: (H) 'inhalation'; ... 'medium pause'; .. 'short pause'.]

We have seen from the examples in this section (Section 1) that the metaphor A TIME IS A PLACE can construe a time as a place independently of motion or ego's point of view. This is evidence that A TIME IS A PLACE exists independently of Moving Ego. However, the two metaphors are fully consistent with one another, as discussed in Lakoff & Johnson (1999), and in many if not most cases A TIME IS A PLACE involves ego's point of view. In the remainder of the paper we will investigate the instantiation in Wolof of A TIME IS A PLACE and the related metonymy A PLACE FOR A TIME.

## **2. Language-specific Phenomena in Wolof**

### **2.1. Bound Morphemes Relevant to Location in Wolof**

Before discussing the metaphor and metonymy data from Wolof, it is appropriate to look briefly at some of the morphology that plays a role in the data. The table in (9) displays bound morphemes in Wolof that are relevant to location (Sauvageot 1965).

#### *(9) Bound Morphemes in Wolof that are Relevant to Location*

|              |                                                                                                                                                                      |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>f-</i>    | location                                                                                                                                                             |
| <i>-i</i>    | proximal deixis (semantically unmarked relative to distal deixis)                                                                                                    |
| <i>-a</i>    | distal deixis                                                                                                                                                        |
| <i>-u</i>    | deictically undetermined                                                                                                                                             |
|              | Examples of words containing these morphemes: <i>fi</i> 'here', <i>fa</i> 'there', <i>fu</i> 'where'. These are clitics that tend to appear before the content verb. |
| <i>-e(e)</i> | This is a general argument-adding suffix. I gloss it LOC where locative arguments are added. Otherwise I gloss it AV for altered valence.                            |
| <i>-(j)i</i> | The action of the verb is done away from the deictic center; i.e., <i>andative</i>                                                                                   |

Before proceeding, it should be pointed out that temporal concepts can be talked about in Wolof without the use of locational morphosyntax, as in the following example:

- (10) ... *nekk-oon*            *fi* *bi* *lii* *di* *am* ...  
 be.located-PAST    here when this IMPF happen  
 '...was here when this was happening. [Jen 1992:39]

In example (10), *fi* 'here' has a purely spatial meaning, and the notion 'when' is expressed with *bi*, which is not a locational morpheme (though *b-* does mark the most general "thing" noun class).

## 2.2. The metaphor A TIME IS A PLACE in Wolof

Although Wolof and English both have A TIME IS A PLACE, some Wolof constructions that instantiate this metaphor do not have equivalent metaphorical expressions in English. Thus the metaphor appears to be more productive in Wolof. For a metaphor to be more productive than another is to occur in more contexts (i.e. occur more freely; cf. Aronoff and Fudeman 2005:241). After looking at the metaphor data we will go on to study the metonymy A PLACE FOR A TIME, which provides evidence for the experiential basis of the metaphor.

In (11) below, the time during which Mben was cooking dinner is referred to in explicit spatial terms and then repeatedly indexed with locative *fi* throughout the sentence. The underlined locative expressions in (11) are all used metaphorically in that they refer to a time and not a place.

- (11) *Diggante fi mu taal-e reer ak fi mu noppee,*  
 between where 3.SBJT light-LOC dinner and where 3.SBJT finish:LOC  
*Mbeen toj na fi leket, duma fi doom ji,*  
 Mben smash PERF.3 here gourd slap here child the,  
*dëgg fib cuuj ba mu dee.*  
 step.on here:INDEF chick to.the.point.of 3.SBJT dead  
 ‘‘Between where she started dinner and where she finished, Mben smashed a gourd here, slapped her child here, and stomped a chick to death here.’’  
 ‘‘Between the time she started dinner and the time she finished, Mben broke a gourd, slapped her child, and crushed a chick to death underfoot.’’  
 [Jen 1992:62]

In example (1) at the beginning of the paper, the brief period of time in which Musaa entered and exited the room is indexed as *fi* ‘here’. (The form is *fee* in the example because the *-i* of *fi* has coalesced with the following *a* ‘vc’; i.e., *fee* = *fi+a*.) In (12) below, the period of time during which the tea got cold is referred to as *fi* ‘here’. According to my consultant, Mr. Sow (who uttered the sentence spontaneously), *fi* has temporal and not spatial reference in this example. However, metonymy cannot be entirely ruled out, since the place of utterance (which presumably could be referred to with *fi* ‘here’) is also the place where the tea got cold.

- (12) *Ma tàngalaat ko ndax jot na fee sedd.*  
 1.SBJT be.hot:CAUS:again 3.OBJ because reach PERF.3 here:vc be.cold  
 ‘‘I’ll heat it up again because it has reached to be cold here.’’  
 ‘‘I’ll heat it up again because it has gotten cold’’ (Talking about a cup of tea. The construction conveys the idea that there’s been enough time for the tea to get cold [062599].) [att.] [APS, Lu:101]

The examples in (1), (11), and (12) show that A TIME IS A PLACE is more productive in Wolof than in English, at least in the observed (linguistic and physical)

contexts. In the next section, we will see evidence that the metonymy A PLACE FOR A TIME is also more productive in Wolof.

### 2.3. The Metonymy A PLACE FOR A TIME in Wolof

This section begins with examples that show a kind of metonymy-to-metaphor continuum from A PLACE FOR A TIME to A TIME IS A PLACE in Wolof. The metonymy is evidence for the experiential basis of the metaphor (cf. Grady & C. Johnson 2002; C. Johnson 1999; Lakoff & Johnson 1980, 1999). The continuum also suggests that the metonymy may have contributed to the conventionalization of the metaphor, since this kind of continuum is characteristic of semantic change, which has been observed to occur via gradual shifts that are supported by context (Heine et al. 1991; Hopper & Traugott 1993). Indeed, various scholars have hypothesized that metaphor (at least in some cases) develops from metonymy (see for example Barcelona 2002; Dirven & Pörings 2002; Radden 2002). However, I do not have spontaneous data supporting a role for metonymy in the conventionalization of A TIME IS A PLACE.

Example (13a) below simultaneously means that the rain began to fall on a person at a particular place *where* she was thinking about her home and that it began to fall on her *as* she was thinking about her home (cf. Emanatian 1992; C. Johnson 1999; Norvig 1988). In (13b) a spatial reading of the locative *fa* is not prominent, but metonymy cannot be ruled out entirely. Example (13c), which does not allow a spatial reading of *fa*, represents the metaphor end of the continuum (Moore 2000:195).

- (13) a. (Metonymy)  
*Fa mu toog-e di fàttaleku dëkkam*  
 where 3.SBJT sit-LOC IMPF remember home:GEN  
*la ko taw bi fekk.*  
 NONSBJT.FOC.3 3.OBJ rain the become.co-located.with  
 “Where she sat thinking of her home is where the rain became collocated with her.” ‘The rain found her at the spot where she sat thinking about her home.’ ‘It began to rain on her where/as she sat thinking of her home.’ [APS, 021899. Constructed]
- b. (More metaphoric than metonymic)  
*Fa mu toog-e di fàttaleku dëkkam la*  
 where 3.SBJT sit-LOC IMPF remember home:GEN NONSBJT.FOC.3  
*taw bi tàmbale.*  
 rain the start  
 “Where she was sitting thinking of her home is where the rain started.”  
 ‘As she was sitting thinking of her home, the rain started.’ ‘It was at a moment when she was sitting thinking of her home that the rain started.’ [APS, 021899. Constructed.]

c. (Metaphoric and not metonymic)

... *weer wi fim teroo ak fim dee-ee.*  
 moon the where:3.SBJT appear:LOC and where:3.SBJT die-LOC  
 “the moon, where it appears and where it dies.”  
 ‘when the moon appears and when it disappears.’ (The speaker is  
 saying that there is a calendar that gives this information on the  
 moon/month.) [s V tape]

Next are more examples of A PLACE FOR A TIME. In the first example the speaker refers directly to the place where he is talking and metonymically to the time when he is talking.

- (14) a. *Mēnuleen ko, ngeen ni coww ñibbi, te du tax ma yóbbu Ndeela,*  
 ‘If you can’t do it [i.e. keep quiet], then go straight home, but that  
 won’t make me take Ndela’

*ndax ba fi may wax-e, jabari*  
 because as.far.as here 1.SBJT:IMPF talk-LOC wife:of  
*jaambur la*  
 someone.else 3.NONSUBJCT.FOC  
 “because all the way to here where I am talking at, she is someone  
 else’s wife”. ‘because up to this point as I speak, she is still someone  
 else’s wife’ [Jeñ 1992:32]

In the next example, the place where the speaker smokes stands for instances of smoking.

- b. *Musuloo gis fu ma tux-e.*  
 have.ever.experience:NEG.2 see where 1.SBJT smoke-LOC  
 “You have never seen where I smoke at.” ‘You have never seen me  
 smoke anywhere.’ ‘You have never seen me smoke.’ [APS, Hai:33]

A PLACE FOR A TIME and A TIME IS A PLACE both seem to be more productive in Wolof than in English. This can be related to a more general phenomenon in which (literal) locative marking is productive in Wolof.

#### 2.4. Linguistic Coding of Location in Wolof

The pervasiveness of locational marking in Wolof may contribute to an explanation of the productivity of A PLACE FOR A TIME and A TIME IS A PLACE in this language if “frequent use of forms directs attention to their functions” as suggested by Slobin (2003) (cf. Whorf 1956). The data in (15) below suggest that location is highly *codable* and frequently mentioned in Wolof (cf. Slobin *ibid*). To be codable is to be accessible and easy to process/express. For example a notion that is expressed by inflection (such as number in English) is highly codable. Below

*A Static Temporal Metaphor in Wolof and English*

we see that the same locational morphemes that play a role in the metonymic and metaphoric expressions we studied above also occur in a wide variety of other locational contexts, sometimes several per sentence.

In (15a) below we see a form in locative *f-* as the relative pronoun in a “headless” relative clause.

- (15) a. *Bu tolloo            fu    sore ñu xàmme ko ndax koll bi.*  
 if measure:COND where be.far they recognize 3OBJ because paunch the  
 “If one is located where is far, they recognize him because of the pot  
 belly.” ‘He is recognizable from a distance because of his pot belly.’  
 [Fal et al. 1990 under *koll (b)*]

In (b), the *-e* suffix on the verb *lekk* ‘eat’ marks the fact that the verb is taking a locative argument *fa* ‘there’, in addition to the expected agent and patient.

- b. *Waaw, fa    laa            lekk-e ceebujën*  
 yes    there NONSBJT.FOC:1 eat-LOC rice:of:fish  
 ‘Yes, there is where I ate rice with fish.’ [Church 1981:325]

Example (c) below has an “extra” locative expression *fi* in a context in which an English speaker would not mention location. (Munro & Gaye 1997:33 list *dàq fi* “be better here” as an idiom meaning ‘be good at’.)

- c. *Tenee            fi    dàq    dow!*  
 cheetah:SBJT.FOC here be.better run  
 “The cheetah is better at running here”  
 ‘The cheetah is really fast!’ [Fal et al. 1990 under *tene (m)*]

The next example, which is an idiom, shows the locative *f-* being repeated for emphasis in a construction that exploits the existence in Wolof of the more emphatic *fii* and the less emphatic *fi* (both meaning ‘here’).

- d. *Fii, wund du            fi    naan-e ñeex.*  
 here cat    IMPF:NEG here drink-LOC sauce  
 ‘A cat doesn’t drink sauce here.’ (I.e. ‘You are in my element; you  
 don’t have the power.’) [Cissé et al. 1982:58]

The next sentence exemplifies the fact that it is possible to code location multiple times in a Wolof sentence. Each locational morpheme is underlined. The underlined *a*’s mark distal deixis.

- e. *Caat mu góor ma moom, ma-nga fége-ji*  
 youngest REL be.male DEF:DIST him 3-PRSNTTV:DIST settle-AND  
*ca taax ya, di fa dawal saret,*  
 LOCPREP:DIST block.buildings PL.DEF.DIST IMPF there drive cart  
*ba jël fa jabar féeete fa.*  
 to.the.point.of take there wife be.situated there  
 “The youngest son, he went and settled in the city, driving a cart there,  
 and taking a wife there, situating himself there.” [Jeñ 1992:30]

The data in (15) above suggest that Wolof grammar encourages speakers to pay attention to location. Many of the linguistic constructions in these data, such as those that employ locative *f-*, deictic *-i* or *-a*, and the locative-argument marking *-e*, are the same as the ones that are involved in A TIME IS A PLACE and A PLACE FOR A TIME. It is thus plausible that Wolof grammar plays a role in facilitating the use of these metaphoric and metonymic structures. Obviously, more languages need to be examined before this claim can be evaluated satisfactorily.

## 2.5. Summary

I have argued that linguistic expressions in which temporal relations are spoken of in terms of static location instantiate the metaphor A TIME IS A PLACE. In this metaphor contrasting places map onto contrasting times. The argument for the experiential basis of A TIME IS A PLACE appealed to the metonymy A PLACE FOR A TIME. I claimed that the assumed productivity of the metonymy and the metaphor in Wolof may have to do with locational morphosyntax and codability of location in that language.

## References

- Aronoff, Mark & Kirsten Fudeman. 2005. *What is morphology?* Malden MA: Blackwell.
- Barcelona, Antonio. 2002. Clarifying and Applying the Notions of Metaphor and Metonymy within Cognitive Linguistics: an Update. In Dirven and Pörings (eds.), 207-277.
- Boroditsky, Lera. 2000. Metaphoric Structuring: Understanding Time through Spatial Metaphors. *Cognition*, 75: 1-28.
- Church, Eric. 1981. *Le Système Verbal Du Wolof*. Dakar: FACULTE DES LETTRES ET SCIENCES HUMAINES de l'UNIVERSITÉ DE DAKAR.
- Cissé, Mamadou. 1994. *Contes wolof modernes*. Paris: L'Harmattan.
- Cissé, Mame Thierno; Mammadu Guèye & Mangoné Touré. 1982. *Proverbes wolof*. Dakar: Centre de Linguistique Appliquée de Dakar.
- Clark, Herbert. 1973. Space, Time, Semantics, and the Child. In T. E. Moore, ed., *Cognitive Development and the Acquisition of Language*. New York: Academic Press. 27-63

*A Static Temporal Metaphor in Wolof and English*

- Dirven, René & Ralf Pörings (eds.). 2002. *Metaphor and Metonymy in Comparison and Contrast*. Berlin: Mouton de Gruyter.
- Dunbar, Alice. 1899[1969]. *The Goodness of St. Rocque and Other Stories*. New York: Dodd/Mead. (Available online through The Gutenberg Project. October, 1996 [Etext #688].)
- Emanatian, Michele. 1992. Chagga ‘Come’ and ‘Go’: Metaphor and the Development of Tense-Aspect. *Studies in language* 16, 1-33.
- Engberg-Pedersen, Elisabeth. 1999. Space and Time. In Jens Allwood & Peter Gärdenfors, eds., *Cognitive Semantics: Meaning and Cognition*. Amsterdam: John Benjamins. 131-152
- Fal, Arame; Rosine Santos & Jean Léonce Doneux. 1990. *Dictionnaire wolof-français*. Paris: Karthala.
- Fauconnier, Gilles & Mark Turner. 2008. “Rethinking Metaphor”. In Ray Gibbs, ed., *The Cambridge Handbook of Metaphor and Thought*. Cambridge University Press. 53-66.
- Fillmore, Charles. 1997 [1971]. *Lectures on Deixis*. Stanford: CSLI Publications.
- Grady, Joseph. 1997. Foundations of Meaning: Primary Metaphors and Primary Scenes. Ph.D. diss., University of California, Berkeley.
- Grady, Joseph & Christopher Johnson. 2002. Converging evidence for the notions of *subscene* and *primary scene*. In Dirven & Pörings (eds.) 533-554.
- Heine, Bernd; Ulrike Claudi & Friederike Hünemeyer. 1991. *Grammaticalization*. Chicago: The University of Chicago Press.
- Hopper, Paul & Elizabeth Closs Traugott. 1993. *Grammaticalization*. Cambridge: Cambridge University Press.
- Jen, Maam Yunus. 1992. *Aawo bi*. Dakar: IFAN Cheikh Anta Diop.
- Johnson, Christopher. 1999. Constructional Grounding: the Role of Interpretational Overlap in Lexical and Constructional Acquisition. Ph.D. diss., University of California, Berkeley.
- Lakoff, George & Mark Johnson. 1980. *Metaphors We Live By*. Chicago: University of Chicago Press.
- Lakoff, George & Mark Johnson. 1999. *Philosophy in the Flesh: The Embodied Mind and Its Challenge to Western Thought*. New York: Basic Books.
- Matlock, Teenie; Michael Ramscar & Lera Boroditsky. 2005. On the Experiential Link between Spatial and Temporal Language. *Cognitive Science* 29, 655-664.
- Moore, Kevin. 2000. Spatial Experience and Temporal Metaphors in Wolof: Point of View, Conceptual Mapping, and Linguistic Practice. Ph.D. diss., University of California, Berkeley.
- Moore, Kevin. 2004. Ego-based and Field-based Frames of Reference in Space to Time Metaphors. In Michel Achard & Suzanne Kemmer, eds., *Language, Culture, and Mind*. Stanford, CA: CSLI Publications. 151-165
- Moore, Kevin. 2006. Space to Time Mappings and Temporal Concepts. *Cognitive Linguistics* 17(2):199-244.

Kevin Ezra Moore

- Munro, Pamela & Dieynaba Gaye. 1997. *Ay Baati Wolof: A Wolof Dictionary* (revised edition). Los Angeles: Department of Linguistics, University of California. [UCLA occasional papers in linguistics, number 19]
- Norvig, Peter. 1988. Interpretation Under Ambiguity. In Shelly Axmaker, Annie Jaisser, & Helen Singmaster, eds., *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society*. 188-201
- Núñez, Rafael & Eve Sweetser. 2006. With the Future Behind Them : Convergent Evidence From Aymara Language and Gesture in the Crosslinguistic Comparison of Spatial Construals of Time. *Cognitive Science*, 30(3), 401-450.
- Radden, Günter. 2002. How metonymic are metaphors? In Dirven & Pörings (eds). 407-434.
- Sauvageot, Serge. 1965. *Description synchronique d'un dialecte wolof: le parler du Dyolof*. Dakar: IFAN (Institut Fondamental d'Afrique Noire.)
- Slobin, Dan. 2003. The Many Ways to Search for a Frog: Linguistic Typology and the Expression of Motion Events. In S. Strömquist & L. Verhoeven, eds., *Relating Events in Narrative: Typological and Contextual Perspectives*. Mahwah NJ: Lawrence Erlbaum Associates.
- Sweetser, Eve. 1988. Grammaticalization and Semantic bleaching. In Shelley Axmaker, Annie Jaisser, and Helen Singmaster, eds., *Proceedings of the Fourteenth Annual Meeting of the Berkeley Linguistics Society*. 389-405.
- Traugott, Elizabeth Closs. 1975. Spatial Expressions of Tense and Temporal Sequencing: A Contribution to the Study of Semantic Fields. *Semiotica* 15, 207-230. Mouton Publishers.
- Whorf, Benjamin Lee. 1956. *Language, Thought, and Reality: Selected Writings of Benjamin Lee Whorf* (ed. J.B. Carroll). Cambridge: The MIT Press.

Kevin Moore  
Linguistics and Language Development  
San José State University  
1 Washington Square  
San José, CA 95192-0093

kmoore3@email.sjsu.edu

## A Case of Rare Fluid Intransitivity in Europe: Russian

JOHANNA NICHOLS

*University of California, Berkeley*

### 1. Introduction

The subject alignment type best known as stative/active subsumes two different patterns: split-S, where intransitive verbs lexically require A or O coding on their subjects; and fluid-S, where most or all verbs can take either kind of coding depending on semantic factors such as volitionality, control, etc.<sup>1</sup> Examples of classic split-S and fluid-S systems are in (1)-(3) and (4)-(5) respectively.<sup>2</sup>

(1) Lakhota (Siouan; Mithun 1991:514-5, hyphens added).  $\Sigma$  = first element of bipartite stem.

|                        |                        |
|------------------------|------------------------|
| <b>a-wá-'u</b>         | <b>a-má-'u</b>         |
| $\Sigma$ 1SG.[A]-bring | $\Sigma$ 1SG.[O]-bring |
| 'I brought it'         | 'he brought me'        |

|                     |                 |
|---------------------|-----------------|
| (2) <b>wa-psíča</b> | <b>ma-xwá</b>   |
| 1SG.[Sa]-jump       | 1SG.[So]-sleepy |
| 'I jumped'          | 'I'm sleepy'    |

|                    |                    |
|--------------------|--------------------|
| (3) <b>wa-lową</b> | <b>ma-hı̄xpaye</b> |
| 1SG.[Sa]-sing      | 1SG.[So]-fall      |
| 'I'm singing'      | 'I fell'           |

(4) Batsbi/Tsova-Tush (East Caucasian; Georgia)

|                         |              |
|-------------------------|--------------|
| so                      | vozhen-sõ    |
| I.ABS[So]               | fell-1sg.ABS |
| 'I fell (accidentally)' |              |

---

<sup>1</sup> S, A, and O as in Dixon 1979. Sa = S coded like A; So = S coded like O.

<sup>2</sup> Clause roles (A, S, O; Sa, So, etc.) are identified in interlinears in square brackets.

- (5) as            vuizhn-as  
 I.ERG[Sa] fell-1s.ERG  
 'I fell (on purpose)'

The split-S type is infrequent, making up only 14% of the sample languages in Nichols 1992. The fluid-S type is very rare: Dixon 1994:78ff. lists only Batsbi, Acehese, spoken Tibetan, and Baniwa as belonging to this type. A few more languages have a split implemented with fluidity for one of the two classes of verbs (Koasati and other Muskogean languages have fixed So vs. fluid Sa/So: Kimball 1991:249, 251; Axininca Campa has fixed Sa vs. fluid So/Sa: Payne 1981:14). The majority of split-S and fluid-S languages are from the Americas, followed by the Pacific; they are quite rare in Eurasia and more so in Africa.

This paper argues that Russian is a fluid-S language of the same type as most of the American and Pacific ones. Though the morphology that implements the fluid-S type is available to all Slavic and Baltic languages, fluidity appears to be found only in one Slavic branch. Since the correlations of the Russian phenomenon with tense/aspect, Aktionsart, subject and object animacy, volitionality/control, and viewpoint are relatively well understood, they can be used to raise hypotheses for testing on other stative-active languages.

Only if object alignment is brought into the picture can Russian be described as a fluid-S language. This requires, in addition to Dixon's (1979) S, A, and O, abbreviations for the two object arguments of ditransitives. I will use P for the more patient-like or theme-like object and G for the more goal-like object. Thus the argument configurations for the basic valence types are:

|                |       |
|----------------|-------|
| Intransitive   | S     |
| Monotransitive | A O   |
| Ditransitive   | A P G |

The morphological coding of S in ergative languages, and the "stative" pattern in split-S and fluid-S languages, can be described loosely as So or more precisely as either Sp or Sg, depending on whether the language has the direct/indirect object type or the primary/secondary object alignment type (in the terms of Dryer 1986). In direct/indirect object languages, P=O; in primary/secondary object languages, G=O. (6)-(7) illustrate P=O alignment in Russian (a direct object language), and (8)-(9) illustrate G=O alignment in Tzotzil (a primary object language).

- (6) ja            chitaju    knigu  
 I.NOM[A] read-1SG book-ACC[O]  
 'I'm reading a book'

- (7) ja            dala            detjam            knigu  
 I.NOM[A] gave        children-DAT[G] book-ACC[P]  
 'I gave the children a book'

*Fluid intransitivity in Russian*

- (8) Tzotzil (Mayan, Guatemala; Dryer 1986:818 citing Aissen 1983:277, 280)  
mi č - a - mah - on  
Q ASP-2SG.ERG[A]-hit-1SG.ABS[O]  
'Are you going to hit me?'
- (9) mi mu š - a - čon - b - on I-a-čitome  
Q NEG ASP-2SG.ERG[A]-sell-BEN[G]-1SG.ABS[P] the-your-pig  
'Won't you sell me your pigs?'

In (4) above, So is more precisely Sp, as Batsbi is a direct object language. But in (3), the right-hand examples illustrating So alignment are more precisely Sg, as Lakhota is a primary object language. Lakhota is typical: most split-S and fluid-S languages have G=O alignment (Nichols 200: ), and this means that Sa/So in its typical form is more precisely Sa/Sg. It should also be emphasized that in many split-S languages a few two-argument verbs are usually included among the "statives". Usually these are verbs of emotion and/or perception (such as 'like', 'fear', 'see'). The subject of a two-argument verb is A, so for most languages the "stative" verb class should be described as consisting of Sg and Ag verbs. Thus the split-S type can be described more precisely and more accurately as having the alignment Sa/Sg and sometimes also Aa/Ag.

So described, the split-S type is not at all rare in Eurasia. The dative-subject construction that is widespread in southern Eurasia (Masica 1976, 1991) and central Europe (Bossong 1998) is precisely Sa/Sg and Aa/Ag (Nichols 200: ). (10)-(13) illustrate So, A, Sg, and Ag from Ingush (Nakh-Daghestanian: Caucasus).

- (10) so wa-vyzhaav  
1S.ABS[So] down-fell  
'I fell down'
- (11) aaz kinashjka diishar  
1S.ERG[A] book[O] read  
'I read a book'
- (12) suona shiila jy  
1S.DAT[Sg] cold be.PRES  
'I'm cold'
- (13) suona hwazaljg bwarjg-deira  
1S.DAT[Ag] bird[O] eye-saw  
'I saw a bird'

**2. Russian dative reflexives and dative intransitives**

Russian has a number of verbs that take dative subjects and are reflexive in form. Most are impersonal, i.e. the verb does not agree with anything (because there is no nominative subject for it to agree with) and appears in the default third person singular or neuter form. A few have a nominative object with which the verb agrees ((14b) below). Most have non-reflexive counterparts that take nominative subjects. (In (14) the reflexive and non-reflexive verbs are not cognate.)

(14) a. Ja ljublju klassičeskiju muzyku.  
 I.NOM[A] like-1SG classical-ACC music-ACC[O]  
 I like classical music.

b. Mne nravitsja èta muzyka.  
 me.DAT[Ag] like-REFL this-NOM music-NOM[Oa]  
 I like this music.

(15) a. Ja xochu kupit' mashinu.  
 I.NOM[A] want buy-INF car-ACC  
 'I want to buy a car'

b. Mne xochetsja poprobovat' shokolad.  
 me-DAT[Ag] want-REFL try-INF chocolate-ACC  
 'I'd like to try (the/some) chocolate'

(16) a. Ja dumaju, čto ...  
 I.NOM[A] think-1SG that ...  
 'I think that ...'

b. Mne думаetsja, čto ...  
 me-[Ag] think-3SG-REFL that ...  
 'I'm inclined to think that...'

(17) a. Ja slyshu ego golos  
 I.[A] hear-1SG his voice.ACC[O]  
 'I hear his voice'

b. Mne slyshitsja ego golos  
 me.DAT[Ag] hear-3SG-REFL his voice.NOM[Oa]  
 'I can hear his voice'

Several of these have cognates in the other Slavic languages and reconstruct to Proto-Slavic (this is true of the verbs of (14b) and (15b)). What makes Russian distinctive is the existence of large numbers of pairs like the following:

*Fluid intransitivity in Russian*

- (18) a. On            xorosho rabotaet  
         he.NOM[S] well    work-3SG  
         He works well. He's working well.
- b. Emu            (zdes') xorosho rabotaetsja  
         him.DAT[Sg] (here) well    work-3SG-REFL  
         He can work well here. He is able to get down to work here.
- (19) a. On    chitaet  
         he.[S] reads  
         He reads. He's reading.
- b. Emu            (xorosho) chitaetsja  
         him.DAT[Sg] (well)    read-REFL  
         He's able to get down to reading.

Dative-reflexive constructions in general, i.e. all those like the (b) examples in (14)-(19), share a number of properties that distinguish them from nominative-subject constructions. One is that verbs with nominative subjects, if imperfective, can easily be interpreted as durative and translated with English progressives (as in the translations above), while the dative-reflexive ones cannot; they can be generic, intermittent, potential, etc. but not durative. A second is that some verbs with nominative subjects can describe activities, while those with datives describe propensities, potential to concentrate, inclinations, perceptions, and the like. Third, for verbs of cognition, perception, etc., those with nominative subjects describe opinions, attitudes, stances, and more or less durable or unhindered perceptions, while those with datives describe reactions, intermittent or contingent perceptions, and the like. Fourth, the perspective in the (b) examples is that of the noun or pronoun in the dative: the speaker reports that person's viewpoint and experience (Nichols 1986; this is discussed in section 4 below).

Examples like (18)-(19) are the main concern of this paper. They share all these properties and have additional distinctive ones. First, as shown in these examples, they tend to occur with negation, adverbials of place or time, and other qualifiers that explicitly indicate contingency of the situation or event. Second, while (14)-(17) have objects or clausal complements, examples like (18)-(19) do not and cannot (Franks 1995:365-6). Some of these are intransitive in their non-reflexive form, like *rabotat'* 'work' of (18). Others are transitive, like *chitat'* 'read' of (19), but cannot take an object in this construction:

- (20) \* Emu            segodnja ne    chitaetsja    gazet/gazety/gazetu/gazeta  
         him-DAT[Ag] today    NEG read-REFL newspaper-GEN.PL/NOM=  
         ACC.PL=GEN.SG/ACC.SG/NOM.SG[O]  
         'He just doesn't feel like reading the paper(s) today', 'He just can't get  
         down to reading the paper today'

(The object 'newspaper(s)' in (20) is put in all case forms that might be used for a direct object or subject of passive, to show that the problem is not the case of the object but its very presence.) Because no object is possible with this kind of dative-reflexive construction, I interlinearize the subject as S in (19) and will call this the *dative-S construction*. The broader category comprising all examples like (14)-(19) is the *dative-subject construction*, and (14)-(17) more specifically illustrate the *dative-A construction*.<sup>3</sup>

Third, the dative-S construction has a distinctive semantics: it implies that there is something the subject is supposed to do or considers it appropriate to do but is disinclined to do or cannot get himself/herself to do, hence the glosses 'just doesn't feel like', 'can't get down to', etc. This is different from ordinary volitionality/non-volitionality and might be described as thwarted or ambivalent volitionality (Timberlake 2004:436-7 calls these reflexives *modal* for that reason; Franks 1995:364 and several earlier sources call them *dispositional*; for semantics and much bibliography see Gerritsen 1991:173-200).

Fourth, the dative-S constructions are paired with nominative-S constructions whose verbs do not form perfectives. *Rabotat'* 'work' of (18) is a durative verb which, like other verbs of this Aktionsart, has no perfective. There are related prefixally derived verbs which do have perfectives, such as *porabotat'* 'work briefly, work a bit, work for awhile' and *zarabotat'* 'start up (of engine, etc.)', but these are different verbs rather than perfectives of *rabotat'*. In contrast, the dative-S verbs, which as noted above are not durative, do have perfectives. Most often they form inceptives with *za-*, and occasionally a telic perfective with *po-*:

- (21) Emu       zarabotalos'  
 him-DAT *za*-work-REFL  
 '(After not being able to get down to work) he got his concentration back',  
 'he got inclined to work', 'he began working with (renewed) energy'
- (22) Xorosho **porabotalos'**! Tri dnja posvjatil dorabotke plana schetov ...  
 well       **po-WORK-REFL**  
 '(Oh boy) did I ever get a lot done! I was able to devote three whole days  
 to working out the account plan (text continues: Nobody bothered me,  
 everybody but the accounting department was on vacation. It was great!)'  
 (forum.klerk.ru/showjournal.php?journalid=411)

These appear to be true perfectives of the unprefixated dative-reflexive verbs, and they differ from the prefixed derivatives of nominative-subject verbs. The *za*-prefixed inceptives are not as strongly inceptive as the *za*-prefixed inchoatives of

---

<sup>3</sup> This terminology assumes that all these datives are syntactically subjects. To be sure, they behave differently from nominative subjects (see Moore & Perlmutter 2000), but I assume that this is because of their non-nominative case and not because of their syntax.

nominative-subject verbs (such as *zaplakat'* 'burst into tears, start to cry'; for the properties of these see Stoll 2001:49-51) but are ordinary perfectives of verbs whose imperfective Aktionsart is (as described above) inceptive or intermittent:

- (23) Xot' i pjatnica, a vse ravno **zarabotalos'** s utra s èntuziazmom ...  
though Friday, nonetheless **za-work-REFL** in morning with enthusiasm  
'Though it was Friday, still we began work enthusiastically'  
([http://www.e-executive.ru/oneday/article\\_1736/forum\\_42300/msg\\_38231/](http://www.e-executive.ru/oneday/article_1736/forum_42300/msg_38231/);) )

And the verb of (22) is not an attenuative durative like *porabotat'* 'work a bit, work awhile' but appears to be a telic 'work (and accomplish something)'.

Fifth, the dative-S construction is highly productive and can be formed from nearly every non-reflexive verb with an agentive subject. Moore & Perlmutter 2000:384-5 describe them as being formed only from unergative verbs and not from unaccusatives:

- (24) \* Vase ne rastetsja  
Vasja-DAT NEG grow-REFL  
'Vasja doesn't feel like growing, just can't seem to grow'

Contrast this stance verb (unergative):

- (25) **Ej javno ne stojalos'** na meste. Ona otbegala v storonu ...  
**her-DAT** clearly NEG **stood-REFL** in place She-NOM ran away  
It [game animal] obviously couldn't stand still and ran away.  
([ps.1september.ru/articlef.php?ID=200408007](http://ps.1september.ru/articlef.php?ID=200408007))

However, not all unergatives can take dative subjects. Aktionsart seems to play an important role: the determinate verb *idti* 'go (in one direction, to one goal)' cannot take a dative subject while its indeterminate *xodit'* 'go (around, in more than one direction, to more than one place)' can:

- (26) a. \*mne ne idetsja  
me-DAT NEG go-REFL  
'(I don't feel like going)'  
b. (segodnja) mne ne xoditsja  
today me-DAT NEG go.INDET-REFL  
'I just don't feel like walking around (today)'

Finally, the dative-S construction can be formed only from a verb that is lexically intransitive or, if transitive, able to occur without an object. Whereas English can use virtually any transitive or oblique-object verb with a null generic or unspecified object (*I'm eating. I'm just looking. I can't come to the phone now,*

*I'm painting. Don't bother me while I'm sewing. It's midnight and I'm still ironing. We're buying today but expect to be selling tomorrow*), in Russian this possibility is much more limited and is lexically restricted. For instance, the two partial synonyms *est'* and *kushat'* 'eat' differ in that only *kushat'* can easily be used without an object; and of these two only *kushat'* takes the dative-subject form in productive contexts with any frequency.<sup>4</sup> Since objectless use is lexically restricted, verbs like that in (19b) can be regarded as derived lexically from intransitive verbs rather than syntactically from objectless clauses.

Thus, in summary, the dative-S construction can be used with any verb that is intransitive, not already reflexive, agentive or at least with a responsible subject, and non-durative. Its most salient semantic properties are its modal sense (inclination or ability – or, more commonly, disinclination or inability – to do something that it would be natural or expected or appropriate to do), which is unique to the dative-S construction, and intermittent, contingent, or transient Aktionsart (common to most dative-subject constructions), which enables them to perfectivize when their non-reflexive source verbs cannot. If dative-subject constructions like those in (14)-(17) had greater text or lexical frequency than they do, Russian could be called a split-subject language, but in fact they are just a minor type of subject coding in Russian. The dative-S construction, however, is lexically unlimited in that it is available to any intransitive with the right Aktionsart and semantics, and this allows Russian to be considered a fluid-S language of the typical sort, i.e. with Sa~Sg subject coding. (Implicit in this discussion is the assumption that the impersonal and reflexive morphology on the verb in Russian dative-subject constructions is the consequence, not the cause, of the non-nominative subject case. Russian, like other Indo-European languages with case, rigidly limits verbal agreement to nominative subjects, and the impersonal form and perhaps the reflexivization are responses to non-nominative subjects.)

It should be noted that dative-subject constructions are very different from passives in Russian. In a passive, the patient is an S and the agent a non-argument; the agent is in the instrumental case, not the dative; the verb agrees with the S (which is nominative); and the verb is reflexive only in imperfectives, while perfective passives use the past passive participle plus 'be'. In the dative-subject construction, there is a case change but no diathesis: the dative-marked noun or pronoun is still A or S. The verb is reflexive in either aspect.

### 3. Other Slavic languages

All Slavic languages have dative-subject constructions, and both the construction

---

<sup>4</sup> Estimates based on Google searches for *mne kushaetsja* and *mne estsja* (me-DAT eat-REFL) 'I feel like eating' and *emu kushaetsja*, *emu estsja* (him-DAT eat-REFL) 'he feels like eating'. *Estsja* actually has higher raw frequency but most examples are folkloristic or in formulaic expressions (e.g. *ne spitsja*, *ne estsja* 'can't sleep or eat'), but *kushaetsja* is used in all kinds of contexts. Both verbs are infrequent in this construction (frequencies in the Russian National Corpus are 0 or 1), probably because there are more idiomatic ways of saying 'have an appetite' and the like in Russian.

*Fluid intransitivity in Russian*

and some of the verbs that take it reconstruct to Proto-Slavic. The fluid dative-S construction as described above appears to be limited to East Slavic (Russian, Belarusian, Ukrainian; see Shevelov 1963:128 for dative-S constructions in Ukrainian). The other Slavic languages have a dative-subject construction that is as productive and widely used as the Russian dative-S construction, and has similar semantics (glossed 'feel like', 'inclined', etc.), but differs in that it is not limited to intransitives and an object can be present. In Polish and Slovenian the object is accusative and the verb is impersonal; in the other languages the patient is nominative and the verb agrees with it:

- (27) Polish            Jankowi czytało się tę            książkę z przyjemnością  
 J.-DAT read REFL **that-ACC** **book-ACC** with pleasure  
 'Janek read this book with pleasure' (Rivero 2002:472)
- (28) Slovenian        Janezu se je jedlo jagode  
 J-DAT REFL AUX. eat-NEUT **strawberries-ACC**  
 'Janez felt like eating strawberries' (Rivero 2002:472)
- (29) Czech            Ta kniha se Janovi četla dobře  
**that-NOM** **book-NOM** REFL J-DAT read-**FEM** well  
 'Jan read that book with ease' (Rivero 2002:473)
- (30) Bosnian/Croatian/Serbian    Pije mi se kava  
 drink me-DAT REFL **coffee-NOM**  
 'I'd like to have some coffee'
- (31) Bulgarian<sup>5</sup>      Na Ivan mu se četjaja knigi  
 DAT Ivan 3S.DAT REFL read-PL books  
 'Ivan felt like reading books' (Rivero 2002:473)

In Polish this construction is much like the impersonal passive except for using the dative case rather than the instrumental. In the languages with nominatives, it is much like an ordinary passive again except for the dative. In the most detailed discussion to date, Marušić and Žaucer (4228) show that the Slovenian construction is not monoclausal like the Russian one but is biclausal with a null modal predicate. In (32), the adverb *včeraj* 'yesterday' applies to the null modal while *jutri* 'tomorrow' applies to 'go'.

- (32) Slovenian      Včeraj se mi ni šlo jutri domov  
 yesterday REFL me.DAT NEG go-PAST-NEUT tomorrow home  
 'Yesterday I didn't feel like going home tomorrow'

---

<sup>5</sup> The proclitic *mu* agrees with *Na Ivan*.

This is impossible in Russian. (In addition, the verb is that of Russian (26a), which is made ungrammatical precisely by this verb in Russian.) These differences suggest that Slovenian has fewer, probably many fewer, dative-subject verbs than Russian, as most dative subjects prove to be governed by this dative-taking null modal predicate. Slovenian is not fluid-S at all, and this probably applies to at least some of the other Slavic languages as well.

#### 4. Two cross-linguistic hypotheses

As noted above, the case of Russian subjects affects the discourse-pragmatic perspective: the nominative-subject construction has external viewpoint (the reader or hearer sees, as it were, the referent of the nominative noun or pronoun), while the dative-subject construction has internal viewpoint (the reader or hearer shares the perspective of the referent of the dative). This was established by close analysis of a few texts, and chiefly for dative-A verbs (Nichols 1986). Is it true of dative-S constructions as well? (33) on the next page gives evidence from the Russian National Corpus ([www.ruscorpora.ru](http://www.ruscorpora.ru)) suggesting that it is. Frequencies are shown for first and third person singular subjects, both nominative and dative, for a few verbs that easily take a dative S. The proportion of first person S is much higher for dative than for nominative. I hypothesize, then, that what may be called *dative viewpoint* is a regular cross-linguistic concomitant of Sg and Ag constructions. A ready counterexample is Icelandic, where dative-subject constructions have speaker viewpoint (Barðdal 2004:124-131). Wider testing is needed, among non-European languages with dative subjects and among stative-active languages.

A second hypothesis concerns the typical tense/aspect/Aktionsart properties of different alignment types. As seems to have been first pointed out by Regamey (1954), ergativity is prototypically centered on a change undergone by a patient and is therefore associated with past and perfective categories, while accusativity is centered on the action of an agent and is associated with present and imperfective categories. The Russian facts reviewed here suggest that dative subject coding has a prototypical configuration different from either of these two: it is associated with experiencers and with the onset of perception or cognition. The three prototypical configurations are shown in (34).

(33) Frequencies of selected verbs with singular pronoun subject: nominative *ja* 'I', *on/ona* 'he/she' vs. dative *mne* 'I-DAT', *emu/je* 'he/she-DAT'. Figures for nominatives are estimates. ( $p < 0.000\dots$ ,  $X^2 = 58.046$ )

| <u>Person</u>   |             | <u>Nominative</u> |      | <u>Dative</u>      |    |
|-----------------|-------------|-------------------|------|--------------------|----|
| 1 <sup>st</sup> | <i>work</i> | ja rabotaju       | 1000 | mne rabotaetsja    | 17 |
| 3 <sup>rd</sup> |             | on/ona rabotaet   | 1500 | emu/je rabotaetsja | 5  |
| 1 <sup>st</sup> | <i>read</i> | ja chitaju        | 900  | mne chitaetsja     | 0  |
| 3 <sup>rd</sup> |             | on/ona chitaet    | 670  | emu/je chitaetsja  | 1  |

*Fluid intransitivity in Russian*

|                       |              |               |      |                  |    |
|-----------------------|--------------|---------------|------|------------------|----|
| 1 <sup>st</sup>       | <i>write</i> | ja pishu      | 900  | mne pishetsja    | 9  |
| 3 <sup>rd</sup>       |              | on/ona pishet | 2200 | emu/ej pishetsja | 8  |
| 1 <sup>st</sup>       | <i>sleep</i> | ja splju      | 600  | mne spitsja      | 39 |
| 3 <sup>rd</sup>       |              | on/ona spit   | 1100 | emu/ej spitsja   | 19 |
| TOTAL 1 <sup>st</sup> |              |               | 2400 |                  | 65 |
| 3 <sup>rd</sup>       |              |               | 5500 |                  | 33 |

|                   |                         |                          |                            |
|-------------------|-------------------------|--------------------------|----------------------------|
| (34)              | <u>S=O, Ergative</u>    | <u>S=A, Accusative</u>   | <u>S=G, "Dative"</u>       |
| <u>Aspect:</u>    | Punctual,<br>perfective | Durative,<br>progressive | Intermittent,<br>inceptive |
| <u>Tense:</u>     | Past                    | Present                  | Generic                    |
| <u>Predicate:</u> | Change of state         | Activity, attitude       | Reaction                   |
| <u>Role:</u>      | Patients                | Agents                   | Experiencers               |

Russian and its sisters, a loner fluid Sa/Sg language family in Eurasia, can probably be presumed to have followed universals or prototypes in innovating this rare alignment type, so they can help us spot those universals. The copious lexical and textual resources for these languages, and their neat grammaticalization of aspect, make it possible to use their dative-subject constructions as a basis for cross-linguistic hypotheses, and I invite other linguists to falsify the claim that Sg and Ag coding are preferentially associated with dative perspective, inceptive aspect, generic tense, experiencers, and transient reactions.

## References

- Aissen, Judith. 1983. Indirect object advancement in Tzotzil. David Perlmutter, ed., *Studies in Relational Grammar 1*. Chicago: University of Chicago Press.
- Barðdal, Jóhanna. 2004. The semantics of the impersonal construction in Icelandic, German, and Faroese: Beyond thematic roles. *Studies in Germanic Typology*, ed. Werner Abraham, 101-130. Berlin: Akademie Verlag.
- Bossong, Georg. 1998. Le marquage de l'expérient dans les langues d'Europe. In *Actance et valence dans les langues de l'Europe*, ed. Jack Feuillet, 259-294. Berlin: Mouton de Gruyter.
- Dixon, R. M. W. 1994. *Ergativity*. Cambridge: Cambridge University Press.
- Dixon, R. M. W. 1979. Ergativity. *Language* 55.59-138.
- Dryer, Matthew. 1986. Primary objects, secondary objects, and antidative. *Language* 62:808-845.
- Franks, Steven. 1995. *Parameters of Slavic Morphosyntax*. New York-Oxford: Oxford University Press.
- Gerritsen, Nelleke. 1990. *Russian Reflexive Verbs: In Search of Unity in Diver-*

- sity. Amsterdam-Atlanta: Rodopi.
- Holisky, Dee Ann. 1987. The case of the intransitive subject in Tsova-Tush (Batsbi). *Lingua* 71.103-132.
- Kimball, Geoffrey. 1991. *Koasati Grammar*. Lincoln, Nebraska: University of Nebraska Press.
- Marušić, Franc, and Rok Zaucer. 4228. On the intensional FEEL-LIKE construction in Slovenian: A case for a phonologically null verb. *Natural Language and Linguistics Theory* 24. 1093-1159.
- Mithun, Marianne. 1991. Active/agentive case marking and its motivations. *Language* 67:510-546.
- Moore, John, and Perlmutter, David M. 2000. What does it take to be a dative subject? *NLLT* 18:373-416.
- Nichols, Johanna. 2008. Why are stative-active languages rare in Eurasia? Typological perspective on split subject marking. In Mark Donohue and Søren Wichmann, eds., *The Typology of Semantic Alignment Systems*, 121-139. Oxford: Oxford University Press.
- Nichols, Johanna. 1992. *Linguistic Diversity in Space and Time*. Chicago: University of Chicago Press.
- Nichols, Johanna. 1986. Aspect and inversion in Russian. In *The Scope of Slavic Aspect*, ed. M. S. Flier and A. Timberlake, 94-117. Columbus: Slavica.
- Payne, David L. 1981. *The phonology and morphology of Axininca Campa*. SIL Publication 66. Arlington, TX: SIL and University of Texas-Arlington.
- Regamey, C. 1954. A propos de la "construction ergative" en indo-aryen moderne. In *Sprachgeschichte und Wortbedeutung: Festschrift Albert Debrunner*, 363-384. Bern: Francke.
- Rivero, María Luisa. 2002. Reflexive clitic constructions with datives: Syntax and semantics. In *Annual Workshop on formal Approaches to Slavic Languages: The Amherst Meeting.*, eds. Wayles Browne, J-Y. Kim, B. H. Partee and R. A. Rothstein, 469-494. Ann Arbor: Michigan Slavic Publications.
- Shevelov, George Y. 1963. *The Syntax of Modern Literary Ukrainian*. (Slavistic Printings and Reprintings, 38.) The Hague: Mouton.
- Stoll, Sabine. 2001. *The Acquisition of Russian Aspect*. Ph.D. dissertation, University of California, Berkeley.
- Timberlake, Alan. 2004. *A Reference Grammar of Russian*. Cambridge: Cambridge University Press.

# **Prosody and Utterance Boundaries in American Sign Language Interpretation**

BRENDA NICODEMUS and CAROLINE L. SMITH

*University of New Mexico*

## **1. Introduction**

Two principal functions of prosody in spoken language are to mark prominence and to group words into larger units, or phrases. There are a variety of proposals as to the organizational structure of phrasal units, which constitute the higher levels of the prosodic hierarchy (see Shattuck-Hufnagel and Turk 1996 for a survey). Although it is clear that languages differ as to the nature and number of phrasal units that they exploit, some kind of phrasing has been identified in virtually every language that has been examined from this perspective (for an exception, see Woodbury 1993). Since phrasing is found so widely in spoken languages, the use of phrasing in signed languages should come as no surprise (Bahan and Supalla 1995, Mather and Winston 1995, Sandler 1999, Wilbur 1999). The variation observed among spoken languages suggests that certain aspects of the structure of the prosodic hierarchy, and the acoustic dimensions that reflect this structure, are language-specific. Signed languages might thus be expected to differ from spoken languages with respect to phrasal prosody because they are distinct languages with their own structural characteristics, in addition to the differences that can be explained by virtue of the distinct modality in which signed languages are expressed.

In spoken language, phrasal structure is used by speakers to organize the message they are communicating, and by perceivers to process the input (Cutler, Dahan and van Donselaar 1997). The principal acoustic dimensions that are involved are  $f_0$ , duration, intensity and segmental spectral properties. The dimensions used to mark phrasing in signed languages are less well-studied, but may include variation in duration and rhythm (Boyes Braem 1999), nonmanual articulations (Wilbur 2000), and use of the nondominant hand (Sandler 2006).

The present study differs from many others in examining prosody as produced by interpreters, rather than native users of signed language. Relatively few studies have looked at interpreters' use of prosody, although one recent study focused on prosodic features that mark topic boundaries in both interpretation and translitera-

tion (Winston and Monikowski 2004). This issue is important because interpreters need to use prosody effectively to indicate boundaries in order to create interpretations that may be more readily processed by Deaf consumers. This task is especially salient for the interpreting profession since most interpreters are second language learners of American Sign Language (ASL) and do not have native competency with the language.

The goal of the study reported here was to examine the type, frequency, and occurrence of prosodic markers that are identified by Deaf consumers of interpreting services. The markers will be examined so as to better determine the form and function of the prosodic boundary markers used in ASL interpretation. Defining sentence structure in signed languages is an ongoing endeavor (Engberg-Pedersen 2006, Hansen and Hessmann 2006) and this paper makes no claims that the identified boundaries are indicating syntactically-defined sentences, nor is it claimed that these boundaries correspond to sentence structure in spoken languages. This study does suggest, however, that Deaf participants can identify some type of boundaries in ASL interpretation and that these boundaries segment the stream of language to facilitate comprehension.

## **2. Research Methodology**

This project was designed to examine the prosodic markers used to indicate boundaries during an ASL interpretation. Research has shown that listeners are sensitive to the markers that cue boundaries in spoken discourse. These boundaries serve to segment the discourse into meaningful units. In order to identify the boundaries that are meaningful to the consumers of interpreted discourse, Deaf people were asked to provide their perceptions of sentence boundaries in an ASL interpretation. This section describes the design of the stimulus material for the study and the Deaf people who served as participants in the project.

### **2.1. Creation of a Source Language Text**

The first step of the research project was to create a segment of spoken English discourse to serve as the source language text for the interpreters. It was decided that a lecture would be an ideal language sample since lectures are typically monologic and a frequently interpreted type of discourse. A professor from the University of New Mexico agreed to provide a 15-minute lecture on a topic of his choosing. He selected the topic, "The Life of the Ant" which covered various aspects of ant life, including their eating and mating practices. The professor was videotaped on a Sony TRV38 Digital Camcorder (mini-DV format) as he presented the lecture to an audience of three graduate students.

### **2.2. Creation of a Target Language Text**

The second step of the research project was to have the spoken English lecture interpreted into the target language, American Sign Language. Five signed language interpreters were recruited to provide an ASL interpretation of the lecture. All five interpreters were certified by the national interpreter certifying

association. Four of the interpreters were female and one was male. One interpreter acquired ASL natively from her Deaf parents. The other four learned ASL through interpreter education programs and contact with members of the Deaf community. The years of professional experience of the interpreters ranged from 7 to 25 years.

All five interpreters provided their interpretation of the lecture individually under the same conditions. Upon arrival at the videotaping site, the interpreters were told that they would be interpreting two videotaped segments from spoken English into ASL. The two segments were described as a 3-minute introduction of the presenter and a 15-minute lecture entitled “The Life of the Ant”.

The interpreters were asked to sign a consent form and complete a professional history summary. They were given preparation materials that are typical of those provided at an interpreting assignment, i.e., an outline of the lecture and a list of key terms. In addition the interpreters viewed a brief videotape of the professor giving an overview of the lecture content.

The interpreters were not informed of the specific focus of the research project. They were only told that a particular linguistic feature of their interpretation would be analyzed. When they were ready to begin, the interpreters were videotaped as they provided an ASL interpretation for both the introduction and the 15-minute lecture. A Deaf native user of ASL served as the audience for all five interpretations. The interpreters were videotaped using the Sony TRV38 Digital Camcorder (mini-DV format).

### **2.3. Creation of the Stimulus Video**

The third step of the research project was to create the stimulus video for viewing by the Deaf participants. The stimulus video was composed of three sections: (1) the directions, (2) the practice trial, and (3) the interpretation.

#### **2.3.1. Directions**

The first portion of the stimulus material was the directions for the research study. The directions were provided in American Sign Language by a Deaf, native user of ASL. The directions stated that participants were participating in a research project about how interpreters created sentence boundaries in ASL interpretation. The participants were asked to look for the completion of a full idea, concept or “sentence.” The term “sentence” was used because of its familiarity. The participants were directed to view a videotaped ASL interpretation on a laptop and press an attached button each time they perceived a sentence boundary. The directions also stated that participants would be given a short practice trial prior to performing the actual research task.

#### **2.3.2. Practice Trial**

The second section of the stimulus material was a practice trial. The practice trial consisted of a three-minute ASL interpretation of a speaker introducing the presenter. During this trial, the Deaf participants practiced pressing the button at

perceived sentence boundaries in the interpretation. They were given the opportunity to perform the practice trial as many times as they wished.

### **2.3.3. Interpretation**

The third section of the stimulus material was the videotaped ASL interpretation of the 15-minute lecture. The lecture was divided into three-minute segments with a 15-second break between them to reduce the risk of fatigue for the Deaf participants.

### **2.3.4. Presentation of the Stimulus Material**

Each of the three sections of the stimulus material was videotaped in digital format and transferred into iMovie software. The files were edited and saved on a Macintosh PowerBook G4 which was also used to present the stimulus material to the Deaf participants. When indicating the perception of a boundary, the participants pressed a Powermate button which left a visual indicator in the iMovie software. The total length of the stimulus material videotape was 22 minutes.

## **2.4. Deaf Participants**

The role of the Deaf participants was to evaluate the occurrence of sentence boundaries in an ASL interpretation. In this section, the Deaf participants are described along with the setting and procedures used in research process.

Fifty Deaf participants took part in this research project. The participants had to satisfy the following criteria:

- a) Identify as a member of the Deaf community;
- b) Report that ASL was their primary language;
- c) Be 18 years of age or older; and
- d) Report frequent use of signed language interpreters.

The participants resided in 10 different states and the District of Columbia. They were fairly evenly divided across gender (males = 21, females = 29) and represented a broad spectrum of age ranges and levels of education. The majority of the participants were employed at residential schools for the deaf.

The participants responded to a call for subjects at either a residential school or a conference. They were recruited in geographical areas other than where the interpreters work in order to assure anonymity and eliminate potential bias from prior experience with the interpreters. They participated voluntarily and were paid twenty dollars apiece for their involvement. Prior to participating in the study, each participant was asked to sign a consent form and complete a personal information sheet.

The participants were told that they were engaging in a linguistic research project on signed language interpreters. They viewed the directions for the project and were allowed the opportunity for questions. They then performed the practice trial task. When the participant indicated readiness to begin the study, the videotape was started and the researcher left the immediate environment.

As stated earlier, five interpreters were videotaped providing separate interpretations of the lecture. It should be noted that each of the Deaf participants viewed only one of the interpreters. Ten Deaf participants viewed the first interpreter, another ten viewed the second interpreter, and so on, for a total of 50 Deaf participants watching five separate interpreters. The study was designed in this way in order to examine the variety of markers that were employed by the individual interpreters.

### **3. Data Analysis**

The section of the paper describes the procedures for collecting and analyzing the data including defining “clusters of agreement” and the type of prosodic markers identified in the coding.

#### **3.1. Defining “Clusters of Agreement”**

Ten Deaf participants viewed a single interpretation and responded to perceived sentence boundaries by pressing a button. Analysis of the participants’ responses focused on “clusters of agreement” which were defined as intervals where six or more of the Deaf participants (out of ten) responded within one second. This one-second interval of agreement was also employed in an examination of prosodic markers in British Sign Language (Fenlon, Denmark and Woll 2006).

Across the five interpretations, there was a total of 153 “clusters of agreement” on the location of sentence boundaries. The number of “clusters of agreement” varied among the interpreters, as shown in Table (1).

(1) Number of clusters of agreement identified in each interpretation

| Interpreters |   |    |    |    | Total |
|--------------|---|----|----|----|-------|
| A            | B | C  | D  | E  |       |
| 46           | 6 | 36 | 21 | 44 | 153   |

The variation in number of agreement points among the interpreters may be due to several factors, including varying attention by participants, or the idiosyncratic use of prosody by the interpreters that may not have consistently cued the participants. It is also possible that the methodology of this study did not fully capture the variation in the interpreters’ use of prosodic markers. It should be noted that in informal interviews following the study, all Deaf participants said that they felt the interpreters were successful in conveying the information in the lecture.

These 153 agreement points were time-aligned to the digitized interpretations for analysis. The analysis of the interpreters’ production of prosodic markers examined a two-second interval, beginning one second prior to the first participant’s response, and ending at the final response in the cluster. The two-second interval in the interpretation was analyzed and coded for the type of prosodic markers that occurred, the frequency of the markers, and the number of overlapping markers.

### **3.2. Coding the Data**

The prosodic markers were analyzed and coded by identifying specific physical movements of the interpreter. The range of prosodic markers produced in signed languages have been described by various researchers and served as a foundation for this analysis. A total of 21 prosodic markers were coded for in the analysis. The markers were coded only if there was a change in state when they were produced. In other words, if a marker, such as a body lean, was held constant throughout the two second interval, it was not coded as marking the sentence boundary.

The videotaped interpretations were viewed frame by frame and coded across each prosodic marker type. Codes were used to designate the specific shift in movement, and each prosodic marker was coded for its duration.

The prosodic markers were designated as falling into one of four broad categories based on specific articulators used in signed languages. The four categories were:

- Category 1 - Hands
- Category 2 - Head and Neck
- Category 3 - Eyes, Nose, and Mouth
- Category 4 - Body

A description of the specific prosodic markers for each category follows.

#### **Category 1 – Hands**

Coding in Category 1 occurred across the following five prosodic markers.

1. Held Handshape - Describes the holding or “freezing” of a handshape.
2. Hand Clasp - Describes the behavior in which the interpreter clasps his/her hands in front of the body. The fingers may be interlocked or folded. The hand clasp tends to occur around the waist with the elbows at a 90 degree angle.
3. Fingers Wiggling - Describes the behavior when one (or both) hands are being suspended in a neutral space in front of the interpreter’s body and the fingers are wiggling.
4. Hands Drop - Describes the behavior of one (or both) hands having completed a sign and are dropped and held without movement.
5. Signing Space - Describes the behavior in which the hands are signing to the left or right of the interpreter’s body.

#### **Category 2 – Head and Neck**

In this category the head is described by movements that involve rotation with respect to an X, Y, and Z axis. For all head position fields, the head first moves to a target position and then maintains that position as some value (front, back, left right, etc.).

Coding in Category 2 occurred across the following seven prosodic markers.

1. Head Position: Tilt (Front and Back) - In this position the interpreter’s head is tilted forward or backwards and maintains that position for some length of time.

### *Prosody and Utterance Boundaries in ASL Interpretation*

2. Head Position: Turn (Left and Right) - In this position, the interpreter's head has rotated on the Y axis (which may be envisioned as a vertical rod originating at the middle of the skull). The head is turned either left or right and held in that position.
3. Head Position: Tilt (Left and Right) - In this position, the interpreter's head has rotated on the Z axis (which may be envisioned as a horizontal rod originating at the back of the skull and coming through the nose). The head is tilted either left or right and held in that position for some length of time.
4. Head Movement: Nod - In this motion, the interpreter's head is moving on the X axis which may be envisioned as a rod running from ear to ear). The head is moving up and down in this position in a repetitive motion.
5. Head Movement: Shake - In this motion, the interpreter's head is moving on the Y axis (which may be envisioned as a vertical rod originating at the middle of the skull). The head is moving left and right and held in a repetitive motion.
6. Head Movement: Side to Side - In this motion, the interpreter's head is moving on the Z axis (which may be envisioned as a horizontal rod originating at the back of the skull and coming through the nose). The head is moving left and right in a repetitive manner.
7. Neck - Describes a shift in the muscular tension of the neck.

#### **Category 3 – Eye, Nose and Mouth**

Coding in Category 3 occurred across the following five prosodic markers.

1. Eyebrows - Denotes a shift in the interpreter's eyebrow height.
2. Eye Gaze - Denotes a shift the direction of the interpreter's eye gaze.
3. Eye Aperture - Denotes a shift in the degree of the eyelid movement such as squinting, widening, or closing.
4. Nose - Denotes that the interpreter is "wrinkling" his/her nose.
5. Cheeks - Denotes a shift in the cheeks by puffing or releasing a puff.

#### **Category 4 -- Body**

Coding in Category 4 occurred across the following four prosodic markers.

1. Body Lean - Denotes a shift and hold of the direction of the interpreter's body.
2. Body Movement - Denotes movement of the interpreter's body that continues in a repetitive manner.
3. Large Breath - Denotes the presence of a visible breath.
4. Shoulders - Denotes that the behavior of the shoulders being raised or lowered.

#### **4. Results**

The initial analysis resulted in two findings: (1) the frequency of prosodic marker type, and (2) the number of prosodic markers at the identified sentence boundaries.

#### 4.1. Frequency of Prosodic Marker Type

Coding the results revealed the most frequent prosodic marker type in each of the four articulator categories. The hands (Category 1) and the body (Category 4) each had a single marker that was dominant, while the head and neck (Category 2) and the eyes, nose and mouth (Category 3) used several different markers. This difference suggests that the fine motor movements of each of the individual articulators can act independently of one another. In addition, the results show that, although the interpreters show variation in their production of prosodic markers, there are specific markers that fairly consistently occur more frequently than others.

##### (2) Frequency of Markers in Category 1 – Hands

|                  | A  | B | C  | D | E  | Total |
|------------------|----|---|----|---|----|-------|
| Hand Clasp       | 42 | 3 | 28 | 8 | 19 | 100   |
| Held Handshape   | 16 | 2 | 10 | 4 | 6  | 38    |
| Sign Space       | 6  | 3 | 6  | 2 | 6  | 23    |
| Hands Drop       | 1  | 0 | 3  | 3 | 11 | 18    |
| Fingers Wiggling | 0  | 0 | 0  | 0 | 0  | 0     |

##### (3) Frequency of Markers in Category 2 – Head and Neck

|                             | A  | B | C  | D  | E  | Total |
|-----------------------------|----|---|----|----|----|-------|
| Head Position: Tilt (F/B)   | 32 | 3 | 19 | 15 | 26 | 95    |
| Head Position: Turn (L/R)   | 31 | 1 | 16 | 7  | 19 | 74    |
| Head Movement: Nod          | 14 | 0 | 16 | 7  | 30 | 67    |
| Head Position: Tilt (L/R)   | 6  | 1 | 18 | 10 | 12 | 47    |
| Head Movement: Shake        | 2  | 0 | 2  | 3  | 2  | 9     |
| Head Movement: Side to Side | 0  | 1 | 0  | 0  | 1  | 2     |
| Neck                        | 0  | 0 | 0  | 0  | 0  | 0     |

##### (4) Frequency of Markers in Category 3 – Eyes, Nose, and Mouth

|                | A  | B | C  | D  | E  | Total |
|----------------|----|---|----|----|----|-------|
| Eye Aperture   | 43 | 6 | 35 | 17 | 44 | 145   |
| Eyebrows       | 32 | 4 | 29 | 12 | 42 | 119   |
| Eye Gaze       | 30 | 6 | 27 | 13 | 42 | 118   |
| Nose Wrinkling | 0  | 0 | 4  | 0  | 0  | 4     |
| Puffed Cheeks  | 1  | 0 | 0  | 0  | 2  | 3     |

##### (5) Frequency of Markers in Category 4 – Body

|               | A  | B | C  | D | E  | Total |
|---------------|----|---|----|---|----|-------|
| Body Lean     | 41 | 3 | 23 | 7 | 22 | 96    |
| Shoulders     | 9  | 0 | 10 | 3 | 2  | 24    |
| Body Movement | 8  | 1 | 2  | 1 | 0  | 12    |
| Breath        | 0  | 0 | 0  | 0 | 0  | 0     |

**4.2. Number of Prosodic Markers at Boundaries**

A second question that was investigated is the number of prosodic markers employed at the boundaries. American Sign Language has been described as being “layered” (Wilbur 2000) because it enables the use of multiple articulators simultaneously. Analysis of the data reveals that prosodic cues that mark boundaries are also produced in a layered manner. Table (6) outlines the number of markers that were observed in the two-second interval of interpretation. The chart shows that the number of prosodic markers being produced most often falls between five and eight per interval.

(6) Number of Prosodic Markers

|               | A  | B | C  | D  | E  | Total |
|---------------|----|---|----|----|----|-------|
| Three Markers | 3  | 0 | 0  | 3  | 0  | 6     |
| Four Markers  | 0  | 1 | 1  | 2  | 0  | 4     |
| Five Markers  | 5  | 2 | 2  | 6  | 8  | 23    |
| Six Markers   | 6  | 1 | 13 | 5  | 13 | 38    |
| Seven Markers | 16 | 0 | 9  | 4  | 14 | 43    |
| Eight Markers | 10 | 2 | 6  | 1  | 5  | 24    |
| Nine Markers  | 6  | 0 | 5  | 0  | 3  | 14    |
| Ten Markers   | 0  | 0 | 0  | 0  | 1  | 1     |
| TOTAL         | 46 | 6 | 36 | 21 | 44 | 153   |

**5. Discussion and Conclusions**

The initial analysis of the type, frequency and number of prosodic markers employed in ASL interpretation suggests that, as with spoken language, people have the ability to detect when prosodic markers are being used for lexical/grammatical purposes versus when they are used for marking phrasal boundaries. One of the surprising findings of this study was the high number of markers used by interpreters during a very short interval of time. Although the number of markers used is relatively high, the data suggest that there is a limited set of prosodic markers used by interpreters to indicate boundaries and that their usage demonstrates a range of stylistic variation is possible while still producing a successful interpretation.

It was observed that when multiple prosodic markers occur together in ASL interpretation (which is almost always the case) they can occur either simultaneously or sequentially. One hypothesis is that the sequential production may be used because of the physical constraints of a visual-gestural language modality. For example, if one large articulator (e.g., body lean, hand clasp, shoulder raise) is being employed to mark a boundary, no other large articulator can occur simultaneously. If a second large articulator is used to mark the boundary, it occurs in a sequential manner. However, fine motor movements (eye aperture, head tilt, head nod) can be used simultaneously with a large articulator. The combination of the more fine-grained articulations with the larger articulations may serve to reinforce

the presence of a boundary. Further investigation will reveal how these articulator categories are timed and coordinated to effectively cue boundaries.

Deeper analysis of the timing and duration of the markers and their sequencing in combination is needed. It would also be enlightening to do a parallel examination of the use of prosodic markers by native users of ASL. The findings from this study will add to the body of knowledge of how human languages employ prosodic structure. In the end, the similarities between the functional role of prosody in spoken and signed languages appear to be more striking than the differences.

## References

- Bahan, Ben, and Sam Supalla. 1995. Line Segmentation and Narrative Structure. In K. Emmorey and J. Reilly, eds., *Language, Gesture, and Space*, 171-191. Hillsdale, NJ: Lawrence Erlbaum Associates Publishers.
- Boyes Braem, Penny. 1999. Rhythmic Temporal Patterns in the Signing of Deaf Early and Late Learners of Swiss German Sign Language. *Language and Speech* 42(2/3):177-208.
- Cutler, Anne, Delphine Dahan, and Wilma van Donselaar. 1997. Prosody in the Comprehension of Spoken Language: A Literature Review. *Language and Speech* 40(2):141-201.
- Engberg-Pederson, Elisabeth. 2006. Intertwined Ellipsis: A Multiclausal Construction in Danish Sign Language. Paper presented at the Annual Meeting of the German Linguistics Society.
- Fenlon, Jordan, Denmark, Tanya, and Bencie Woll. 2006. Seeing Sentence Boundaries. Paper presented at the Annual Meeting of the German Linguistics Society.
- Hansen, Martje, and Jens Hessmann. 2006. Reanalysing Sentences in German Sign Language (DGS) Texts. Paper presented at the Annual Meeting of the German Linguistics Society.
- Mather, Sue, and Elizabeth Winston. 1995. Spatial Mapping and Involvement in ASL Storytelling. In C. Lucas, ed., *Pinky Extension and Eye Gaze*, 183-210. Washington, DC: Gallaudet University Press.
- Sandler, Wendy. 1999. Prosody in Two Natural Language Modalities. *Language and Speech* 42(2/3):127-142.
- Sandler, Wendy. 2006. Phonology, Phonetics and the Nondominant Hand. In L. Goldstein, D. Whalen, and C. Best, eds., *Laboratory Phonology 8*. Berlin: Mouton de Gruyter. 185-212.
- Shattuck-Hufnagel, Stephanie, and Alice Turk. 1996. A Prosody Tutorial for Investigators of Auditory Sentence Processing. *Journal of Psycholinguistic Research* 25(2):193-247.
- Wilbur, Ronnie. 1999. Stress in ASL: Empirical Evidence and Linguistic Issues. In *Language and Speech* 42(2/3):229-250.

*Prosody and Utterance Boundaries in ASL Interpretation*

- Wilbur, Ronnie. 2000. Phonological and Prosodic Layering of Nonmanuals in American Sign Language. In K. Emmorey and J. Lane, eds., *The Signs of Language Revisited*, 215-244. Mahwah, NJ: Erlbaum.
- Winston, Elizabeth A., and Christine Monikowski. 2004. Marking Topic Boundaries in Signed Interpretation and Transliteration. In M. Metzger, S. Collins, V. Dively, and R. Shaw, eds., *From Topic Boundaries to Omission: New Research on Interpretation*, 187-227. Washington, DC: Gallaudet University Press.
- Woodbury, Anthony. 1993. Against Intonational Phrases in Central Alaskan Yupik Eskimo. Paper presented at the Annual Meeting of the Linguistic Society of America.

Brenda Nicodemus  
Department of Interpretation  
Gallaudet University  
800 Florida Avenue, NE  
Washington, DC 20002

[nicodemusb@gmail.com](mailto:nicodemusb@gmail.com)

Caroline L. Smith  
Department of Linguistics  
University of New Mexico  
MSC 03-2130  
Albuquerque, NM 87131-0001

[caroline@unm.edu](mailto:caroline@unm.edu)



## GO and COME Revisited: What Serves as a Reference Point?

DAVID Y. OSHIMA  
*Stanford University*

### 0. Introduction

This paper develops an analysis of GO/COME (English *go/come* and their counterparts in other languages) which improves on existing analyses. I propose that GO/COME refer to a contextually provided *set* of individuals, which I call *RP* (reference point(s)), rather than to a specific entity that serves as the “deictic center”, and that GO requires that no member of the RP be at the goal (of the described motion) while COME requires that some member thereof be at the goal.

The proposed analysis makes empirically correct predictions where existing analyses fail, and further allows us to identify the possible range of cross-linguistic variation in terms of two implicational hierarchies: (i) the person hierarchy for RP inclusion: **1st < 2nd < 3rd**, and (ii) the relevance hierarchy for deictic verbs: **an RP member’s location at the utterance time < an RP member’s location at the event time < an RP member’s “home base”**.

### 1. Previous Analyses of GO/COME

There have been two major approaches to the semantics of deictic motion verbs: (i) the classical approach based on the concept of “deictic center”, and (ii) the person-based approach along the lines of Fillmore (1997). This section provides a brief review of the two approaches and point out their empirical problems.

#### 1.1. Motion from the Center vs. Motion to(ward) the Center

It has been commonly believed that GO describes motion *from* the deictic center, whereas COME describes motion *to(ward)* the deictic center (Talmy 1975, 2000; Oe 1975, among others; cf. Wilkins and Hill 1995). While the deictic center is understood to match the speaker by default, it can be “shifted” to some other entity too, as in (1).

- (1) a. Can I come visit *you*?
- b. John was preparing a meal. Then, the cat came to *him*.

The “deictic shift” is subject to various restrictions (e.g., topicality), and some restrictions are language-specific; for example, when a situation is described where the speaker is moving toward the addressee, the addressee can be the “center” in English but not in Japanese (see section 4.1). This line of analysis suffers from at least two problems:

(i) *Asymmetry between go and come*:

In the following pair of English sentences, the one with *come* is preferred to the one with *go*. In other words, “shifting” of the deictic center to the addressee is preferred.

(2) Can I {a. ??go/b. come} visit you?

This is already intriguing, as under the classical analysis the pattern where the speaker and the deictic center match must be the conceptually most unmarked. Data like (3) pose an even more serious problem.

(3) Will you {a. \*go/b. come} visit me?

If it is possible for the deictic center to be shifted from the speaker to the addressee, (3a) must be acceptable. The classical analysis cannot explain why shifting is preferred in (2) but is blocked in (3).

(ii) *Multiple reference points*:

In a sentence like (4b), the described motion is neither toward the speaker nor a particular individual that serves as the deictic center.

(4) At least two students {a. went/b. came} to talk to three professors.

It is not clear how the classical analysis can deal with such cases.

## 1.2. Fillmore’s Person-based Analysis

Fillmore (1997, among others) characterizes the distribution of English *go* and *come* as follows:

- (5) a. *Come* indicates motion towards {the location at the utterance time, the location at the event time, or the “home base”} of {the speaker or the addressee}.
- b. *Go* indicates motion toward a location distinct from the speaker’s location at the utterance time.

These generalizations make correct predictions for a wide range of data, including the following:

(6) a. Can you {go/come} to the station tomorrow to pick me up?

*GO and COME Revisited*

- b. John {went/come} to my office [= the speaker's "home base"] last week, but I was out of town.

Although Fillmore's analysis of *go* and *come* has been highly influential in the literature, it has certain problems too:

(i) *Motion toward the addressee:*

Fillmore's generalizations predict that when the speaker is the moving entity and the addressee is at the goal (at the event time or the utterance time), *go* and *come* would be equally acceptable. However, in this configuration, generally *come* is strongly preferred to *go* (Nakazawa 1990).

- (7) a. (on the phone) Is it hot there? I hope it will be cooler by the time I {come/\*go}.
- b. (on a street) Should I {come/\*go} and help you tomorrow?  
(Nakazawa 1990:103; the judgments are Nakazawa's)

(cf.) I {came/went} to you last night. Don't you remember it? (Oe 1975:44)

Similarly, in many contexts, *come* is preferred to *go* when the moving entity is not a speech-act participant (SAP) and the addressee is at the goal point (Oe 1975).

- (8) a. John will {come/??go} to help you tomorrow.
- b. Did Mr. Yamada {come/\*go} to you yesterday?  
(Oe 1975:43,88; the judgments are Oe's)

(cf.) She'll {go/come} there to meet you. (Fillmore 1997:88)

The preference for *come* in such configurations (which is affected by various factors<sup>1</sup>) does not follow from Fillmore's generalizations.

(ii) *Third person narrative:*

As illustrated in (9), it is possible for *come* to describe a motion toward a place where neither the speaker nor the addressee is located.

- (9) (**Situation:** Neither the speaker nor the speaker is or was at Bill's place.)  
John {a. went/b. came} to Bill's place.

To deal with such data, Fillmore (1997:99) adds: "[c]ome also indicates, in discourse in which neither speaker nor addressee figures as a character, motion toward a place taken as the subject of the narrative, toward the location of the

---

<sup>1</sup> Oe (1975) observes that when a motion toward the addressee is described, the preference for *come* increases when (i) the sentence is an interrogative or imperative rather than a declarative (*ibid.*:85ff), (ii) the moving entity contacts or intends to contact the addressee (*ibid.*:43), and/or (iii) the sentence describes a future event rather than a past event (*ibid.*:44).

central character at reference time [(event time)], or toward the place which is the central character's home base at reference time". Thus, for Fillmore's analysis, it is crucial to separate third person narrative, where "neither speaker nor addressee figures as a character", as a special case for the use of *go/come*. However, the distinction between "(third person) narrative" and "non-narrative" does not seem to be a crucial factor for the use of *come* exemplified in (9). In sentences (discourses) given in (10), for example, reference to the speaker is made with a first-person pronoun (i.e., the speaker "figures as a character"), yet the occurrences of *come* are not particularly awkward, which describe motion toward a location distinct from the speaker's and the addressee's location.

- (10) a. It seems that John *came* to my sister's place yesterday.  
b. Yesterday, John *came* to Mary's place. He might come to my place as well.  
c. A lot of guests *come* to Mary's place, unlike my place.

Also, in a sentence like (4b) above, there seems to be no particular individual that serves as the "central character" of the narrative or the place that "is taken as the subject of the narrative", and thus it is not clear how the use of *come* is licensed.

### 3. An Alternative Analysis: Reference Point as a Set

The two lines of analyses reviewed above share the assumption that the appropriateness of *go/come* is determined by the location(s) of a particular, single individual, or at most two (i.e., the speaker and the addressee). Instead, I propose that deictic verbs refer to a contextually salient *set* of individuals: RP (reference points). Semantically, an RP can be understood as part (a coordinate) of the context of utterance in the Kaplanian sense; accordingly, deictic verbs can be treated as kinds of indexicals, on a par with *I*, *here*, *now*, etc. (see Oshima 2006a,b).

With this setting, the pragmatic meanings of English *go* and *come* can be formulated as follows:

- (11) a. *Go* requires that no member of the RP be at the goal at the utterance time.  
b. *Come* requires that (i) there be some member of the RP at the goal at the utterance time or at the event time, or (ii) the goal be the home base of a member of the RP (at the event time).

The selection of members of the RP is subject to the following, person-based constraints:

- (12) Constraints on the RP in English:  
a. The speaker is always a member of the RP.

## *GO and COME Revisited*

- b. It is preferred for the addressee to be a member of the RP as well. The degree of preference is affected by various factors (see fn.1); under certain conditions, the inclusion of the addressee in the RP is almost obligatory (e.g. *Can I {??go/come} see you?*).
- c. A non-SAP (third person) entity can be chosen as a member of the RP if it is discourse-salient. Inclusion of a non-SAP entity is marginal, however, when the speaker or the addressee is the theme (i.e. the moving entity or group) or a member thereof.

These conditions correctly predict the asymmetry between *go* and *come* illustrated in (2)/(3) above, and the preference for *come* in a configuration where the addressee is at the goal point (e.g., (7)/(8)). They also correctly predict that a sentence like the following is marginal.

- (13) (**Situation:** Neither the speaker nor the addressee is at John's office at the utterance time, or will be there at the event time.)  
?\*{a. I/b. You} should come to John's office.

Note also that there is no limit on the number of members of the RP. In (4b), for example, all individuals who satisfy the property of being a professor are taken to be members of the RP (i.e., RP = {speaker, addressee, professor<sub>1</sub>, professor<sub>2</sub>, professor<sub>3</sub>, ...}).<sup>2</sup>

Finally, it is worth noting that, under certain conditions, the effect of (12c) seems not to be categorically strong. (14b), for example, would be excluded by (12c), but nevertheless some speakers consider it not entirely unacceptable:

- (14) John may be fired from his job if I don't {a. go/b. ?~\*come} to give him a hand.

This suggests that it is possible for the proposed person-based restrictions (in particular (12c)) to be overridden by other factors like (a high degree of) discourse salience.<sup>3</sup>

---

<sup>2</sup> Considering the acceptability of an utterance like *About 27 million tourists come to Paris each year* (uttered by and addressed to a person not located in Paris), it would probably be necessary to allow non-sentient entities (e.g. the city of Paris) to be included in the RP.

<sup>3</sup> In an attitude/speech report, the choice of GO/COME can be made with respect to either the primary (external) speaker's perspective or the secondary agent's (Hockett 1990; Oe 1975).

- (i) (**Situation:** The speaker is in Tokyo; John and Linda are in New York.)
  - a. John told Linda that he would come to Tokyo on Thursday.
  - b. John told Linda that he would go to Tokyo on Thursday.
  - cf. \*John will go to Tokyo on Thursday.

See Oshima (2006a,b) for detailed discussion of this "deictic perspective shift" phenomenon.

#### 4. Cross-linguistic Comparison

Not only does the proposed, set-based analysis make empirically correct predictions for the English data presented above, it also has an additional advantage from the typological perspective: it allows us to understand differences among motion deictic systems across languages in a simple fashion (cf. Gathercole 1978; Nakazawa 2005, 2006). I propose that motion deictic systems in many, if not all, languages follow conditions derived from the following two principles based on implicational hierarchies:

(I) **The person hierarchy for RP inclusion**

Inclusion of X in the RP (i) implies inclusion of Y, and (ii) sometimes further requires that Y be not the theme (or a member thereof), where X outranks Y in the hierarchy of person: **1st < 2nd < 3rd**.

(II) **The relevance hierarchy for deictic predicates**

A given deictic verb refers to some lower portion or the totality of the following hierarchy: **an RP member's location at the utterance time < an RP member's location at the event time < an RP member's "home base" (at the event time)**.

The first principle dictates that the sets in (15a), among others, are possible RPs (in some languages, under certain conditions) while those in (15b), among others, are not (in any language):

- (15) a. {speaker}, {speaker, addressee}, {speaker, addressee, non-SAP<sub>1</sub>, non-SAP<sub>2</sub>}  
b. {addressee}, {speaker, non-SAP<sub>1</sub>}, {non-SAP<sub>1</sub>}

From principle (II), we can derive three varieties of GO and three varieties of COME:

- (16) GO<sub>1</sub>: No RP member is at the goal at the utterance time.  
GO<sub>2</sub>: No RP member is at the goal at the utterance time or at the event time.  
GO<sub>3</sub>: No RP member is at the goal at the utterance time or at the event time, and the goal is not an RP member's home base (at the event time).
- (17) COME<sub>1</sub>: Some RP member is at the goal at the utterance time.  
COME<sub>2</sub>: Some RP member is at the goal at the utterance time or at the event time.  
COME<sub>3</sub>: Some RP member is at the goal point at the utterance time or at the event time, or the goal point is an RP member's home base (at the event time).

Note that *go* is an instance of  $GO_1$ , and *come* is an instance of  $COME_3$ . When a language has  $GO_m$  and  $COME_n$  where  $m < n$ , it is possible to find a configuration in which either *GO* or *COME* can be used under the same RP (as in (6a,b) above); when  $m = n$ , *GO* and *COME* are in complementary distribution under the same RP. If a language has  $GO_m$  and  $COME_n$  where  $m > n$ , then there will be “ineffable” situations, which can be described neither by *GO* nor *COME*; it seems quite likely that such a language does not exist.<sup>4</sup>

In the following, the proposed hypothesis will be tested against data from languages other than English, namely, Japanese, Mandarin Chinese, and Sive.

#### 4.1. *Iku* ‘Go’ and *Kuru* ‘Come’ in Japanese

There have been extensive comparative studies on English *go/come* and Japanese *iku/kuru* (Oe 1975; Gathercole 1978; Nakazawa 1990, among others). The major differences between the motion deictic systems in the two languages can be reduced to two points: (i) in Japanese, the preference for inclusion of the addressee is not as strong as in English (i.e., the status of the addressee is closer to that of a third person entity) and (ii) English *go* refers to the utterance time only, while Japanese *iku* refers to both the utterance time and the event time.

- (18) a. Asita,        watasi-ga anata-no tokoro-ni {iki/\*ki}-masu.  
          tomorrow I-Nom    you-Gen    place-Dat    go/come-Polite.Pres  
          ‘I will come to you tomorrow.’  
       b. Asita,        Taro-ga anata-no tokoro-ni {iki/ki}-masu.  
          tomorrow T.-Nom you-Gen    place-Dat    go/come-Polite.Pres  
          ‘Taro will come to you tomorrow.’
- (19) a. Asita,        watasi-ga Taro-no tokoro-ni {iki/\*ki}-masu.  
          tomorrow I-Nom    T.-Gen    place-Dat    go/come-Polite.Pres  
          ‘I will go to Taro tomorrow.’  
       b. Asita,        anata-ga Taro-no tokoro-ni  
          tomorrow you-Nom T.-Gen    place-Dat  
          {iku/(?kuru)}-nodesu-ka?  
          go/come-Aux.Polite.Pres-Q  
          ‘Will you go to Taro tomorrow?’  
       c. Asita,        Hanako-ga Taro-no tokoro-ni {iki/ki}-masu.  
          tomorrow H.-Nom    T.-Gen    place-Dat    go/come-Polite.Pres  
          ‘Hanako will go/come to Taro tomorrow.’
- (20) Asita,        eki-made watasi-o mukae-ni-{\*itte/kite}-kudasai.  
          tomorrow station-to I-Acc        pick.up-go/come-Ben.Polite.Imper  
          ‘Please go/come to the station to pick me up tomorrow.’

---

<sup>4</sup> Thanks to Dmitry Levinson for pointing this out.



### GO and COME Revisited

Motion toward a place where neither the speaker nor the addressee is located can be described with *lai* too, but only when the theme is a non-SAP entity.

- (25) (**Situation:** Neither the speaker nor the speaker is at Lisi's home at the utterance time or was there at the event time.)  
{?\*Wo/?\*Ni/Zhangsan} bu lai Lisi jia bu cheng.  
I/You/Z. not come L. home not become  
'I/You/Zhangsan should come to Lisi's home.'

Also, *qu* 'go' can be used when the speaker is located at the goal at the event time (and not at the utterance time).

- (26) Wo zai chezhan deng zhe, sandian ni {qu/lai}.  
I at station wait Asp three.o'clock you go/come  
'I'll be waiting at the station. Please go/come at three o'clock.'  
(Nakazawa 2005:57)

These observations lead to the following analysis of the motion deictic system in Mandarin Chinese:

- (27) Constraints on the RP in Mandarin Chinese:  
a. The speaker is always a member of the RP.  
b. The addressee can be a member of the RP, whether the speaker is (a member of) the theme or not. The inclusion of the addressee is not as preferred as in English (see also (34)/(35) below).<sup>6</sup>  
c. A non-SAP entity can be chosen as a member of the RP only if neither the speaker nor the addressee is the theme (or a member thereof).
- (28) a. *Qu* is an instance of GO<sub>1</sub>.                      b. *Lai* is an instance of COME<sub>3</sub>.

#### 4.3. *Genembi* 'Go' and *Jimbi* 'Come' in Sive

Kubo (1997) reports that, in Sive (a language closely related to Manchu; it is also known as Sibe, Sive Manchu, etc.), verbs corresponding to *go* and *come* (*genembi* and *jimbi*, respectively) both refer to the speaker's location at the utterance time only, and not the addressee's location, the speaker's "home base", etc.

- (29) (**Situation:** The speaker is not at home.)  
a. si cimare mon-i bo-de {gene/\*ji}-me-na  
you tomorrow we(Excl)-Gen house-Dat go/come-Fin.Impf-Q  
'Are you coming to our house tomorrow?'

---

<sup>6</sup> Chen (2004:161) notes that motion toward the addressee tends to be described with *lai* when the described event is temporally/spatially proximate to the context of utterance, as in *Ni deng zhe, wo mashang xialai* 'Wait a second, I'm coming down right away'.

- b. tere cixsé      mon-i              bo-de      {gene/\*ji}-make  
 he yesterday we(Excl)-Gen house-Dat go/come-Conv.Pf  
 mi-maqe gisun gisere-xei  
 I-Com talk talk-Fin.Pf  
 ‘Yesterday he came to our house and talked to me.’  
 (adapted from Kubo 1997:22)

From these data, it seems reasonable to hypothesize the following:

- (30) Constraints on the RP in Sive:  
 The speaker is always a member of the RP, and no other individual can be a member of the RP (i.e. RP = {speaker}).
- (31) a. *Genembi* is an instance of GO<sub>1</sub>.    b. *Jimbi* is an instance of COME<sub>1</sub>.

**5. Fine Tuning**

So far, I have discussed general conditions (in four languages) under which the use of GO and COME is required, acceptable, or unacceptable. As much as these general conditions are not violated, the choice between GO and COME (the choice of RP members) are affected by various additional factors, which include: linguistic empathy, topicality, tense, sentential force, and temporal/spatial proximity of the described motion event to the context of utterance; also, how exactly each of such factors affects the use of GO and COME may differ across languages (see fn.1 and fn.6). It is beyond the scope of the present work to present the exhaustive list and detailed discussion of such factors. I would like, however, to mention one factor that seems to have quite a conspicuous effect on determination of motion deixis:

**(III) The mode of goal specification**

The preference for inclusion of individual X to the RP increases when X himself (rather than the place where X happens to be located) is specified as the goal.

The following data from English and Mandarin support this claim.

- (32) **(Situation:** On the phone. The speaker knows that the addressee is and will be in San Jose.)  
 You know what, I’ll {go/come} to San Jose next week. (Maybe we can hang out together.)
- (33) I’ll {??go/come} visit you next week.

- (34) (**Situation:** On the phone. The speaker knows that the addressee is and will be in Beijing.)  
 Wo xiazhou yao {qu/(? )lai} Beijing.  
 I next.week will go/come B.  
 ‘I will go/come to Beijing next week.’
- (35) Wo yao {(?)qu/lai} bang ni.  
 I will go/come help you  
 ‘I will go/come to help you.’

**6. Conclusion**

The proposed analysis of GO and COME is “two-dimensional”, in the sense that the core meanings of deictic motion verbs and the constraints on the choice of reference points are separated.

In the four languages taken up in the present paper, we found instances of GO<sub>1</sub>, GO<sub>2</sub>, COME<sub>1</sub>, and COME<sub>3</sub>, but not GO<sub>3</sub> or COME<sub>2</sub>:

(36)

|   | GO                                               | COME                                             |
|---|--------------------------------------------------|--------------------------------------------------|
| 1 | <i>go</i> (E), <i>qu</i> (M), <i>genembi</i> (S) | <i>jimbi</i> (S)                                 |
| 2 | <i>iku</i> (J)                                   |                                                  |
| 3 |                                                  | <i>come</i> (E), <i>kuru</i> (J), <i>lai</i> (M) |

I leave it open for future research whether we can find varieties of GO/COME that fill the missing two cells, and if not, why that is the case.

Finally, it is worth noting that the proposed analysis makes certain predictions as to possible felicity conditions for a given deictic verb (in a given language), which do not follow from analyses along the lines of Fillmore (1997). It predicts, for example, that there can be no deictic verb which can be felicitously used iff (i) the speaker is at the goal at the utterance time, (ii) the speaker is at the goal at the event time, or (iii) the addressee is at the goal at the utterance time. A prediction like this, if borne out, would lend strong support to the current analysis.

**Acknowledgments**

I would like to thank Yuan Zhao, Tsuneko Nakazawa, Ivan Sag, Dmitry Levinson, Peter Sells, Itamar Francez, Beth Levin, and the audience of BLS 32 for valuable comments and help. Any remaining errors are my own.

**References**

- Chen, Shun-Yi. 2004. *Taiwango to hutuuwa no hookoohyoogen ni kansuru taisyoo kenkyuu: "lai", "qu" o tyuusin ni, nihongo to no taisyoo mo kanete* [A comparative study of directional expressions in Taiwanese and Mandarin: *lai, qu*, and comparison with Japanese]. Ph.D. thesis, University of Tokyo.
- Fillmore, Charles J. 1997. *Lectures on Deixis*. Stanford: CSLI Publications.
- Gathercole, Ginny. 1978. Towards a universal for deictic verbs of motion. *Kansas Working Papers in Linguistics* 3:72-88.
- Hockett, Charles F. 1990. Bring, Take, Come and Go. *Journal of English Linguistics* 23(1/2):239-244.
- Kubo, Tomoyuki. 1997. "Come" and "Go" in Sive Manchu. *Saksaha: A Review of Manchu Studies* 2:19-24.
- Nakazawa, Tsuneko. 1990. Pragmatic account of the distribution of *come* and *go* in English, Japanese and Korean. In H. Hoji, ed., *Japanese/Korean Linguistics*, vol. 1, 97-110. Stanford: CSLI Publications.
- Nakazawa, Tsuneko. 2005. On *come* and *go* in English, Japanese, and Chinese: Why do they come while others go? In *Language, Information, Text*, vol. 12, 43-62. Tokyo: University of Tokyo.
- Nakazawa, Tsuneko. 2006. Motion event and deictic motion verbs as path-conflating verbs. In S. Müller, ed., *The Proceedings of the 13th International Conference on Head-Driven Phrase Structure Grammar*, 284-304. Stanford: CSLI Publications.
- Oe, Saburo. 1975. *Nitieigo no hikakukenyuu: syukansei o megutte* [A comparative study of Japanese and English: On subjectivity]. Tokyo: Nan'undo.
- Oshima, David Y. 2006a. Perspectives in Reported Discourse. Ph.D. thesis, Stanford University.
- Oshima, David Y. 2006b. Indexicality, motion deixis, and presupposition. In M. Gibson and J. Howell, eds., *Proceedings of Semantics and Linguistic Theory*, vol.16, 172-189. Ithaca: CLC Publications.
- Talmy, Leonard. 1975. Semantics and syntax of motion. In J. P. Kimball, ed., *Syntax and Semantics*, vol. 4, 181-238. New York: Academic Press.
- Wilkins, David P. and Deborah Hill. 1995. When GO means COME: Questioning the basicness of basic motion verbs. *Cognitive Linguistics* 6(2):209-259.

David Y. Oshima  
Department of Linguistics  
Stanford University  
Stanford, CA 94305-2150

davidyo@gmail.com

# **Punctuation as Social Action: The Ellipsis as a Discourse Marker in Computer-Mediated Communication**

JOSHUA RACLAW

*University of Colorado*

## **1. Sociolinguistic Variation in Internet Discourse**

The last decade has seen a tremendous increase in the use of computer-mediated communication (CMC) within wired societies, and with this increased visibility has come a growing scholarly interest in the linguistic structures of internet discourse. The majority of research in this area has been sociolinguistic in nature, though it has dealt largely with interaction management and the sequential organization of talk rather than the specific linguistic variables used by speaker to constitute online styles and registers. Those studies that take the latter approach have typically presented these variables as features of a more generalized online language, and attributed their use broadly to speakers operating within a certain medium of CMC, such as email or electronic bulletin boards (e.g. Collot and Belmore's (1996) *electronic language*, Naomi Baron's (2002) *email style*, Crystal's (2004) *netspeak*). Even when variation among speakers operating within the same medium or community of practice is noted by a researcher, such as Cherny's (1999) acknowledgment that certain syntactic and morphological phenomena of MUD discourse only occurs in the speech of particular speakers, this phenomenon is often placed in the periphery of the work and the researcher avoids detailed accounts of possible motivations for variation in online discourse (though see Paolillo 2001 and Squires 2005).

This paper does not intend to condemn these prior approaches, as they have produced necessary research on otherwise undocumented linguistic practices. It can be argued, however, that they have left little room for conceptualizing changes in style and register within CMC. This has left a notable gap in the literature of the field, though one that is rapidly being filled by contemporary scholars approaching internet discourse with these processes in mind. This paper aims to not only contribute to this body of work, but to expand the scope of variationist work on CMC by considering the following premises: one, that forms of punctuation, especially when used in ways that stray from their traditional uses in written texts, can be studied as variables that speakers use to signal distinct ways of talking; two, that speakers switch into these ways of talking for reasons

similar to those described in sociolinguistic analyses of spoken discourse, such as situational and metaphorical forms of codeswitching or styleshifting (Blom and Gumperz 1972); and three, that the use of punctuation in non-standard capacities can be attributed to the pursuit of covert prestige (Labov 1972, Trudgill 1974) linked to these forms, to an association with the positive ideologies surrounding the use of a punctuation marker, or possibly to both.

## **2. IRC and Prototypical Synchronicity**

The data used in this analysis is taken from the logfiles of 5 twenty-minute, naturally occurring English conversations held through Internet Relay Chat, with a total of 39 speakers contributing to the corpus. IRC is a chatroom style of what I call *prototypically synchronous* computer-mediated communication; though a brief description of this designation will be provided here, a more thorough explanation of the features of IRC can be found in Werry (1996).

The prototypical synchronicity of a medium, either synchronous or asynchronous, reflects whether the structures of the medium seem aimed at accommodating talk that occurs in approximate real-time or at less immediate intervals. Chatrooms, instant messages, and similar mediums are considered prototypically synchronous because speakers can potentially see the discourse as it unfolds directly into the chatroom or instant message box, allowing for responses to utterances to be constructed immediately after a previous speaker has taken a turn at talk. This process is contrasted with prototypically asynchronous mediums such as message boards and email, where previous talk must first be accessed by actively opening a message thread or email before a response can even begin to be constructed, and future talk will likewise be accessible only by first opening the new email or thread. As spoken discourse seems to be the model for how researchers are defining CMC synchronicity, it can be argued that prototypically synchronous media are better equipped to approximate that model than prototypically asynchronous forms. This is reflected in a general tendency (and in certain circumstances an expectation, though this is not always the case) for speakers operating within prototypically synchronous mediums to interact in approximate real-time with their interlocutors, even if this tendency is by no means universal across speakers or even across interactions. Although researchers are not in complete agreement over whether prototypically synchronous communications use the standards of either spoken discourse or of written text as a model for shaping internet discourse, the present research supports the view that online talk is likely shaped by a combination of the standards of both (Baron 1998).

## **3. The Ellipsis as Conjoining Marker**

The functions of ellipses in internet discourse are varied, and can be simply categorized by whether they adhere to the marker's traditional uses within written English (i.e. to indicate deleted material, to mark hesitation or silence, to suggest unfinished thoughts) or are more innovatively employed by speakers. For the purposes of tracing the origins of use of the ellipsis within CMC, it would also be

### *Punctuation as Social Action*

helpful to make a distinction between those uses of the marker that have differed from standard uses but have appeared historically in various written representations of speech, such as those appearing in novels, comic books, and closed-captioned television. It would be equally helpful to note cross-linguistic uses of the ellipsis in various written formats, such as its role in Japanese manga to represent speechlessness and implicate surprise, guilt, or incredibility, as potential influences on the use of ellipses within English internet discourse. Due to constraints on space, however, this analysis will consider these latter distinctions best saved for future research, and will focus instead on a wide-spread online use of the ellipsis that can be categorized as straying from its traditional applications within standardized writing practices: as a conjoining marker between grammatical and other constituents.

The first use of an ellipsis as a conjoining marker functions to connect two grammatical constituents within the same utterance, acting much as a “replacement” for a lexical conjunction or relative pronoun. Similarly, ellipses can be used as a replacement of sorts for other forms of punctuation, such as commas and periods, so as to connect any number of other constituents within an utterance.

- (1) <marine> thats scary foreman...I hope its not that big
- (2) <yahoo> you mean to tell me cutie...you don't have any old shoes
- (3) <modern> lets get ice cream...pickles...soda :)
- (4) <wolfen> I usually go for a slght undrstatement myself...thats jst me...

In fragment 1, for example, an ellipsis is used in place of what would likely be a comma or period used to connect the two clauses spoken by marine. Fragment 2 shows an ellipsis standing in for what would likely be a relative pronoun used to connect the clauses. In fragment 3, the first ellipsis can be read as functioning as would either a comma or a coordinating conjunction, while the second ellipsis likely functions as a coordinating conjunction; in this case, these conjunctions would most likely be read similarly to *and* by other speakers. The first ellipsis of fragment 4 appears to also function in place of a conjunction to join the two clauses, though this would likely be read as *but*. The second ellipsis is used here as end punctuation similarly to how a period might function. Although this might be read as one of the standard uses of the ellipsis, that of representing unfinished thoughts or speech, wolfen does not speak for another 23 lines after this utterance, and that is in response to an unrelated topic. Similarly, other speakers from the data would frequently use an ellipsis as end punctuation without orienting to the marker’s possible interpretation as leaving the speaker with more to say.

While the above examples lack a specific pattern based on the syntax of an utterance for determining how frequently an ellipsis would be used rather than a conjunction, relative pronoun, or other form of punctuation, there are specific types of utterances that the data show to be vastly more likely to contain an ellipsis than any other.

- (5) <pumpkin> babez...your so damn mean
- (6) <rockout> lol..you better kick Carol out first
- (7) <mareena> hey just kidding...huggles
- (8) <lovely> w00t....thanks grey

As IRC is a multi-user medium where conversations can potentially involve dozens of speakers talking at once, users have adopted practices of addressivity in which they overtly address the recipient of their message within the course of their turn. Addressivity typically occurs at the beginning or end of an utterance, and as fragment 5 illustrates, speakers within the corpus frequently separate their addressivity terms from the rest of their utterances through the use of an ellipsis. Similarly, fragments 6 and 7 show examples of speakers separating various forms of textual play, such as written representations of laughter (“lol” or “laughing out loud”) or of actions such as hugging another speaker (“huggles”), from the utterances that precede or follow the play. If we conceptualize that the speakers in these examples are at least partially patterning their discourse after spoken interactions, it seems likely that they are using the ellipses to separate what would be the spoken portion of an offline interaction from what would be the extralinguistic features. In the case of addressivity, a parallel can be drawn to gesture, eye gaze, or similar actions used in face-to-face interactions to select the recipient of an utterance; in the case of textual play, a parallel can be drawn to those actions that the play represents within the chat, such as laughing or hugging. By using an ellipsis to separate the two types of constituents within an utterance, it can be argued that there is a conceptual split for a large number of speakers from the data between the communicative content of an utterance and the *metadiscourse* that accompanies it.

#### **4. Motivations Behind Non-Traditional Use of the Ellipsis**

What still remains unanswered is why the speakers cited above use conjoining marker ellipses rather than lexical constituents or more traditional pieces of punctuation, as well as why they have chosen to use an ellipsis to separate the communicative content from the metadiscourse of an utterance. While there are likely numerous answers to these questions, and even more likely a number of them that work together in determining the frequent use of the ellipsis in these capacities, this analysis offers the possibility that the ellipsis has become a discourse marker among the speakers of many online communities of practice, and that it has grown to carry various types of prestige among these speakers. It can be argued that the positive ideologies surrounding the use of the ellipsis, then, contribute to its frequent use among the speakers from the corpus.

To discuss how these ideologies came about, it is first necessary to consider the widespread variation in ellipsis use that exists among speakers in online settings. Though the previous data fragments perhaps hint towards a universality of their use among all speakers operating in both IRC or in other CMC mediums, this is far from the case. In the uses of the ellipsis cited above, variation could be

### *Punctuation as Social Action*

seen in at least three situations that occurred throughout the data: an increase in ellipsis use could be seen as correlative to a decrease in the formality of an interaction, and vice versa, signifying a shift in register achieved through the degree that ellipses were included or excluded within one's speech; an increase in use was tied to a type of metaphorical styleshifting, such as that used in a *sympathetic speech style*; and an increase in use was tied to a type of situational styleshifting, such as a shift into an ellipsis-heavy speech style when entering a specific online environment, likely used to signify membership within a particular community of practice. It is likely that the motivations behind these shifts in speech style are somehow linked, at least diachronically, and future research beyond what is posited in this analysis is certainly necessary to more accurately determine these motivations.

As heavy uses of the ellipsis that stray from the marker's traditional uses in written English are seen as marking an informal style of speech in internet discourse, illustrated through the correlative relationship between an increase in formality and a decrease in ellipsis use, it can be argued that the standards of written discourse are being held as formal, acrolect-type standards for talk online. This notion is also supported by prescriptivist language ideologies held by numerous speakers that place the standardized writing practices of written English higher than the more innovative uses found in certain types of internet discourse; these ideologies are noted, for example, in the abuse of certain players of online games who make use of "CMC-specific" features in talk that veer from the standards of written English (Iorio 2005). However, the construal of these types of features as informal and non-standard may also lead to a type of covert prestige attached to their use, and it is perhaps this covert prestige that speakers are tapping into in their use of ellipses in the examples discussed here. However, there are certainly other CMC-specific features which would be construed by prescriptivist language ideologies as non-standard and could therefore provide this same covert prestige, such as orthographic practices that make use of alphanumeric homophony (i.e. "cu l8r") or heavy use of emoticons, and it is likely that these features are used in concert with ellipses to reflect a particular register or style within internet discourse.

There is likely another reason, then, either apart from or working in conjunction with the covert prestige afforded to speakers using ellipsis-heavy styles, why the ellipses serve in the capacity that they do. The adoption of a sympathetic speech style through metaphorical styleshifting is one of a number of ways that speakers can show empathy with another speaker in an interactional environment where pitch, physical gestures, and other extralinguistic features of the talk are not available to convey such emotions. One of the style's most notable and constant features across interactions is its increased use of ellipses in non-standard fashions, especially as a replacement for standard punctuation (such as periods, commas, and semi-colons), and its inclusion before question marks.

(9) 148 <genova> yeah pumpkin, pass it over

169 <genova> yum yum its goooooooooood. lol  
317 <genova> oh honey...are you goign to be all right...?  
324 <genova> I know...i'm just sososo sory to hear that... :(  
330 <genova> yeah...  
336 <genova> well...you kno my number if you need it...

The data in fragment 9 illustrates the progression of genova's speech into a sympathetic speech style, a response to news about one of the other speakers in the chat recently being dumped by her boyfriend occurring during lines 310-314 (omitted for privacy of the speaker). The obvious changes in genova's speech style can be seen when comparing lines 148 and 169, which make use of both a comma and period, to lines 317, 324, and 336, which all make use of ellipses to connect the grammatical constituents in each utterance as well as to end each sentence (or to precede the use of a question mark as end punctuation, as seen in line 317).

The use of an ellipsis in such a style can be attributed to some of the ideologies surrounding its use, described through interviews with speakers from the IRC data who claimed it showed that the speaker adopting the style was attentive and listening to his or her interlocutor, and that users generally felt more comfortable with a speaker who adopted this style. The interviewed speakers unanimously agreed that this positive effect on the perception of a speaker using this style also carried over to speakers who did not switch into ellipsis-heavy style due to a metaphorical styleshift, but who frequently made use of ellipses in non-standard ways as a part of another type of register or style. These ideas about ellipsis use can likely be traced back to one of the standard uses of an ellipsis, to represent silence, as a perception of silence achieved while still engaging in conversation could likely convey the idea that the speaker is actively listening to his or her interlocutor. Since speakers from the data hold the idea that these qualities carry over to speakers who make use of ellipses in non-standard ways, even without switching into a sympathetic speech style, it is likely that the frequent use of the ellipses in the non-standard ways illustrated in fragments 1 through 8 can be tied not only to the possibility of seeking covert prestige among other members of the chat, but to the pursuit of appearing as conscientious speakers to their chat partners or even to an association with the positive ideologies surrounding the marker that originally sprang from this type of perception.

## 5. Conclusion

There is still a great deal of work to be conducted on the study of linguistic variables and sociolinguistic variation within online discourse; the brief analysis offered here is intended as an exploratory work into the use of only one such variable, and barely scratches the surface in the documentation of its variation in use among speakers. It should be noted that the data discussed here was taken from but one online community of practice, and that the examples shown above were largely from core members of this group rather than peripheral members or

first-time visitors to the chatroom. The exclusion of non-peripheral members in the analysis was not explicitly the choice of the researcher, but the result of ellipsis use in the capacities described above occurring almost exclusively in the speech of the chatroom's regulars. Though this variation in use was noted indirectly in the attribution of increased ellipsis use to possibly signify membership in a community of practice, it is deserving of much more detailed attention in further research than could be provided here. Additionally, discussions of the use of ellipsis in other IRC communities, as well as broader studies grounded in data taken from similarly prototypically synchronous mediums and in prototypically asynchronous mediums are viable and quite necessary directions for future work. It is also the hope of the researcher that studies of punctuation other than the ellipsis and discussions of their role within the discourse of speakers operating in all areas of the online sphere will be conducted by linguists interested in the workings of internet discourse.

## **6. Acknowledgments**

I am extremely grateful to Kira Hall, Nichole Hansen, Lauren Squires, and Jenny Davis for their time spent providing generous feedback on previous drafts of this paper. Any remaining weaknesses are solely my responsibility.

## **References**

- Baron, Naomi. 1998. Letters by Phone or Speech By Other Means: The Linguistics of Email. *Language and Communication* 18:133-170.
- Baron, Naomi. 2002. Who Sets E-Mail Style? Prescriptivism, Coping Strategies, and Democratizing Communication Access. *The Information Society* 18:403-413.
- Blom, Jan-Petter, and John Gumperz. 1972. Social Meaning in Linguistic Structure: Code-switching in Norway. In John Gumperz and Dell Hymes, eds., *Directions in Sociolinguistics*, 407-434. New York: Holt, Rinehart and Winston.
- Collot, M. & Belmore, N. 1996. Electronic Language: A New Variety of English. In Susan Herring, ed., *Computer-Mediated Communication: Linguistic, Social, and Cross-Cultural Perspectives*, 13-28. Amsterdam: John Benjamins.
- Crystal, David. 2002. *Language and the Internet*. Cambridge: Cambridge University Press.
- Iorio, Josh. 2005. Personal communication.
- Labov, William. 1972. *Sociolinguistic Patterns*. Philadelphia: University of Pennsylvania Press.
- Paolillo, John. 2001. Language Variation on Internet Relay Chat: A Social Network Approach. *Journal of Sociolinguistics* 5(2):180-213.
- Squires, L.M. 2005. *Whats the Use of Apostrophes? Gender Difference and Linguistic Variation in Instant Messaging*. Presented to Internet Research 6.0: Generations, Oct. 6-9, 2005, Chicago, IL, USA.

Joshua Raclaw

- Trudgill, Peter. 1974. *The Social Differentiation of English in Norwich*. Cambridge: Cambridge University Press.
- Werry, C. 1996. Linguistic and Interactional Features of Internet Relay Chat. In Susan Herring, ed., *Computer-Mediated Communication: Linguistic, Social, and Cross-Cultural Perspectives*, 47-64. Amsterdam: John Benjamins.

Joshua Raclaw  
Dept of Linguistics  
295 UCB – Hellems 290  
University of Colorado  
Boulder, CO 80309

[joshua.raclaw@colorado.edu](mailto:joshua.raclaw@colorado.edu)

## Fictive Motion: Construction or Construal?

JOSEF RUPPENHOFER  
*Universität Hildesheim*

### 1. Introduction

This paper seeks to develop an understanding of why a certain class of motion sentence, exemplified by (1), is unattested both in large corpora such as the British National Corpus (BNC)<sup>1</sup> and on the Internet.

(1) ?#The road **arrives** ∅.

Sentence (1) is special in that, on the intended reading, it represents a peculiar constellation of semantic and pragmatic features that together result in low acceptability (or at least low frequency of use) even though individually the features seem unproblematic. First, sentence (1) is an instance of fictive construal of motion. While the core use of motion verbs, exemplified in (2) and (3) below, is to present the motion of an entity which actually moves, possibly portrayed relative to one or more stationary locations, the fictive use consists of applying a motion verb to a stationary entity, usually a potentially traversable path, to indicate its location or topology, without any assumption of actually ongoing travel along the path (Matlock 2004a, 2004b, Matsumoto 1996, Talmy 2000, *inter alia*).<sup>2, 3</sup> In addition to actual and fictive motion uses, motion verbs have at least two other types of uses, shown in (4) to (7). In sentences (4) and (5), an instance of what I call *relative motion*, there is a reversal in the presentation of the actually moving Theme and the stationary Location such that the Location is construed as moving and the Theme as stationary. Sentences (6) and (7) are instances of what Talmy calls the pattern-path type of fictive motion, in which the resulting path entity comes into being as a result of some ongoing process (2000:128-130).

---

<sup>1</sup> The British National Corpus is a 100-million word, genre-balanced corpus of spoken and written British English (<http://www.natcorp.ox.ac.uk>).

<sup>2</sup> I thank Michael Ellsworth, Charles Fillmore, Shweta Narayan, and Laura Michaelis for their comments on this work. All remaining errors are, of course, my own.

<sup>3</sup> Other terms used for this phenomenon are abstract, virtual, and subjective motion.

**Actual motion**

- (2) The dog **ran** into the kitchen.
- (3) Then about 15 minutes later another man **arrived** at Saint Mary's hospital.

**Relative motion**

- (4) I was fascinated at the speed with which the telegraph poles **raced** by.
- (5) After passing through two ... tunnels the road finally **arrives** Ø.

**Pattern-path**

- (6) A thin line of yellow highlighter ink **inched** down my colleague's chin as he pointed to question 9.
- (7) The farmers will sell their land once the road **arrives** Ø.

Note that although they are sometimes easily confused with fictive motion uses, the relative-motion and pattern-path uses are to be distinguished from the fictive uses and will be of secondary interest here.

The second important semantic feature of sentence (1) is that like *come*, *leave*, *depart*, *pass*, and *cross*, the verb *arrive* is a location-oriented motion (LOM) verb. It inherently profiles a location, specifically a Goal, with respect to which the motion is described. Motion verbs like *go*, *hop*, or *zigzag* and many others do not profile a location in the same way. The third respect in which sentence (1) is special is that it exhibits the phenomenon of definite null instantiation (DNI). That is, in (1) the conceptually obligatory Goal location is omitted because it is assumed to be retrievable from the physical context or prior discourse (Fillmore 1986). A fourth noteworthy attribute of sentence (1) is that it has a discourse-given subject referent coded by a definite NP.

That none of the above features is by itself a cause of ungrammaticality or unacceptability is shown by examples (8)-(11), all featuring LOM-verbs.

- (8) After some steep turns the road **arrives** in the valley itself. (+definite subject (def.), +fictive (fict.), -DNI)
- (9) The solution occurred to me right before the examiner **arrived** Ø. (+def., -fict., +DNI)
- (10) A path **arrives** Ø from the south and is joined by a smaller one that heads down an embankment to the river east and below. (-def. +fict., +DNI)
- (11) The slip road **leaves** Ø at an almost 90 degree angle with no deceleration lane. (+def., +fict., +DNI)

The acceptability of sentence (11), headed by the verb *leave*, which profiles a particular Source location, shows that the constellation of features found in (1) is acceptable with at least some location-oriented motion verbs (see section 2.7.).

What then are we to make of the fact that sentences like (1) are not attested? I will argue that, appearances notwithstanding, the lack of attestation of sentences like (1) is owed neither to an unmotivated lexical idiosyncrasy of *arrive* nor to a

constraint imposed by the fictive construal or by any of the other features mentioned above, but rather to the interaction of various factors with the establishment of a point-of-view.

**2. Potential explanations**

What motivation is there to be found for the overall distribution of null instantiation with fictive uses of location-oriented motion verbs? Here I will discuss possible explanations in terms of (1) the frequency of fictive construal, (2) polysemy, (3) aspect, (4) the pragmatic role of the referents, (5) the discourse status of the referents and the discourse function of fictive motion sentences, (6) the discourse status of the referents and the point-of-view of the utterances, and (7) the semantics of the lexical items. I will argue for the importance of the last two factors: the POV of the utterances and the lexical semantics of the predicates.

**2.1. Frequency of fictive construal**

In studying fictive uses of LOM-verbs like *arrive*, two frequency facts are noticeable. First, even including uses with overt location referents, the fictive motion construal itself is relatively rare for verbs such as *arrive*, *leave*, and *cross*, especially in comparison to motion verbs like *zigzag* or *meander*, which inherently specify a particular path-shape. This is illustrated by the counts in (12)

(12) **Frequency of fictive construal (random samples from BNC)**

| Verb type   | Verb lemma | # of fictive (% of fictive) | Sample size |
|-------------|------------|-----------------------------|-------------|
| Self-motion | skip       | 0 (0.0)                     | 89          |
|             | hop        | 1 (1.2)                     | 82          |
| LOM         | arrive     | 0 (0.0)                     | 100         |
|             | enter      | 3 (3.2)                     | 94          |
|             | exit       | 3 (3.3)                     | 91          |
|             | pass       | 15 (10.9)                   | 137         |
|             | cross      | 12 (12.0)                   | 100         |
| Path-shape  | zigzag     | 10 (26.3)                   | 38          |
|             | meander    | 49 (42.2)                   | 116         |
|             | snake      | 48 (48.0)                   | 100         |

That fictive uses of LOM-verbs are rare is also suggested by an examination of sentences randomly sampled from the BNC in which the NP *the road* occurs as the subject of a motion verb. The majority of tokens in the sample (n=115) are contributed by the verbs *lead*, *run*, and *climb* and the frames Cotheme, Self-motion, Motion, and Motion-directional. Only 16 instances belong to the LOM-subtypes Arriving, Departing, and Traversing. Similar results were found for other subject NP candidates such as *the path*, *the highway*, etc.

The second relevant frequency fact is that for location-oriented motion verbs, DNI is in fact much rarer in fictive contexts than in actual-motion contexts. For instance, of 200 uses of the sequence *the highway passes* that were randomly sampled from the Google search engine, none exhibited null instantiation of the Landmark location, whereas in a random sample of actual-motion uses (n=100) of *pass* from the British National Corpus (BNC), 25% of the Landmarks are omitted. Similarly, in a random sample (n=125) of the sequence *the road arrives* taken from the Google search engine, only 7 (5.6%) Goals were omitted, whereas the Goal omission rate among all actual-motion uses of *arrive* is 62.2% in the BNC. And in fact, all 7 uses of *the road arrives* lacking a Goal are instances of the pattern-path use seen in (6) and (7) rather than of the fictive motion use.

Despite these frequency facts, it seems that the oddness of such sentences is not simply due to the rareness with which they are encountered, given that similar sentences such as (10) and (11), which are also rare, seem perfectly acceptable.

## 2.2. Polysemy

One way of accounting for the absence of sentences like (1) is to treat fictive uses, at least of LOM verbs, as cases of polysemy. The fictive-motion use of *arrive* would thus be a different sense from the actual-motion use. As a separate sense, the lexical entry for the fictive sense of *arrive* could require overt instantiation of the Goal location. The analysis of *arrive* would thus be similar to that of *complain*: while the medical sense of *complain* ‘state that one is suffering from a symptom of illness’, disallows DNI, the general sense of *complain* ‘express dissatisfaction or annoyance’, does allow DNI. Example (13) is interpreted rather differently depending on whether the *of*-PP is included or not. Similarly, *win* in (14) can have the sense ‘achieve’ only when occurring with an overt object NP.

- (13) Has a patient ever **complained** (\*of ”feeling hotter” with sunscreens)?  
(14) Our negotiators **won** (\*language that calls for ... a toll-free line).

A polysemy analysis of fictive motion sentences is, however, unsatisfying. First, since fictive motion sentences like (10) are acceptable, it would not be descriptively adequate for a fictive motion sense of *arrive* to require overt instantiation of the Goal location. But, while workable, positing two fictive entries with Goal omissibility conditioned on the discourse status of the Theme seems arbitrary. Second, fictive uses of motion verbs are far too regular and productive to be either polysemous senses or to arise just as patterns of analogical coinage.<sup>4</sup>

## 2.3. Aspect

Unlike actual-motion uses, fictive uses are stative. Maybe stativity makes DNI less acceptable? This is false because there are acceptable fictive uses of LOM-

---

<sup>4</sup> It should be noted, however, that there are specifically fictive verbs such as *taper* and *jut*. Thus, not all fictive motion uses are productively formed from verbs of (actual) motion.

verbs with DNI that differ only in POV, e.g. *A path arrives Ø from the south*. Also, stativity actually goes rather well with DNI omissions (Ruppenhofer 2004).

#### **2.4. Retrievability**

Another attempt at explanation targets the discourse status of the Location rather than its pragmatic role. More specifically, fictive-motion uses of LOM verbs may be constrained to occur only when speakers newly introduce the locations into the discourse, as in (15). Since DNI requires prior mention or contextual accessibility, there are few fictive uses of location-oriented motion verbs with zero locations.

- (15) The Long Range Mountains come into view around Deer Lake. In the island's interior, you pass many small lakes (called "ponds"), rocky outcroppings, and unique ecosystems. The highway **passes** Springdale, Grand Falls, and Bishop's Falls before heading in an easterly direction.

However, given that examples such as *A path arrives Ø from the south* (cf. 10) are attested, this explanation falls short: in these sentences it is the road that is newly introduced while the Goal location is given and highly discourse-active.

#### **2.5. Narrow focus**

Another hypothesis is that most location referents in fictive uses of location-oriented motion verbs are in narrow focus and therefore cannot be omitted due to a general principle barring omission of focal material. However, most of the fictive uses of location-oriented motion verbs are topic-comment rather than narrow-focus predications. Example (15) above, for instance, does not presuppose a propositional function of the form 'The highway passes x' (Lambrecht 1994). An account in terms of narrow focus is therefore not feasible.

#### **2.6. Point-of-view**

As we have seen, general information-structural properties do not explain the absence of fictive uses of LOM-verbs with the Theme's point-of-view (POV). We may now ask whether the problem has to do with the POV that the non-occurring kinds of sentences would have. By POV, I mean the viewing arrangement of the reported fictive motion scene: roughly speaking, whether, in a filmic portrayal, the camera is at the location, attached to the Theme, or external to both.<sup>5</sup>

##### **2.6.1. Actual motion**

In particular, we may hypothesize (1) that only one POV is allowed at any given time and (2) that null complementation with the POV on the Theme is unacceptable because the intended POV on the Theme clashes with the point-of-view on the

---

<sup>5</sup> If one assumes a theory of language that grounds language understanding in mental simulation, as does Embodied Construction Grammar (Bergen & Chang 2005), the choice of camera angle as a translation of linguistic POV seems an apt one.

Goal that is strongly cued by the null instantiation.<sup>6</sup> To evaluate this proposal let us begin by considering the factors that influence POV in actual-motion sentences. The POV assigned to an actual-motion sentence built around *arrive* is influenced by several different factors. One is the presence of cognitive or perceptual predicates in the context that strongly suggest continuity of a particular POV. In (16), an act of perception/cognition by the Theme is reported as coinciding with (and being caused by) the Theme's arrival, suggesting that the arrival is also to be envisioned from the Theme's point-of-view.

- (16) When he **arrived** Ø, he found other boys were in the forest, boys like him, forced from their villages while they were in fields tending cattle.

There need not be any explicit evocation of perception or cognition by a particular participant or external viewer. Certain facts are inherently, or most plausibly within the context, accessible only to particular participants. For instance, in (17), the knowledge that she is at home alone is accessible only to Pethammal at the time of the police's arrival. The viewpoint thus cannot be with the police but has to be that of Pethammal or of an external viewer.

- (17) At least six policemen and a villager forced their way into Pethammal's house. Pethammal was alone sleeping when the policemen **arrived** Ø ...

In addition to the cues above, the choice of NP form type for both the Theme and the Location also contributes to the selection of a POV. Consider the following set of sentences, in which the form-type of the Theme NP is varied.

- (18) A man **arrived** at the house.  
(19) The police **arrived** at the house.  
(20) We **arrived** at the house.

With its indefinite subject, sentence (18) has to be interpreted such that the house is the point-of-view and the man is portrayed as arriving at it. In the consciousness of the viewer at the house, the arriving man is a new entity and has to be encoded accordingly as an indefinite NP. This interpretation follows from Lambrecht's (1994) Principle of the Separation of Reference and Role which says that introducing a referent and simultaneously predicating of it anything other than its existence of presence in a scene, is strongly dispreferred. Using the first person plural *we* as subject, (20), normally has to describe a situation in which the referents of *we* are the point-of-view, since the group includes the speaker. A reading with the POV on the location is possible, for instance, when the sentence is uttered while watching a surveillance video of the house: the speaker may then

---

<sup>6</sup> More strictly speaking, within a mental spaces framework (Sweetser & Fauconnier 1996) we might say that only one POV per mental space is allowed.

### *Fictive Motion: Construction or Construal?*

notice him- or herself among the group of arriving persons. With the NP *the police* as subject, sentence (19) can describe a situation in which the POV is with the police and one in the POV is at the Goal location.

Consider now a set of examples varying the form type of the Goal.

- (21) Five minutes later, John **arrived** at a house.
- (22) Five minutes later, John **arrived** at the house.
- (23) Five minutes later, John **arrived** there.
- (24) Five minutes later, John **arrived**  $\emptyset$ .

With the indefinite NP *a house* as Goal, example (21) requires that the point-of-view follow John and that we discover the house with him. With the NP *the house* as Goal, (22) allows three different readings: John, somebody at the destination, or an external viewer. The last version, (24), with a zero Goal, has the same readings as the version with the Goal NP *the house*. With the adverb *there* as Goal, sentence (23) is most easily interpreted with the POV away from the Goal location and on John or an external viewer. Given the right narrative set-up, a reading with the point-of-view on the Goal location is, however, possible, too.

The sets of examples considered just now suggest that the POV cannot be put on inaccessible referents. Inaccessible referents are frequently encoded by indefinite NPs but note that not all indefinite NPs have inaccessible referents. In particular, generically interpreted indefinite NPs, as in (25), can be interpreted as accessible, given that they refer only to the type rather than a particular instance.

- (25) In this neighborhood, when a policeman **arrives** at a house,
  - a. he'll usually be very worried. (policeman's POV)
  - b. the occupants run as soon as they see him approach. (occupants' POV)

#### **2.6.2. Fictive motion**

Against the background of actual-motion sentences, the missing cases of DNI with fictive motion might now be explained as follows. The road/path or highway itself is not a viable point-of-view since it does not denote a conscious participant or the static location of one. Fictive motion uses often imply a sentient Theme, favorable for point-of-view status, but that Theme is not represented by an overt NP, let alone an argument of the predicate. The implicit Theme thus has very low discourse prominence. By contrast, the location, as a definite zero, has a highly discourse active referent and readily serves as the POV. Under this account, the non-occurring sentences—fictive uses with location DNI and POV on the Theme—are avoided because they would involve a POV clash between the Location and the Theme.

Note that the account given for the unattested sentences is also compatible with cases such as (26) where we have the POV on the implicit Theme at the same time as having a definite Goal location.

- (26) Winding its way around bay after magical bay, the highway **arrives** in Gisborne, where Captain James Cook made ... landfall in 1769.

What is relevant to the POV selection is activation status rather than mere identifiability. In (26), the Goal location is a uniquely identifiable referent but not a discourse-active one. It is thus not a viable POV and the POV of the sentence can be assigned to the implicit Theme. In fact, it seems that the Theme's point-of-view is too weak only when the Goal is a zero-coded referent. When the location is a definitely-coded referent with a prior mention, as in (27), the point-of-view of the implicit Theme can still prevail.

- (27) The trail steeply descends for about 0.8 mile to the road, **crosses** it, evens up and in 0.2 mile reaches Cold Creek Trail.

The activation-status analysis of POV is of course also consistent with pattern-path uses like (28), where the POV is on the Goal location and there is movement of the road surface during construction.

- (28) The farmers will sell their land once the road **arrives**  $\emptyset$ . (=7)

Let us return now to the problem of the missing fictive sentences where location DNI combines with POV on the implicit Theme. Consider examples (29)-(32), which are constructed to suggest a reading with the POV on the Theme.

- (29) The road goes over a dozen bridges before it **arrives** in Oakley.  
(30) The road from here to Oakley crosses a dozen bridges before it **arrives**  $\emptyset$ .  
(31) How do I get to Oakley?  
a. Well, there's a road you could take. It goes over a dozen bridges before it **arrives**  $\emptyset$ .  
b. Well, there's a road you could take. It goes over a dozen bridges before it **arrives**  $\emptyset$ , so you have to pay a lot of toll.  
(32) Where does this road lead to?  
a. It goes to Oakley. You should take a drive there. The road is a lot of fun. It winds through the mountains for miles before it **arrives**  $\emptyset$ .

These sentences are interpretable and, though unfamiliar, they probably are acceptable to most speakers. What is it that makes these sentences acceptable, especially compared to simpler ones like (33)? And why aren't they as readily interpreted as very simple actual-motion sentences such as (34)? (We will ignore here the reading of (33) as a relative-motion sentence where the actual Theme is treated as stationary and the highway intersection as approaching.)

- (33) ?? Get on I80 and stay on it. {The highway/it} **arrives**  $\emptyset$  after two hours.

(34) **I arrived** Ø.

There seem to be two considerations that contribute to the greater acceptability of (30)-(32). First, they seem to be aided by the strong contextual support for a sustained point-of-view of a Theme, who may be generic or an actual person that considers traveling along the path. For instance, evoking the paying of toll or mentioning that the addressee could take the trip help promote the implicit Theme to greater prominence.

Second, note that LOM-verbs are achievements and entail a change of state of the Theme. When such a change is highlighted, the Theme is a likelier point-of-view. The examples above were constructed purely to improve acceptability but unwittingly emphasized the run-up to the Goal through the use of a fictive, durative main verb, with *arrive* in a dependent *before*-clause. Simple assertions like *The road {arrives/arrived} Ø* are difficult to process because they lack any evocation of a Theme. Also, unlike a sentence like *This road goes to San Jose*, such sentences are not plausibly understood as asserting that a road goes by a certain place because such a reading ignores the Theme's transition upon arrival.

## 2.7. Lexical differences

As we have seen, not all LOM verbs act like *arrive*. With *exit* and *leave*, there are attested examples such as (35) and (36) that have a null instantiated Source and that involve fictive motion. These uses seem to be possible because, in the departure case, the Theme's point-of-view overlaps with that of a perceiver at the Source location. With verbs like *arrive* and *come*, this is not possible.

(35) U.S. 23 southbound enters Interstate 75 northbound and continues to the next interchange (Exit 193), where the highway **leaves** [the interstate, JR] in tandem with U.S. 20 to Stony Ridge and Lemoyne.

(36) The road **exits** [the Rouge Valley, JR] into the Pickering side of the Rouge Valley area.

Note incidentally that the difference between *arrive* and *depart* also plays a role with pattern-path uses. While *arrive* and *come* have such uses, *leave* and *depart* seem to lack them. Compare (7) to (37). A parallel asymmetry exists between the verbs *enter* and *exit*.

(7) The farmers will sell their land once the road **arrives** Ø.

(37) ?#The construction workers' camp will be moved south once the road **leaves** Ø.

The explanation for the difference seems to lie in the fact that the events of arrival allow for a higher-level construal of the scene as coming into existence of a road-connection, whereas the beginning of construction or the idea of boundary crossing do not entail a road connection for the relevant locations. Note that the same

difference in interpretational affordances is also observed when verbs of motion are used with actually moving entities.

- (38) The door opened and into the room **walked** a small man.  
(39) ... as I was getting low to get more good air, all of the sudden, out of the room **walked** a big, hairy, smelly, rodent-looking ...

Both (38) and (39) have presentational readings—enforced in fact by the inversion construction. However, the presentational reading requires that the new referent is newly apprehended and therefore the POV must be inside the room in (38) and outside in (39). Sentence (39) thus differs from (37) in that the crossing of the portal by the creature entails its appearance as a new arrival on the outside whereas in the case of the road neither the road as a whole nor the most recently constructed part has left one place to appear at another. Finally, if we present events of a person entering or exiting a room with the point-of-view inside the room, then only the former case has a presentational reading. Disappearances and departures cannot be ‘presented’ in the same way as appearances and arrivals.<sup>7</sup>

- (39) All of a sudden a man **entered** Ø.  
(40) #All of a sudden a man **left** Ø.

When used fictively, LOM verbs differ not only from each other but also from other motion verbs. Fictive motion simulates generic travel and generally no specific purposes and significant state changes of the implicit Theme are simulated, which conflicts with the normal use of LOM-verbs like *arrive* and *leave*. These verbs inherently imply a change of state and when it can be evoked in context, the fictive motion reading is improved (see section 2.6.2). Also, to the extent that fictive motion uses ascribe properties to paths, it seems that while path shape is readily ascribed to a fixed path, particular way points along the path are not readily seen as starting and end points for segments of potential travel.

Finally, I want to consider the question of whether the missing fictive sentences with LOM-verbs are tied specifically to these verbs’ lexical class membership or if we find similar gaps in available interpretations when we combine path-shape or manner verbs with PPs denoting Goal, Source, or intermediate Landmark locations. Sentences (41) and (42) represent clear cases of referent accessibility and POV interacting. Example (43) is the crucial test case for whether the incompatibility between fictive construal and mention of a bounding location such as Goal, Source, or intermediate Landmark exists at the compositional clausal level or at the level of the lexical predicate. In other words, the question is whether (43) can be used with the point-of-view of an implicit Theme.

---

<sup>7</sup> Sentence (40) may have a presentational reading when imagined against the background of seeing the person leave but not in the context of noticing a previously filled seat.

- (41) A road **meanders** through the forest.
- (42) The road **meanders** through a forest.
- (43) The road **meanders** through  $\emptyset$ .

A web-search for *[tT]he road meanders through* yielded 1 instance among 200 matches in which the Landmark of the preposition was missing.

- (44) ... journey up into the High Atlas Mountains, traveling through very dramatic and rocky mountain scenery. The road **meanders** through  $\emptyset$  to the spectacular Tizi n' Tichka pass before dropping into Marrakesh.

Note, however, that in (44) there is an overtly specified Goal present in the form of a *to*-PP, reinforcing the POV of the implicit Theme. Inspection of 200 cases of *the road crosses  $\emptyset$*  and did not yield any cases where the POV was on the road with the Landmark location null-instantiated. Likewise, among 115 instances of *the road meanders past*, there were none that had a POV on the road and a null-instantiated Landmark. Given the available corpus evidence, there is thus some reason to believe that fictive uses in which path-shape verbs combine with a Goal, Source, or intermediate Landmark behave just like sentences with LOM-verbs when it comes to the need for a single consistent POV.

### 3. Conclusion

Location null-instantiation is possible when location-oriented motion verbs are used in actual-motion contexts. There, null-instantiated locations do not have to serve as the point-of view, leading one to expect that in fictive motion contexts the POV of the implicit Theme should be available when the location is null instantiated. However, in fact, location-oriented motion verbs readily only have fictive motion uses with zero locations when the point-of-view is at the location.

Made-up sentences such as (30)-(32) which contain fictive uses of verbs like *arrive* that have the implicit Theme as the POV do not seem incomprehensible or ungrammatical. However, such sentences do not seem to occur in the wild. The absence of such sentences cannot be derived in terms of the pragmatic properties of the road and location referents. Rather, a central part of the explanation seems to lie in the low activation status of the implicit Theme and the idea that the Theme and the location are competing for the status as sole point-of-view. The paucity of fictive motion uses of location-oriented motion verbs is then explained as a consequence of the low discourse accessibility of the implicit Themes. In fictive motion sentences, Themes make poor points-of-view and become acceptable only (1) in contexts where the point-of-view of the Theme and the Location accidentally overlap, as with verbs of departure, (2) contexts in which the Location is not highly discourse-active, in particular, when it is discourse-new, or (3) contexts in which the idea of a generic or potential Theme is particularly strongly evoked, also emphasizing their transition from moving to arriving.

On this account, positing polysemous verb senses or stipulating a construction requiring overt instantiation of the location in order to block DNI with POV on the Theme is not necessary. That sentences such as *The road arrived Ø* are rare or unattested thus has a similar explanation to the fact that sentences such as *A man arrived Ø* are hard to contextualize when the POV is assumed to be on the Theme.

The difference between location-oriented motion verbs and path-shape incorporating ones then consists in the former having an obligatory location argument that is competing with the implicit Theme for point-of-view status. When verbs like *zigzag* or *snake* are used without any overt location element, be it a Goal, Source, or Landmark, the Theme is the only available point-of-view; but with *arrive* and *leave*, the Goal and Source are always available as points of view.

Finally, with respect to methodology, this paper illustrates that very low corpus frequency of a phenomenon may be due to the rarity of occasions for using it rather than specific principles or constructions blocking them. The data considered here also show that we need refined theories of activation, and especially of POV to recognize the limits of their applicability.

## References

- Bergen, Benjamin K., and Nancy C. Chang. 2005. Embodied Construction Grammar in Simulation-based Language Understanding. In Jan-Ola Östman and Mirjam Fried, eds., *Construction Grammar(s)*, 147-190. Amsterdam/Philadelphia: John Benjamins.
- Fillmore, Charles J. 1986. Pragmatically Controlled Zero Anaphora. *Berkeley Linguistics Society* 12:95–107.
- Lambrecht, Knud. 1994. *Information Structure and Sentence Form*. New York, N.Y.: Cambridge University Press.
- Matlock, Teenie. 2004a. The Conceptual Motivation of Fictive Motion. In Günther Radden and Klaus Uwe Panther, eds., *Studies in linguistic motivation*, 221–248. Berlin: Mouton de Gruyter.
- Matlock, Teenie. 2004b. Fictive Motion as Cognitive Simulation. *Memory & Cognition* 32:1389–1400.
- Matsumoto, Yo. 1996. Subjective Motion and English and Japanese vVrbs. *Cognitive Linguistics* 7:183-226.
- Ruppenhofer, Josef, 2004. The Interaction of Valence and Information Structure. Ph.D. diss., University of California, Berkeley.
- Sweetser, Eve, and Gilles Fauconnier, eds. 1996. *Spaces, Worlds, and Grammar*. Chicago: University of Chicago Press.
- Talmy, Leonard. 2000. *Toward a Cognitive Semantics*, volume I: Concept Structuring Systems. Cambridge, MA: MIT Press.

*Fictive Motion: Construction or Construal?*

Josef Ruppenhofer  
Institut für Informationswissenschaft und Sprachtechnologie  
Universität Hildesheim  
Marienburger Platz 22  
D-31141 Hildesheim

[josef.ruppenhofer@uni-hildesheim.de](mailto:josef.ruppenhofer@uni-hildesheim.de)



# The Syntax of Floating Intensifiers in Polish and its Implications for the Determiner Phrase Hypothesis<sup>1</sup>

PAWEŁ RUTKOWSKI

*Warsaw University/Yale University*

## 0. Introduction

In this paper, I will attempt to show that the Polish word *sam* ('himself', an adjectival modifier) should be interpreted as a "floating intensifier" – a term I base on the parallel with so-called floating quantifiers (cf. Sportiche 1988). The surface syntactic position of the intensifier *sam* with respect to personal pronouns and nouns can serve as evidence as to the applicability of the Determiner Phrase hypothesis to Polish. I propose a generative analysis of why the adjective *sam* can appear both adnominally and adverbially, and how its position influences the scope of intensification.

## 1. Noun/Pronoun Asymmetries in Polish: N-to-D Movement

It has been proposed in the generative literature on nominal syntax (see, e.g., Willim 2000), that the lack of articles makes Abney's (1987) DP hypothesis inapplicable to languages such as Polish. Following the analysis of Serbian proposed by Progovac (1998), Rutkowski (2002b) argues that Polish nominal expressions must be analyzed as DPs at least in one case, namely when they include a personal pronoun. In this section, I will give a brief overview of this line of reasoning. The crucial observation made by Progovac (1998) and Rutkowski (2002b) is that nouns and personal pronouns occupy different surface syntactic slots in a number of nominal expressions in Serbian and Polish.

---

<sup>1</sup> For many useful comments on various aspects of this paper, I am indebted to Samuel D. Epstein, Jan Fellerer, Jadwiga Linde-Usiekiewicz, Giuseppe Longobardi, Paweł M. Nowak, Ljiljana Progovac, Marek Świdziński, Corey Yoquelet, and the audience at BLS 32. Earlier versions of this analysis were presented at the Annual Conference of the British Association for Slavonic and East European Studies (2004, Cambridge, UK), the 15th Colloquium on Generative Grammar (2005, Barcelona, Spain), the University of Michigan at Ann Arbor, Wayne State University, and Warsaw University. I would like to thank all these audiences for helpful feedback. The research reported here was partially supported by grants awarded by the Kosciuszko Foundation, the Foundation for Polish Science (FNP) and the Polish-American Fulbright Commission.

**2.1. Pron Adj vs. Adj Noun**

Progovac (1998) shows that Serbian personal pronouns can never be pre-modified by adjectives. The only possibility of modification is to put the adjective in postposition:

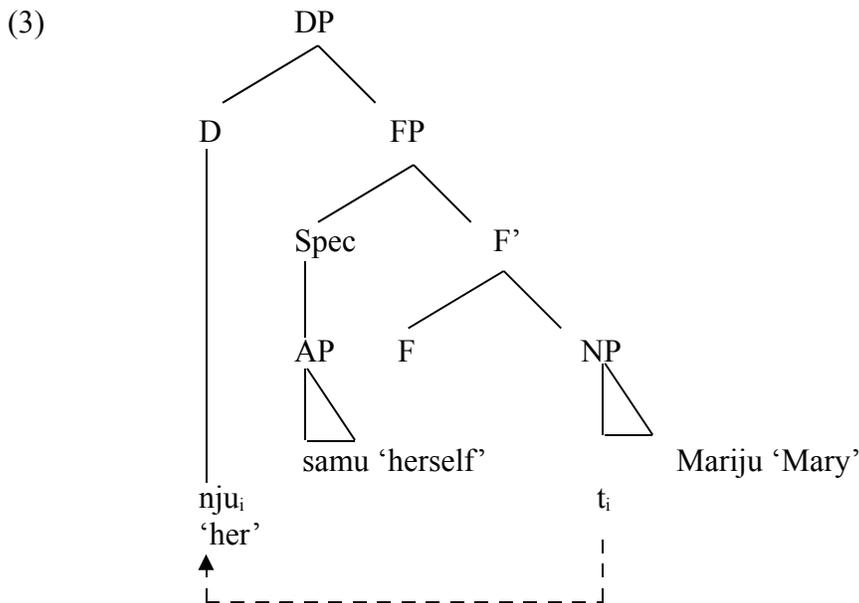
(1a) I [nju samu] to nervira.  
 and her herself that irritates  
 ‘That irritates even her.’

(1b) \*I [samu nju] to nervira.  
 and herself her that irritates

On the other hand, regular nouns (including proper names) always follow their adjectival modifiers:

(2) I [samu Mariju] to nervira.  
 and herself Mary that irritates  
 ‘That irritates even Mary.’

Progovac (1998) shows that such noun/pronoun asymmetries find a principled explanation if the DP hypothesis is assumed. Following the idea put forward by Postal (1969), many researchers analyze personal pronouns as occupying the D node. Progovac (1998) proposes a more complex derivation: according to her, pronouns originate in N (similarly to regular nouns) and are raised to D for referential reasons (cf. also Cardinaletti 1994). Therefore, they precede modifying adjectives in surface syntax (adjectives are specifiers in a functional projection located in the region in between DP and NP).



If adjectives are taken to reside in the specifier of a functional projection above the noun, the personal pronoun arguably moves to the head of that projection first (so that the features of the adjectives can be checked – cf., e.g., Cinque 1994) and then to the D node. Therefore, the diagram in (3) (as well as other diagrams in the present paper) is a simplified illustration of the N-to-D movement of personal pronouns.

Interestingly, Polish exhibits a pattern of noun/pronoun asymmetries which is exactly parallel to the Serbian one shown in (1-2):

- (4a) [On sam] nas irytuje.  
he himself us irritates  
'He himself irritates us.'
- (4b) \*[Sam on] nas irytuje.  
himself us irritates
- (5) [Sam dyrektor] nas irytuje.  
himself director us irritates  
'The director himself irritates us.'

Rutkowski (2002b) adopts the analysis proposed by Progovac (1998) and extends it by showing that similar cases of noun/pronoun asymmetries are not limited to structures with adjectives. As will be discussed below, various kinds of Polish modifiers must follow personal pronouns, although they normally precede nouns. Such DP-internal word order facts support the view that Polish must be a DP-type language, although it lacks overt articles (Veselovská (2003) and Franks and Pereltsvaig (2004) present similar accounts of Czech and Russian, respectively). It should be noted that the N-to-D analysis of the syntax of personal pronouns does not imply that all nominal expressions in languages such as Polish must be considered DPs. Following Longobardi (1994), I assume that the DP layer is necessary for argumenthood. However, if a nominal expression is not an argument, no functional structure needs to be projected above the NP level. Longobardi (2006) provides an interesting argument for the lack of the DP layer in certain non-argumental positions. He points out that personal pronouns surface post-adjectivally in exclamations such as the following:

- (6) Poveri noi!  
poor we  
'Poor us!'

Longobardi (2006) interprets the whole exclamation as a bare NP. This analysis is confirmed by the fact that no determiners can be used in such constructions:

- (7a) Povero cane!  
 poor dog  
 ‘Poor dog!’
- (7b) ?\*Povero il cane!  
 poor the dog

Longobardi (2006) suggests that example (6) receives a straightforward explanation if the personal pronoun is analyzed as occupying N. Thus, there seems to be no N-to-D raising in this case. Interestingly, certain exclamations in Polish do not seem to involve the raising of pronouns either:

- (8a) Cały ty!  
 whole you  
 ‘It’s so typical of you!’
- (8b) \*Ty cały!  
 you whole
- (9) Cały Cezary!  
 whole Cezary  
 ‘It’s so typical of Cezary!’

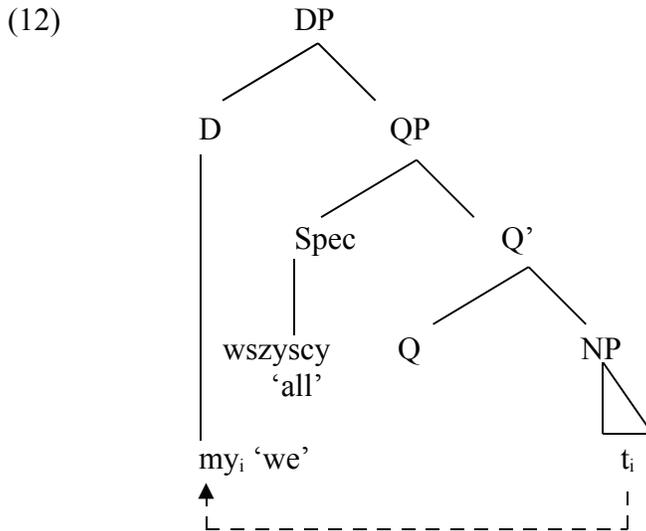
The word *cały* ‘whole’ is an adjective that agrees with the (pro)noun. The above examples seem to support the idea that non-arguments are not necessarily DPs in Polish. When they are bare NPs, personal pronouns must surface in N, so their overt syntactic position is not different from the one occupied by regular nouns – cf (9).

## 2.2. Pron Q vs. Q Noun

The assumption that the surface position of personal pronouns is in D finds confirmation in the following data:

- (10a) [My wszyscy] cię irytujemy.  
 we all you irritate  
 ‘All of us irritate you.’
- (10b) \*[Wszyscy my] cię irytujemy.  
 all we you irritate  
 ‘All of us irritate you.’
- (11) [Wszyscy lingwiści] cię irytują.  
 all linguists you irritate  
 ‘All linguists irritate you.’

The quantifier *wszyscy* ‘all’ follows personal pronouns in Polish, but precedes regular nouns. Independently from its position, *wszyscy* always exhibit agreement with the quantified noun/pronoun, therefore, it seems justified to analyze it as located in the specifier of a functional head above the NP (case, gender, and number agreement being an instance of spec-head relation, cf. Rutkowski 2002a). The quantified element is always base generated in N, however, if it is a personal pronoun, its strong referentiality makes it move to D. The following figure illustrates the internal structure of Polish expressions with the general quantifier *wszyscy* (cf. Rutkowski 2002b):



The syntactic configuration shown in (12) supports the model outlined in Section 2.1. Since personal pronouns are strongly referential, they must be raised to D (N-to-Q is most likely the first step of this movement, however this issue does not influence the analysis I argue for). Therefore, they precede quantifiers in surface syntax.

### 2.3. Pron Num vs. Num Noun

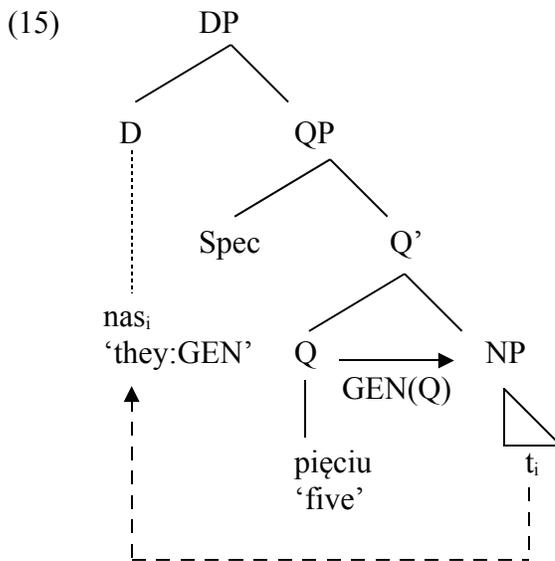
The syntax of cardinal numerals is another instance of noun/pronoun asymmetries in Polish. Similarly to adjectives and quantifiers, numerals normally precede nouns, but follow pronouns:

(13a) [Nas pięciu] cię irytuje.  
 we:GEN five you irritate  
 ‘Five of us irritate you.’

(13b) \*[Pięciu nas] cię irytuje.  
 five we:GEN you irritate

- (14) [Pięciu lingwistów] cię irytuje.  
 five linguists:GEN you irritate  
 ‘Five linguists irritate you.’

The above structure is even more interesting than those presented in Sections 2.1 and 2.2 because it provides a very clear argument for the claim that personal pronouns are base generated in N. It should be noted that, as shown in (14), numerals such as *pięć* ‘five’ assign genitive to the following noun. Since the pronoun in (13a) is also marked genitive, it must be analyzed as merged inside the NP and then raised to D. The derivation of (13a) is illustrated below:



If the pronoun were base generated in D, the genitive assignment would not be possible (GEN(Q) is assigned locally, i.e. within the QP; see Rutkowski 2002a, for a detailed discussion of the syntax of Polish QPs).

### 3. The Phenomenon of *sam*-float

In Section 2, I have shown that Polish personal pronouns differ from nouns in terms of their surface syntactic position. The fact that there are many expressions in which modifiers such as adjectives, numerals or quantifiers follow pronouns suggests that the latter are raised to D. This, in turn, is a strong argument for the DP analysis of Polish nominals. However, the N-to-D model presented in the previous section seems to be questioned by examples such as the following:

- (16) Dyrektor sam nas irytuje.  
 director himself us irritates  
 ‘The director irritates us himself.’

In (16), the element *sam* is apparently admitted to the right of the head noun. This should not be allowed because Polish nouns, unlike personal pronouns, are not raised to D in overt syntax. If it was really the case that adjectives may surface post-nominally, the noun/pronoun asymmetries described in the first part of this paper could not be treated as clear evidence for the DP model. However, in what follows I will argue that the element *sam* in (16) is not part of the subject DP in surface syntax. This analysis finds support in the fact that interrupting/parenthetical expressions cannot separate the post-nominal *sam* from the verbal complex. As illustrated in (17d), if *sam* surfaces post-nominally, its position seems adverbial. On the other hand, example (17c) shows that *dyrektor sam* ‘director himself’ is not a syntactic constituent (as opposed to *sam dyrektor* ‘himself director’ in (17a) or *on sam* ‘he himself’ in (17b)). I conclude that the post-nominal *sam* surfaces outside of the subject DP in examples such as (17d). Instead, it belongs to the verbal complex.

- (17a) Sam dyrektor, jak wiemy – człowiek inteligentny, czytał mój artykuł.  
himself director as all we know man very intelligent read my article  
‘The director himself, as we know – an intelligent person, read my article.’
- (17b) On sam, jak wiemy – człowiek inteligentny, czytał mój artykuł.  
he himself as all we know man very intelligent read my article  
‘He himself, as we all know – a very intelligent person, read my article.’
- (17c) \*Dyrektor sam, jak wiemy – człowiek inteligentny, czytał mój artykuł.  
director himself as all we know man very intelligent read my article
- (17d) Dyrektor, jak wiemy – człowiek inteligentny, sam czytał mój artykuł.  
director himself as all we know man very intelligent read my article  
‘The director, as we know – an intelligent person, read my article himself.’

König and Siemund (1999) call elements such as *selbst* in German, *x-self* in English or *x-même* in French *intensifiers*. They point out that, cross-linguistically, intensifiers often have at least two uses: an adnominal one and an adverbial one (see (18) and (19), respectively):

(18) I would like to talk to the director himself.

(19) The director wrote that speech himself.

Many languages further differentiate between two distinct adverbial uses: an exclusive one (with the interpretation ‘alone’/‘without help’), as illustrated in (20), and an inclusive one (‘too’), as illustrated in (21).

(20) The director repaired that car himself.

(21) I had a car like that myself.

It seems that the three uses of intensifiers distinguished by König and Siemund (1999) are also available in Polish:

(22) [Sam dyrektor] może przyjąć nas jutro. [adnominal]  
himself director can receive us tomorrow  
'The director himself can receive us tomorrow.'

(23) Dyrektor [sam nareperował ten samochód]. [adverbial, exclusive]  
director himself repaired this car  
'The director repaired that car himself.'

(24) Dyrektor [sam miał taki samochód]. [adverbial, inclusive]  
director himself had such car  
'The director had a car like that himself.'

If we adopt König and Siemund's (1999) analysis saying that the uses of *sam* shown in (23-24) are adverbial (this is illustrated above with appropriate bracketing), it becomes clear why they do not exhibit the pattern of noun/pronoun word order asymmetries exemplified in (4-5). It is only in the adnominal use shown in (22) that the element *sam* is actually part of the DP.

Surprisingly, the adverbial intensifier *sam* in structures such as (23-24) manifests adjectival behavior in terms of case, gender and number agreement with the head noun:

(25) Mój ojciec sam miał taki samochód.  
my father himself had such car  
'My father had a car like that himself.'

(26) Moja matka sama miała taki samochód.  
my mother herself had such car  
'My mother had a car like that herself.'

*The Syntax of Floating Intensifiers in Polish*

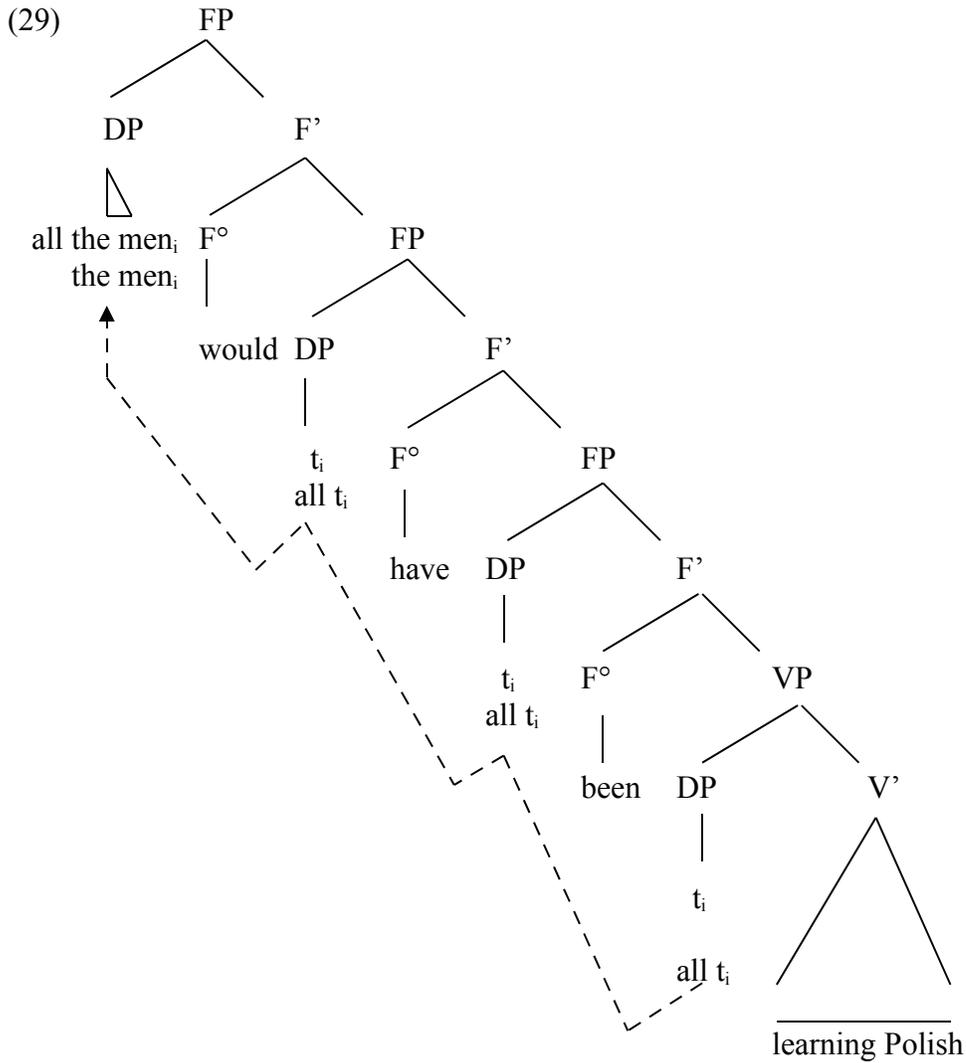
Moreover, the element *sam* has to agree with the subject independently from its surface position inside the verbal complex:

- (27a) [Moja żona] [sama będzie jutro reperować ten samochód].  
 my wife herself will tomorrow repair this car
- (27b) [Moja żona] [będziesama jutro reperować ten samochód].  
 my wife will herself tomorrow repair this car
- (27c) [Moja żona] [będziejutro sama reperować ten samochód].  
 my wife will tomorrow herself repair this car  
 ‘Tomorrow, my wife will repair that car herself.’

The pattern presented above seems intriguingly similar to the one exhibited in many languages by so-called floating quantifiers (cf. Puskas 2002, Bobaljik 2003):

- (28a) Tous les architectes ont réalisé un projet.  
 All the architects have realized a project
- (28b) Les architectes ont tous réalisé un projet.  
 the architects have all realized a project
- (28c) Les architectes ont réalisé tous un projet.  
 the architects have realized all a project.  
 ‘All the architects realized a project.’

Sportiche (1988) accounts for the data in (28) by arguing that quantifiers such as *tous* ‘all’ are always base generated in the DP-initial position. He further assumes that the structure in which the sentential subject occupies the specifier of IP is derived from the underlying structure in which the subject is VP-internal. As the subject moves up from its base position (in a step-wise, head-to-head fashion), it leaves traces. Sportiche (1988) interprets the phenomenon of Q-float as the stranding of the quantifier in a position adjacent to the trace of the subject DP. This is illustrated below: the phrase-marker in (29) corresponds to examples (30a-d), the label *FP* standing for any verbal functional projection:

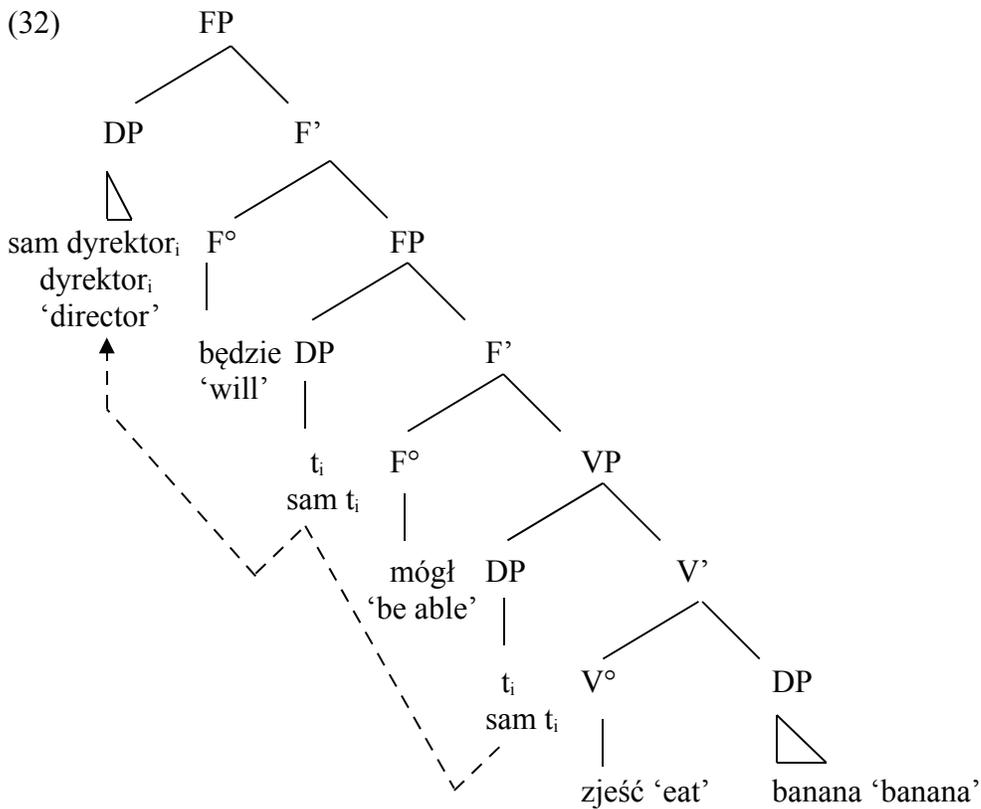


- (30a) All the men would have been learning Polish.
- (30b) The men would all have been learning Polish.
- (30c) The men would have all been learning Polish.
- (30d) The men would have been all learning Polish.

I argue that Sportiche’s (1988) analysis could also be used to account for the phenomenon of *sam*-float shown in (27). The intensifier *sam* is always base generated as a modifier of the subject noun (hence the adjectival agreement). Subsequently, the subject moves from its base (VP-internal) position to Spec-IP. Thus, the variations of surface word order shown in (31) are all derived from structure (32):

*The Syntax of Floating Intensifiers in Polish*

- (31a) Sam dyrektor będzie mógł zjeść banana.  
 himselfdirector will be-ableeat banana  
 ‘The director himself will be able to eat a banana.’
- (31b) Dyrektor będzie sam mógł zjeść banana.  
 director will himselfbe-ableeat banana  
 ‘The director will himself be able to eat a banana.’
- (31c) Dyrektor będzie mógł sam zjeść banana.  
 directot will be-ablehimselfeat banana  
 ‘The director will be able to eat a banana himself.’



If the intensifier *sam* is stranded within the VP, its interpretation must be ‘exclusive’; if it is stranded above the VP it becomes a marker of ‘inclusiveness’; if no stranding occurs, the only available interpretation is the adnominal (focalizing) one.

It should be noted that the stranding analysis outlined above is supported by the fact that neither the floating quantifier in (30) nor the floating intensifier in (31) can appear more than once in one sentence:

- (32) \*All the men would all have been learning Polish.

- (33) \*Sam            dyrektor        będzie sam            mógł zjeść  
         himselfdirector        will        himselfbe-ableeat  
         banana.  
         banana

Example (33) clearly indicates that the adnominal *sam* and the adverbial *sam* cannot be merged independently.

#### 4. Conclusion

I conclude that the DP analysis of Polish nominals (as presented in Section 2) is not disproved by the fact that the intensifier *sam* may surface postnominally. Neither does it seem necessary to assume that there are multiple lexical entries for the intensifier *sam* (an adnominal one and an adverbial one). *Sam* is always base generated as a DP-internal adnominal modifier, but it does not have to end up in the surface position of the subject it belongs to. When the intensifier is stranded, its interpretation changes to what König and Siemund (1999) call ‘inclusive’ or ‘exclusive’. It should also be added that the phenomenon of *sam*-float is possible only because floated intensifiers do not yield the same interpretation as non-floated ones (otherwise, floating would be redundant).

#### References

- Abney, Steven P. 1987. *The English Noun Phrase in its Sentential Aspect*. Ph.D. diss., MIT.
- Bobaljik, Jonathan David. 2003. *Floating Quantifiers: Handle with Care*. In Lisa Cheng and Rint Sybesma, eds., *The Second Glot International State-of-the-Article Book. The Latest in Linguistics*, 107-148. Berlin, New York: Mouton de Gruyter.
- Cardinaletti, Anna. 1994. *On the Internal Structure of Pronominal DPs*. *The Linguistic Review* 11:195-219.
- Cinque, Guglielmo. 1994. *On the Evidence for Partial N Movement in the Romance DP*. In Guglielmo Cinque, Jan Koster, Jean-Yves Pollock, Luigi Rizzi, and Raffaella Zanuttini, eds., *Paths towards Universal Grammar: Studies in Honor of Richard S. Kayne*, 85-110. Washington, D.C.: Georgetown University Press.
- Franks, Steven. 1995. *Parameters of Slavic Morphosyntax*. New York, Oxford: Oxford University Press.
- Franks, Steven, and Asya Pereltsvaig. 2004. *Functional Categories in the Nominal Domain*. In Olga Arnaudova, Wayles Browne, Maria Luisa Rivero, and Danijela Stojanović, eds., *Formal Approaches to Slavic Linguistics: the Ottawa Meeting 2003*, 109-128. Ann Arbor: Michigan Slavic Publications.
- König, Ekkehard, and Peter Siemund. 1999. *Intensifiers as Targets and Sources of Semantic Change*. In Klaus von Heusinger and Regine Eckardt, eds., *Meaning*

*The Syntax of Floating Intensifiers in Polish*

- Change – Meaning Variation*, 97-109. Konstanz: Fachgruppe Sprachwissenschaft, Universität Konstanz.
- Longobardi, Giuseppe. 1994. Reference and Proper Names: A Theory of N-Movement in Syntax and Logical Form. *Linguistic Inquiry* 25:609-665.
- Longobardi, Giuseppe. 2006. Reference to Individuals, Person, and the Variety of Mapping Parameters. Ms., Università di Trieste.
- Postal, Paul M. 1969. On So-called 'Pronouns' in English. In: David A. Reibel and Sanford A. Schane, eds., *Modern Studies in English: Readings in Transformational Grammar*, 201-224. Englewood Cliffs, NJ: Prentice-Hall.
- Progovac, Ljiljana. 1998. Determiner Phrase in a Language without Determiners. *Journal of Linguistics* 34:165-179.
- Puskas, Genoveva. 2002. Floating Quantifiers: What They Can Tell Us about the Syntax and Semantics of Quantifiers. *Generative Grammar in Geneva* 3:105-128.
- Rutkowski, Paweł. 2002a. The Syntax of Quantifier Phrases and the Inherent vs. Structural Case Distinction. *Linguistic Research/Recherches linguistiques* 7(1):43-74.
- Rutkowski, Paweł. 2002b. Noun/Pronoun Asymmetries: Evidence in Support of the DP Hypothesis in Polish. *Jezikoslovlje* 3(1-2):159-170.
- Sportiche, Dominique. 1988. A Theory of Floating Quantifiers and Its Corollaries for Constituent Structure. *Linguistic Inquiry* 19:425-449.
- Veselovská, Ludmila. 2003. A Note about Nothing. In Peter Kosta, Joanna Błaszczak, Jens Frasek, Ljudmila Geist, and Marzena Żygis, eds., *Investigations into Formal Slavic Linguistics: Contributions of the Fourth European Conference on Formal Description of Slavic Languages – FDSL IV*, Vol. 2, 745-758. Frankfurt am Main: Peter Lang.
- Willim, Ewa. 2000. On the Grammar of Polish Nominals. In Roger Martin, David Michaels, and Juan Uriagereka, eds., *Step by Step: Essays on Minimalism in Honor of Howard Lasnik*, 319-346. Cambridge, MA: MIT Press.

Department of General Linguistics and Baltic Studies  
Katedra Językoznawstwa Ogólnego i Bałtystyki  
Wydział Polonistyki, Uniwersytet Warszawski  
ul. Krakowskie Przedmieście 26/28  
00-927 Warszawa  
Poland

p.rutkowski@uw.edu.pl



## Compromising Positions and Polarity Items

WILLIAM SALMON  
*Yale University*

### 0. Introduction

This paper looks at two theories of negative polarity licensing that utilize the notion of strength or strengthening to explain NPI distribution. I consider Kadmon and Landman (1993) and Israel (1996, 2001, 2005), both of whom define strength in terms of downward inferencing relations.

I claim that various compromising adverbs such as *pretty much*, *virtually*, *practically*, etc., disrupt this pragmatic inferencing and so raise problems for theories depending on this type of motion. Taking *pretty much* as a test case, I suggest that the compromising data can be accounted for by the semantic notion of (non)veridicality, as demonstrated in Giannakidou (1998, 1999, 2002, etc.). In the rest of the paper then, I will illustrate the problems the compromisers raise first for Kadmon and Landman (K&L) and then Israel. The last section shows how the (non)veridicality theory of Giannakidou successfully manages the data.

First, however, it is necessary to make some general remarks in regard to the meaning and use of *pretty much*. As a compromiser or otherwise, *pretty much* has rarely been mentioned in linguistic literature. However, the approximator *almost*, which has a similar (though not identical) semantics and distribution has received much attention over the years (Sadock 1981, Rapp and von Stechow 1999, Horn 2002, Morzycki 2002, etc.). In the next section, I will provide a brief introduction to the semantics and syntax of *pretty much* as they compare with *almost*.

### 1. Meaning and Use of *Pretty Much*

There are at least two uses of *pretty much*, which might not be totally distinct from one another. Use 1 is a speaker-oriented hedge, which normally requires a parenthetical pause to set it apart from the sentence it modifies. As with most hedges this use can occur before or after almost any constituent, and it makes a comment on the speaker's commitment to that particular element or to what is said generally: i.e., it can take wide or narrow scope. Importantly, this use almost always requires a parenthetical pause.

- (1) USE 1: speaker-oriented hedge that does not contribute to semantic truth conditions. Requires parenthetical pause.

The arrows in (2) indicate possible hedge sites (though the longer the parenthetical pause the more versatile the hedge becomes), and the scope can often be predicted by its location—though again, not always. This use does not seem to contribute to the semantic truth conditions, and I will consider two diagnostics in §1.5 in support of this suggestion.

- (2) ^Rikki ^saw ^all his friends ^in Georgia ^last summer ^. (Use 1)

Use 2, however, is fully integrated into the syntactic structure: it does not require a parenthetical pause. I suggest Use 2 does contribute to semantic content. And, we see in (4) that its distribution is much more limited than the speaker hedge in Use 1.

- (3) USE 2: Compromising adverb that does contribute to truth conditions. No parenthetical pause is required. It is fully integrated to the syntax, as in (4):

- (4) Rikki ^saw ^all his friends in Georgia last summer. (Use 2)

Non-pause *pretty much* (Use 2) does not generally appear sentence initial, as in (5a-b), unless it is restricting a universal quantifier, as in (5c). Use 1 is fine sentence initial in (5d-e).

- (5) a. \*Pretty much someone stole the crown jewels. (Use 2)  
b. \*Pretty much Bret ate all the meat. (Use 2)  
c. Pretty much everyone left the party early. (Use 2)  
d. Pretty much, someone stole the crown jewels. (Use 1)  
e. Pretty much, Bret ate all the meat. (Use 1)

Use 2 does not generally occur immediately below negation as in (6a), but it is okay with a bit more distance (6b). Use 1 is fine immediately below negation in (6c) or at a distance in (6d).

- (6) a. \*Gene didn't pretty much see anyone. (Use 2)  
b. Gene didn't see pretty much anyone. (Use 2)  
c. Gene didn't, pretty much, see anyone. (Use 1)  
d. Gene didn't see, pretty much, anyone. (Use 1)

From here on, I will be interested only in *Use 2*, or the one that is fully integrated to the syntax and contributes semantic content.

### 1.1. What *Pretty Much* Modifies

*Pretty much*, like *almost*, can function as a verbal modifier or a nominal modifier, as in (7a) and (7b), respectively. I will rely on both the nominal and verbal modifiers throughout this paper, but primarily so on the verbal modifier.

As a nominal modifier, *almost* prefers to restrict universals, as in (7b), and so has been used as a diagnostic for universal quantification (Carlson 1981, but see Horn 2005 for an alternate view). In (7b) we see *pretty much* prefers universals as well. In (7b') the existential *someone* is difficult for both *pretty much* and *almost*.

- (7) a. Rod {pretty much/almost} won the race.  
b. {Pretty much/almost} everyone left the party early.  
b'. \*{Pretty much/almost} someone left the party early

In (7c), in which *anyone* would seem to require an existential reading under the negation, *almost* appears to be unacceptable. Examples such as (7c) have a long history of “ungrammaticality”, dating at least to Horn (1972), Carlson (1981), and others over the last three decades. (But see Horn 2005 for numerous examples that suggest this construction is more acceptable than previously thought.)

- (7) c. (\*)I didn't talk to almost anyone.  
c'. \*I didn't almost talk to anyone.

*Pretty much* in the same position appears to be less controversial. In (7d) it straightforwardly modifies *anyone* under negation. However, in (7e) it is less acceptable directly under negation, as is *almost* above in (7c').

- (7) d. I didn't talk to pretty much anyone.  
e. \*I didn't pretty much talk to anyone.

I'll return to examples like (7d) a bit more in §2.1, as they will be useful in arguing against Chierchia (2004), who proposes a theory of NPI licensing based on an extension of K&L, but with a more rigid scope definition.

### 1.2. Scalar Positions of *Pretty Much* and *Almost*

*Pretty much* seems to occupy a point or range of points nearer the endpoint of the relevant scale than does *almost*. In (8a) *almost* suggests completion of Sid's dissertation is close, but that it clearly has not been achieved.

- (8) a. Sid has almost finished his dissertation.

In (8b) *pretty much* also suggests completion is close, but there is the further suggestion that ultimate completion could hinge on something other than Sid's not having finished writing the dissertation.

- (8) b. Sid has pretty much finished his dissertation.

A likely explanation for this is that *pretty much* suggests a point nearer the scalar endpoint than does *almost*: <pretty much, almost, not quite, halfway, etc.>. So in an ordering of steps to ‘dissertation completion’,<sup>1</sup> *almost finished* might allow one to still be in the writing process, while *pretty much finished* might extend from the final stages of writing to the post-writing administrative tasks of dissertation completion, as in (8c) where Sid has finished writing his dissertation but has yet to defend or file it.

- (8) c. Sid is pretty much finished with his dissertation, now he just has to defend it.

In (8d) with *almost*, it seems odd to continue with the exception of Sid having to defend the dissertation. For comparison, *not quite* seems even worse in this example.

- (8) d. # Sid is {almost, not quite} finished with his dissertation, now he just has to defend it.

The difference in scalar positions is supported by Horn’s (1972) diagnostic for quantitative scales, in which the conjunction *in fact* requires the second conjunct to make a stronger claim than the first.

- (9) a. Johnny almost won the race, in fact he pretty much did win it.  
b. # Johnny pretty much won the race, in fact he almost did win it.

One final example suggesting the differing scalar locations is adapted from Horn (2002).

- (9) c. Republicans would concede that Gore almost won the 2000 election, but most would deny that he pretty much won it.

### 1.3. *Almost Counterfactuals*

Another clear contrast between *pretty much* and *almost* is that most of the *almost* examples allow a counterfactual reading in addition to approximating, while *pretty much* allows only the compromising reading. In (10) *pretty much* provides the expected weakening of the strong NPI *lift a finger* such that Tommy actually did lift a finger to help, but only a little bit.

- (10) Tommy {pretty much/almost} didn’t lift a finger to help.

---

<sup>1</sup> We might envision such an ordering as something like <filing, defense, writing, outlining, etc.>

However, with *almost*, the more primary reading is a counterfactual one, where Tommy had planned not to help but then changed his mind. Perhaps a paraphrase such as *Tommy wasn't going to lift a finger to help, but then he did after all when he remembered the Good Samaritan parable*. In this reading there need not be a comment on the amount of help Tommy actually gave. (Cf. Rapp and von Stechow 1999 for discussion of *almost* counterfactuals.)

If we increase the strength of the NPI using a squattive (Horn 2001, and unpublished work by Háj Ross and Paul Postal 1995), only the counterfactual reading seems to be available, as in (11), and Vince cannot be said to have received even a small amount of the item X in question.

(11) Vince almost didn't get squat.

In (12), however, with the *pretty much* squattive, Vince clearly can have received just a little bit of X.

(12) Vince pretty much didn't get squat.

#### **1.4. Composition of *Pretty Much***

*Much* is an understating NPI, as in (13a).<sup>2</sup> It makes weaker claims than stronger NPIs, as in (13b), and it is awkward in the non-negative environment in (13c).

- (13) a. Ted doesn't read much.  
b. Ted doesn't read at all.  
c. \*Ted reads much.

*Pretty*, as intensifying adverb, prefers a positive environment, as in (14a), and it is less acceptable under negation in (14b).

- (14) a. Axl was pretty late last night.  
b. \*Axl wasn't pretty late last night.

This allergy toward negation isn't normal behavior for an intensifier, as can be seen in a comparison with *very* in (15).

- (15) a. Axl was very late last night.  
b. Axl wasn't very late last night.

Compositionally, *pretty much* amounts to a fusion of a PPI and an NPI. For the most part, its distribution is similar to a PPI. It is perfectly acceptable in (16a) in a positive environment and less acceptable in the immediate negative environment

---

<sup>2</sup> Cf. Israel (1996) on understating NPIs.

of (16b).

- (16) a. David Lee pretty much doesn't want to go to school.  
b. \*David Lee doesn't pretty much want to go to school.

While *pretty much* does have positive tendencies, they are not absolute, as suggested above in (7d). We could speculate that the fusion of the NPI and PPI has something to do with its freer distribution or lessened sensitivity, but this is not material to the greater purpose of this paper.

### 1.5. Speaker-oriented vs. What is Said<sup>3</sup>

Potts (2005) distinguishes integrated VP adverbs that do contribute to the narrow sense of what is said from speaker-oriented adverbs that do not and instead function as utterance modifiers. In (17a-c) [Potts's (4.121)] *luckily* is set off by comma intonation.

- (17) a. *Luckily*, Willie won the pool tournament.  
b. Willie, *luckily*, won the pool tournament.  
c. Willie won the pool tournament, *luckily*.

According to Potts the commas represent intonational phrase boundary markers, suggesting the adverb contributes supplemental material and does not contribute to the narrow sense of what is said. For Potts, this is the primary factor in differentiating uses of the adverb. Compare (17) to the pause-free (18a-b) [Potts's (4.122)], which he claims do make semantic contributions in the narrow sense.

- (18) a. Willie *luckily* won the pool tournament.  
b. Willie won the pool tournament *luckily*.  
c. \**Luckily* Willie won the pool tournament.

The diagnostic can be adapted easily to the degree compromising *pretty much* examples. The primary readings of (19a-c) involve a speaker comment on Eddie's winning.

- (19) a. Pretty much, Eddie didn't win anything.  
a'. \*Pretty much Eddie didn't win anything.  
b. Eddie, pretty much, didn't win anything.

---

<sup>3</sup> Here and throughout, I use Grice's expression "what is said" (1989) to indicate asserted content and to contrast with what is *implicated* as well as with what Bach (1999) (following Grice) has called second-order speech acts: for example, adverbials such as *confidently*, *in other words*, etc., that can be "used to comment on some aspect of the speech act being performed in the utterance of the matrix sentence" (328). Relevance theorists would refer to these two levels of meaning as *conceptual* and *procedural*.





### 2.1. Chierchia's Extension of K&L

Chierchia (2004) extends K&L's system of NPI strengthening as licensing. However, he wants strengthening to occur within the c-command environment between licensor and licensee: i.e., between negation and the NPI. What goes on outside this environment is irrelevant. In other words, Chierchia has a scope requirement for strengthening. K&L clearly do not have this kind of scope requirement (see K&L §2.6), nor does Israel.

Accordingly, the examples used above against K&L are not problematic for Chierchia, as the compromisers in (26)-(27) are located outside the negation/NPI c-command environment. For Chierchia then, it is necessary to compromise within the scope site, as in (28).

(28) Richie didn't see pretty much anyone.

(28) does not seem strengthened by the presence of the NPI—even with the stronger scope requirements. This would need to be explained by Chierchia.

### 3. Israel's Scalar Model of Polarity

Israel (1996, 2001, 2005) classifies polarity items as either emphatic or attenuating. Emphatic polarity items include minimizers such as *a red cent*, *move an inch*, etc., and they must appear in sentences that are stronger or more informative than an assumed scalar norm. For example, (29a) contains the minimizer *a drop*, which is an emphatic NPI. For this NPI to be felicitous the sentence it appears in must be more informative than the assumed scalar norm, as in (29b).

(29) a. Jimmie didn't drink a drop. =>  
b. Jimmie didn't drink. scalar norm

(29a) is more informative than (29b), and thus the emphatic NPI should be licensed, as Israel predicts.

Attenuating NPIs are the mirror image of the emphatic, and so sentences with attenuating NPIs should be less informative than the scalar norm. Thus, (30b) contains the attenuating or weakening NPI *much*, and we see that the scalar norm in (30a) is in fact more informative, so *much* should be licensed.

(30) a. Jerry didn't drink. => scalar norm  
b. Jerry didn't drink much.

For the rest of the paper, however, I will only be concerned with the emphatic NPIs, as in (29).

Israel arranges the notions of informativity within a scalar model, which is based on work by Fillmore, et al. (1998) and Kay (1990). The scalar model is essentially a set of ordered statements, within which quantitative inferencing relations can be predicted. Dramatically simplifying, in a set of statements, {x3,

$x_2, x_1\}$ , if  $x_3$  is the stronger statement, then we can infer that if  $x_3$  is true then  $x_2$  is also true. That is,  $x_3$  unilaterally entails  $x_2$ . But, if  $x_1$  is true it does not follow that  $x_2$  is true. Importantly, this is a pragmatic entailment rather than a logical one. Nothing about the structure of the world guarantees it, but the structure of the scale suggests the inferences should be valid, *ceteris paribus*.

For Israel, then, the compromisers disrupt the inferencing relations that are necessary for him to predict where emphatic NPIs should appear. Consider (29) again, in which the inferencing relations hold and NPIs are licensed as Israel predicts. Compare (29) now with (31), in which the compromised emphatic in (31a) does not entail the scalar norm in (31b), but in which the NPI is still licensed.

- (31) a. Jimmie pretty much didn't drink a drop.                    -/→  
       b. Jimmie didn't drink.

According to Israel, “if a proposition entails the norm, its assertion is informative [emphatic] because it exceeds what one would normally expect to be asserted” (1998:47). So, the failed entailment relation of (31a-b) causes a bit of tension for Israel, as he depends on the entailment relation to determine whether NPIs (or statements that contain NPIs) are informatively emphatic or understating, and thus in what environments they should be allowed to occur.

#### 4. Giannakidou's (Non)veridicality

For Giannakidou (1998, 1999, 2002, etc.), NPI licensing boils down to a couple of heuristics, which are given below in (32)-(34).

- (32) (i) *A definition of (non)veridicality*  
       *Op* is veridical just in case  $Op \ p \rightarrow \ p$  is logically valid.  
       Otherwise, *Op* is nonveridical.  
       (ii) A nonveridical operator *Op* is antiveridical just in case  
        $Op \ p \rightarrow \ \neg \ p$  is logically valid.
- (33) *A linguistic expression  $\alpha$  is a polarity item iff:*  
       (i) The distribution of  $\alpha$  is limited by sensitivity to some semantic property  $\beta$  of the context of appearance; *and*  
       (ii)  $\beta$  is (non)veridicality, or a sub-property thereof:  $\beta \in \{\text{veridicality, nonveridicality, antiveridicality, modality, intentionality, extensionality, episodicity, downward entailingness, ...}\}$
- (34) *Polarity licensing by nonveridicality*  
       A polarity item  $\alpha$  will be grammatical in a sentence S iff  $\alpha$  is in the scope of a nonveridical operator  $\beta$  in S.

Essentially, a polarity item is acceptable if it falls within the scope of a nonveridi-

cal operator such as negation and various others. So, what happens with the *pretty much* examples? Consider (35).

(35) Bruce pretty much didn't have any money.

NPI *any* occurs in the immediate scope of a nonveridical operator, i.e., negation, and it is licensed regardless of the status of DE-ness or strengthening, etc. This is already superior to K&L and Israel. But what about (28) above that was used against Chierchia, which was compromised within the scope site?

(28) Jon didn't see pretty much anyone.

We can paraphrase *not-pretty much* in (28) as *hardly* or *barely*. However, if Jon hardly saw anyone, then the fact remains that he did see someone. This is a veridical context then, and we would not expect polarity items to be licensed in it. So the (non)veridicality theory has a bit more explaining to do with examples like this one.

Giannakidou allows for a Linebarger-like negative implicature<sup>5</sup> as a secondary licensing mechanism for weaker NPIs such as *any*, *ever*, *at all*, etc. She refers to these as the *any*-class of NPIs,<sup>6</sup> and they are not *licensed* but are instead “rescued” or “tolerated.” According to Horn (2001) *hardly* and *barely* convey ‘not at all’ via negative implicature, so it seems no great leap to allow the same thing here, especially since we seem to be talking about a similar subset of weak NPIs appearing in the *not-pretty much* environment. That is, *not-pretty much* allows the weaker NPIs in (36a-c), but it is more allergic to the stronger NPIs of (36d-f), which the (non)veridicality theory does not allow to be rescued anyway.

- (36) a. I haven't seen Disneyland that empty pretty much ever.<sup>7</sup>  
b. So I didn't have pretty much any money ...<sup>8</sup>  
c. We didn't have pretty much any furniture in the living room ...<sup>9</sup>  
d. \*Kris didn't have pretty much a red cent.  
e. \*Merle didn't move pretty much an inch.  
f. \*Waylon didn't buy pretty much squat.

So, the *not-pretty much* examples seem to be accounted for by the existing

---

<sup>5</sup> However, Giannakidou wants licensing by negative implicature as only a last-resort operation, not as a general pragmatic condition on NPIs like Linebarger (1987) does.

<sup>6</sup> Exactly how class membership is calculated here is not clear, as there do not seem to be free choice possibilities for *ever* and *at all*, as there is with *any*.

<sup>7</sup> <<http://www.brendoman.com/index.php?cat=264>>

<sup>8</sup> <<http://oompaprincess.livejournal.com/>>

<sup>9</sup> <<http://www.mayamalia.com/longs/simplicity/chapter38.html>>

machinery of the (non)veridicality approach.<sup>10</sup>

## 5. Conclusion

Statements that contain NPIs often do seem stronger or to carry a greater rhetorical force than their non-NPI bearing counterparts, but it is questionable whether this plays any important role in actually licensing NPIs. That is, strong statements can be compromised and the NPIs remain completely interpretable. It seems then that notions of NPIs needing to strengthen statements (K&L) or NPIs needing to appear in stronger statements (Israel) are not exactly what is needed to answer the question of NPI distribution. On the other hand, the identification of a common semantic feature such as (non)veridicality seems to avoid problems raised by the compromisers.

## References

- Bach, Kent. 1999. The Myth of Conventional Implicature. *Linguistics and Philosophy* 22:327-366.
- Carlson, Greg. 1981. The Distribution of Free-choice *Any*. Proceedings of Chicago Linguistics Society 17.
- Chierchia, Gennaro. 2004. Scalar Implicatures, Polarity Phenomena, and the Syntax/Pragmatics Interface. In A. Belletti, ed., *Structures and Beyond*, 39-104. Oxford: Oxford University Press.
- Fillmore, Charles, Paul Kay, and M.C. O'Connor. 1988. Regularity and Idiomaticity in Grammatical Constructions: The Case of *Let Alone*. *Language* 64:501-538.
- Giannakidou, Anastasia. 1998. *Polarity Sensitivity as (Non)veridical Dependency*. Amsterdam: John Benjamins.
- Giannakidou, Anastasia. 1999. Affective Dependencies. *Linguistics and Philosophy* 22:367-421.
- Giannakidou, Anastasia. 2002. Licensing and Sensitivity in Polarity Items: From Downward Entailment to (Non)veridicality. Proceedings of Chicago Linguistics Society 39.
- Horn, Laurence. 1972. On the Semantic Properties of the Logical Operators in English. Ph.D. diss., University of California, Los Angeles. Distributed by IULC.
- Horn, Laurence. 2001. Flaubert Triggers, Squatitive Negation, and Other Quirks of Grammar. In J. Hoeksema, H. Rullman, V. Sanchez-Valencia, and T. van der Wouden, eds., *Perspectives on Negation and Polarity Items*. Amsterdam: John Benjamins.

---

<sup>10</sup> Horn's (2002) notion of assertoric inertia also provides a nice account of NPI licensing by *hardly* and *barely*. In this story, the positive propositions of *hardly* and *barely* are not asserted (in the sense of Stalnaker 1978) and so are transparent to negative licensing. *Hardly* and *barely* contrast with *almost*, in which the positive proposition is asserted and does not license NPIs.

*Compromising Positions and Polarity Items*

- Horn, Laurence. 2002. Assertoric Inertia and NPI Licensing. Proceedings of Chicago Linguistics Society 38.
- Horn, Laurence. 2005. Airport '86 Revisited: Toward a Unified Indefinite *Any*. In Carlson, et al., eds., *The Partee Effect*. Stanford: CSLI.
- Israel, Michael. 1996. Polarity Sensitivity as Lexical Semantics. *Linguistics and Philosophy* 19:619-666.
- Israel, Michael. 1998. The Rhetoric of Grammar: Scalar Reasoning and Polarity Sensitivity. Ph.D. diss., University of California, San Diego.
- Israel, Michael. 2001. Minimizers, Maximizers, and the Rhetoric of Scalar Reasoning. *Journal of Semantics* 18:297-331.
- Israel, Michael. 2005. Saying Less and Meaning Less. In B. Birner and G. Ward, eds., *A Festschrift for Larry Horn*. Amsterdam: John Benjamins.
- Kadmon, Nirit and Fred Landman. 1993. *Any*. *Linguistics and Philosophy* 16:353-422.
- Kay, Paul. 1990. *Even*. *Linguistics and Philosophy* 13:59-111.
- Krifka, Manfred. 1995. The Semantics and Pragmatics of Polarity Items. *Linguistic Analysis* 25:209-257.
- Linebarger, Marcia. 1987. Negative Polarity and Grammatical Representation. *Linguistics and Philosophy* 10:325-387.
- Morzycki, Marcin. 2001. *Almost* and Its Kin, Across Categories. Proceedings of SALT XI, NYU.
- Potts, Chris. 2005. *The Logic of Conventional Implicature*. Oxford:Oxford University Press.
- Rapp, Irene and Arnim von Stechow. 1999. *Fast* 'almost' and the Visibility Parameter for Functional Adverbs. *Journal of Semantics* 16:149-204.
- Ross, Háj and Paul Postal. 1995. Esquatology. Unpublished Electronic Memo.
- Sadock, Jerrold M. 1981. *Almost*. In P. Cole, ed., *Radical Pragmatics*. New York: Academic Press.
- Stalnaker, Robert. 1978. Assertion. In P. Cole, ed., *Syntax and Semantics 9: Pragmatics*, 315-332. New York: Academic Press.

William Salmon  
Yale University  
Department of Linguistics  
370 Temple  
New Haven, CT 06511

[william.salmon@yale.edu](mailto:william.salmon@yale.edu)



## Right Adjunction in the Right Peripheries\*

SERKAN ŞENER

*University of Connecticut*

### 0. Introduction

The primary goal of this paper is to investigate some instances of rightward scrambling in Turkish, and propose an analysis for them adopting a theory in which  $\Theta$ -roles are considered to be features. More explicitly, it will be suggested that instances of rightward scrambling should be interpreted as *base-generation/pure merge*, where the timing of merger is argued to be determinable by the strength of the  $\Theta$ -feature of the selected category. The empirical domain of this study covers rightward scrambling in the context of nominalized embedded clauses in Turkish. Two puzzling observations will be at the center of the investigation: (i) The grammaticality of *local rightward scrambling* within a nominalized complement clause depends on whether the nominalized clause itself is rightward scrambled or in-situ, and (ii) while *long distance rightward scrambling* of an XP out of an in-situ embedded clause is grammatical, *local rightward scrambling* of an XP within an in-situ embedded clause is ungrammatical. In addition to the assumptions noted above, two more assumptions of the current analysis will be that (i) right-adjunction is an option available in the grammar, and (ii) lowering at LF is possible in line with Bošković and Takahashi (1998).

This paper is organized as follows: Section 1 lays out the facts examined in the paper. Section 2 outlines the proposal, and Section 3 demonstrates how it fares with respect to the relevant facts. Section 4 considers a number of predictions of the proposal, and Section 5 concludes the paper by presenting a summary.

### 1. Turkish Facts

One type of complement clause in Turkish that will be the empirical focus of this paper is formed by the nominalization of the embedded verb. I will call such

---

\* I wish to thank the following people for comments and discussion in developing the ideas in this paper: Duk-Ho An, Jonathan Bobaljik, Norvin Richards, Nilüfer Şener, Susi Wurmbrand, and especially Željko Bošković. I would also like to extend my thanks to the audience at the 32<sup>nd</sup> BLS Conference (University of California, Berkeley, February 2006). Nobody acknowledged above necessarily agrees with the claims made in this paper, and all errors are mine.

complement clauses *Nominalized Complement Clauses* (henceforth, DPNCC), an example of which is given in (1) below (see Kennelly 1996, Kornfilt 1985, 2001, Aygen 2002, a.o., for detailed investigation of such complement clauses):

- (1) Biz [Cem-in araba-ya bin-diğ-in-i] bil-iyor-uz.  
 we-NOM Cem-GEN car-DAT get.in-NOML-3sg<sub>AgR</sub>N-ACC know-PRES-1pl.  
 ‘We know that Cem got in the car.’

The example in (1) illustrates the following well-known characteristics of DPNCCs: (i) DPNCCs are morphologically marked for nominalization, (ii) Vs of DPNCCs bear nominal agreement morphology *triggered* by the embedded subject, which is marked Genitive, and (iii) the nominalized V of DPNCCs bears possessive and case morphology.

One of the major observations which is of primary importance to this study has been previously reported in Sezer (1978), Kennelly (1996), Kornfilt (1997). According to them, a constituent of a DPNCC cannot appear to the right of the embedded V, an instance of scrambling which I will call in this paper *Local R(ightward)-Adjunction*.<sup>1</sup> See an example of this in (2):

- (2) \* Biz [Cem-in t<sub>i</sub> bin-diğ-in-i araba-ya<sub>i</sub>] bil-iyor-uz.  
 we-NOM Cem-GEN get.in -NOML-3sg<sub>AgR</sub>N-ACC car-DAT know-PRES-1pl.  
 ‘We know that Cem got in the car.’

The ungrammaticality of Local-R-Adjunction to DPNCCs is not limited to argumental XPs. Non-argumental XPs such as time adverbs and/or PPs also cannot be locally R-Adjoined. Witness the ungrammaticality of the sentences in (3) where an adverb and a PP, respectively, appear in the post-embedded-V position:

- (3) a. \* Biz [Cem-in araba-ya bin-diğ-in-I bugün] bil-iyor-uz.  
 we-NOM Cem-GEN car-DAT get.in-NOML-3sg<sub>AgR</sub>N-ACC today  
 know-PRES-1pl.  
 ‘We know that Cem got in the car today.’
- b. \* Biz [Cem-in araba-ya bin-diğ-in-I çanta-yla] bil-iyor-uz.  
 we-NOM Cem-GEN car-DAT get.in-NOML-3sg<sub>AgR</sub>N-ACC bag-with  
 know-PRES-1pl.  
 ‘We know that Cem got in the car with a bag (on his back).’

<sup>1</sup> I use traces only to indicate the canonical positions of DPs in Turkish. The reader should not interpret this as an indication of my subscription to *movement* as a theoretical device since I do not appeal to movement in my explanation of facts. Therefore, when used, the term movement will only be used figuratively, and this will be signaled by single quotes (i.e., ‘movement’).

Curiously, while Local-R-Adjunction of an embedded argument/adjunct XP is not available as an option, Non-Local-R-Adjunction of an embedded XP to the extended projection of the matrix V yields a perfectly grammatical sentence as illustrated in (4) below:

- (4) Biz [Cem-in t<sub>i</sub> bin-diğ-in-i] bil-iyor-uz araba-ya.  
we-NOM Cem-GEN get in-NOML-3sg<sub>AggrN</sub>-ACC know-PRES-1pl. car-DAT  
'We know that Cem got in the car.'

In the next section, an attempt is made to formulate an analysis.

## **2. The Proposal**

The following basic assumptions are adopted towards an analysis:<sup>2</sup>

- (5)
- (i) I assume that a grammar model without D-structure and Projection Principle (as in Chomsky's Minimalist Program) leaves open the possibility of movement and/or lowering into  $\Theta$ -positions, following Bošković (1994), Bošković and Takahashi (1998), Lasnik (1995).
  - (ii)  $\Theta$ -roles are features that need to be checked, and like any other syntactic features, they come in two varieties (cf. Chomsky 1995, for  $\phi$ - and Case-features): strong  $\Theta$ -features and weak  $\Theta$ -features (cf. Bošković and Takahashi 1998, Lasnik 1995).<sup>3</sup>
  - (iii) Following standard assumptions regarding strong and weak features, I assume that
    - A. A strong  $\Theta$ -feature has to be checked prior to SPELL-OUT upon initial MERGE (i.e., within the maximal projection of the  $\Theta$ -checker).
    - B. A weak  $\Theta$ -feature is not forced to MERGE within the maximal projection of the  $\Theta$ -checker, and its checking may be delayed until after SPELL-OUT (see Chomsky 1993, where unchecked strong features are ill-formed PF objects). The checking mechanism in question is *category lowering*.<sup>4</sup>

---

<sup>2</sup> I should note at this point that Kornfilt (1998) also argues for an analysis adopting Chomsky's (1986) ban on adjunction, which is appealed to below, although her analysis and the current one radically differ in details. Furthermore, Kornfilt (1998) deals exclusively with the basic data given in (2); she does not extend her analysis to cover the larger set of data addressed in the present study.

<sup>3</sup> See Boeckx and Hornstein (2004) for more recent arguments that  $\Theta$ -roles are features. See also Bošković (1994).

<sup>4</sup> As far as I can tell, there is in principle nothing in the system to ban *feature lowering*. The question is whether feature lowering has different repercussions than category lowering, an issue I will not discuss further. I will stick to category lowering in this paper.

- (iv) Following Bošković and Takahashi (1998), I assume that scrambling involves base-generation, i.e., base-generated adjunction. More precisely, scrambled elements are base-generated in their surface positions, undergoing lowering to the  $\Theta$ -position in LF the  $\Theta$ -feature being weak. (The lowering will actually not play any role in my analysis. What is important to me here is that traditional scrambling involves base-generation, and that the relevant  $\Theta$ -feature is weak.)
- (v) Adjunction to arguments is banned (cf. Chomsky 1986; McCloskey 1992, 2006; Bošković 1997, 2004a).<sup>5</sup>

In line with the assumptions in (5), I would like to adopt a slightly revised version of Chomsky's (1986) ban on adjunction.

- (6) Ban on adjunction (revised)  
Adjunction to a category bearing strong  $\Theta$ -features is disallowed.

Adopting (6) as a major ingredient of my analysis, I will also investigate the validity of the following two hypotheses in an extension of the current analysis to several contrasts between Turkish and English, which essentially follows Bošković and Takahashi's (1998) proposal regarding Japanese/English:

- (7) (i) Argumental XPs in Turkish may optionally bear strong or weak  $\Theta$ -features.
- (ii) Argumental XPs in English may not bear weak  $\Theta$ -features. (In other words, English is not a scrambling language.)

### 3. Analysis

Let us first consider the sentence in (1) where there is no R-Adjunction of any kind, repeated below as (8) for convenience:

- (8) Biz [Cem-in araba-ya bin-diğ-in-i] bil-iyor-uz.  
we-NOM Cem-GEN car-DAT get.in-NOML-3sg<sub>AGR</sub>N-ACC know-PRES-1pl.  
'We know that Cem got in the car.'

There are two DPs in (8) that are crucial for our purposes. One is the complement clause itself, a DPNCC, and the complement of the embedded V, call it DPDAT. We can conjecture then that both DPNCC and DPDAT enter the derivation with

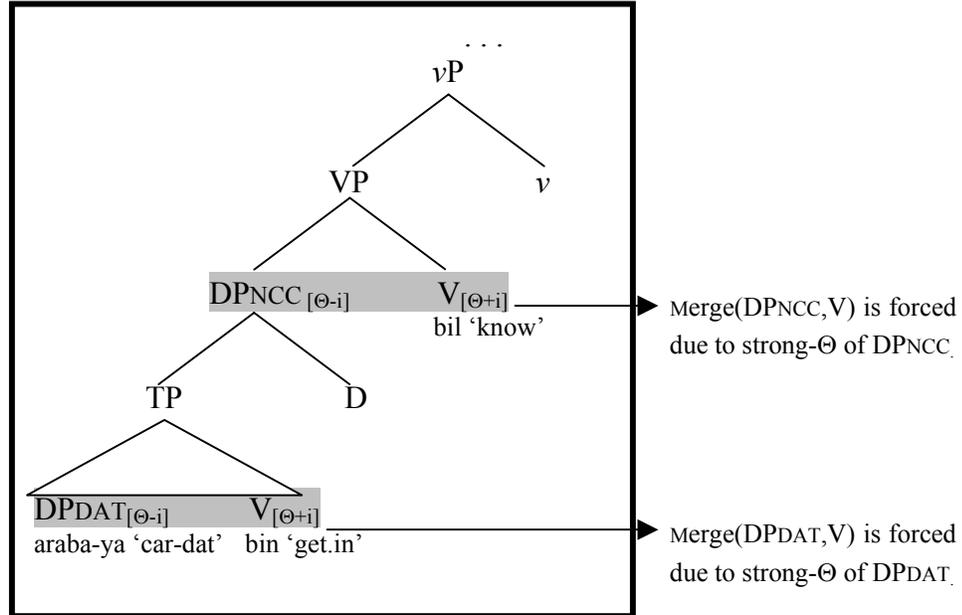
---

<sup>5</sup> (i) is an example of a type of sentence this ban rules out (data due to McCloskey 2006:7-8):

- (i) a. She swore that [<sub>IP</sub> [after she finished her thesis] [<sub>IP</sub> she would move to Paris]]
- b. \*She swore [<sub>CP</sub> [after she finished her thesis] [<sub>CP</sub> that she would move to Paris]]

strong  $\Theta$ -features, which suggests that they are to merge before Spell-Out (by 5iiiA). (9) gives a partial graphic illustration of the derivation of (8):

(9)

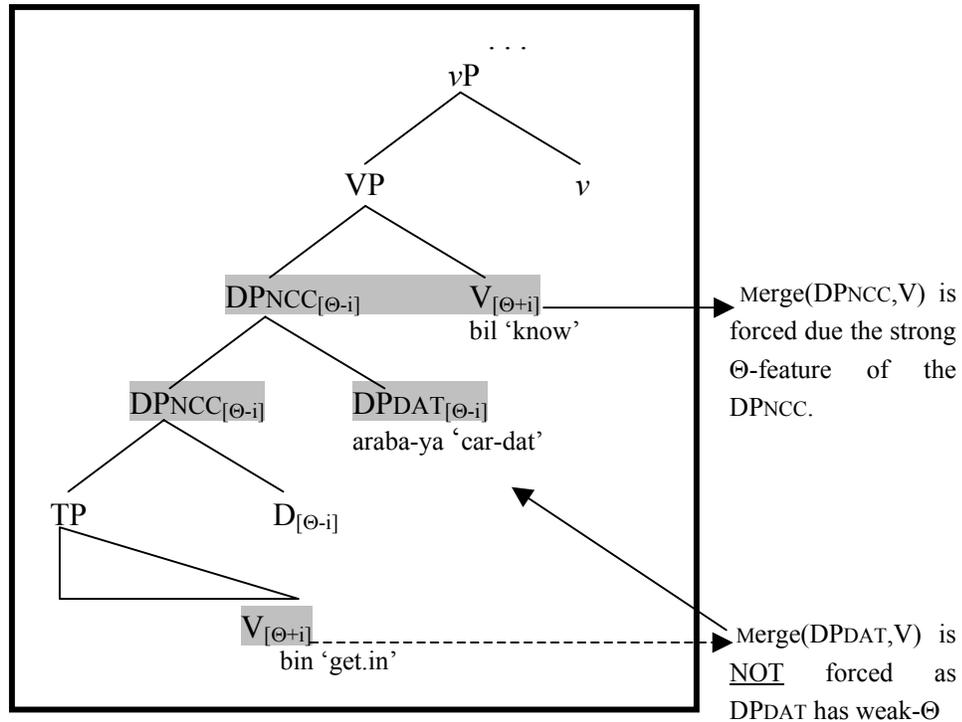


The sentence in (2), repeated below as (10), involves a post-embedded-V constituent and the sentence is ungrammatical.

(10) \*Biz [Cem-in  $t_i$  bin-diğ-in-I araba-ya $_i$ ] bil-iyor-uz  
 we-NOM Cem-GEN get.in-NOML-3sg<sub>AGR</sub>N-ACC car-DAT know-PRES-1pl.  
 'We know that Cem got in the car.'

Under the current analysis the non-canonical appearance of the DPDAT in (10) will be accounted for as follows: As a theoretical possibility, DPDAT may bear weak  $\Theta$ -features while DPNCC may bear strong  $\Theta$ -features. Given the assumptions about the timing of merger in (5) this amounts to saying that the DPNCC requires early merge (i.e., merge-in-the-base) while the DPDAT does not. See the derivation of (10) below (The tree is again only partial):

(11)



The ungrammaticality of (11) is due to the ban on adjunction as formulated in (6): Adjunction (i.e., pair-merge) of a(ny) category to a category with strong  $\Theta$ -features is banned. In the case of (11), then, adjunction of DPDAT to DPNCC is not permitted. An assumption remained unarticulated thus far shows itself in the derivation depicted in (11), in which DPDAT is R-Adjoined to DPNCC. Notice that the DPDAT is not R-Adjoined to a lower category in the tree, for instance, TP. The assumption that a postverbal constituent is R-Adjoined to the highest XP in the structure is not novel and previously argued for in Kural (1997) in a different context, so I adopt it here.<sup>6</sup>

Recall from Section 1 that a post-embedded-V *adjunct* in Turkish is as degraded as an argument DP in the same position (cf. (2)). The relevant examples were given in (3), though here I only repeat the one in (3a) as (12) below:

<sup>6</sup> The assumption in question is important because 'movement' (or movement, an issue which demands further exploration, and that would go beyond the scope of this paper) to pre-subject position, which I take to be (left-) adjunction to TP, does not yield ungrammaticality. The relevant example is (i):

(i) Biz [araba-ya<sub>i</sub> Cem-in t<sub>i</sub> bin-diğ-in-i] bil-iyor-uz.  
we-NOM car-DAT Cem-GEN get.in-NOML-3sg<sub>AGR</sub>N-ACC know-PRES-1pl.  
'We know that Cem got in the car.'

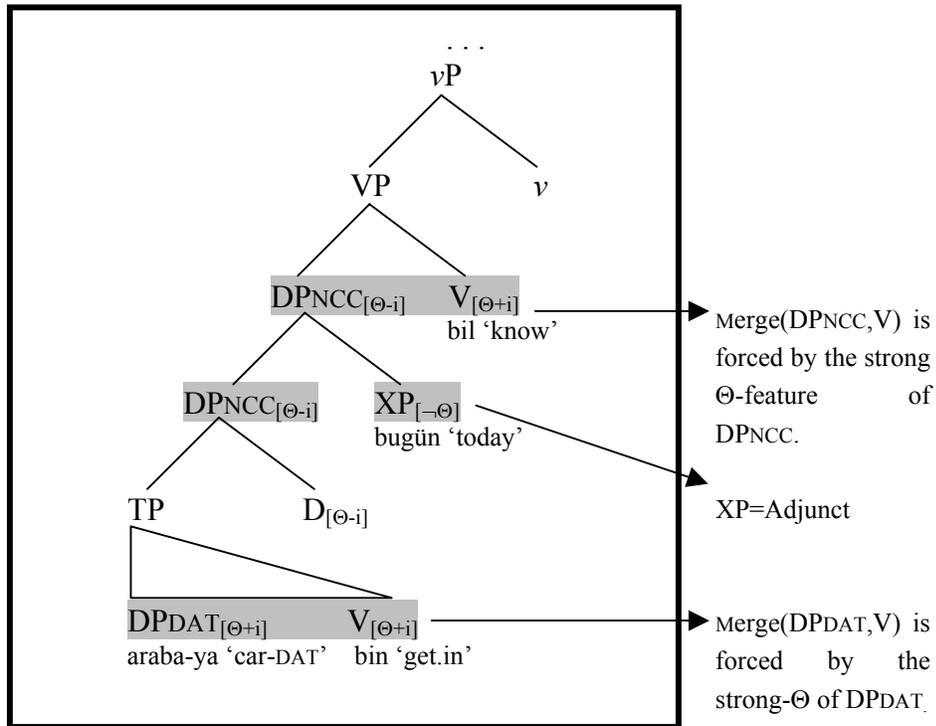
Notice that adjunction to TP in (i) is not banned simply because TP does not bear  $\Theta$ -features.

*Right Adjunction in the Right Peripheries*

- (12) \*Biz [Cem-in araba-ya bin-diğ-in-I bugün]  
 we-NOM Cem-GEN car-DAT get.in-NOML-3sgAgrN-ACC today  
 bil-iyor-uz.  
 know-PRES-1pl.  
 ‘We know that Cem got in the car today.’

The ungrammaticality of (12) is once again accounted for assuming that the DPNCC has strong  $\Theta$ -features, and the adjunction of the non-argumental XP to it is precluded by (6) as illustrated in (13):

- (13)



The grammaticality of (4), repeated below as (14), is interesting: while the Local-R-Adjunction of embedded material yields ungrammaticality, as has been discussed and analyzed above, Non-Local-R-Adjunction of embedded material is perfectly grammatical:<sup>7</sup>

<sup>7</sup> Non-Local R-Adjunction of an adverb with scope over the embedded clause is ungrammatical as (i) shows:

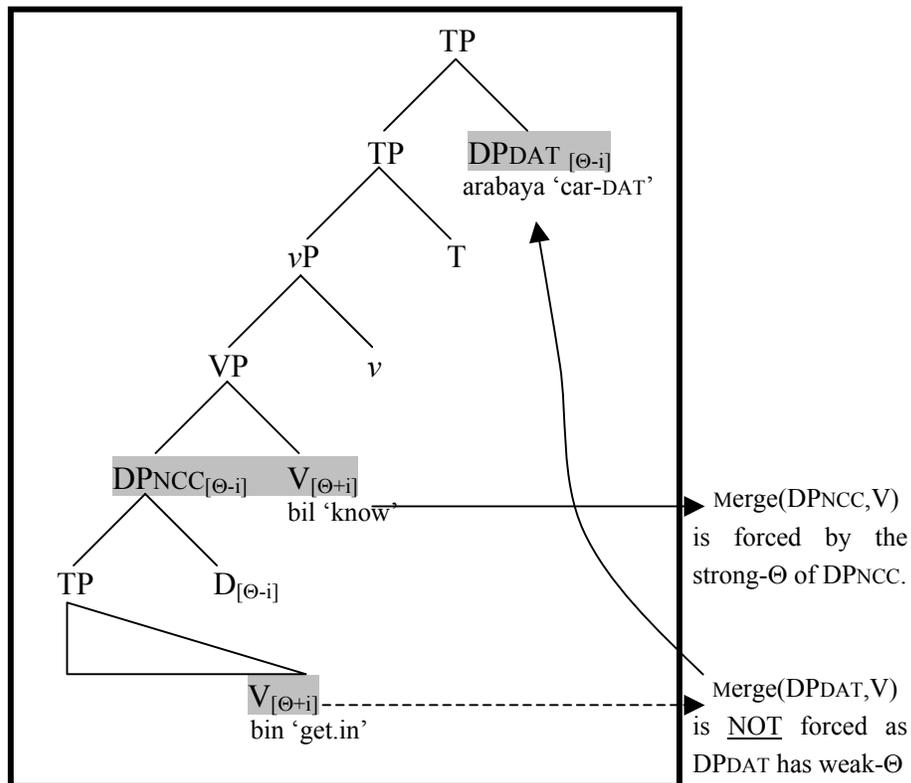
- (i) \*Biz [Cem-in araba-ya bin-diğ-in-i] bil-iyor-uz dün.  
 we-NOM Cem-GEN car-DAT get.in-NOML-3sgAgrN-ACC know-PRES-1pl. yesterday  
 ‘We know that Cem got in the car yesterday.’

The ungrammaticality of (i) is accounted for under the current analysis given that (i) the adverb is base generated in its surface position, and not moved at all, and (ii) there is no reason for it to lower at LF into some position within the embedded clause (i.e., a position where it may take scope) given that lowering would not be  $\Theta$ -feature-driven for adjuncts. See Bošković and

- (14) Biz [Cem-in t<sub>i</sub> bin-diğ-in-i] bil-iyor-uz araba-ya.  
 we-NOM Cem-GEN get.in-NOML-3sg<sub>AgfN</sub>-ACC know-PRES-1pl. car-DAT  
 ‘We know that Cem got in the car.’

Suppose that the DPNCC in (14) has strong  $\Theta$ -features, and it is merged early with the embedded V whereas DPDAT has weak  $\Theta$ -features, thus not forced to MERGE within the maximal projection of its  $\Theta$ -checker. In the case of (14), DPDAT is adjoined (i.e., pair-merged) to the highest maximal projection TP, as shown in (15).<sup>8,9</sup>

- (15)



The weak  $\Theta$ -feature of the ‘moved’ DPDAT is then checked via lowering at LF. This analysis of (14) makes it possible to give an explanation of why the non-Locally R-Adjoined DPDAT is not subject to the RIGHT ROOF CONSTRAINT of Ross (1967). Under the current analysis, DPDAT is not moved but base-generated in its

Takahashi (1998), Boeckx and Sugisaki (1999), which illustrate the well-known fact that long-distance scrambling of adjuncts is disallowed.

<sup>8</sup> I assume here that the highest projection in a matrix clause is TP but this assumption is not crucial for the current analysis, and it may well be CP along the lines of Kural (1997).

<sup>9</sup> Note that I do not adopt a model invoking *Phases* or Multiple Spell-Out.

surface position, and therefore is not subject to the restrictions that movement is subject to. The assumption here is that lowering is not constrained by the standard locality restrictions imposed on raising, setting CED effects aside.<sup>10</sup>

#### 4. Further Predictions

Notice that the facts from Turkish examined thus far do not exhaust the theoretical possibilities. There are two other possibilities, which have not yet been considered, and in fact are predicted to be grammatical under the current analysis. Let us now see what they are:

(16) DPNCC has weak  $\Theta$ -features, while DPDAT has strong  $\Theta$ -features.

(17) ✓ Biz  $t_i$  bil-iyor-uz [Cem-in araba-ya bin-diğ-in-i]<sub>i</sub>  
we-NOM know-PRES-1pl. Cem-GEN car-DAT get.in-NOML-3sgAgrN-ACC  
'We know that Cem got in the car.'

(18) Both DPNCC and DPDAT have weak  $\Theta$ -features.

(19) ✓ Biz  $t_i$  bil-iyor-uz [Cem-in  $t_j$  bin-diğ-in-i araba-ya]<sub>i</sub>  
we-NOM know-PRES-1pl. Cem-GEN get.in-NOML-3sgAgrN-ACC car-DAT  
'We know that Cem got in the car.'

(19) presents an interesting piece of data particularly when it is compared with the ungrammatical (2). The major difference between (19) and (2) is that while both involve Local R-Adjunction in the embedded context, only the former also has its complement clause placed to the right of the matrix verb. That, in fact, is an important factor in explaining the grammaticality of (19) since in (19) the locally R-Adjoined DPDAT is adjoined to DPNCC with weak  $\Theta$ -features, and the ban in (6) is irrelevant. In (2), however, the DPDAT involves adjunction to DPNCC with strong  $\Theta$ -features, which is a violation of (6).

A brief digression is in order here concerning the assumed structural analysis of (19). As indicated by the bracketing in (19), the DPDAT is within the boundaries of the DPNCC (i.e., the former is Locally-R-Adjoined to the latter), and the DPNCC itself is also R-Adjoined to the highest functional category in the extended projection of the matrix verb. As pointed out to me by Norvin Richards (p.c.), this is indeed not the only possible analysis of (19). One might conjecture that the DPDAT is extracted from the DPNCC either before or after the latter is also 'moved.' Put differently, the DPDAT and the DPNCC may be R-Adjoined to

---

<sup>10</sup> I would like to only note in passing that instances of Non-Local R-Adjunction (= 'long distance rightward scrambling') show CED effects, which may be a problem for the base-generation analysis entertained in this paper. I leave this issue unaddressed in this paper due to space limitations, but for an articulated analysis factoring island-sensitivity in, see Şener (in progress). For relevant discussion of island sensitivity and scrambling, see also Bošković (2004b).

different layers of the extended projection of the matrix V. Such an analysis makes a clear prediction: A matrix-V-related adverb should grammatically appear between the DPNCC and the DP<sub>DAT</sub> if the extraction analysis of the DP<sub>DAT</sub> is on the right track. The ungrammaticality of (20) rules out this option, though: A matrix-V-related adverb cannot intervene between the DPNCC and the DP<sub>DAT</sub> when both of them are in the postverbal field.<sup>11</sup>

- (20) \*Siz t<sub>i</sub> öğren-ecek-siniz [Cem-in t<sub>j</sub> bin-diğ-in-i]<sub>i</sub> .  
 you-NOM learn-FUT-2pl. Cem-GEN get.in-NOML-3sg<sub>AGR</sub>N-ACC  
*gelecek hafta araba-ya*<sub>j</sub>  
 next week car-dat  
 ‘You will know (by) next week that Cem has got in the car.’

Thus, I take the structural analysis given in (19) as the right one.

Another prediction of the current analysis that I will now briefly explore is based on the hypothesis stated in (7ii) in Section 2. Recall that (7ii) states that argumental XPs in English may not bear weak  $\Theta$ -features contrasting English with Turkish in the relevant respect.<sup>12</sup> Let us start the investigation by first considering the contrast between (21) and (22):

(21) Adjunction to IP

✓ Jane does not believe [<sub>CP</sub> that [<sub>IP</sub> yesterday [<sub>IP</sub> Mary scolded John]]].

(22) Adjunction to CP

\* Jane does not believe [<sub>CP</sub> yesterday [<sub>CP</sub> that [<sub>IP</sub> Mary scolded John]]].

The grammaticality contrast between (21) and (22) indicates that while adjunction to IP is permitted, adjunction to CP is not. The prediction of the current analysis along with the assumption that  $\Theta$ -features in English may not be weak is that the grammaticality contrast between (21) and (22) should remain unaffected even when the CP is moved.<sup>13</sup> Compare the sentences in (23) and (24).<sup>14</sup>

(23) CP topicalization

✓ [<sub>CP</sub> That [<sub>IP</sub> Mary scolded John]], Jane does not believe \_\_\_\_.

<sup>11</sup> Note that in Turkish an adverb with matrix scope (or scope over smaller domains such as vP/VP etc.) may legitimately appear in the postverbal field. See Şener (in progress).

<sup>12</sup> Following Bošković and Takahashi (1998), I take this to be the distinction between scrambling and non-scrambling languages (see also 7ii in Section 2).

<sup>13</sup> Notice that *moved* is not in quotation marks this time as I assume that CP-topicalization in English is to be interpreted as *literal* movement, and thus different from the instances of ‘rightward scrambling’ in Turkish, which are argued to be base-generated.

<sup>14</sup> Judgments are due to Jonathan Bobaljik, Jon Gajewski, and William Snyder.

(24) Topicalization of a CP hosting adjunction

\* [<sub>CP</sub> Yesterday [<sub>CP</sub> that [<sub>IP</sub> Mary scolded John]]], Jane does not believe \_\_\_\_.

(23) shows that topicalization of CPs in English is licit. The ungrammaticality of (24) is surprising at first sight particularly when we take the grammaticality contrast between (2) and (19) from Turkish into consideration. Recall that, in Turkish, ‘scrambling’ of a complement clause (i.e., DPNCC) is critical in that the DPNCC only permits Local-R-Adjunction of an XP within it if the former is ‘rightward scrambled.’ As the ungrammaticality of both (22) and (24) shows, however, in English, movement of a CP has no effect on (dis)allowing adjunction to CP itself. This is what the current analysis predicts along with the clause in (7ii): Since complement DPs/CPs may not bear weak  $\Theta$ -features in English, merger of such DPs/CPs must be early, that is, they must be merged immediately with their  $\Theta$ -checker. This means that the ban formulated in (6) will never fail to rule out adjunction to complement DPs/CPs in English, as it always involves adjunction to a category with strong  $\Theta$ -features. I must leave a further exploration of this idea to future research due to space limitations.

## 5. Summary and Conclusions

The chief empirical domain of this study has been postverbal constituents in embedded and matrix contexts in Turkish. It has been shown that a theory that adopts the hypothesis that  $\Theta$ -roles are features, in which the strength of  $\Theta$ -features determines the timing of merger, accounts for the behavior of postverbal constituents in the relevant contexts.

The current analysis also provides evidence for Bošković and Takahashi (1998) proposal that strength of  $\Theta$ -features determines crosslinguistic variation with respect to whether or not a language has *scrambling*, distinguishing scrambling from topicalization and focalization this way. It was shown that the presence of such a variation makes the right predictions in accounting for the presence or absence of amelioration effects with scrambling for scrambled elements/topicalization for topicalized elements.

## References

- Aygen, Gülşat. 2002. Finiteness, Case and Clausal Architecture. Ph.D. diss., Harvard University.
- Boeckx, Cedric, and Koji Sugisaki. 1999. How to get a free ride? Additional scrambling effects and the Principle of Minimal Compliance. In S. Bird et al. ed., *Proceedings of WCCFL 18*, 43-54. Somerville, MA: Cascadilla Press.
- Boeckx, Cedric, and Norbert Hornstein. 2004. Movement under Control. *Linguistic Inquiry* 35(3): 431-452.

- Bošković, Željko. 1994. D-Structure,  $\Theta$ -Criterion, and Movement into  $\Theta$ -positions. *Linguistic Analysis* 24: 247-286.
- Bošković, Željko. 1997. *The Syntax of Nonfinite Complementation: An Economy Approach*. Cambridge, MA: MIT Press.
- Bošković, Željko. 2004. Be Careful Where You Float Your Quantifiers. *Natural Language and Linguistic Theory* 22: 681-742.
- Bošković, Željko. 2004b. Topicalization, Focalization, Lexical Insertion, and Scrambling. *Linguistic Inquiry* 35(4): 613-638.
- Bošković, Željko, and Daiko Takahashi. 1998. Scrambling and Last Resort. *Linguistic Inquiry* 29(3): 347-366.
- Chomsky, Noam. 1986. *Barriers*. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1993. A Minimalist Program for Linguistic Theory. In Ken Hale and Samuel J. Keyser eds., *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, 1-52. Cambridge, MA: MIT Press.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Kennelly, Sarah. 1996. Turkish Subordination: [-CP, +Tense, +Case]. In Ahmet Konrot ed., *Modern Studies in Turkish Linguistics: Proceedings of the 6<sup>th</sup> International Conference on Turkish Linguistics*, 55-75. Anadolu University, Eskişehir.
- Kornfilt, Jaklin. 1984. Case Marking, Agreement and Empty Categories in Turkish. Ph.D. diss., Harvard University.
- Kornfilt, Jaklin. 1996. On rightward movement in Turkish. In Lars Johanson ed., *The Mainz Meeting, Proceedings of the Seventh International Conference on Turkish Linguistics*, 107-123. Wiesbaden: Harrassowitz.
- Kural, Murat. 1997. Postverbal Constituents in Turkish and the Linear Correspondence Axiom. *Linguistic Inquiry* 28(3): 498-519.
- Lasnik, Howard. 1995. A Note on Pseudogapping. In *MIT working papers in linguistics 27: Papers on minimalist syntax*, 143-163. Cambridge, MA: MITWPL.
- McCloskey, James. 1992. Adjunction, Selection, and Embedded Verb Second. Linguistics Research Center, Santa Cruz, CA.
- McCloskey, James. 2006. Questions and Questioning in English. Ms., University of California, Santa Cruz.
- Ross, John Robert. 1967. Constraints on Variables in Syntax. Ph.D. diss., Massachusetts Institute of Technology.
- Sezer, Engin. 1978. Farsçadan Gelen Yabancı ya da Türkçe'de ki'li Ad Tümcükleri. *Genel Dilbilim Dergisi* I(2), 18-31. Ankara.
- Şener, Serkan. 2010. (Non-)Peripheral Matters in Turkish Syntax. Ph.D. diss., University of Connecticut.

*Right Adjunction in the Right Peripheries*

Serkan Şener  
University of Connecticut, Storrs  
Department of Linguistics, U-1145  
337 Mansfield Rd. Storrs,  
CT 06269-1145

[serkan.sener@uconn.edu](mailto:serkan.sener@uconn.edu)



## Unergative Verbs in Norwegian Intransitive Expletive Constructions

KJERSTI G. STENSRUD  
*University of Chicago*

### 0. Introduction

Intransitive expletive constructions (IECs) in Norwegian occur with both unaccusative and unergative verbs.

- (1) Det forsvant en skatt i havet.  
there disappeared a treasure in the.ocean  
'A treasure disappeared in the ocean.'
- (2) Det jobber en mann i skogen.  
there works a man in the.forest  
'A man is working in the forest.'

To account for (1) is fairly straightforward; the object of the unaccusative has remained in its base generated position, with the expletive satisfying the EPP. The occurrence of the unergative *jobbe* 'work' in (2) carries far more theoretical interest, as unergatives are commonly assumed to combine with an *external* argument. Previous analyses have generally posited the same structure for both unaccusative and unergative IECs, assuming unergative IECs to involve a marked realization of agents as syntactic objects.

In this paper I provide strong empirical evidence in favor of disassociating unaccusative and unergative IECs. I further show that unergative IECs more closely resemble expletive copula constructions in Norwegian. On the basis of this, I develop an analysis of unergative IECs as *verbal existentials*, where I propose that unergatives in IECs function analogous to copulas.

The discussion is structured as follows. I start by introducing the basic properties of Norwegian IECs. I then provide a brief overview of some of the earlier unified IEC-analyses and show that they fail to capture a group of salient differences between unaccusative and unergative IECs. Then I discuss the relation between unergative IECs and expletive copula constructions in Norwegian, and

develop an existential analysis of unergative IECs on the basis of this. The last section summarizes the discussion.

### 1. Norwegian Intransitive Expletive Constructions: Data

Expletive constructions with intransitives feature both unaccusative and unergative verbs, as illustrated by the following examples.<sup>1</sup>

#### *Unaccusatives:*

- (3) Det sank et skip i havet.  
there sunk a ship in the.ocean  
'A ship sunk in the ocean.'
- (4) Det døde mange mennesker i flyulykken.  
there died many people in the.plane.crash  
'Many people died in the plane crash.'

#### *Unergatives:*

- (5) Det jobber en mann i hagen.  
there works a man in the.garden  
'A man works in the garden.'
- (6) Det kjørte mange biler over broa.  
there drove many cars over the.bridge  
'Many cars drove over the bridge.'

Crucially, there are other constructions that do distinguish between unaccusatives and unergatives in Norwegian, for instance adjectival and impersonal passives.

The only type of verb that is excluded from these constructions is unergatives referring to internal states of a human being, like *tenke* 'think' and *føle* 'feel.'

- (7) \*Det tenker en jente på biblioteket.  
there thinks a girl in the.library
- (8) \*Det føler en dikter på poesifestivalen.  
there feels a poet on the.poetry.festival

Like the other mainland Scandinavian languages, Norwegian does not have the transitive expletive constructions that we find in Icelandic.

---

<sup>1</sup> Thematic subjects in IECs are strictly subject to the Definiteness Effect.

*Unergatives in Norwegian Expletive Constructions*

- (9) Það hefur einhver borðað epli.  
there has someone.NOM eaten apple.ACC  
'Someone has eaten an apple.'
- (10) \*Det har noen spist et eple.  
there has someone eaten an apple

Unlike in the transitive expletive constructions, the thematic subject appears *post-verbally* in IECs, as becomes evident when an auxiliary is present and the main verb remains inside the VP.

- (11) Det har jobbet en mann i hagen.  
there has worked a man in the.garden  
'A man has worked in the garden.'
- (12) \*Det har en mann jobbet i hagen.  
there has a man worked in the.garden

Furthermore, the post-verbal DP obligatorily appears immediately after the verb, before any adverbial phrases.

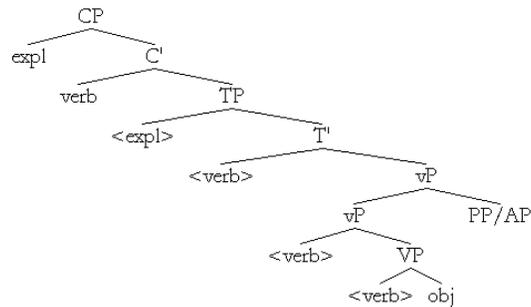
- (13) Det jobber (ofte) en mann (\*ofte) i hagen.  
there jobber often a man often in the.garden  
'A man often works in the garden.'
- (14) \*Det forsvant i havet en skatt.  
there disappeared in the.ocean a treasure

The position of the post-verbal DP thus appears to correspond to a regular object position. This has commonly led to the assumption that the thematic subject is realized as object in both unaccusative and unergative IECs. I now proceed to a discussion of some of the unified IEC-analyses that have emerged from this assumption.

**2. Previous Analyses: Unified Approaches to IECs**

Previous discussions of IECs generally assume that unergative and unaccusative IECs are structurally identical: the thematic agent subject is realized as object with the expletive subject satisfying the EPP (e.g. Sveen 1997, Lødrup 1999, Mikkelsen 2001 for Danish).

(15)



The structure in (15) provides a fairly straightforward account of unaccusative IECs: the object remains in its base generated position with the expletive satisfying the EPP.

The assumption that the structure in (15) is the correct analysis also for unergative IECs is of far more theoretical interest. This of course pertains to the conflation of unergatives and unaccusatives in these constructions, more specifically the realization of unergative arguments as *objects*. The apparent mapping of agents onto object positions contradicts the assumptions of the U(T)AH. Theory-specific claims aside, the association between the agent and syntactic subject (crucially as a one-way implication) is the one association that seems to hold for the lexicon-syntax interface across languages (e.g. Levin and Rappaport Hovav 2005). Unified approaches to IECs are thus faced with the theoretical task of determining what mechanisms underlie the “unaccusativization” of unergative verbs in IECs.

In addition to some conceptual challenges, the unified accounts face a set of empirical problems: there are salient differences between unaccusative and unergative IECs which the unified accounts fail to accommodate.

### 3. Structural Differences Between Unergative and Unaccusative IECs

Unaccusative and unergative IECs differ in (at least) three ways: i) with respect to limitations on what verbs may appear in the construction, ii) requirements on the presence of a *locative* predicate, and iii) constituency. I address these differences in turn.

As was mentioned in brief in 2.1, all unaccusative verbs may occur in IECs, whereas the use of unergatives is restricted. Some unergative verbs are entirely excluded from the construction, namely the ‘internal activity’ verbs we saw in (7)-(8) repeated here for convenience.

(16) \*Det tenker en jente på biblioteket.  
 there thinks a girl in the.library

(17) \*Det føler en dikter på poesifestivalen.  
 there feels a poet on the.poetryfestival

*Unergatives in Norwegian Expletive Constructions*

On a unified IEC-account, it is not clear why what appears to be a restriction on whether the activity described by the verb relates to physical space would apply only to unergative verbs. For instance, the distinction between two unaccusative verbs like *die* and *sink* is not that different from the relation between *think* and *sit* in this respect. Still the restriction only applies to the latter.

The second difference between unergative and unaccusative IECs is that unergative IECs *require* the presence of a locational predicate.

- (18) Det løper en gutt \*(på veien/ over jordet/ her ... etc.).  
there runs a boy on the.road/ across the.field/ here ...  
'A boy runs (on the road/across the field/here ... ).'

Naturally, no locational predicate is obligatory with a regular (i.e. non-expletive) intransitive.

- (19) Gutten løper (på veien/ i skogen/ over jordet ... etc.).  
the.boy runs on the.road/ in the.forest/ across the.field ...  
'The boy runs (on the road/ ... etc.).'

The locational predicate can either signify a location (*on the road*) or a path (*across the field*) and may be either a prepositional phrase or a locative adverbial (*here/there*). Temporal PP/APs are not acceptable.

- (20) \*Det løp en gutt i går/ da.  
there ran a boy in yesterday/then

Furthermore, the locational predicate must immediately follow the post-verbal thematic subject.

- (21) Det løp en gutt (\*i går) i skogen.  
there ran a boy in yesterday in the.forest

This indicates that the locational predicate is in fact selected by the verb. The required presence of locative predicate points back to the restrictions on unergative verbs in IECs – *location* evidently plays a crucial role in these constructions.

With unaccusative IECs, a locative predicate is optional, and the locative predicate (if present) behaves like any other adjunct with respect to adjacency.

- (22) Det forsvant en skatt (i havet/ i brannen/ der... )  
there disappeared a treasure in.the.ocean/in.the.fire/ there ...  
'A treasure disappeared (in the ocean/in the fire/there).'

- (23) Det har sunket mange skip (gjennom tidene) i Atlanterhavet.  
there has sunk many ship through the.times in the.Atlantic.Ocean  
'Many a ship has sunk in the Atlantic Ocean over the years.'

A third difference emerges with respect to constituency. If the thematic subject is realized as object in both unaccusative and unergative IECs, we expect the verb and the thematic subject to form a constituent in both cases. Looking at the possibility of VP-coordination in unaccusative and unergative IECs, this prediction is not borne out. As we would expect, the verb and post-verbal DP in unaccusative IECs can be coordinated.

- (24) Det har [ visnet en blomst] og [dødd et tre] i hagen.  
there has withered a flower and died a tree in the.garden  
'A flower has withered and a tree has died in the garden.'
- (25) Det [forsvant noen småbåter] og [sank et par skip].  
there disappeared some small.boats and sunk a couple ships  
'Some small boats disappeared and a couple of ships sunk.'

However, coordination is *not* possible with the unergative IECs.<sup>2</sup>

- (26) \*Det har [løpt en rev] og [hoppet en kanin] over jordet.  
there has ran a fox and jumped a rabbit over the.field
- (27) \*Det [lekte mange barn] og [jobbet mange menn] i parken.  
there played many children and worked many men in the.park

The relation between the verb and the thematic subject thus appears to be essentially different from that in unaccusative IECs.

In sum, there are substantial differences between unergative and unaccusative IECs that the unified IEC-analyses fail to account for. More specifically, the unaccusative structure in (15) does not provide an adequate analysis of the unergative cases.

#### 4. Unergative IECs as Verbal Existentials

In this section I develop an alternative that captures the particular syntactic and semantic properties of unergative IECs. I show that unergative IECs bear a close syntactic and semantic resemblance to existential copula constructions and argue on the basis of this that they ought to be analyzed as *verbal existentials*. This analysis elaborates on an idea initially explored in Hoekstra and Mulder (1990): a group of unergative verbs have the option of combining either with an agent DP

---

<sup>2</sup> Note that we do get Right Node Raising constructions with unergative IECs, crucially involving the intonational break associated with RNRs. The unacceptable examples in (26) and (27) reflect structures where no such break is present, i.e. regular conjunction.

or with a small clause complement, the former yielding agentive intransitives and the latter giving rise to unergative IECs.

#### **4.1. Unergative IECs and Expletive Copular Constructions**

A requirement of a predicate following the thematic subject is also found with expletive copular constructions in Norwegian.

- (28) Det er en elg \*(i hagen).  
there is a moose in the.garden  
'There is a moose in the garden.'

Like we saw with the unergative IECs, nothing can intervene between the thematic subject and this predicate.

- (29) Det var en elg \*(hver dag) i hagen.  
there was a moose every day in the.garden

Note however, that expletive copula constructions differ from IECs by also allowing temporal predicates in some cases.

- (30) Det var en fest etter middag.  
there was a party after dinner  
'There was a party after dinner.'

This seems to be related to the fact that the copula allows for thematic subjects referring to events. As will be discussed further below, both unergative IECs and expletive copula constructions state the existence of an entity *relative to some location*. Unergatives typically require animate subjects, and to locate animates (as well as other physical objects) in time is conceptually problematic. As we would expect, temporal predicates in expletive copula constructions are unacceptable when the thematic subject refers to a physical object.

- (31) \*Det var en elg etter middag.  
there was a moose after dinner

Events on the other hand may naturally be located in time, and this explains why temporal predicates occur with expletive copular constructions. Unergative IECs and expletive copula constructions thus share a strict requirement of a locational predicate, which may refer either to physical or temporal locations depending on the nature of the thematic subject.<sup>3</sup>

---

<sup>3</sup> Note that the use of expletive copula constructions in Norwegian is limited to predication of location (physical or temporal), and thus more restricted than what we find e.g. in English. As was shown above, Norwegian does not allow for only a thematic subject after the copula.

(i) There's a man / \*Det er en mann.

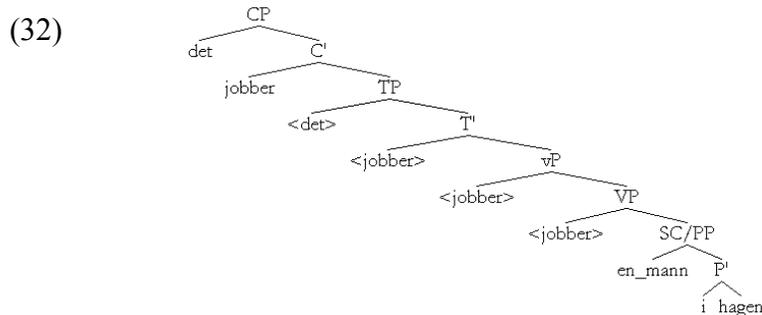
Crucially, there is also a close semantic relation between unergative IECs and expletive copular constructions. Like expletive copula constructions, unergative IECs assert the existence of an entity in the location denoted by the locational predicate. This existence is further characterized by the unergative verb such as *working*, *running*, etc. A sentence like *Det jobber en mann i hagen* (‘there works a man in the garden’) could be paraphrased as ‘There is a man in the garden such that he is working.’

Note that unaccusative IECs with locative PPs do not have this existential interpretation. For a sentence like *Det smelter en is i solen* (‘there melts an ice cream in the sun’) the paraphrase ‘There is an ice cream in the sun such that it is melting’ is infelicitous. Location is predicated of the entire event in these cases.

## 4.2. The Syntax of Unergative IECs

### 4.2.1. A Small Clause Analysis

The particular syntactic and semantic properties seen with unergative IECs as well as the similarity they bear to expletive copula constructions is straightforwardly captured if we assume that the group of unergatives occurring in IECs have the option of combining with a small clause complement. On analogy to small clause analyses of copula constructions (e.g. Stowell 1978, Bowers 1993, 2002, Hazout 2004), I propose that the unergative verbs that occur in IECs subcategorize for a small clause complement containing a locational predicate (either PP or AP). The unaccusative nature of these structures stems from the absence of an external argument in Spec-*v*P (i.e. an “unaccusative” little *v*). An initial version of this structure is given in (32).



This analysis straightforwardly captures the complement-like behavior of the locational predicate as well as the coordination facts. Interestingly enough, the small clause analysis relates the unergative IECs to other constructions where what looks like a direct object is assumed to actually originate as a small clause subject, most notably adjectival resultatives in English (e.g. Kratzer 2004).

The structure in (32) in turn raises several theoretical questions, most significantly regarding the relation between unergatives and external (agentive) argu-

---

Likewise, we do not find non-locational adjectivals preceding the thematic subject in Norwegian.

(ii) There were three students drunk/\*Det var tre studenter fulle.

ments, theta-assignment, and whether (32) has non-expletive counterparts.

#### **4.2.2. The Relation Between Unergatives and External Arguments**

The analysis in (32) assumes that unergatives in some cases occur without an external (agentive) subject. Note that this assumption differs in a subtle, yet important way from what we saw with the unified IEC accounts. The unified analyses argue against the common assumption in linking theory that agents are always realized as syntactic subjects: they may also map onto the object position in certain cases. These accounts thus assume that unergatives have *one* lexical entry, and that the difference between regular unergative intransitives and unergative IECs originates in the lexicon-syntax interface.<sup>4</sup> The analysis presented here assumes that multiple lexical entries are what gives rise to different syntactic structures. The agentive intransitives results from a “bare” unergative combining with *v* selecting an external argument. The unergative IECs are a result of the verb subcategorizing for a small clause complement, and combining with an agent-less (i.e. “unaccusative”) *v*.

In short, while it follows from the unified IEC accounts that agents are not necessarily realized as subjects, the current analysis assumes that unergative verbs do not necessarily occur with agents. This presupposes a *constructional* view on the external argument: on the view that external arguments are assigned structurally through the mediation of a functional head (Kratzer 1996, Marantz 1997 among others), we may allow for the option that unergatives in certain cases occur without an agentive functional projection.

#### **4.2.3. Theta Assignment**

Another question that needs to be addresses is how the DP receives a  $\theta$ -role from the verb in these constructions. A short recapitulation of the core semantic properties of unergative IECs is in place here. There is consensus in the literature that unergative IECs are de-agentivized relative to regular (non-expletive) unergative constructions (e.g. Maling 1987, Lødrup 1999) and are best characterized as involving *presentational focus* in the sense of Bresnan (1994). “[...] a scene is set and a referent introduced on the scene to become the new focus of attention” (Bresnan 1994:91). A *scene* is naturally expressed as a location and the referent as something of which this location is predicated, i.e. a *theme*. This description applies to Norwegian expletive copula constructions and unergative IECs alike. In unergative IECs this state is additionally characterized as *working*, *playing*, etc., as was discussed in section 4.1.

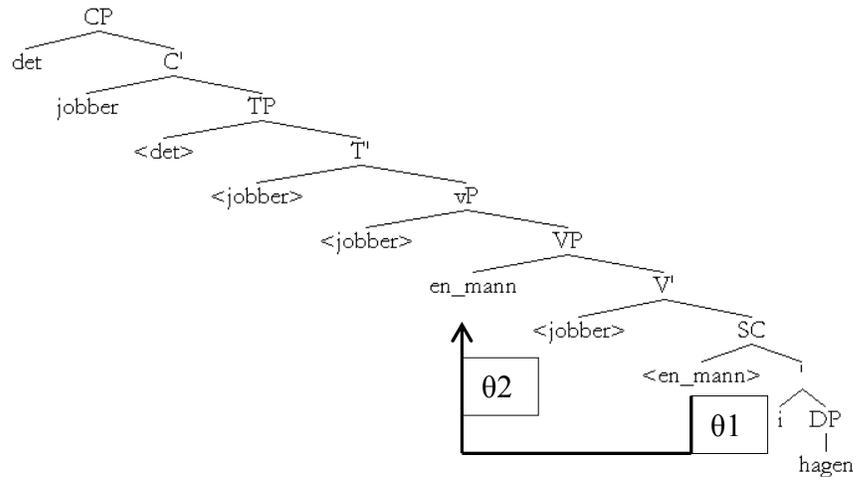
As a way of both capturing these semantic facts *and* accounting for  $\theta$ -assignment, we could assume that thematic subjects in unergative IECs receive two  $\theta$ -roles. The first is assigned within the small clause itself. The second is assigned through short  $\theta$ -driven movement of the DP to Spec-VP. Along the lines

---

<sup>4</sup> A related idea is found in Bresnan’s 1994 analysis of Locative Inversion in English: a locative-theme frame, or “thematic overlay” is imposed on the argument structure of an agentive verb as a pragmatic requirement.

of Hornstein (1999) we have to assume that  $\theta$ -roles are features of the verb that can drive movement, and that nominals may receive more than one  $\theta$ -role.<sup>5</sup>

(33)



The structure in (33) involves a case of what Jeong (2006) calls “literal object sharing”: co-indexation of objects via movement where the syntax forces the semantics to interpret the subevents that relate to the shared object as connected parts of a whole event structure (Jeong 2006:3). In this sense, the DP-movement assumed in (33) reflects the two semantic components that constitute the meaning of unergative IECs.

There is (at least) one significant remaining challenge for the analysis in (33) however: what to make of the Spec-VP position. If we take (33) to be the correct analysis of unergative IECs, not only do we have to assume that unergatives may occur without an agent and in combination with a small clause complement, but we also have to assume that they license a Spec-VP. I argued earlier that the lack of an external argument receives justification from the little-*v* hypothesis. Unergatives have been assumed to combine with small clauses in adjectival resultatives (e.g. *John ran himself tired*). But that unergatives may license a Spec-VP position deviates from any previous assumptions about the syntax of unergatives. By positing this rather unaccusative property, we arrive at some of the same problems that arise with the unified IEC accounts, albeit via a different route. Although the current analysis does provide a more adequate account of the syntactic and semantic properties of unergative IECs, the actual occurrence of unergative verbs in this structure remains as a rather puzzling fact of Norwegian syntax.

#### 4.2.4. Do unergative IECs have non-expletive counterparts?

The last question to be addressed in this section is whether unergative IECs have

<sup>5</sup> Note that moving the small clause subject to Spec-vP gets the word order wrong in sentences when the main verb does not move to T, unless we stipulate additional verb-movement to some lower projection above vP in these cases. Assuming movement to SpecvP would also face some trouble explaining the de-agentivized flavor of these constructions.

non-expletive counterparts. With unergatives, we would expect a non-expletive unergative intransitive to be ambiguous between a non-expletive counterpart to IECs (34) and a regular agentive intransitive with an adjunct PP (35), i.e. between an existential and an agentive reading.

(34) En mann<sub>i</sub> jobber [<sub>SC</sub> t<sub>i</sub> i hagen].

(35) En mann<sub>i</sub> [<sub>VP</sub> t<sub>i</sub> [<sub>VP</sub> jobber]] [<sub>PP</sub> i hagen].

As an initial speculation, it is interesting to note that unergatives with indefinite subjects have been claimed to often yield a modal marking of the indefinite subject: “[...] a kind of objective reference, used e.g. when telling a joke or describing a picture” (Lødrup 1999:214). This “objective reference” could be a reflection of the structure in (34). Whether non-expletive unergative intransitives actually are ambiguous in the way my analysis predicts still remains to be properly tested.

## 5. Summary

The primary theoretical focus of this paper has been on how to go about analyzing the unexpected occurrence of unergative verbs in intransitive expletive constructions in Norwegian. I started out by showing that analyses unifying unergative and unaccusative IECs are empirically inadequate. I further argued that the close syntactic and semantic relation we find between unergative IECs and expletive copula constructions supports an analysis of unergative IECs as *verbal existentials*, where unergatives combine with a small clause complement, without an external argument. The difference between agentive and copular use of unergatives was assumed to be rooted in core syntax rather than resulting from a “pragmatic overlay” of some sort.

## References

- Borer, Hagit. 2004. The Grammar Machine. In A. Alexiadou, E. Anagnostopoulou and M. Everaert, eds., *The Unaccusativity Puzzle- Explorations of the Syntax-Lexicon Interface*. New York: Oxford University Press.
- Bowers, John. 1993. The Syntax of Predication. *Linguistic Inquiry* 24:591-656.
- Bowers, John. 2002. Transitivity. *Linguistic Inquiry* 33:183-224.
- Bresnan, Joan. 1994. Locative Inversion and the Architecture of Universal Grammar. *Language* 70:72-131.
- Hazout, Ilan. 2004. The Syntax of Existential Constructions. *Linguistic Inquiry* 35: 393-430.
- Hoekstra, Teun A. and René Mulder. 1990. Unergatives and Copular verbs: Locational and Existential Predication. *The Linguistic Review* 7:1-79.
- Hornstein, Norbert. 1999. Control and Movement. *Linguistic Inquiry* 30:69-96.

Kjersti G. Stensrud

- Kratzer, Angelika. 1996. Severing the External Argument from the Verb. In J. Rooryck and L. Zaring, eds., *Phrase Structure and the Lexicon*, 109-37. Dordrecht: Kluwer.
- Kratzer, Angelika. 2004. Building Resultatives. Ms., University of Massachusetts, Amherst.
- Levin, Beth. 2005. *Argument Realization*. Cambridge: Cambridge University Press.
- Lødrup, Helge. 1999. Linking and Optimality in the Norwegian Presentational Focus Construction. *Nordic Journal of linguistics* 22:205-230.
- Maling, Joan. 1987. Existential Sentences in Swedish and Icelandic: Reference to Thematic Roles. *Working Papers in Scandinavian Syntax* 28.
- Marantz, Alec. 1997. No Escape from Syntax: Don't Try a Morphological Analysis in the Privacy of Your Own Lexicon. *U Penn Working Papers in Linguistics* 4(2):201-225.
- Mikkelsen, Line Hove. 2001. Reanalyzing the Definiteness Effect: Evidence from Danish. *Rutgers Optimality Archive* 470-1001. <http://roa.rutgers.edu>.
- Platzack, Christer. 1983. Existential Sentences in English, Swedish, German and Icelandic. In F. Karlsson, ed., *Papers from the Seventh Scandinavian Conference on Linguistics*, 80-100.
- Stowell, Tim. 1978. What Was There Before There Was There. In D. Farkas, W.M. Jacobsen and K. W. Todrys, eds., *Papers from the 14th Regional Meeting of the Chicago Linguistics Society*, 458-471.
- Sveen, Andreas. 1997. *Norwegian Impersonal Actives and the Unaccusativity Hypothesis*. PhD diss, University of Oslo.

Kjersti G. Stensrud  
University of Chicago  
Department of Linguistics  
1010 E. 59<sup>th</sup> St  
Chicago, IL 60637

[kgs@uchicago.edu](mailto:kgs@uchicago.edu)

## **Noun Incorporation and Case: Evidence from Sakha**

CHRISTOPHER A. STRAUGHN

*University of Chicago*

### **0. On Sakha**

Sakha (also known as Yakut) is a typically Turkic language, featuring vowel harmony, a nominative-accusative case system, strict SOV word order with modifiers before modified, ‘agglutinative’ word formation with suffixing morphology, and a complex system of converbs to indicate mood and aspect. It is spoken in Russia in the Sakha Republic (formerly Yakutia), by approximately 380,000 people. Contacts with surrounding languages, mostly Tungusic and Paleosiberian, have introduced large numbers of loanwords into Sakha and have affected its grammar. As many of these languages feature noun incorporation (henceforth NI), it is reasonable to speculate that the NI-like phenomena found in Sakha developed from these contacts (Kirişcioğlu 1999).

### **1. Introduction**

A characteristically non-Turkic feature of Sakha is the presence of noun-incorporation-like phenomena, similar to the type exhibited in West Greenlandic Eskimo. Unlike traditional forms of NI, though, the form of NI found in Sakha causes alternation in case when the internal argument of the incorporating verb is conjoined to the verb, thereby disrupting normal assignment of accusative case. In order to explain the mechanics of this case alternation, I will invoke Bittner and Hale’s analysis of case-assignment by means of a KP shell.

By analyzing the data in Sakha, I will show that while canonical NI is not present, the data still provides insights into the structure of the verb. By employing Bittner and Hale’s analysis of case, I will show that the data in Sakha are best accounted for by positing a D+V complex as the standard structure of transitive verbs in accusative languages. This analysis not only accounts for Sakha, but promises to account for a wide range of NI-like and light verb phenomena in a wide range of languages.

The behavior of the incorporating/light verb in Sakha is unique among Turkic languages, yet the analysis of this verb sheds light not only on the range of possibilities in Turkic language, but on the structure of the verb itself.

**2. The -LAA- Suffix in Sakha**

Sakha possesses a verbalizing suffix *-LAA-* which acts in certain cases similarly to an incorporating verb. This suffix derives from a Common Turkic morpheme *\*-LĀ-*, which is present in most, if not all other Turkic languages. As a result of vowel harmony and consonant assimilation, this verbalizer (which I represent using archiphonemes) is realized as sixteen different forms based on conditioning environment:

(1)

|                  |         | CONSONANT ASSIMILATION |       |                  |       |
|------------------|---------|------------------------|-------|------------------|-------|
|                  |         | AFTER:                 | l, V  | p, t, ç, s,<br>x | r, y  |
| VOWEL<br>HARMONY | a, ĩ, u | -laa-                  | -taa- | -daa-            | -naa- |
|                  | e, i, ü | -lee-                  | -tee- | -dee-            | -nee- |
|                  | o       | -loo-                  | -too- | -doo-            | -noo- |
|                  | ö       | -löö-                  | -töö- | -döö-            | -nöö- |

The *-LAA-* verbalizer is promiscuous, attaching to most non-verbs, including interjections, numerals, quantifying adverbs, question words, adjectives, temporal adverbs, and nouns. Examples below are from Vinokurova 2005 and Kirişcioğlu 1999.

(2) Interjections:

- (2.1) *ayikka!* ‘interjection of pain’ > *ayikka-laa-* ‘to express pain’
- (2.2) *hay!* ‘interjection for driving cattle’ > *hay-daa-* ‘to drive cattle’

(3) Numerals:

- (3.1) *ikki* ‘two’ > *ikki-lee-* ‘to do two times’
- (3.2) *ikkis* ‘second’ > *ikkis-tee-* ‘to do a second time’

(4) Quantifying Adverbs:

- (4.1) *baçça* ‘this much’ > *baçça-laa-* ‘to do this much’
- (4.2) *oçço* ‘that much’ > *oçço-loo-* ‘to do that much’

(5) Question Words:

- (5.1) *tuox* ‘what?’ > *tuox-taa-* ‘to do what?’
- (5.2) *xanna* ‘where?’ > *xanna-laa-* ‘to go where?’

(6) Temporal Adverbs:

- (6.1) *erde* ‘early’ > *erde-lee-* ‘to do something early’
- (6.2) *urut* ‘before, previously’ > *urut-taa-* ‘to do something before something’

(7) Adjectives

- (7.1) *aççik* ‘hungry’ > *aççik-taa-* ‘to be hungry’
- (7.2) *kihil* ‘red’ > *kihil-laa-* ‘to be red, become red’

(8) Nouns:

(8.1) *ötüye* ‘hammer’ > *ötüye-lee-* ‘to hammer’

(8.2) *oġo* ‘child’ > *oġo-loo-* ‘to babysit’

The resulting verbs are then treated as any other verb and are marked accordingly to tense, aspect, person<sup>1</sup>, etc.

(9) *Üleġ-in töhö-löö-tüŋ?*  
 Work-2s.poss how.much-LAA-2sPST  
 ‘How much of your work have you done?’

(10) *Miexe telefon-naa-bit.*  
 1s.DAT telephone-LAA-3s.hearsay  
 ‘He supposedly called me.’

Based on the data in (2)-(8) *-LAA-* appears to behave like a typical verbalizing morpheme that exhibits nothing unusual – certainly nothing syntactic in nature. Examine, however, the example provided below:

(11) *Sargi oġo-lor-u kihil, saharxay, küöx šarik-tar-daa-ta.*  
 Sargi child-PL-ACC red yellow blue balloon-PL-LAA-3sPST  
 ‘Sargy gave the children red, yellow, and blue balloons.’

It appears that the noun *šarik* ‘balloon’ is being modified by *kihil, saharxay, küöx* ‘red, yellow, blue’. Because adjectives always precede the noun they modify, ‘red, yellow, blue’ may modify neither ‘children’ nor ‘Sargy’. And because the modifiers do not have an adverbial ending (in which case their forms would be *kihildik, saharxaydik, küöxtük*) an adverbial reading, in which the entire verb is modified, is not possible. A third possibility is that ‘red, yellow, blue’ are merely nouns acting as objects of the verb *šarik-tar-da-*, but (12) rules out this possibility, as it is not possible to assign the optional accusative case to these words:

(12) \**Sargi oġo-lor-u kihil-ï šarik-tar-daa-ta.*  
 Sargi child-PL-ACC red-ACC balloon-PL-LAA-3sPST  
 ‘Sargy gave the children red balloons.’

Such a construction not only improperly assigns accusative case to ‘red’, but assigns that case to *both* the theme and goal of the sentence. The only remaining interpretation is that the verbalized noun is receiving external modification.

While the evidence in (17) and (18) strongly suggests the presence of NI-like phenomena, further examination is necessary before claiming that every instance

<sup>1</sup> Note that only the subject is marked on verbs in Sakha.

of verbalization in Sakha is NI. To that end, I present below Vinokurova's 2005 semantic breakdown of possible results of application of the *-LAA-* suffix:

(13)

| MEANING                  | MODIFIED N | PLURAL N | TRANSITIVE V |
|--------------------------|------------|----------|--------------|
| a. Provide w/ N          | Y          | Y        | Y            |
| b. Go toward N           | Y          | N        | N            |
| c. Use N as instrument   | N          | N        | Y            |
| d. Remove N              | N          | N        | Y            |
| e. Make/Hunt/Gather N    | N          | N        | N            |
| f. Look after N          | N          | N        | Y            |
| g. Consume N             | N          | N        | Y            |
| h. Imitate/Act/Work as N | N          | N        | Y            |
| i. Play N                | N          | N        | N            |
| j. 'Weather' N           | N          | N        | N            |

Based on the data in (13), we see that in certain cases the verbalized noun may be modified and/or plural. These cases (Types a. & b.) and only these cases are consistent with phenomena associated with NI. The second type however, reveals little compared to the first, so the example provided below will be the only mention made of this second type:

- (14) Ookko iraa*s* djie-lee-te.  
 Ookko clean house-LAA-3sPST  
 'Ookko went to a clean house.'

The form in (14) exhibits the most interesting aspect of the second – the 'go toward' type verb: the ability of the verbalized noun to be modified by an external adjective. But because these forms exhibit none of the case alternations found in the first – the 'provide with' forms, I will not focus on them further.

### 3. But is it NI?

Up to this point, the nature of the *-LAA-* phenomenon in Sakha has been left ambiguous. The history of noun incorporation is contentious, with most authors defining the term in a slightly different manner. In Sakha it is clear that *-LAA-* incorporates phonologically and morphologically, but syntactic incorporation is harder to prove.

The evidence for phonological incorporation of the noun+*LAA* complex lies in the complex system of vowel harmony and consonant assimilation that gives *-LAA-* one of its sixteen forms. The disharmonic form in (15) never surfaces:

- (15) \*šarik-tar-nöö-  
 balloon-PL-LAA

*Noun Incorporation and Case: Evidence from Sakha*

While the term incorporation may be inappropriate here, a term such as ‘unified’ adequately describes the fact that the noun plus *-LAA-* are a single phonological unit.

Evidence for morphological incorporation comes from the inability of the syntax to alter the noun+*LAA* complex. For example, question particles (which behave like focus markers in Sakha) may not be inserted between the noun and *-LAA-*:

- (16) \**Ayaal küter-ni külüüs du-laa-ta?*  
 Ayaal muskrat-ACC key Q.Part-LAA-3sPST  
 ‘Did Ayaal give the muskrat a key?’

Instead, the question particle treats the verb as a single unit and follows it:

- (17) *Ayaal küter-ni külüüs-tee-te du?*  
 Ayaal muskrat-ACC key-LAA-3sPST Q.Part  
 ‘Did Ayaal give the muskrat a key?’

(Notably, in this sort of construction, the semantic vacuity of *-LAA-* prevents it from being the object of focus. In (17), *key* is the only possible object of focus.)

Other evidence for the morphological unity of the noun+*LAA* complex comes from passive constructions. In standard passives in Sakha, which involve a full verb plus its arguments, only the lowermost argument may be raised to become the subject of the sentence. The second, or indirect object may not be raised in passivization. In *-LAA-* constructions, however, the noun attached to *-LAA-* may never be raised; only the indirect object, which receives accusative case in standard transitive constructions, may be raised:

- (18) \**Saharxay, küöx šarik-tar ožo-lor-?? -LA-n-nI-lAr.*  
 Yellow blue balloon-PL child-PL-Case?-LAA-PASS-3sPST-PL  
 ‘Yellow and blue balloons were given to the children.’

- (19) *Ožo-lor saharxay, küöx šarik-tar-la-n-ni-lar.*  
 Child-PL yellow blue balloon-PL-LAA-PASS-3sPST-PL  
 ‘The children were given yellow and blue balloons.’

Likewise, the noun attached to *-LAA-* may not be raised for the purposes of topicalization or separated from *-LAA-* in any other way.

Syntactic incorporation is somewhat more difficult to prove, as what occurs in Sakha is either inconsistent with or difficult to reconcile with traditional views on noun incorporation. Mithun, for example, states that “[i]n incorporating languages, a verb minus its I[n]corporated N[oun] is still a well formed verb...” (1986:32). Sadock’s interpretation of similar phenomena in West Greenlandic Eskimo as NI, however, supports the view of the phenomena in Sakha as NI. In West

Greenlandic, incorporating verbs are in a distinct class from ordinary verbs. For example, the standard term for ‘to eat’ is *neri-*, where as the incorporating form is *-tor-* (Sadock 1980:309). Sakha’s *-LAA-* resemblance to West Greenlandic is somewhat tenuous, though, as Sakha possesses only the one incorporating verb, whereas West Greenlandic has about one hundred.

Baker’s take on NI is more theoretically based. According to Baker, incorporation is present if a noun (typically the direct object) undergoes syntactic movement and unifies with the verb:

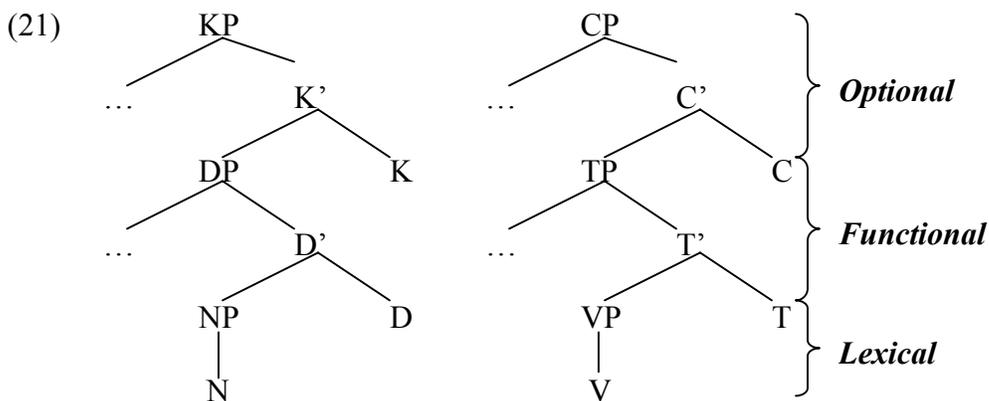


Adding to the support for Baker’s approach is the statement that “Noun Incorporation NPs do not need to have Case” (1988:129), which is consistent with the data in Sakha. The ‘incorporated’ NP in Sakha receives no case, and, as in the cases of Eskimo and Niuean discussed by Baker, the cases of other arguments are altered. Baker writes off these case alternations to a “Case absorption” effect,’ but is not explicit with regards to the exact mechanics of this operation (1988:129).

In order to better resolve the case alternations in Sakha, I turn to Bittner and Hale’s analysis of case.

#### 4. Bittner and Hale’s System of Case

Among the most accepted aspects of Bittner and Hale’s system of case is the presence of a K-head above nominals which acts as the morphological manifestation of case. Under this system, the K-head is parallel to C, the clausal head, the D-head is parallel to T or I, the tense/inflectional head, and the lexical N head is parallel to the lexical V head (1996:7). These relations are further illustrated in (21) below:



*Noun Incorporation and Case: Evidence from Sakha*

Under this system, the K-head will manifest itself (in some cases, at least) as an adposition. In Sakha, this supposition holds true, as case is marked as a clitic on the last element of a DP (which is always the noun):

- (22) *Sargi* [<sub>KP</sub>[<sub>DP</sub> *oğo-lor*]-**go**] [<sub>KP</sub>[<sub>DP</sub> *küöx šarik-tar*]-**ni**] *bier-de*.  
*Sargi* [<sub>KP</sub>[<sub>DP</sub> *child-PL*]-**DAT**] [<sub>KP</sub>[<sub>DP</sub> *green balloon-PL*]-**ACC**] *give-3sPST*  
 ‘Sargy gave the children green balloons.’

As shown in (21), however, a K-head is not always present. Where case is not traditionally marked, as in nominative or absolutive nominals, K is not present.

Case under this system is divided into structural case and inherent case, where structural case is a syntactically assigned case (accusative or ergative) and inherent case is that case which is assigned by some inherent case feature in the assigner (as with dative or ablative objects). In order for the K-head to be filled, a *Case-competitor* must be present. A *Case-competitor* is defined, then, as the following:

- (23)  $\gamma$  is a *Case-competitor* for an argument  $\beta$ , iff  $\gamma$  is a K-less nominal which is in a chain with a co-argument, or a pseudo co-argument, or  $\beta$  (1996:43).

The nominative-accusative array in Sakha is summed up in Bittner and Hale’s statement of direct case realizations:

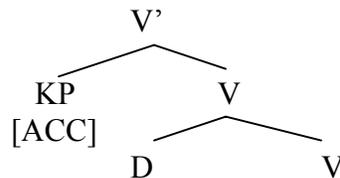
- (24) If  $\alpha$  Case-binds an overt empty-headed KP  $\beta$ , then the empty K of  $\beta$  is realized as ACC, if  $\alpha$  is V and has an adjoined D (1996:11).

The conditions for case binding are given later:

- (25) Let  $\alpha$  be a head which delimits a small clause and let  $\beta$  be an argument. Then  $\alpha$  *Case-binds*  $\beta$ , and  $\beta$ ’s head, iff  
 (i)  $\alpha$  locally c-commands  $\beta$ ;  
 (ii)  $\alpha$  governs a *Case-competitor* for  $\beta$  (1996:18)

As part of these case relations, Bittner and Hale posit a D-head attached to the verb in nominative accusative languages. A standard array is shown below:

- (26)



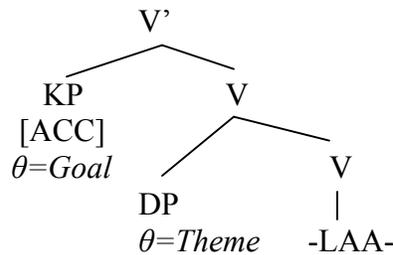
The D-head attached to the verb acts as a Case-competitor for the nominal receiving accusative case. Other cases (e.g. dative, instrumental, ablative) are assigned by language specific conventions based on position within the clause. Methods for assigning case in ergative, split ergative, or three-way case systems are outlined by Bittner and Hale as well, but a full discussion of those cases is beyond the scope of this paper.

A point not fully elaborated upon by Bittner and Hale regarding the proposed D+V complex is that this complex, once formed, is a single morphological unit. Bittner and Hale compare the D-head proposed for the verbal complex to the antipassive morpheme in ergative languages. Just as the antipassive morpheme may not undergo any of the sorts of movements allowed of standard verbal arguments, neither may the D-head in accusative languages move.

### 5. Implications for Sakha

The system of case proposed by Bittner and Hale provides a new way to examine the *-LAA-* morpheme in Sakha. I propose that *-LAA-* is a deficient verb that does *not* already possess an attached D-head. Accordingly, the first argument selected for by *-LAA-*, the theme, merges without a K-head and therefore may not receive case. The next argument, the goal, possesses a K-head however, and a similar array to (27) results:

(27)



As applied to a full sentence, the result is as shown in (28):

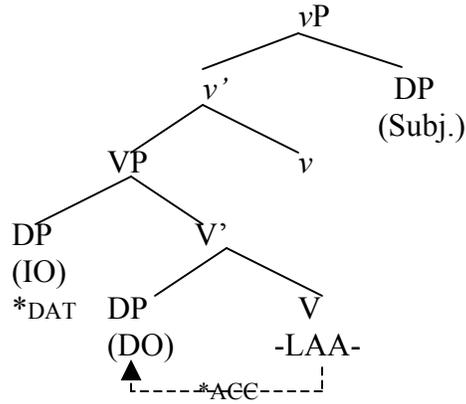
(28) [DP *Sargi*] [KP[DP *oġo*]-*nu*] [V[DP *kihil, kũõx šarik-tar*]-*daa-ta*.]  
*Sargi* child-ACC red, blue balloon-PL-LAA-3sPST  
 ‘Sargy gave the child red and blue balloons.’

As noted previously, Bittner and Hale do not allow for the D+V complex to be separated, as that would result in the raising of the antipassive morpheme or transitivizing morphology. Similarly, Sakha does not allow the D in the D+V constructions to separate, as that would result in the stranding of the deficient *-LAA-* verb.

While it appears that Bittner and Hale’s system of case merely provides an explanation for the data in Sakha, the data in Sakha in turn support Bittner and Hale. Traditional methods of case assignment fail to account for the lack of case

on the lowest argument and the presence of accusative, rather than dative case on the indirect object, as shown in (29):

(29)



By distinguishing between nominals with and without K-shells, Bittner and Hale resolve the dilemma that would arise when traditional systems of case assignment attempt to describe Sakha, namely, what prevents the direct object from receiving accusative case? By allowing the presence or absence of a K-head, this dilemma is avoided under Bittner and Hale’s case system.

## 6. Conclusions

Based on Baker’s movement-based definition, the phenomena in Sakha are not NI. Although morphology and phonology indicate some sort of union between *-LAA-* and its arguments, no syntactic movement occurs. Given the contentious history of NI, though, it seems appropriate to examine other languages considered to have NI to see if the D+V approach is more fruitful.

With regards to other Turkic languages, the phenomena in Sakha are unique. Compare the form used previously with the ungrammatical form in Uzbek:

(30) **Sakha**

*Sargi oġo-lor-u kihil, saharxay, küöx šarik-tar-daa-ta.*  
 Sargi child-PL-ACC red yellow blue balloon-PL-LAA-3sPST  
 ‘Sargy gave the children red, yellow, and blue balloons.’

(31) **Uzbek**

\**Sargi oġ’il-lar-ni qizil, sariq, va ko’k sharik-lar-la-di.*  
 Sargy child-PL-ACC red yellow and blue balloon-PL-la-3sPST  
 ‘Sargy gave the children red, yellow, and blue balloons.’

The equivalent form in Uzbek is ungrammatical because of the external modification of ‘balloon’ by the color adjectives and the pluralization of ‘balloon’ before the addition of the verbalizing *-la-* morpheme.

However, there is promise in the analysis of other phenomena in Turkic using Bittner and Hale's analysis to examine light verbs. Most Turkic languages possess not only a verbalizing suffix based on Proto-Turkic *\*-LĀ-*, they also possess light verbs, as shown in the examples below:

- (32) **Uzbek**  
Alido'st            men-I            qo'ng'iroq qil-di.  
Alidost            me-ACC            phone.ring LV-PST3s  
'Alidost called me.'

- (33) **Turkish**  
Bu    merkez            kredi kart-I            kabul            ed-er.  
This   store            credit card-ACC            acceptance            LV-AOR.3s  
'This store accepts credit cards.'

Before analyzing these and other light verbs as D+V complexes further examination is necessary.

By analyzing data from Sakha and implementing Bittner and Hale's system of case assignment, it has been shown that Sakha possesses a form of NI unlike that of any other Turkic language, and that Bittner and Hale's system is required to account for it. The case alternations in Sakha, along with the possibility of modification of the incorporated noun provide evidence that there is, indeed, a D adjoined to the verb.

## References

- Baker, Mark C. 1988. *Incorporation: A Theory of Grammatical Function Changing*. Chicago: UC Press.
- Bittner, Maria and Ken Hale. 1996. The Structural Determination of Case and Agreement. *Linguistic Inquiry* 27:1-95.
- Kirişçioğlu, M. Fatih. 1999. *Saha (Yakut) Türkçesi Grameri*. 2nd ed. Atatürk Kültür, Dil ve Tarih Yüksek Kurumu 594. Ankara: Türk Dil Kurumu.
- Mithun, Marianne. 1986. On the Nature of Noun Incorporation. *Language* 62:32-38.
- Sadock, Jerrold M. 1980. Noun Incorporation in Greenlandic: A Case of Syntactic Word Formation. *Language* 56:300-319.
- Vinokurova, Nadezha. 2005. *Lexical Categories and Argument Structure: A Case Study with Reference to Sakha*. Diss., Universiteit Utrecht.

*Noun Incorporation and Case: Evidence from Sakha*

Christopher A. Straughn  
University of Chicago  
Department of Linguistics  
1010 E. 59<sup>th</sup> St.  
Chicago, IL 60637-1512

[straughn@uchicago.edu](mailto:straughn@uchicago.edu)



## Frame-Based Constraints on Lexical Choice in Metaphor

KAREN SULLIVAN

*University of Queensland*

### 0. Introduction

Most of what we know about conceptual metaphors like KNOWING IS SEEING and HAPPINESS IS LIGHT comes from metaphoric language (cf. Sweetser 1990, Kövecses 2002), yet there are some substantial gaps in our understanding of metaphoric language itself. For example, why do many semantically similar items have different metaphoric uses? Why does *brilliant* metaphorically mean ‘intelligent’, as in *brilliant idea* (via KNOWING IS SEEING), whereas *sunny* metaphorically means ‘cheerful’, as in *sunny mood* (via HAPPINESS IS LIGHT)? Both *sunny* and *brilliant* refer to qualities of light, so these items might be expected to have the same metaphoric uses and limitations. To further complicate the issue, the adjective *bright* can be used in either KNOWING IS SEEING or HAPPINESS IS LIGHT, as in *bright idea* ‘intelligent idea’ or *bright mood* ‘cheerful mood’.

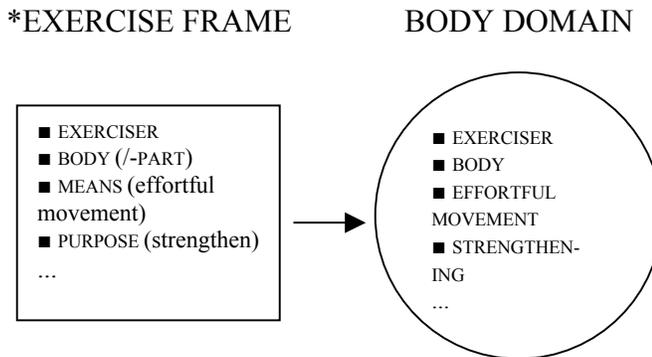
In this paper I hope to strip away one layer of mystery surrounding lexical choice in metaphor, using the tools of frame semantics (Fillmore 1982). I argue that the frames evoked by lexical items’ nonmetaphoric senses can determine which items are chosen to express a given conceptual metaphor. I suggest that the Invariance Principle (Lakoff 1993) applies to frame structure as well as image-schema structure, and can help account for the role of frames in metaphoric extension.

My analysis is based on a study of the metaphoric and nonmetaphoric uses of a set of adjectives and adverbs in the British National Corpus. The metaphoric uses involve either HAPPINESS IS LIGHT or one of two submappings of KNOWING IS SEEING: INTELLIGENCE IS LIGHT-EMISSION or COMPREHENSIBILITY IS VISIBILITY. The nonmetaphoric senses of these modifiers evoke particular frames, which (in accordance with the extended Invariance Principle), must be carried over into the items’ metaphoric uses, making them either suitable or unsuitable for expressing HAPPINESS IS LIGHT, INTELLIGENCE IS LIGHT-EMISSION, or COMPREHENSIBILITY IS VISIBILITY. This analysis will explain, among other things, why *brilliant* means ‘intelligent’ but *sunny* means ‘cheerful’, and why *bright* can refer to either intelligence or cheerfulness.

**1. Frames, domains, and the Invariance Principle**

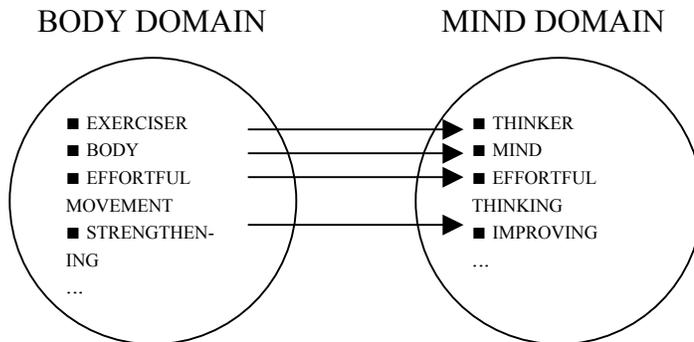
Before diving into the data, I will briefly characterize my interpretation of how frames and domains interact. By ‘metaphoric domain’ I refer to the structure comprising all schematic information potentially available for mapping via a given metaphor. Much of the schematic information in a domain comes from frame structure. For example, certain structure in the BODY domain (the source domain of THE MIND IS A BODY) is derived from the \*EXERCISE frame (evoked by the verb *exercise*), as in Figure (1).<sup>1</sup> A domain is usually structured by multiple frames, so that for example the BODY domain is structured by frames related to ‘eating’ (INGESTION), ‘dying’ (DEATH), and others not shown in this diagram.

(1) The \*EXERCISE frame structures the BODY domain



The information about ‘exercise’ in the BODY domain can be mapped to a target domain, such as MIND, via THE MIND IS A BODY. The mapping of ‘exercise’ structure to MIND is evident in expressions like *mental exercise* or *a workout for your brain*. Several mappings of THE MIND IS A BODY which preserve EXERCISE frame elements are shown below.

(2) THE MIND IS A BODY



<sup>1</sup> Frames marked with an asterisk have not been documented by the FrameNet project. All frame diagrams and discussions in this paper include only a subset of the frames’ structure; more complete analysis of the documented frames can be found at <http://framenet.icsi.berkeley.edu/>.

### *Frame-Based Constraints on Lexical Choice in Metaphor*

Metaphoric mappings preserve frame relations and inferences as well as frame elements. In the BODY domain, the BODY element must refer specifically to the EXERCISER's body. This relation carries over into the MIND domain, in which the MIND must be specifically the THINKER's mind. Likewise, the STRENGTHENING element in the BODY domain is the effect of EFFORTFUL MOVEMENT, which leads to the inference in the MIND domain that EFFORTFUL THINKING will result in mental IMPROVEMENT.

The preservation of frame elements, relations, and inferences in metaphoric mappings suggests that frame structure, like image-schema structure, is subject to the Invariance Principle (Lakoff 1993:215):

Metaphorical mappings preserve the cognitive topology (that is, the image-schema structure) of the source domain, in a way consistent with the inherent structure of the target domain.

If the definition of 'cognitive topology' is extended to include frame structure as well as image-schema structure, then the preservation of frame elements and relations in metaphors such as THE MIND IS A BODY is predicted.

The Invariance Principle does *not* predict whether any particular source-domain structure will be mapped in a given instance of a metaphor. Metaphoric mappings are always partial, preserving only a subset of the source-domain structure (Lakoff and Johnson 1980). The structure that is mapped will vary even between instances of a single conceptual metaphor, when different submappings of the metaphor are involved in each instance.

The partial nature of metaphoric mappings should be kept in mind when tracking the effects of frame structure on metaphor. Since metaphoric domains are often structured by multiple frames, different submappings of a metaphor may preserve the structure of different frames. For instance, IDEAS ARE FOOD (as evinced by phrases like *half-baked ideas* and other examples cited by Lakoff [1980:46-47]) is a submapping of THE MIND IS A BODY which does not map elements from the \*EXERCISE frame. Instead, the submapping draws on the structure of the INGESTION frame, such that an INGESTOR maps to a THINKER, INGESTIBLES map to IDEAS, and so forth. The fact that different submappings can map material from different frames will be a crucial assumption in sections (4) and (5) of this paper, which compare the frame structure involved in two submappings of KNOWING IS SEEING: INTELLIGENCE IS LIGHT-EMISSION and COMPREHENSIBILITY IS VISIBILITY.

Much of the analysis in this paper depends on another corollary of the Invariance Principle, one that is usually assumed rather than stated: that metaphorically mapped 'cognitive topology' is evidence of source-domain structure. In other words, structure that is mapped must logically be present in the source domain. Mappings in THE MIND IS A BODY, such as EFFORTFUL THINKING IS EFFORTFUL MOVEMENT and A THINKER IS AN EXERCISER, demonstrate that EFFORTFUL MOVEMENT and EXERCISER are elements in the BODY domain, which in turn provides evidence that the frame with these elements, \*EXERCISE, is structuring

the BODY domain. Throughout this paper, metaphoric mappings will be taken as evidence of source-domain structure, including frame structure.

Metaphorically mapped frame structure can be directly compared with the frame structure evoked by the nonmetaphoric senses of lexical items. If the hypothesis of this paper is correct, and lexical items' frame structure constrains their compatibility with a given metaphor, we will find the reasons for the items' compatibility or incompatibility in the frame structure evoked by the items' nonmetaphoric uses.

## 2. Methodology

The data were collected in a series of searches within the British National Corpus (c.100 million words) involving the following collocations: *bright N* (n = 4,172), *brightly V* (n = 323), *V brightly* (n = 160), *brilliant N* (n = 1,456), *brilliantly V* (n = 100), *V brilliantly* (n = 83), *sunny N* (n = 587), *sunnily V* (n = 1), *clear N* (n = 3,524), *clearly V* (n = 2,591), *dim N* (n = 345), *dark N* (n = 4,856).

The search items' metaphoric and nonmetaphoric senses were usually disambiguated by the collocated nouns and verbs (for example, *brilliant idea* involves a metaphoric sense of *brilliant*, whereas *brilliant star* involves a nonmetaphoric sense). When the collocated noun or verb permitted multiple senses of the modifier (as in *brilliant one*), I determined which sense was intended based on the larger context in which the collocation occurred.

Collocations with over a thousand hits were counted only above a certain frequency cutoff. Single-occurrence collocations were excluded (except for *sunnily began*, the only instance of *sunnily V*).

## 3. Lexical choice in HAPPINESS IS LIGHT

A chief function of several adjectives referring to 'light' is the communication of the metaphor HAPPINESS IS LIGHT. For example, the adjective *bright* means 'happy/cheerful', as in *looking on the bright side*, *bright greeting* and *bright outlook*, in 33% of the total collocations of *bright*. The adjectives *sunny* and *dark* also express HAPPINESS IS LIGHT as in *sunny disposition* or *dark mood*, with the frequencies shown below.

Table 1. HAPPINESS IS LIGHT collocations

| Item            | Total 'LIGHT' | Example         | Total 'HAPPINESS' | Example                        | Percent 'HAPPINESS' (of total hits) |
|-----------------|---------------|-----------------|-------------------|--------------------------------|-------------------------------------|
| <b>bright</b>   | <b>2430</b>   | bright place    | <b>1371</b>       | bright disposition             | <b>32.9</b>                         |
| <b>brightly</b> | <b>382</b>    | glowed brightly | <b>101</b>        | laughed brightly               | <b>20.9</b>                         |
| <b>dark</b>     | <b>4340</b>   | dark room       | <b>444</b>        | dark thought                   | <b>9.2</b>                          |
| <b>sunny</b>    | <b>554</b>    | sunny terrace   | <b>33</b>         | sunny mood                     | <b>5.6</b>                          |
| <b>sunnily</b>  | <b>0</b>      |                 | <b>1</b>          | sunnily began to take requests | <b>100</b>                          |

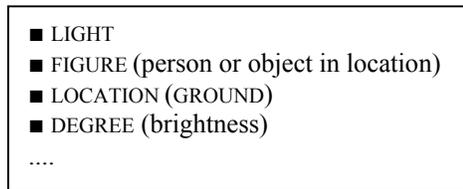
NOTE: The column Total 'LIGHT' includes all nonmetaphoric senses referring to 'light' or 'seeing', regardless of frame evoked. Percent 'HAPPINESS' reflects a percentage of the total analyzed collocations of the listed item, which may include senses not added into the totals for either 'LIGHT' or 'HAPPINESS'.

However, some adjectives referring to ‘light’ cannot express HAPPINESS IS LIGHT. For example, *brilliant* never means ‘cheerful’ or ‘happy’, as in: *?looking on the brilliant side* or *?brilliant disposition*.

We can see why *brilliant* differs from adjectives like *bright* and *sunny* when we turn to the nonmetaphoric uses of these adjectives, and specifically the frame structure that these uses evoke. Nonmetaphoric *bright*, *sunny* and *dark* often modify nouns denoting a location, as in *bright room*, *sunny place*, and *dark corner*. However, *brilliant* is rarely used in this way, as in collocations like *?brilliant place* or *?brilliant street*.

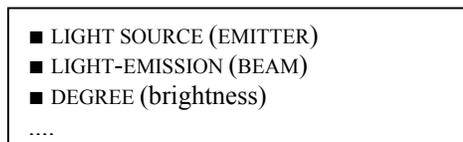
This difference is indicative of the fact that adjectives like *bright* and *sunny* usually evoke the LOCATION\_OF\_LIGHT frame as in Figure (3), which involves a LOCATION where the light is apparent (called a ‘GROUND’ element in FrameNet notation).<sup>2</sup> The modified location nouns denote this LOCATION element.

(3) LOCATION\_OF\_LIGHT frame (*sunny*, *bright*, *dark*)



The adjective *brilliant*, on the other hand, typically refers to light emanating from a source, as in *brilliant star* or *brilliant torch*. These uses evoke the LIGHT\_MOVEMENT frame in Figure (4), which does not involve a LOCATION element.

(4) LIGHT\_MOVEMENT frame (*brilliant*, *bright*, *dim*)



Adjectives that evoke the LOCATION\_OF\_LIGHT frame frequently modify nouns denoting the LOCATION element in this frame; while adjectives that evoke the LIGHT\_MOVEMENT frame do not modify these nouns. This distinction makes the presence or absence of collocated LOCATION nouns a useful diagnostic of which frame an adjective evokes.

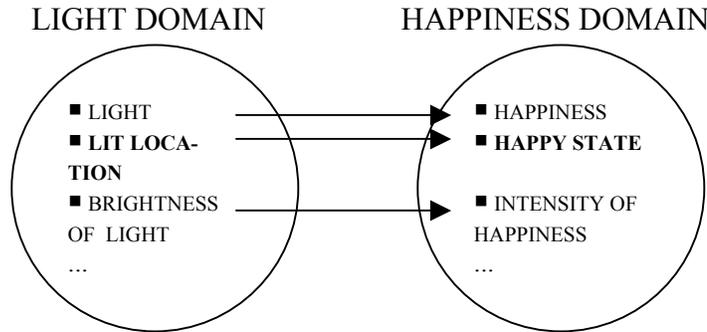
The LOCATION element also provides evidence that the LOCATION\_OF\_LIGHT frame is part of the LIGHT source domain. The metaphor HAPPINESS IS LIGHT includes the mapping HAPPY STATES ARE LIT LOCATIONS, apparent in preposition phrases such as *in a sunny mood* or *in a dark state of mind*. As discussed above,

---

<sup>2</sup> When my name for a frame element differs from the one found in FrameNet, the FrameNet term is indicated in parenthetical small caps following the element name. Clarifying descriptions of the elements are in parenthetical normal text following the element name.

metaphoric mappings reflect source-domain frame structure via the extended Invariance Principle. The mapping HAPPY STATES ARE LIT LOCATIONS (shown in boldface in Figure [5] below) therefore reflects a LOCATION element in the source-domain structure; and the presence of a LOCATION element is evidence, in turn, that the LIGHT domain is structured by LOCATION\_OF\_LIGHT.

(5) HAPPINESS IS LIGHT



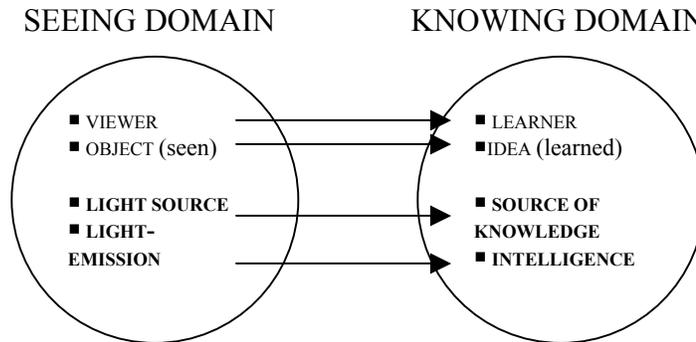
Adjectives like *sunny*, which evoke the LOCATION\_OF\_LIGHT frame, can express the metaphor HAPPINESS IS LIGHT because their frame structure matches the frame structure of the LIGHT source domain. Adjectives like *brilliant*, which evoke a frame other than LOCATION\_OF\_LIGHT, are inconsistent with the LIGHT source domain and cannot acquire metaphoric meanings in the domain of HAPPINESS. This analysis of the data in Table 1 supports the central hypothesis of this paper: that lexical items' frame evocation constrains the items' uses in metaphor.

**4. Lexical choice in INTELLIGENCE IS LIGHT-EMISSION**

Although the frame structure of *brilliant* renders it incompatible with the metaphor HAPPINESS IS LIGHT, this same frame structure evidently permits *brilliant* to refer metaphorically to 'intelligence' as in *brilliant idea* or *brilliant mind*. This sense of *brilliant* expresses the metaphor KNOWING IS SEEING and its submappings SOURCES OF KNOWLEDGE ARE LIGHT SOURCES and INTELLIGENCE IS LIGHT-EMISSION, shown in Figure (6) below (LIGHT-EMISSION, which enables us to see objects, maps to INTELLIGENCE, which enables us to understand concepts). Since light-emission presupposes a light source, I will refer to these two submappings collectively as INTELLIGENCE IS LIGHT-EMISSION.<sup>3</sup>

<sup>3</sup> In accordance with the partial nature of metaphoric mappings, some instances of KNOWING IS SEEING do not involve the mapping INTELLIGENCE IS LIGHT-EMISSION. The observations in this section apply only to those usages of KNOWING IS SEEING in which the mapping is evident.

(6) KNOWING IS SEEING and INTELLIGENCE IS LIGHT-EMISSION



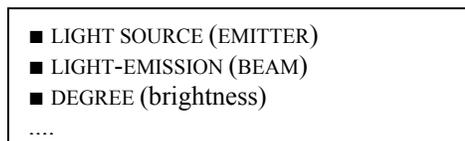
The mapping INTELLIGENCE IS LIGHT-EMISSION, like the metaphor HAPPINESS IS LIGHT, can be expressed by certain modifiers but not by others. We saw that *brilliant* expresses this submapping, as in *brilliant mind*. Like *brilliant*, the adjective *dim* can express INTELLIGENCE IS LIGHT-EMISSION, as in *dimwit* or *dim child*. The usage frequencies of these and other items are listed below.

Table 2. INTELLIGENCE IS LIGHT-EMISSION collocations

| Item               | Total 'LIGHT' | Example           | Total 'INTELLIGENCE' | Example            | Percent 'INTELLIGENCE' (of total hits) |
|--------------------|---------------|-------------------|----------------------|--------------------|----------------------------------------|
| <b>brilliantly</b> | <b>40</b>     | shine brilliantly | <b>35</b>            | reason brilliantly | <b>19.1</b>                            |
| <b>brilliant</b>   | <b>1070</b>   | brilliant sun     | <b>179</b>           | brilliant idea     | <b>12.3</b>                            |
| <b>bright</b>      | <b>2430</b>   | bright jewel      | <b>371</b>           | bright student     | <b>8.9</b>                             |
| <b>dim</b>         | <b>260</b>    | dim star          | <b>4</b>             | dim child          | <b>1.1</b>                             |
| <b>brightly</b>    | <b>382</b>    | glow brightly     | <b>0</b>             |                    | <b>0</b>                               |

Although a considerable percentage of the occurrences of *brilliant* reflect INTELLIGENCE IS LIGHT-EMISSION, other items, like *sunny* and *dark*, fail to express this metaphor even once. To explain the distinction between items like *brilliant* and items like *sunny*, let us return to the LIGHT\_MOVEMENT frame evoked by *brilliant*, repeated as Figure (7) below.

(7) LIGHT\_MOVEMENT frame (*brilliant*, *bright*, *dim*)



Items like *brilliant* tend to modify nouns denoting the LIGHT SOURCE in this frame, as in *brilliant star*, *brilliant flash*, and *brilliant sun*. Conversely, items such as *sunny* and *dark* exhibited no collocations with LIGHT SOURCE nouns and presumably do not evoke the LIGHT\_MOVEMENT frame.

The SEEING source domain of KNOWING IS SEEING, as in Figure (6) above, also includes a LIGHT SOURCE. This element maps to a SOURCE OF KNOWLEDGE in the KNOWING domain (a mapping evident in phrases like *this book is illuminating* or *your answer shed light on the topic*). The presence of this LIGHT SOURCE element indicates that the LIGHT\_MOVEMENT frame is active in the SEEING source domain.

Now that we have identified LIGHT\_MOVEMENT frame structure in the SEEING domain, centered around the submapping INTELLIGENCE IS LIGHT-EMISSION, we can make a prediction: Only lexical items that evoke the LIGHT\_MOVEMENT frame, as *brilliant* does, will be chosen to express INTELLIGENCE IS LIGHT-EMISSION.

In fact, the rest of the items under consideration support this generalization. Like *brilliant*, the item *dim* often literally refers to a light source, as in *dim star*, *dim torch* or *dim lantern*. This reference to LIGHT-EMISSION allows *dim* to refer metaphorically to INTELLIGENCE as in *dim child*.

Unlike *brilliant*, *sunny* does not modify light source nouns, but refers only to ambient sunlight. The item *sunny* could, in theory, be used image-metaphorically to describe a light source that resembles sunlight, as in *?sunny firelight* or *?sunny lantern*; but there were no examples of this type in the corpus. The item *sunny* does not typically evoke LIGHT\_MOVEMENT and, as a result, is incompatible with INTELLIGENCE IS LIGHT-EMISSION.

Like *sunny*, the item *dark* was not found to modify potential light sources (*?dark streetlight*). In practice, *dark* seems to refer to a level of available light, not to an absence of light from a given source. Consequently *dark* does not refer to a lack of intelligence via INTELLIGENCE IS LIGHT-EMISSION.

The LIGHT SOURCE element in the LIGHT\_MOVEMENT frame seems to determine adjectives' compatibility with INTELLIGENCE IS LIGHT-EMISSION, much in the same way that the LOCATION element in LOCATION\_OF\_LIGHT predicted compatibility with HAPPINESS IS LIGHT. This consistency between frames and mappings supports the idea that semantic frames shape items' metaphoric uses.

#### 4.1. The metaphoric and nonmetaphoric polysemies of *bright*

Most of the adjectives we have examined (*brilliant*, *dim*, *sunny* and *dark*) work with either HAPPINESS IS LIGHT or INTELLIGENCE IS LIGHT-EMISSION, but not with both. The adjective *bright* is the exception. Alongside the metaphoric uses meaning 'cheerful', as in *bright mood*, we find collocations like *bright idea* and *bright child*, where *bright* means 'intelligent'.

The metaphoric polysemy of *bright* is put in perspective when we consider the diverse nonmetaphoric senses of the item. While one sense of *bright* evokes the LOCATION\_OF\_LIGHT frame, as in *bright room* etc., a second sense of *bright* evokes the LIGHT\_MOVEMENT frame, as in *bright fire*, *bright object* and *bright moon*.

In accordance with the Invariance Principle, the frame evocation properties of the nonmetaphoric senses of *bright* are preserved in its metaphoric uses. The

sense of *bright* in *bright room* can, as a result, extend to the metaphoric sense in *bright mood* via HAPPINESS IS LIGHT, whereas the sense in *bright fire* can extend to the metaphoric sense in *bright idea* via INTELLIGENCE IS LIGHT-EMISSION. None of the other adjectives share this polysemy, and as a result, only *bright* can express both HAPPINESS IS LIGHT and INTELLIGENCE IS LIGHT-EMISSION.

It is worth noting that although both *bright* and *brilliant* can express INTELLIGENCE IS LIGHT-EMISSION, *bright* denotes a lesser DEGREE of intelligence than *brilliant*. The adjective *bright* often refers to children or students, as in *bright child*, *bright boy*, or *bright pupil*. In contrast, *brilliant* is more likely to occur in *brilliant engineer*, *brilliant scholar* or *brilliant scientist*. This distinction shows that the values assigned to the DEGREE element in the LIGHT\_MOVEMENT frame (in which *brilliant* involves a greater DEGREE of light-emission than *bright*) are carried over into the target domain, in which the adjectives denote differing DEGREES of intelligence.

**5. KNOWING IS SEEING and COMPREHENSIBILITY IS VISIBILITY**

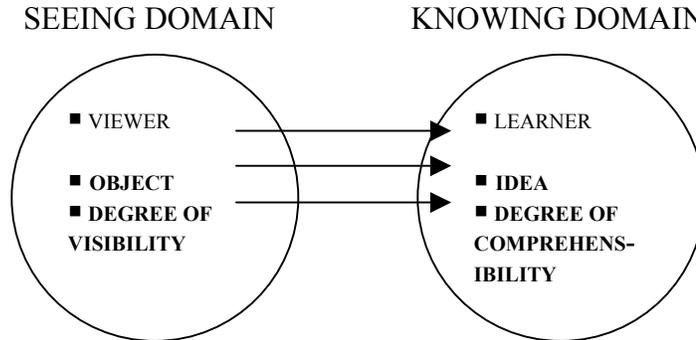
The final set of examples I will discuss involve another submapping of KNOWING IS SEEING, COMPREHENSIBILITY IS VISIBILITY. Certain items that cannot refer to ‘stupidity’ or ‘intelligence’ nevertheless have metaphoric meanings related to KNOWING IS SEEING. For example, *a dim idea* normally means a ‘vague’ or ‘uncertain’ idea, not a ‘stupid’ one. The item *dark* similarly can refer to something ‘unknown’ or ‘mysterious’, as in *a dark area in our understanding*. Most dramatically, the adjective *clear* means ‘obvious’ or ‘certain’ 83 percent of the time as in *a clear understanding*, *clear idea* or *a clear statement*, and adverbial *clearly* means ‘certainly’ or ‘obviously’ 86 percent of the time, as shown below.

Table 3. COMPREHENSIBILITY IS VISIBILITY collocations

| ITEM           | TOTAL<br>‘LIGHT’ | EXAMPLE     | TOTAL<br>‘COMPRE-<br>HENSIBILITY’ | EXAMPLE                       | PERCENT<br>‘COMPRE-<br>HENSIBILITY’<br>(of total hits) |
|----------------|------------------|-------------|-----------------------------------|-------------------------------|--------------------------------------------------------|
| <b>clearly</b> | <b>381</b>       | see clearly | <b>2308</b>                       | reason clearly                | <b>85.8</b>                                            |
| <b>clear</b>   | <b>558</b>       | clear image | <b>2919</b>                       | clear statement               | <b>82.8</b>                                            |
| <b>dim</b>     | <b>260</b>       | dim figure  | <b>30</b>                         | dim idea                      | <b>8.7</b>                                             |
| <b>dark</b>    | <b>4340</b>      | dark shape  | <b>51</b>                         | dark area of<br>understanding | <b>1.1</b>                                             |

Items like *clear* ‘obvious/certain’ are not based on the ‘light-emission’ mapping of KNOWING IS SEEING that is active in *brilliant* ‘intelligent’. Instead, these uses focus on the sub-mappings IDEAS ARE OBJECTS and COMPREHENSIBILITY (of an idea) IS VISIBILITY (of an object), shown in Figure (8). Because the latter mapping presupposes the former, I refer to these two submappings collectively as COMPREHENSIBILITY IS VISIBILITY.

(8) KNOWING IS SEEING and COMPREHENSIBILITY IS VISIBILITY

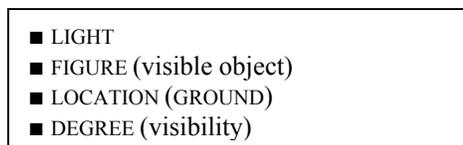


We know that items are not chosen to express COMPREHENSIBILITY IS VISIBILITY on the basis of the LIGHT\_MOVEMENT frame, because, as we saw in the previous section, *clear* and *dark* do not evoke this frame.

Instead, the nonmetaphoric uses of the relevant items point to a different frame involved in COMPREHENSIBILITY IS VISIBILITY. Even though the item *dim* occurs in collocations denoting a light source (as in *dim lantern*), in fact *dim* more often refers to an object that is only vaguely or partially seen (*dim shape*, *dim figure*, or *dim blur*). These senses evoke a frame that includes a visible object and a level of visibility ascribed to that object. These elements may seem familiar, because we saw them in the LOCATION\_OF\_LIGHT frame (a frame that structures HAPPINESS IS LIGHT).

The LOCATION\_OF\_LIGHT frame, shown in Figure (3), is repeated in Figure (9) with a few changes in emphasis. Nouns modified by *clear* or *dim* denote the FIGURE element in the LOCATION\_OF\_LIGHT frame, rather than the LOCATION element evoked by nouns in phrases like *bright room*. Noun phrases like *bright room* denote a LOCATION (such as a ‘room’), whereas noun phrases like *clear outline* denote the FIGURE that is visible in some LOCATION (such as a visible ‘outline’). A related difference between Figure (3) and Figure (9) is that the DEGREE element in LOCATION\_OF\_LIGHT as evoked by *clear*, *dim* etc. refers specifically to the visibility of the FIGURE rather than the brightness of light at the LOCATION.

(9) LOCATION\_OF\_LIGHT frame (*clear*, *dim*, *dark*)



Just as the LOCATION element in LOCATION\_OF\_LIGHT is apparent in the source domain of HAPPINESS IS LIGHT, the FIGURE and DEGREE (of visibility) in this frame contribute structure to the source domain of KNOWING IS SEEING. The

element DEGREE (of visibility) maps from SEEING to KNOWING via DEGREE OF COMPREHENSIBILITY IS DEGREE OF VISIBILITY, as we saw in Figure (8).

As a result of this mapping, items like *dim*, which have nonmetaphoric uses referring to the VISIBILITY of a FIGURE (*dim shape*, *dim outline*) also allow metaphoric uses referring to the COMPREHENSIBILITY of an IDEA (*dim memory*, *dim idea* or *dim awareness*). *Clear* and *dark* also refer to the VISIBILITY of a FIGURE (*clear footprint* or *dark shape*), so these items can likewise refer metaphorically to COMPREHENSIBILITY (*clear idea* or the idiom *dark horse*).

These collocations show that COMPREHENSIBILITY IS VISIBILITY imposes different frame requirements on lexical choice than INTELLIGENCE IS LIGHT-EMISSION, even though both are submappings of KNOWING IS SEEING. Since the LIGHT\_MOVEMENT and LOCATION\_OF\_LIGHT frames are both part of the SEEING domain, certain submappings of KNOWING IS SEEING map structure from one frame, while different submappings map structure from the other.

#### 6. Adjectives vs. adverbs: *brilliantly*, *clearly*, *brightly* and *sunnily*

Adverbs and adjectives that share a common root generally evoke the same frames, and as a result have the same range of metaphoric uses. For example, *brilliant* and *brilliantly* express INTELLIGENCE IS LIGHT-EMISSION 19.1% and 12.3% of the time, respectively, as in Table 2; and *clear* and *clearly* express COMPREHENSIBILITY IS VISIBILITY 82.8% and 85.8% of the time, as in Table 3. Once again, similarities in frame structure lead to similar metaphoric uses.

Discrepancies between adjectives and adverbs can usually be attributed to factors other than frame structure. For example, *brightly* differs from *bright* in that *brightly* is not used in INTELLIGENCE IS LIGHT-EMISSION (Table 2). This discrepancy is part of a more general trend in which roots referring to ‘intelligence’ are less likely to be used as adverbs than roots referring to ‘cheerfulness’. For example, the collocation *intelligent N* (n = 916) is twice as common in the BNC than *cheerful N* (n = 441), yet adverbial *intelligently V* (n = 38) is rare compared to *cheerfully V* (n = 151).

The adverb *sunnily* presents another case of adverb/adjective difference. Although *sunny* refers to HAPPINESS only 5.6% of the time, the lone instance of *sunnily* refers to HAPPINESS (Table 1). The nonoccurrence of literal *sunnily* is due to a combination of two factors: First, just as the adjective *sunny* does not normally modify nouns denoting light sources other than the sun (section [4]), *sunnily* rarely modifies verbs denoting light-emission produced by light sources other than the sun (*?the firelight burned sunnily* or *?the lantern shone sunnily*). Second, *sunnily* is redundant in describing light-emission that actually is from the sun, as in *?the sun shone sunnily* or *?the sunlight gleamed sunnily*. These two restrictions conspire to rule out most nonmetaphoric uses of *sunnily*.

In the absence of factors such as those at work in *brightly* and *sunnily*, adverbs seem to share the metaphoric uses of their adjectival counterparts. The previous sections have shown that adjectives that evoke the same frames (such as *bright*, *sunny* and *dark*, which all evoke LOCATION\_OF\_LIGHT) have the same metaphoric

uses (such that *bright*, *sunny* and *dark* all express HAPPINESS IS LIGHT). Apparently, adjectives and adverbs which evoke the same frames likewise have similar metaphoric uses. This suggests that items' frame evocation is a more important factor than lexical category in determining metaphoric usages.

## 7. Conclusion

There seems to be a certain logic behind the choice of lexical items in expressing metaphor. Acknowledging this logic is an important step for conceptual metaphor theory, because understanding the regularities of lexical choice in metaphor will improve metaphor theorists' control over language as a data source. Furthermore, the central role of frame semantics in metaphoric language should draw attention to the significance of frames in conceptual metaphor and the necessity for an extended Invariance Principle.

The correlations noted in this paper also suggest three new avenues for research: First, the role of frames in metaphoric extension needs to be tested in conceptual domains other than LIGHT and SEEING. Second, the frame evocation properties of items belonging to other lexical categories (particularly verbs) remain to be examined. And finally, we should look for other forces that help shape lexical choice in metaphor. These will include stylistic concerns (such as the redundancy issue affecting *sunnily*), which should be sorted out from considerations such as frame compatibility. We have seen in this paper that lexical choice in metaphor is anything but arbitrary. However, it will take time, ingenuity, and a great deal of further research to unravel the complexity of factors at work in metaphoric language.

## References

- Fillmore, Charles J. 1982. Frame Semantics. In The Linguistic Society of Korea, ed., *Linguistics in the Morning Calm*, 111-137. Seoul: Hanshin Publishing Co.
- Kövecses, Zoltan. 2002. *Metaphor*. Oxford: Oxford University Press.
- Lakoff, George 1993. The Contemporary Theory of Metaphor. In Andrew Ortony, ed. *Metaphor and Thought*, 2<sup>nd</sup> edition, 202-251. Cambridge: Cambridge University Press.
- Lakoff, George and Mark Johnson 1980. *Metaphors We Live By*. Chicago: The University of Chicago Press.
- Sweetser, Eve 1990. *From etymology to pragmatics: Metaphorical and cultural aspects of semantic structure*. Cambridge: Cambridge University Press.

*Frame-Based Constraints on Lexical Choice in Metaphor*

Karen Sullivan  
University of Queensland  
School of Languages and Comparative Cultural Studies  
Gordon Greenwood  
QLD 4072  
Australia

[ksull@uq.edu.au](mailto:ksull@uq.edu.au)



# **From *Keigo* ‘Honorifics’ to *Keii-Hyougen* ‘Respect Expressions’: Linguistic Ideologies of Japanese Honorifics<sup>1</sup>**

MAKIKO TAKEKURO  
*Waseda University*

## **0. Introduction**

Japanese honorifics are often associated with hierarchy and seniority. To many native speakers of Japanese, honorifics are markers of hierarchy and power, as they say that they *must* use honorifics to someone older, superior, or unfamiliar. However, in actual speech practices, speakers who claim that honorific usage is based on hierarchy and power sometimes use honorifics among peers and communicate a sense of solidarity and camaraderie with them.

In this paper, I first examine how a reformulation of the linguistic ideology of Japanese honorifics has become a focal point for a broad-ranging process of institutional restructuring in contemporary Japan. I demonstrate that a shift in honorification terminology from *keigo* ‘honorifics’ to *keii-hyougen* ‘expressions of respect’ indexes a more general change in language use, perceived to be necessary for a transformation of institutional system based on hierarchy to one based on efficiency and performance. I point out an ideological shift of honorification in various institutions and their prescriptions. Then I examine a series of honorific usage and demonstrate that depending on the contexts in which people use them, honorifics signify hierarchy on the one hand, and solidarity on the other.

## **1. Situating Honorifics in Socio-political Contexts of Japan**

In contemporary Japan, a reformulation of the linguistic ideology of Japanese communication has become a focal point for a broad process of institutional restructuring. Changes are occurring in the underlying demographic and financial structure of the economy, governmental organizations, and educational institutions. As a result of these social changes, traditional Japanese forms of

---

<sup>1</sup> An earlier version of this paper in part appeared in Takekuro (2005). It was presented at the 2005 Meeting of American Ethnological Society in April 2005. I wish to thank Charles Briggs and Michael Silverstein for inviting me to the Keyword Panel and the participants for their questions and insightful comments. Needless to say, I am solely responsible for the data and analysis.

institutional organizations are perceived as inefficient, opaque, and hierarchical as opposed to new (usually American or Western) forms of institutional organizations, perceived as efficient, transparent, and egalitarian. Institutional reformulation in many parts of the society necessitates a more general change in communication, including the usage of honorifics.

Honorifics are one of them that have first become a target for change. At the government level, a change in language policy was announced in December 2000, when *Kokugo Shingikai* (the Japanese Language Council) submitted guidelines of language use, originally submitted to the Minister of Education in 1952 (Kokugo Shingikai 2000). Unlike the previous guidelines for honorific usage, in which prescriptive honorific usage was emphasized, the new guidelines of the Council minimized the use of the term *keigo* ‘honorifics’. Instead, they introduced the new term *keii-hyōgen* ‘respect expressions’, incorporating ideas related to linguistic politeness in Anglo-European sociolinguistic studies (Lakoff 1973, 1975; Brown and Levinson 1987[1978]; Leech 1983). In discussing language use in the New Age of Japan, the Council acknowledges the general public’s divided opinions concerning Japanese honorific usage. Some who are concerned about *midareta* ‘corrupted’ honorific usage in contemporary Japanese argue that honorifics signify the refinement of the traditional Japanese culture, as many linguists in *kokugogaku* ‘National Language Studies’ romanticized honorifics and said that they manifest “a refined custom of deference for Japanese” (Yamada 1924) and “[the] thoughtfulness in our national character” (Matsushita 1925; both translated by Wetzel 2004:21). Other people argue that honorifics are no longer necessary in contemporary Japanese society. Honorifics symbolize old, hierarchical, and undemocratic social structures, thus should be either simplified or abolished. The Council states that successful communication is not limited to the use of honorifics, but rather involves all kinds of communicative behavior that indicate “considerations towards others and situations” (*aite ya bamen he no hairyo*). Thus, the Council introduced the notion of *keii-hyōgen* which is based on “reciprocal respect” (*sōgo sonkei*) rather than hierarchy and seniority. According to the members of the Council (Asamatsu 2001, Ide 2001) and the researchers involved (Sugito 2001), their reports were made with the hope that people with different social backgrounds, dialects, and beliefs about language could still achieve successful communication by employing honorifics, respect expressions, and other linguistic and semiotic means.

In business, dramatic changes in honorific usage are often mentioned. On October 30, 2003, the *New York Times* journalist Norimitsu Onishi reported a growing trend to drop honorifics in Japanese corporate culture.

[M]any Japanese companies, traditionally divided rigidly by age and seniority, have dropped the use of titles to create a more open - and, they hope, competitive - culture... The long economic slump has forced companies to abandon seniority in favor of performance, upsetting the traditional order,” which forced companies to discourage their employees from using “honorifics that Japanese have traditionally used toward an older person, a boss, a customer, a stranger. (Onishi 2003)

Onishi reports that some companies have introduced this new policy of dropping honorifics by discouraging their employees from addressing each other by honorific titles (e.g. ‘president,’ ‘department chief,’ or ‘manager’).<sup>2</sup> Instead, they encourage the use of the polite suffix *-san* added to names, such as *Takekuro-san* ‘Ms. Takekuro’ as opposed to *Takekuro-buchō* ‘Department Chief Takekuro’. By addressing each other by names rather than by honorific titles, companies hope that their employees will exchange ideas freely, make decisions quickly, and develop innovative ideas and better human relationships. One female employee commented on this new language policy in her company: “There is less distance and human relations in the workplace have improved.”

The journalist further points out that for many young Japanese, using honorifics hinders innovation, openness, and personal touch in communication. But for many older Japanese, not using honorifics means “losing the deep beauty of their language” and “the coarsening of the social culture,” bringing chaos to society. This article portrays honorifics as something that symbolizes cultural refinement. On the other hand, honorifics support or reflect Japan’s rigidity and traditional social structures based on seniority or hierarchy, by hindering open communication, information disclosure, good human relations, and flexible attitudes to accept new ideas. In his latter interpretation, the dropping of honorifics is perceived as if it could create open-mindedness, equality-based social structure, quick decision-making, innovation, more intimacy in communication, and better human relations.

Linguistic ideologies of Japanese honorifics seem to be shifting to the direction of developing a more fluid understanding of honorifics, dropping honorifics, or even abolishing honorifics at the expense of efficiency and better human relationships. However, if honorifics were truly undemocratic and useless to users of the language or to the society, they would have disappeared by now. But honorifics die hard in Japanese. This suggests that honorifics serve people’s purposes. Honorific usage in some situations can be a solidarity-based, dynamic, and spontaneous phenomenon that promotes close and flexible communication. Hence, it is important to investigate why and under what circumstances honorifics are interpreted as markers of distance, power, and inequality, as opposed to markers of closeness, solidarity, and equality.

## **2. Unconventional Honorific Usage Among Young Speakers of Japanese**

We have thus far seen that institutional authorities such as the Language Council

---

<sup>2</sup> This attempt is similar to feminists’ attempts to change English pronouns in 1970s. Attempts were made to avoid *he*, the “neutral” masculine pronoun, and to use *he or she*, *s/he*, or syntactic circumlocutions like passivization, *they* (Lakoff 2004:103). There have been attempts to substitute *Ms.* for *Miss* and *Mrs.* as a title for women (Lakoff 1975). Today, *Ms.* is in many cases the norm, even though non-parallelism still exists in that men only have one choice for the title while women are often offered a three-way choice (Lakoff 2004:112). This suggests that actual language usage does not fully follow authorities’ prescriptions.

and corporations suggest solutions, by promoting the dropping of honorifics or encouraging the use of *keii-hyougen* ‘respect expressions,’ in order to be mutually respectful. The new guidelines of the Language Council explicitly mentioned that the “correct” use of honorifics is not the only goal in successful communication. Whether or not the institutional authorities’ suggestions are influential to actual speakers’ speech is open to investigation, but some young speakers of Japanese use honorifics unconventionally in some contexts. By analyzing examples of unconventional honorific usage, this section suggests that young speakers convey mutual respect, affinities, or humor with honorifics in ways that are different from what the institutional authorities had expected.

Before analyzing my data, I should mention general rules of honorific usage in contemporary Japanese. The major characteristics of honorific usage in contemporary Japanese is to raise others or to lower the speaker and the speaker’s ingroup members. To raise others, respectful forms including the honorific prefix are used. To lower the ingroup in respect to oneself, humiliating forms are used so that the status of others is relatively raised. Using respectful forms in reference to oneself is pragmatically inappropriate, although it is syntactically possible. In the speech of young people, however, there are some “pragmatically inappropriate” uses of respectful forms.

Example (1) is an opening in a conversation between two friends. Rika and Yumi are females in their late 20s. Notice their use of the honorific prefix *o-*.

- (1) 1 Rika: *Yumi-chan o-genki?*<sup>3</sup>  
 Yumi-DIM HONP-fine?  
 ‘Yumi, (are you) honorably fine?’
- 2 Yumi: *un o-genki*  
 yeah HONP-fine  
 ‘Yeah, (I’m) honorably fine.’
- 3 Rika: *atashi mo*  
 1sg too  
 ‘Me, too.’

In asking about Yumi’s health, Rika said *o-genki?* in line 1. Typically, close friends would not normally use the honorific prefix *o-*. Rika’s unusual use of the honorific prefix influenced Yumi to answer in an unusual way in the next turn. In line 2, Yumi said *un o-genki* ‘yeah, I’m fine.’ Yumi’s use of *o-genki* with *o-* is incorrect, because the honorific prefix *o-* is conventionally used to describe objects or people that are worthy of the speaker’s respect.

Yumi would not have used the honorific prefix with people that she would not

<sup>3</sup>Transcription conventions are as follows: COP=copula; DAT=dative; DIM=diminutive; HONP=honorific prefix; HUM=humble form of referent honorific; NEG=negative; NOM=nominalizer; O=object; PAST=past; POL=polite form (addressee honorific); Q=question; QT=quotative; RESP=respectful form of referent honorifics; SFP=sentence-final particle; SUB=subject; SUF=suffix; TOP=topic; ?=rising intonation; (( ))=scenic detail.

*Linguistic Ideologies of Japanese Honorifics*

feel comfortable with. Her use of the honorific prefix to herself suggests that she and Rika are in good and close social relationship. Thus, Yumi's use of the honorific prefix not only signified her effort to attune to Rika's unusual and playful ways of speaking but also acknowledged and reassured their relationship of camaraderie.

The next example is part of a conversation among Fumiko (female), Mika (female), and Sakio (male). Sakio, age 33, is Fumiko's boyfriend. Mika, age 29, and Sakio have known each other for years. Fumiko, age 24, and Mika met through Sakio two days before this conversation was recorded. Throughout the conversation, Fumiko invariably used polite forms (*desu* or *masu* ending) to Mika and even to Sakio, her boyfriend. Mika and Sakio used plain forms (without *desu* or *masu* ending) in their conversation.

- (2)
- |   |         |                                                                                                                                                                     |
|---|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Fumiko: | Tanabe-san yoku <b>go-</b> ryokoo toka<br>Miss Tanabe often <b>HONP</b> -trip sort                                                                                  |
| 2 |         | <i>nasaru</i> <i>n</i> <i>desu</i> <i>ka?</i><br>do:RESP            NOM    COP:POL            Q<br>'Ms Tanabe, do (you) often do honorable-traveling?'              |
| 3 | Mika:   | ((smiling)) <i>nasai-</i> <i>masen</i><br>do:RESP            POL:NEG<br>'(I) honorably do not.'                                                                     |
| 4 | Sakio:  | <i>ima</i> <i>no</i> <i>haamonii?</i><br>now    NOM    harmony<br>'(Was that) a harmony?'                                                                           |
| 5 | Mika:   | <i>datte</i> <i>go-ryokoo</i> <i>nasaru</i> <i>nante</i><br>cause    HONP-trip            do:RESP            like<br>'Because (Fumiko) said 'honorable-travelling,' |
| 6 |         | <i>chou</i> <i>teineini</i> <i>iu</i> <i>n</i> <i>damon</i><br>super    politely            say            NOM    COP.SFP<br>'and (it) was super polite.'           |

In lines 1 and 2, Fumiko uses the polite form of the copula *desu* in addition to two respectful forms: the honorific prefix *go-* and the respectful form of the verb 'to do' *nasaru*. Because of the two instances of the respectful forms, Fumiko's speech sounded to Mika too deferential, as Mika said in lines 5 and 6. Mika was overwhelmed that Fumiko was giving too much deference to her. In response to Fumiko's highly respectful speech in lines 1 and 2, Mika copied the respectful form of the verb 'to do' *nasai-* from Fumiko's speech, and negated it with *masen*, the negative form of the copula in the polite form. This use of the respectful form in line 3 is a violation of Japanese honorific usage because the speaker is not supposed to honorify herself. But as Mika explained later, she violated the conventions of honorific usage in Japanese, in order to remove the referentially encoded deference. By her unconventional and sarcastic use of honorifics, she suggested that Fumiko can speak to Mika without too many honorifics. In (2),

honorifics are used to diminish their status difference and to make their distance close.

In order to gain a wide range of responses, I played the recordings of these examples and collected native speakers' metalinguistic commentaries from speakers of different generations. To subjects in their 50s and 60s, the examples were unbearable to listen to (*kikizurai*) and therefore hard to comprehend (*wakarinikui*), because they found "mistakes" in the examples. When they heard the examples, their main concern was whether these forms were grammatically correct and pragmatically appropriate. They attributed the unconventional uses of respectful forms to speakers' lack of common sense and proper education. All the subjects in their 20s and 30s admitted that using respectful forms to oneself is generally not considered *tadashii keigo* 'correct use of honorifics,' but they did not associate the speakers' uses of respectful forms with a lack of common sense or proper education. Rather, they interpreted such unconventional uses of respectful forms as demonstrating a sense of humor. One subject in her early 30s said, "By daring to use respectful forms unconventionally, the speakers in the examples try to present their friendliness rather than rudeness and ignorance." Another subject in his late 20s said that "using respectful forms to oneself is to make the hierarchical relationship implied by previous speakers' use of respectful forms ambiguous and useless." This way, the speakers can lessen the deference that the previous speakers showed to themselves and demonstrate their egalitarian relationship with their addressees.

These young speakers' use of self-respectful forms and their metalinguistic commentaries suggest two points. First, young speakers are less constrained than are older speakers by the prescriptive conventions of honorific usage. Young speakers understand the convention but are not bound by it. Second, actual speakers' honorific usage is not overdetermined by prescriptions or explicit proposals of the Council and corporations. Speakers especially in younger generations are trying to find innovative and less-hierarchical ways of using honorifics, independently of prescriptions from institutional authorities. Thus, authorities' linguistic ideologies only partially influence actual speakers' communicative practices.

### **3. Reciprocal and Non-reciprocal Uses of Honorifics**

Despite various functions of honorifics, most native speakers of Japanese believe that honorifics are markers of social hierarchy. Their belief is so strong that honorifics are not considered apart from the traditional Japanese social system, based as it is on seniority and hierarchy. Some think that honorifics are the cause of social evils, because younger people or subordinates are lowered in status and prevented from speaking, when their elders or seniors misspeak or misbehave. For such people, honorifics are anti-democratic and unfair. But my analysis in this section will demonstrate that honorifics serve their diverse and meaningful purposes in situated contexts.

*Linguistic Ideologies of Japanese Honorifics*

This section analyzes two cases in which honorifics are used reciprocally and non-reciprocally. In the first example, honorifics are used in mutually respectful ways, while in the second example honorifics are treated as power-laded linguistic resources. In other words, speakers use honorifics as part of their linguistic resources that can help them accomplish various communicative goals.

Example (3) was collected on December 28, 2002, at the community center in the village of Kariwa in Niigata prefecture (cf. Takekuro forthcoming). Mr. Suzuki is a local man in his late 60s and a head of the volunteer group at the community center. Ms. Fujita is a visitor in her 50s and has been living in a neighboring city for one year and a half. At the community center, Ms. Fujita had met Mr. Suzuki for the first time. Their relationships are variously asymmetric: older and younger, volunteer and visitor, familiar and unfamiliar with others, and insider and outsider in the region. Prior to this segment of conversation, Mr. Suzuki had used plain forms and Ms. Fujita had invariably used polite forms but had not used respectful and humiliating forms. Mr. Suzuki inserts polite and respectful forms when Ms. Fujita's speech becomes more deferential than her usual speech, as in (3).

- (3) Mr. Suzuki had talked about handmade noodles that were made at the community center. Then, he served Ms. Fujita the noodles.
- |   |         |                                                     |            |                       |                    |             |  |
|---|---------|-----------------------------------------------------|------------|-----------------------|--------------------|-------------|--|
| 1 | Suzuki: | <i>kore</i>                                         | <i>ga</i>  | <i>sono</i>           | <i>soba</i>        | <i>dayo</i> |  |
|   |         | this                                                | SUB        | the                   | noodle             | COP.SFP     |  |
|   |         | 'These are the noodles.'                            |            |                       |                    |             |  |
| 2 | Fujita: | <i>ara</i>                                          | <i>maa</i> | <i>jaa</i>            | <i>enryo</i>       | <i>naku</i> |  |
|   |         | well                                                | wow        | then                  | hesitation         | NEG         |  |
| 3 |         | <b><i>choodai itashi</i></b>                        |            |                       | <b><i>masu</i></b> |             |  |
|   |         | <b>HUM:receive</b>                                  |            | <b>do:HUM</b>         | <b>POL</b>         |             |  |
|   |         | 'Well, wow, then, (I) eat them with no hesitation.' |            |                       |                    |             |  |
| 4 | Suzuki: | <b><i>meshiagatte</i></b>                           |            | <b><i>kudasai</i></b> |                    |             |  |
|   |         | <b>RESP:eat</b>                                     |            | <b>please:POL</b>     |                    |             |  |
|   |         | 'Please eat.'                                       |            |                       |                    |             |  |

In line 1, Mr. Suzuki spoke in a plain form as usual. In line 3, for the first time Ms. Fujita included two humble forms, *choodai* and *itashi-*, in addition to the polite form *masu*. In her consistent uses of polite forms, these humiliating forms, due to the rarity of their occurrence in her speech, highlighted the change of her speech form. In line 4, Mr. Suzuki used respectful and polite forms to Ms. Fujita, demonstrating alignment with her use of humiliating and polite forms. After this exchange, Mr. Suzuki switched back to plain forms.

This example illustrates that Mr. Suzuki adjusted his own uses of speech forms, responding to Ms. Fujita's speech. In doing so, Mr. Suzuki indicated that he and his interlocutor were both respectful beings and worthy of equal amounts of respect, while making himself look like a friendly and polite person who knew how to receive and return deference. Given Mr. Suzuki's position as a head of the

volunteer group and the older person, he had a choice of maintaining his typical use of plain forms. But what made their communication successful was his willingness to adapt himself to his interlocutor's speech. Their reciprocal use of honorifics shows mutual respect to one another.

In contrast, honorifics are regarded as power-laden linguistic forms in the conversation between Hide, 32, and Akira, 24. On July 12, 2003, Hide and Akira accidentally met outside the train station in Hakone, the Tokyo countryside, after they last met in the US in 2001.<sup>4</sup> Hide and Akira are eight years apart in age. Such a difference is usually enough to cause the younger person to use polite forms to the older one, unless both are very close friends or related to each other. Hide expected Akira to use polite forms to him, but Akira did not use polite forms unless Hide initiated the use of honorifics. Example (4) shows part of their conversation.<sup>5</sup>

- (4) After exchanging greetings, Hide started to ask Akira about his life.
- |   |        |                                                                                                                                               |
|---|--------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Hide:  | [ <i>e</i> <i>ima</i> <i>doko</i> <i>sunderu?</i><br>oh     now     where     live<br>'Where (do you) live now?'                              |
| 2 | Akira: | <i>inokashira</i> <i>sen</i> <i>no</i> <i>ikenoue</i><br>Inokashira     line     NOM     Ikenoue<br>'(I live) in Ikenoue on Inokashira Line.' |
| 3 |        | <i>e</i> <i>dō?</i><br>oh     how<br>'Oh, how (are you)?'                                                                                     |
| 4 | Hide:  | <i>iya</i> <i>māmā</i> (0.2)<br>no     so-so<br>'Well, so-so.'                                                                                |
| 5 |        | <i>kyō</i> <i>wa</i> <i>doko</i> <i>ni</i> <i>iku</i> <i>n</i><br>today     TOP     where     to     go     NOM                               |
| 6 |        | <b><i>desu</i></b> <i>ka</i><br>COP:POL     Q<br>'Today where (are you) going?'                                                               |
| 7 | Akira: | <i>anō</i><br>well<br>'Well...'                                                                                                               |
| 8 | Hide:  | <i>onsen</i> <i>toka</i> <b><i>ikareru</i></b> <i>n</i><br>hot spring     sort     go:RESP     NOM                                            |
| 9 |        | <b><i>desu</i></b> <i>ka?</i><br>COP:POL     Q<br>'(Are you) going to a hot spring or something?'                                             |

<sup>4</sup> I was visiting Hakone with Hide and carrying the MD Recorder in my backpack. After this encounter, I contacted to Akira and got his consent to use this data.

<sup>5</sup> For the entire conversation between Hide and Akira and Hide's comments about Akira's honorific usage, please see Takekuro (2005).

*Linguistic Ideologies of Japanese Honorifics*

- 10 Akira: *a mae no dōryō to au*  
oh previous NOM co-worker and see
- 11 *dake desu kedo*  
just COP:POL but  
'Oh, (I'm) just meeting my previous colleague.'
- 12 Hide: *ō kuruma de kita? odakyū?*  
oh car by come:PAST Odakyu  
'Oh, (did you) come (here) by car? (By) Odakyu line?'
- 13 Akira: *odakyū ssu tōi ssu*  
Odakyu COP:POL far COP:POL
- 14 *ne koko*  
SFP here  
'By Odakyu train. This place is far, isn't it?'
- 15 Hide: *dandan keshiki ga inaka ni*  
gradually view SUB countryside to
- 16 *naru*  
become
- 17 *tte iu ka na*  
QT say Q SFP  
'It's like the view slowly turning into a country view.'
- 18 Akira: *oi tanbo da yo tte*  
hey rice field COP SFP QT  
'It's like "Hey, (there's) a rice field!"'
- 19 *a hide-san onsen iku*  
oh Hide-SUF.POL hot spring go
- 20 (0.1) *no?*  
SFP  
'Oh, Hide-san, (are you) going to a hot spring?'
- 21 Hide: *iya uchira sisimai o*  
no 1pl lion dance O
- 22 *mi ni iku n desu*  
see DAT go NOM COP:POL
- 23 *kedo*  
but  
'No, we are going to see a lion dance.'
- 24 Akira: *yūmeinan desu ka?*  
famous NOM COP:POL Q  
'Is (it) famous?'
- 25 Hide: *ttsūka tada shiriai ga yatteru tte*  
QT:say:Q only friend SUB doing QT
- 26 *dakede*  
only  
'Well, it's just someone (I know) is performing.'

On the surface, their interaction seems to be normal and smoothly completed. But Akira used honorifics only after Hide did so, as in lines 10-11 and 24, and dropped honorifics when Hide did so, as in lines 3 and 19-20. In fact, after the conversation with Akira, Hide expressed his annoyance. He said to me that because Akira was younger than he was, Akira had to use honorifics at all times while Hide did not. To summarize Hide's comments, he expected complementary uses of plain and polite forms between himself and Akira. Although Akira did use polite forms, Akira's use of polite forms was neither voluntary nor spontaneous because they were used only to respond to or align with Hide's. Since Hide expected Akira to use polite forms spontaneously and complementarily, Hide found Akira's overall speech both unsatisfactory and irritating. Hide explicitly said that he used honorifics in order to induce Akira's use of honorifics. In their interaction, Akira clearly failed to figure out Hide's expectation, but Hide also failed to understand Akira's view of honorifics. The cause of their unsuccessful interaction was not only Akira's insufficient amount of honorific use but also Hide's one-sided imposition of honorific use on Akira.

These examples make clear that honorifics may signify hierarchy and solidarity, depending on the contexts in which people use them. What is undemocratic are often people's imposition of honorific use on others and their refusal to use honorifics themselves, as in example (4). Therefore, viewing honorifics as inherently undemocratic and hierarchical linguistic forms is an oversimplification. The problem does not lie in the linguistic form itself, but in the uses to which it is put. In interaction, honorifics are linguistic resources that can help people accomplish their communicative goals.

#### **4. Is the Function of Honorifics Shifting from Power-based to Solidarity-based?**

We have seen that an ideological shift of honorifics from power-laden linguistic forms into performative ones. Some speakers, especially younger ones, seem to start using honorifics as markers of solidarity. Does this mean that Japanese honorifics are shifting from a power-based system to a solidarity-based one?

Studies in *kokugogaku* ('National Language Studies') suggest that Japanese honorifics started among the nobility in pre-Old Japanese (before A.D.710) and Old Japanese (A.D.710-794) (Tsujimura 1992). In Middle Japanese, honorifics came to be used based on intimacy, formality, or group membership. In contemporary Japanese, membership in an ingroup or an outgroup is described as the most crucial factor in the use of Japanese honorifics (Wetzel 1984, 1994; Inoue 1999). Moreover, some argue that the function of honorifics has shifted from a power-based system to a solidarity-based one over a long period of time (Mizutani and Mizutani 1987), as Brown and Gilman's study (1972[1960]) indicated such a path in pronouns in European languages. Traugott and Dasher (2002:229) summarize Held's study on politeness in Japanese and quote shifts in power relations as a change from social rank to social value, and from vertical to horizontal distance, in which social hierarchy is replaced by "psychological,

affective components of proximity, familiarity” (Held 1999:24). Indeed, some of the examples of honorific usage and native speakers’ metalinguistic commentaries about honorifics presented in the above show change in progress in Japanese honorific usage. However, this by no means suggests that the function of Japanese honorifics has shifted from a power-based system to a solidarity-based one for several reasons.

First, even though younger speakers sometimes use honorifics playfully as a demonstration of solidarity, much of their honorific usage is still based on conventional Japanese honorific usage. For example, young people expect much younger people to use honorifics to them, as illustrated in Hide’s interaction with Akira and in some junior-high and high schools, in which senior students expect (or require) junior students to use polite forms. Even though each instance of honorific usage carries different meanings in different contexts, honorifics are most conventionally used to indicate speakers’ respect and hierarchical differences among participants.

Second, speakers’ use of self-respectful forms of honorifics becomes effective, only when speakers understand and share the conventional uses of honorifics. If speakers do not, unconventional or unexpected honorifics cannot be used to provide additional meanings in an interaction. Using self-respectful forms of honorifics is not yet part of Japanese pragmatic conventions.

Depending on the interactive situation, speakers of Japanese of all ages use honorifics, in order to invoke conventional meanings such as hierarchy and formality or unconventional meanings such as solidarity and playfulness. It is too early to claim that Japanese honorifics have shifted to a solidarity-based system. Today’s honorific usage is both power-based and solidarity-based, not in opposition but in co-habitation. Because of these different functions that honorifics serve in situated contexts, speakers can utilize them for many purposes in social interaction. More studies are necessary if we are to come to grasp honorifics in relation to socio-political situations and actual speakers’ communicative practices.

## References

- Asamatsu, Junko. 2001. ‘*Korekara no keigo*’ kara ‘*gendai shakai ni okeru keii hyōgen*’ he: *Kokugo shingikai no tenkai* [From ‘keigo from now on’ to ‘respect expressions in modern society’: The development of the National Language Council]. *Nihongogaku* 20(4):38-47.
- Brown, Penelope and Stephen C. Levinson. 1987[1978]. *Politeness: Some universals in language usage*. Cambridge: Cambridge University Press.
- Brown, Roger and Albert Gilman. 1972[1960]. The pronouns of power and solidarity. In P.P. Giglioli, ed., *Language and social context*, 252-282. New York: Penguin.

- Held, Gudrun. 1999. Submission strategies as an expression of the ideology of politeness: Reflections on the verbalization of social power relations. *Pragmatics* 9:21-36.
- Ide, Sachiko. 2001. *Kokusaika shakai no naka no keii hyōgen: Sono kokusaisei to bunka dokujisei* [Respect expressions in the internationalized society: Its internationality and cultural specificity]. *Nihongogaku* 20(4):4-13.
- Inoue, Fumio. 1999. *Keigo wa kowaku nai: Saishin yore to kiso chishiki* [Honorifics are not scary: The latest usage and basic knowledge]. Tokyo: Kodansha.
- Kokugo shingikai. 2000. *Gendai shakai ni okeru keii hyōgen* [Respect expressions in modern society]. In *Kongo shingikai tōshin* [Report by the Japanese Language Council]. Ministry of Education, Culture, Sports, Science, and Technology.
- Lakoff, Robin. 1973. The logic of politeness: Or minding your p's and q's. In C. Corum, T. Cedric Smith-Stark, and A. Weiser, eds., *Papers from the Ninth Regional Meeting of the Chicago Linguistics Society*, 292-305. Chicago: University of Chicago Department of Linguistics.
- Lakoff, Robin. 1975. *Language and woman's place*. New York: Harper & Row.
- Lakoff, Robin T. 2004. *Language and woman's place: Text and commentaries* (revised and expanded by Mary Bucholtz). Oxford: Oxford University Press.
- Leech, Geoffrey. 1983. *Principles of pragmatics*. London: Longman.
- Matsushita, Daizaburō. 1925. *Hyōjun nihonbunpō* [Standard Japanese grammar]. Tokyo: Kigensha.
- Mizutani, Osamu and Nobuko Mizutani. 1987. *How to be polite in Japanese*. Tokyo: The Japan Times.
- Onishi, Norimitsu. 2003. Japanese workers told from on high: Drop the formality. *New York Times*, Thursday, October 30.
- Sugito, Seiju. 2001. *Keii hyōgen no hirogari: 'Waruikedo' to 'itte ii kanaā' o tegakari ni* [Broadening respect expressions: Based on 'I'm afraid, but' and 'is it okay to say?']. *Nihongogaku* 20(4):22-37.
- Takekuro, Makiko. 2005. Attunement in interaction: Sequential use of Japanese honorifics. Ph.D. diss., University of California, Berkeley.
- Takekuro, Makiko. Forthcoming. Attunement in sequential use of Japanese honorifics. In the Proceedings of the Thirty-First Berkeley Linguistics Society. Berkeley: Berkeley Linguistics Society.
- Traugott, Elizabeth and Richard Dasher. 2002. *Regularity in semantic change*. Cambridge: Cambridge University Press.
- Tsujimura, Toshiki. 1992. *Keigo ronkō* [Theories of keigo]. Tokyo: Meiji Shoin.
- Wetzel, Patricia J. 1984. *Uti and soto (In-group and out-group): Social deixis in Japanese*. Ph.D. diss., Cornell University.
- Wetzel, Patricia J. 1994. A movable self: The linguistic indexing of *Uchi* and *Soto*. In Jane M. Bachnik and Charles J. Quinn, Jr., eds., *Situated meaning: Inside and outside in Japanese self, society, and language*, 73-87. Princeton, New Jersey: Princeton University Press.

*Linguistic Ideologies of Japanese Honorifics*

Wetzel, Patricia J. 2004. *Keigo in modern Japan: Polite language from Meiji to the present*. Honolulu: University of Hawai'i Press.

Yamada, Yoshio. 1924. *Keigo-hō no kenkyū* [Research on the grammar of honorifics]. Tokyo: Takara Bunkan.

Makiko Takekuro  
Waseda University  
School of Law  
1-6-1 Nishiwaseda, Shinjuku-ku  
Tokyo, 169-8050, Japan

mtakekuro@waseda.jp



# The Perfect Converb? Semantically-Related Functions of the Sinhala Conjunctive Participle

CHRIS TAYLOR  
*Rice University*

## 0. Introduction

In recent years, the term ‘converb’ has increasingly been used to describe constructions with crosslinguistically comparable forms and functions which include nonfinite verbal affixation, dependency on a finite verb, clause linking, and the sequencing of events (Bickel 1998, Genetti 2005, Hasplemath and König 1995, Masica 1991).<sup>1</sup> Among such constructions, two broad areal categories have been suggested (Bickel 1998), European and Asian converbs, differing primarily with respect to the potential for what Bickel refers to as ‘narrative chaining.’ Asian converbs perform a clause chaining function in addition to various types of modification, whereas the European type “does not include chaining functions but rather stands in a binary relation to the main verb.” One form potentially instantiative of the former category comes from the Indo-Aryan language Sinhala, namely the conjunctive participle. Examples include the following.<sup>2</sup>

(1) *bootəle wəti-la kəɖuna*  
bottle fall-CP break-PAST  
The bottle fell and broke.

(2) *miniha gallak ussə-la wandura-ɾə gaha-lla duwə-la heŋguna*  
man rock lift-CP monkey-DAT throw-CP run-CP hide-PAST  
The man picked up a rock, threw it at the monkey, ran away, and hid.

---

<sup>1</sup> My thanks to Nissanka Wickremasinghe, for his patience and insights, and to Michel Achard, Claire Bower, and Robert Englebretson, for their suggestions and comments. Of course, any remaining errors or omissions are my own.

<sup>2</sup> The following glosses will be used throughout: ACC (accusative); CONJ (conjunction); CP (conjunctive participle); COMP (complementizer); DAT (dative); GEN (genitive); INF (infinitive); INST (instrumental); PL (plural); PP (postposition); PRTMP (prior temporal); PAST; REDUP (reduplicated); REL (relativizing verb form). The glossing conventions used here are adapted from Gair 2003.

As examples (1) and (2) illustrate, the Sinhala conjunctive participle (which is morphologically marked by the suffix *-(l)la*) performs several of the abovementioned functions characteristic of converbs. For instance, in each example the conjunctive participle expresses temporal sequence, and in (2) we observe narrative chaining, claimed to be characteristic of Asian converbs. Moreover, the verbal form exemplified here does not indicate time reference *per se*, and as such is less finite than the past tense form which occurs clause-finally.

Despite these similarities between the Sinhala conjunctive participle and Asian converbs, the former may also occur as a nondependent predicate when expressing perfect aspect, which distributionally appears to violate the converbal criteria of nonfiniteness and dependency (Genetti 2005, Hasplemath 1995). This function, which Gair (2003) appropriately describes as “an unusual if not unique feature among South Asian languages,” is illustrated by (3) below.

- (3) mamə Renu-wə dækka habei dæn æyə gihi-lla  
 I R-ACC see-PAST but now she go-CP  
 I saw Renu but now she has gone.

While in many respects the Sinhala conjunctive participle functions as a converb (per the definition put forward by Genetti 2005), utterances such as (1)-(3) illustrate a type of multifunctionality absent in similar South Asian verbal forms, namely, the functions of both nonfinite clause linking and nondependent predication. Faced with this duality of function, we must decide how best to characterize the relationship between the different uses.

One possibility is to analyze the conjunctive participle form in (1) and (2) as a homonym of the form in (3). Such an account is flawed, however, in that it fails to capture similarities in scene construal among the conjunctive participle’s different uses. In contrast, I will argue for a polysemy analysis of the Sinhala conjunctive participle. On this view, certain qualities of the construal traditionally accorded to the expression of perfect aspect are shown to crosscut the interpretations of the two aforementioned grammatical functions, nondependent predication and clause linking. Regarding the latter, I will discuss two specific functions – event sequencing and recapitulation – that provide evidence for analyzing the conjunctive participle as one form with related senses. Specifically, the analysis will demonstrate a parallel between a state’s continued relevance to the speech act and the conceptual interrelatedness of certain event sequences.

The paper is structured as follows. After describing the data and methodology used for the study in Section 1, I provide a brief overview of the Sinhala conjunctive participle’s functions in Section 2, each of which is subsequently discussed in Sections 2.2-2.5. A summary of the findings relating each of the functions follows in Section 3.

## 1. Data and Methodology

The data used in this study come from three sources, including published literature on Sinhala, structured elicitation, and a small corpus of ten texts. From the latter, which comprises nine narratives and one recipe, only those instances in which the conjunctive participle functions as a clause linker or nondependent predicate were included in the analysis. Such criteria were necessary in order to exclude other uses of the verb form in question which do not fall within the scope of the present study, such as its use in what Genetti (2005) refers to as “conventionalized collocations,” as well as the participial form of the verb *kiyannə* ‘tell’ – *kiyəla* – which functions as a complementizer. In total, 66 target instances of the conjunctive participle were collected from the corpus.

## 2. Functions

### 2.1. Overview

As was illustrated by examples (1) and (2) above, the conjunctive participle expresses the temporal sequence of events, typically in cases of same-subject reference across clauses. This quality of utterances containing the participle is only a tendency, though, in contradistinction with many Indo-Aryan languages (Masica 1991). The utterance in (4) illustrates this point: here, the subject of the first clause, *kocciə* ‘train’, differs from that of the second, *api* ‘we.’

- (4) *kocciə* *æwi-lla* *api* *jannə* *giya*  
train come-CP we go-INF go-PAST  
The train came and we left.

The verb form in question is also often employed successively within an intonation unit to express a sequence of more than two events and/or states (as in example (2)). Such utterances invariably end with a tense-marked verb. In this way, the Sinhala conjunctive participle may be described as a clause chaining strategy (Longacre 1985, Genetti 2005), similar in function to participle or converbal constructions in other languages.

In a similar yet syntactically-distinct function, the conjunctive participle serves to repeat information expressed by an immediately preceding clause. Genetti (2005:49) terms this use of the participle construction in Dolakhae ‘recapitulation,’ describing it as “a process common in South Asian narrative, where one begins a syntactic sentence by repeating, often in abbreviated form, the substance of the preceding finite clause or sentence.” As (5a)-(5b) below demonstrate, this function of the conjunctive participle is similar to those discussed above, in that the recapitulated event or state is sequenced with a following event or state.

- (5a) *itiŋ andəre ʈikak hitə-la daval-ʈə gedərə giya*  
 then A. a.little think-CP afternoon-DAT home go-PAST  
 Then Andare pondered for awhile and went home for the afternoon.
- (5b) *gedərə gihi-lla eya-ge putaa-ʈə anḍegaha-lla andəre kiwwa*  
 home go-CP he-GEN son-DAT call-CP A. say-PAST  
 After going home and calling his son, Andare said...

In (5b), the initial phrase *gedərə gihi-lla* ‘(after) going home’ repeats information expressed by the last clause in (7a), namely, that Andare ‘went home for the afternoon,’ *davalʈə gedərə giya*. Moreover, the repeated event is temporally sequenced with two subsequent events: ‘calling his son’ and a speech event, as we see in (5b). In this way, the conjunctive participle’s recapitulative use performs the same sequencing function we see in examples such as (1)-(3).

The last function of the Sinhala participle construction to be examined here is illustrated by example (6) below. In this and similar utterances, the form in question cannot be characterized as dependent, as it occurs either as a monoclausal predicate or as the final verb in a complement clause. The conjunctive participle’s use as a nondependent form imposes an aspectual construal of the situation describable in terms of perfect aspect, as indicated by the English translation in (6). Here, the state of having gone, expressed by means of the participle construction, relevantly persists until and bears on the arrival of the speaker’s interlocutor in Texas.

- (6) *oya Texas wələʈə enə-koʈə mamə Indiawə-ʈə gihi-lla*  
 you T. PP come-PRES-REL-when I India-DAT go-CP  
 When you came to Texas I had gone to India.

With the preceding overview in mind, each of these functions is now considered in turn, beginning with event sequencing.

## 2.2. Event Sequencing

As Gair and Paolillo (1997) point out, the conjunctive participle is the most common way of expressing a sequence of actions or events in Sinhala. The corpus data used for the present study indicate that, in the least, such event sequences strongly favor a single agent (or non-patientive) participant which maps onto one noun phrase functioning as the subject of both clauses. In such cases, the two events are highly congruous, sharing a single agentive participant realized as a shared subject relation. This tendency contrasts with the ‘participant identity’ relationships (i.e. one or two distinct agentive participants) which obtain between events sequenced by other strategies for expressing similar temporal relations. To

### *The Perfect Converb?*

this end, at least two other forms are also available, the prior temporal form and the use of an instrumentalized verb immediately followed by the lexeme *passe* ‘after.’ The existence of these potential alternatives to the use of the conjunctive participle makes necessary an explanation of one’s use over another in a particular context and syntactic environment. Although a comprehensive explanation of this sort is beyond the scope of the present analysis, I present a few preliminary observations below.

First, as was noted above, the expression of an event sequence involving same-subject reference across clauses favors the use of the conjunctive participle. By contrast, nearly all of the utterances taken from the corpus which contain a combination of an instrumentalized verb and *passe* (5/6 total), as well as half of the utterances containing the prior temporal form (2/4 total), express a sequence of events involving a change in subject. Consider (7) below.

- (7) *tikkə* *welawak* *giya-in* *passe* *ʔoppi* *welenda* *nægiʔta*  
a.little time go-INST after hat-PL merchant awaken-PAST  
After a little time went by, the hat seller woke up.

The content of the first clause in (7) helps illustrate this form’s use in the corpus and elicitation data. Here, the phrase *tikkə welawak giyain passe* ‘after a little time went by’ renders the temporal relation expressed by the instrumentalized verb-*passe* combination more transparent. In such cases, the use of this construction as a clause linking strategy entails both nonsimultaneity of the events (or states) and an intervening temporal interval. For example, in (7) a short duration of time passes before the hat seller awakes. This quality of events depicted by the verbal construction in (7) is suggested not only by the translation, ‘After X, Y...’ but also by elicited minimal pairs varying only in the use of either the conjunctive participle or the combination of an instrumentalized verb and *passe*, illustrated in (8) and (9) below.

- (8) *itin* *ookə* *dækka-in* *passe* *mage* *yaaluwek* *kiwwa*  
so that see-INST after I-GEN friend say-PAST  
So after seeing that, a friend of mine said...

- (9) *itin* *ookə* *dəkə-la* *passe* *mage* *yaaluwek* *kiwwa*  
so that see-CP after I-GEN friend say-PAST  
So seeing (having seen) that, a friend of mine said...

According to the language consultant, the utterance in (8) depicts a situation in which the ‘seeing’ event concludes a short time before the speaker’s friend begins to talk. By contrast, the utterance in (9) can be interpreted as involving temporal overlap, the first event preceding the second inceptively, or, alterna-



*The Perfect Converb?*

tween the two sequenced events. To illustrate this dissimilarity, first consider (12a)-(12c) below.

(12a) wandura kehelgediya kææwa-in passe mæruna  
monkey banana eat-INST after die-PAST  
After the monkey ate a banana he died.

(12b) wandura kehelgediya kææwaamə mæruna  
monkey banana eat-PRTMP die-PAST  
When the monkey ate a banana he died.

(12c) wandura kehelgediya kaa-la mæruna  
monkey banana eat-CP die-PAST  
The monkey ate a banana and died.

In (12a), the combination of instrumentalized verb and *passe* expresses the nonoverlapping temporal relation between the two events, namely, the monkey eating a banana and the event of its death. Similarly, the utterance in (12b) depicts a specific temporal relation, namely one of near-simultaneity, with the first event minimally-preceding the second. Moreover, in (12c), the use of the conjunctive participle also expresses a temporal relation between the events depicted by each clause, but in this case, the relation is less fleshed-out, indicating only consecution. In this way, the three forms appear to be similar in function, differing only minimally with respect to the nature and degree of the temporal relation specified by each. Furthermore, a correlational interpretation of the event sequence in each utterance above is possible; that is, one may infer a relation between the two events beyond that of temporality. The possibility of such an interpretation of each utterance raises a descriptive question, namely, whether such a construal of the events results from the conventional interpretation evoked by each verb form or is arrived at primarily through an interaction of world knowledge and discourse context. One source of possible explanation comes from elicited utterances, such as (13a)-(13b).

(13a) kurula sindukiwwa-in passe mage amma aawa  
bird sing-PAST-INST after I-GEN mother come-PAST  
After the bird sang, my mother arrived.

(13b) kurula sindukiwwaamə mage amma aawa  
bird sing-PRTMP I-GEN mother come-PAST  
When the bird sang, my mother arrived.

Each of these examples depicts a situation involving two events occurring in succession. However, given our knowledge of bird songs and the coming and going of people, the two events are not interpreted as standing in a correlational relation, only one of temporal sequence. Thus, the two verb forms in (13a) and (13b) do not appear to encode a correlation between events beyond that of temporality. With this in mind, we would expect that if the conjunctive participle encoded only temporal consecution, it could felicitously substitute for either verb form in the examples above. This, however, is not the case, as the language consultant rejected the participle's replacement of either the instrumentalized verb or prior temporal form in this and similar utterances, as is illustrated in (13c).

- (13c) kurula sindukiyə-la passe mage amma aawa  
 bird sing-CP after I-GEN mother come-PAST  
 \* The bird sang and my mother arrived.

This disparity in usage provides evidence that the Sinhala conjunctive participle does conventionally express a correlational relation between the two events in addition to a relation of temporal sequence.

One potential counterargument to such a proposal relies on distributional evidence, namely, the fact that the conjunctive participle overwhelmingly favors event sequences involving same-subject reference. However, as was discussed in Section 2.1, the participle construction can depict event sequences with distinct subjects, as illustrated by example (4), repeated here as (14).

- (14) koccia əwi-lla api jannə giya  
 train come-CP we go-INF go-PAST  
 The train came and we left.

The significance of such utterances lies in the nature of the relation between the two events. In (14), they are not only sequenced, but also exhibit a correlation beyond that of succession. This sequentially-interrelated relevance of events is not evidenced by utterances such as (13a) and (13b) above. Instead, in these and similar utterances, the events are construed as standing only in a temporal relation.

### 2.3. Clause Chaining

In a related function, the conjunctive participle can occur several times in one utterance expressing a sequence of events. This capacity to form clause chains (Genetti 2005, Longacre 1985, Myhill and Hibiya 1988) is illustrated by (15).

### *The Perfect Converb?*

- (15) æyə nəgitə-la koopi hadə-la pattəre kiyəwə-la giya  
she awaken-CP coffee boil-CP paper read-CP go-PAST  
She woke up, made coffee, read the paper and left.

In this utterance, we observe a series of events, temporally-sequenced, involving one subject shared by each clause. Moreover, the sequence of events exhibits a type of correlational coherence absent in utterances such as (13a)-(13b) above. For instance, the events in (15) taken together constitute a larger ‘macro-event,’ namely, what may be termed a prework morning ritual. Each clause thus describes one subevent, the completion of which brings the utterance’s subject one step closer to the culmination of the event chain: departure for work. In this way, the completion of each act—waking up, making coffee, and reading the paper—bears relevantly on the subsequent event in the chain.

Thus, the two preceding functions of the conjunctive participle—(simple) event sequencing and clause chaining—correspond conceptually in their construal of event sequences. Specifically, as demonstrated by the discussion of examples illustrative of both functions, the state resulting from an anterior action, such as making the coffee, exhibits a continued relevance bearing on the inception of a subsequent event. In this way, each use of the conjunctive participle expresses both a correlational relation between events and a coarse temporal relation.

#### **2.4. Recapitulation**

In addition to the preceding functions, the conjunctive participle is also used in cases of recapitulation, as described in Section 2.1. In this capacity, the form in question not only performs the discourse function of repetition, but also serves to sequence two events: one expressed by the repeated information and another predicated by a following clause. Furthermore, the observed correlational relation between successive events is also in evidence, as illustrated by (16a)-(16b).

- (16a) baisikəle galəkə həpuna  
bicycle stone hit-PAST  
The bicycle hit a stone.

- (16b) galəkə həpi-la laməya-i persgeḍi okomə bimə wəṭuna  
stone hit-CP child-CONJ pears all ground fall-PAST  
After hitting the stone, the child and the pears all fell to the ground.

In this case, as a result of the first event, the boy riding the bicycle loses his balance and consequently falls to the ground. Thus, the state of imbalance relevantly bears on the boy’s fall.

### 2.5. Non-Dependent Predication

As was noted in the Introduction, the Sinhala conjunctive participle is unique among Indo-Aryan languages in its capacity to function as a nondependent predicate. Moreover, in such cases, the participle expresses perfect aspect, as illustrated by the following example.

- (17) oya heṭə enə-koṭə mamə California wələṭə gihi-lla  
 YOU tomorrow come-PRES-REL-when I C. PP go-CP  
 When you come tomorrow, I will have left for California.

Following Comrie (1976:52), I take perfect aspect to indicate “the continuing...relevance of a past situation.” We observe this sense precisely in (23) above, in which the continued relevance of ‘having left’ persists until the interlocutor’s expected arrival. Similarly, in (18a)-(18b), we see that the resulting state of the theft relevantly bears on the man’s observation that his food has been taken, depicted by the participial form of the verb *kəraṇṇə* ‘do’ in the expression *horəkam kərəla*.

- (18a) ohuge baharyawə hoyənə-gaman  
 he-GEN wife look-PRES-REL-when  
 While looking for his wife...

- (18b) horek tamange kəæmə horəkam kərə-la kiyəla ohu dəæka  
 robber self-GEN food theft do-CP COMP he see-PAST  
 he saw that a robber had stolen his food.

As examples (17) and (18a)-(18b) show, the Sinhala conjunctive participle can function as a nondependent predicate, occurring as either the main clause verb or embedded in a complement clause. In such cases, we observe a meaning consistent with the interpretation traditionally attributed to the expression of perfect aspect.

### 3. Common Construal

To summarize the findings relating each function considered above (event sequencing, clause chaining, recapitulation, and nondependent predication), we observed first, in cases of two-event sequences, that the conjunctive participle expresses a correlation between the events in addition to a rough temporal relation, as we see in example (19) below.

*The Perfect Converb?*

- (19) maŋ gihi-lla ee kaaryaləyin əhua mage bææg ekə  
I go-CP that office ask- PAST I-GEN bag one  
kohedə kiyəla  
where COMP  
I went to that office and asked ‘Where is my bag?’

Here, the conjunctive participle not only sequences the events of going and asking, but also profiles the correlational coherence between the two events. This correlation, which was shown to be in evidence for the related functions of clause chaining and recapitulation, involves the continued relevance of a resultant state bearing on the event expressed by the following clause. In example (19) above, the resultant state of the speaker going to ‘that office’ relevantly bears on the inquiry made once there. This relationship among events has been observed in Dravidian and Indo-Aryan languages by Lindholm (1975) and Masica (1991:400), respectively, the latter noting that, in regard to the conjunctive participle’s use as a clause linkage strategy, “not just any two clauses may be so linked: they must have what [Lindholm] calls ‘natural relevance’ – an elusive concept when one tries to define it, but independently cited by other investigators.”

With respect to the construal imposed by the conjunctive participle’s use as a nondependent predicate, we observe a similar relationship in the expression of perfect aspect. In such cases, the participle expresses the continued relevance of a resultant state to the speech act, as well as the moment of a past or future event, as illustrated in (20) below.

- (20) gəhəni kukula-wə marə-la dən həmotəmə kaanə puluwan  
woman chicken-ACC kill-CP now everyone eat- INF can  
The woman has killed the chicken and now everyone can eat

In this example, the resultant state of the first event, namely that of killing a chicken, relevantly bears on the speaker’s immediate situation at the time of the utterance. Specifically, the state expressed by the second clause follows as a consequence of killing the chicken. Thus, the construal evoked by the participle’s use in utterances such as (20) parallels the construal imposed by its use as a clause linkage strategy, exemplified in (19). In both cases, a correlational coherence obtains between two situations which involves the resultant state of a prior event relevantly persisting until and directly bearing on a succeeding event. In this way, the scene construal characteristic of perfect aspect conceptually unites the syntactically-disparate functions.

#### 4. Conclusion

The significance of the findings presented here are twofold. First, I have presented evidence in favor of a polysemy analysis of the Sinhala conjunctive participle. Specifically, I have argued that a ‘common construal’ is in evidence for each of the participle’s distinct syntactic functions. This construal, which involves a correlational relationship between a prior event and a subsequent situation, crosscuts each of the conjunctive participle’s functions discussed above. Second, I have shown that the form in question performs a number of the functions typical of converbal constructions, despite its capability to serve as a nondependent predicate. These observations contribute to the ongoing typological dialogue concerned with establishing a crosslinguistic characterization of such forms.

#### References

- Bickel, Balthasar. 1998. Review of *Converbs in Cross-Linguistic Perspective*, by Martin Haspelmath and Ekkehard König, eds. *Linguistic Typology* 2:381-397.
- Gair, James W. 1970. *Colloquial Sinhalese Clause Structures*. The Hague: Mouton.
- Gair, James W. 1976. The verb in Sinhala, with some preliminary remarks on Dravidianization. *International Journal of Dravidian Linguistics* 5(2):259-273.
- Gair, James W. 2003. Sinhala. In G Cardona and D. Jain, eds., *The Indo-Aryan Languages*, 766-817. London: Routledge.
- Gair, James W. and John Paolillo. 1997. *Sinhala*. München: LINCOM Europa.
- Genetti, Carol. 2005. The Participle Construction of Dolokha Newar: Syntactic Implications of an Asian Converb. *Studies in Language*. 29(1):35-87.
- Haspelmath, Martin. 1995. The Converb as a Cross-Linguistically Valid Category. In M. Haspelmath and E. König, eds., *Converbs in Cross-Linguistic Perspective*, 1-55. Berlin: Mouton de Gruyter.
- Haspelmath, Martin and Ekkehard König. 1995. *Converbs in Cross-Linguistic Perspective*. Berlin: Mouton de Gruyter.
- Lindholm, James. 1975. *The Conceptual Basis of the Tamil Adverbial Participle*. Ph.D. diss., University of Chicago.
- Longacre, Robert. 1985. Sentences as combinations of clauses. In T. Shopen, ed., *Language Typology and Syntactic Description 2: Complex Constructions*, 235-286. Cambridge: Cambridge University Press.
- Masica, Colin. 1976. *Defining a Linguistic Area*. Chicago: University of Chicago Press.
- Masica, Colin. 1991. *The Indo-Aryan Languages*. Cambridge: Cambridge University Press.
- Myhill, John and Junko Hibiya. 1988. The Discourse Function of Clause Chaining. In J. Haiman and S. Thompson, eds., *Clause Combining in Grammar and Discourse*, 361-398. Amsterdam: John Benjamins.

*The Perfect Converb?*

Chris Taylor  
Rice University  
Dept. of Linguistics, MS 23  
6100 Main St.  
Houston, TX 77005-1892

sastre@rice.edu



# Plurality of Events: Parallels between Language and Perception

TESS WOOD

*University of California, Berkeley*

## 1. Introduction

Grammatical markers of event plurality ('pluractionality') express repetition of events in time or space, or across distinct participants. In this paper I address a contrast between two types of pluractional meaning which are found across languages: repetition of events, and repetition within a single event (Cusic 1981). Based on the findings of a survey of over 40 languages, I argue that this contrast has its basis in a distinction between grouped and ungrouped pluralities, with a process of group-formation similar to that described by Gestalt psychologists in visual perception. I also propose that it can be integrated with analyses of nominal plurality, and specifically that it is parallel to the collective-distributive distinction in plural NPs.

Grammatical marking of plural events occurs in a wide range of languages (cf. Dressler 1968, Cusic 1981, Xrakovskij 1997, among others). The examples in (1) and (2) from Chechen and Finnish illustrate the basic contrast between single and pluractional verbs. In Chechen the pluractional is marked by ablaut, in Finnish by one of several suffixes.

(1) Chechen (Yu 2003:293)

|         |               |         |                          |
|---------|---------------|---------|--------------------------|
| d.uttu  | 'to pour'     | d.yttu  | 'to pour repeatedly'     |
| molu    | 'to drink'    | myylu   | 'to drink repeatedly'    |
| teba    | 'to sneak up' | tieba   | 'to sneak up repeatedly' |
| q'oiq'a | 'to thunder'  | q'ieq'a | 'to thunder repeatedly'  |

(2) Finnish (Karlsson 1999:239)

|       |         |           |                     |
|-------|---------|-----------|---------------------|
| ajaa  | 'drive' | ajella    | 'drive around'      |
| astua | 'step'  | astella   | 'step, walk around' |
| kysyä | 'ask'   | kysellä   | 'ask repeatedly'    |
| oppia | 'learn' | opiskella | 'study'             |

Cross-linguistically, pluractional meanings have been argued to fall into two main types. Cusic (1981:67) distinguishes plurality *internal* to an event (i.e. a

single event consists of repeated phases) from plurality *external* to an event (i.e. a single bounded event is repeated, either on one occasion or multiple occasions). Following Garrett (2001), I use the terms “event-internal” and “event-external” to refer to these two types of meaning.

The examples in (3) to (6) illustrate these two types of pluractional meaning.

- (3) Event-internal repetition: Koasati –*ci* (Kimball 1991:329-330)  
 moláp-ka-n ‘to gleam’ molap-lí-:ci-n ‘to glitter’  
 haccá:lin ‘to stand’ [sg] haca:-ká-:ci-n ‘to stand agitatedly’ [sg]  
 páłłin ‘to split up sthg’ pałłí:cin ‘to splinter sthg.’
- (4) Event-internal repetition: Yup’ik –%*ur*- postbase (Jacobson 1984:581)  
 kaleg- ‘to brush against’ kalguraa ‘he is strumming it’  
 naveg- ‘to break’ navguraa ‘he is wrecking it’
- (5) Event-external repetition: Hausa (Newman 2000:423-424)  
 tùna ‘remind’ tuntùna ‘remind many or often’  
 hàifā ‘give birth’ hàhhaifā ‘give birth many times/to many children’
- (6) Event-external repetition: Yup’ik –*qaqe*- postbase (Jacobson 1984:535)  
 nere- ‘to eat’ nerqaqluniq ‘eating now and then’  
 quuyurni- ‘to smile’ quuyurniqa’aqluni ‘smiling now and then’  
 ayag- ‘to go’ ayakaqluni ‘moving now and then from place to place’

For example, the Yup’ik postbase exemplified in (4) applies to the verb *naveg-* ‘to break’ with an event-internal pluractional meaning. Its effect is to indicate a complex event consisting of repeated breaking, which amounts to an instance of ‘wrecking.’

The Hausa verb reduplication in (5) produces a meaning of event-external repetition. For instance, when reduplicated, *hàifā* ‘to give birth’ indicates multiple distinct events of giving birth.

## 2. Characteristics of Event-Internal Pluractionals

Pluractionals construe repetition either as a sequence of separate events or as a single event with multiple internal phases. However, actual instances of repetition are not inherently divided into these two types. Therefore, the question arises of what properties of repeated occurrences require or predispose them to be construed as forming a single, complex event rather than as a sequence of events. Comparing the uses of event-internal pluractionals across languages reveals certain patterns in the types of events and the types of contexts which occur with these single-event interpretations, as will be outlined in this section.

While the relative importance of these characteristics and their interactions undoubtedly varies from language to language, the general pattern is clear, and

can contribute to an understanding of the semantics of the contrast between event-internal and event-external pluractionals.

### 2.1. Pluralization of Arguments

The typical interpretation of most pluractionals is one of repetition in time. However, in addition to this basic meaning, many pluractionals also have interpretations in which they pluralize a participant.<sup>1</sup> In these cases, event-internal and event-external pluractionals show different behavior. Yurok has two pluractionals: one, an infix *-eg-*, has event-external meaning (7); the other, a reduplicative prefix, has event-internal meaning (8) (examples from Garrett et al. 2005).

- (7) Yurok event-external pluractional (*-eg-* infix)
- |            |           |                     |                               |
|------------|-----------|---------------------|-------------------------------|
| nep-       | ‘to eat’  | <b>negep-</b>       | ‘to eat regularly/habitually’ |
| tenpewehl- | ‘to rain’ | <b>tegenpewehl-</b> | ‘to rain often’               |
- (8) Yurok event-internal pluractional (reduplication)
- |            |            |                       |                                 |
|------------|------------|-----------------------|---------------------------------|
| menoot     | ‘to pull’  | <b>menomenoot</b>     | ‘to keep pulling’               |
| prkwrh(s)- | ‘to knock’ | <b>prkwprkwrh(s)-</b> | ‘to be knocking, give >1 knock’ |

The examples in (9) and (10) show the plural-participant interpretations of each of the pluractionals.

- (9) Event-external pluractional
- |          |                    |                  |                                       |
|----------|--------------------|------------------|---------------------------------------|
| wesah    | ‘to bathe oneself’ | <b>wegesah</b>   | ‘to bathe oneself’ (pl.) <sup>2</sup> |
| helomey- | ‘to dance’         | <b>hegel</b>     | ‘to dance’ (pl.)                      |
| nep-     | ‘to eat’           | <b>negep</b>     | ‘to eat’ (pl.)                        |
| nahchk   | ‘to pay’           | <b>negahchk-</b> | ‘to pay’ (pl. agent or pl. payment)   |
- (10) Event-internal pluractional
- |            |                 |                        |                        |
|------------|-----------------|------------------------|------------------------|
| tekws-     | ‘to cut’        | <b>tekwtekws</b>       | ‘to cut’ (pl. object)  |
| yekwoh(s)- | ‘to fold’       | <b>yekwoyekwoh(s)-</b> | ‘to fold’ (pl. object) |
| ket’ey     | ‘to park, moor’ | <b>ket’ket’ey</b>      | ‘to lie (of boats)’    |

The event-external infix can pluralize any participant, but commonly pluralizes subjects of transitive and unergative intransitive verbs. Event-internal reduplication, on the other hand, only produces plural interpretations of objects of transitive verbs and subjects of unaccusative intransitives.

The pattern seen in Yurok is typical. Event-external pluractionals, when they

<sup>1</sup> There are languages with pluractional categories which have exclusively plural-location or plural-argument meanings, but I will not discuss these here.

<sup>2</sup> All of the examples in (9) and the first two examples in (10) also permit an interpretation of repetition in time (involving a single participant). In some cases this is the preferred reading.

pluralize participants, often pluralize an Agent/external argument. They may also pluralize other arguments but tend to suggest a strongly distributive interpretation ('do to each'), and commonly refer to humans or other highly individuated entities. This can be seen in example (11) from Yimas, in which the pluractional (reduplicated) verb pluralizes an animate direct object.

- (11) Yimas (Foley 1991:319)  
 pu-kra-nanaŋ-**tarat**-awram-tut  
 3PL A-1PL O-DUR-**hold**(RED: *tal-*)-enter-RM PAST  
 'They were holding (each one of us), as they entered.'

Event-internal pluractionals, on the other hand, pluralize Patient/internal arguments, and often the pluralized argument is of low individuation and the pluractional verbs are translated as 'do to a lot of things', 'do to all', rather than 'do to each'.

## 2.2. Proximity

Repetitions which are continuous or closely spaced in time are more likely to be construed as constituting a single event than those spaced further apart. Event-internal pluractionals are never distributed across separate occasions (this is in fact a definitional property according to Cusic), and generally do not indicate intermittent action. Event-external pluractional interpretations often involve distribution over occasions or intermittent action on a single occasion. The Yup'ik pluractionals in (4) and (6) above illustrate this difference.

## 2.3. Aktionsart

Certain classes of events, and in particular certain Aktionsarten, are more likely than others to occur with event-internal pluractional meaning. Semelfactive predicates are commonly pluralized with event-internal pluractional meaning. Semelfactives describe events which are more-or-less instantaneous, and which do not involve a change of state or have an inherent final boundary — verbs meaning 'cough', 'kick', 'knock', 'flash', and so on. The Turkmen examples in (12) are typical.

- (12) Turkmen (Clark 1998:537)<sup>3</sup>  

|         |             |            |              |
|---------|-------------|------------|--------------|
| θilkmek | to shake'   | θilkelemek | to quiver'   |
| baθmak  | to step on' | baθgılamak | 'to trample' |

The nature of semelfactive predicates means that they are easily repeated in quick succession. As a result, when pluralized they lend themselves to an interpretation of continuous repetition. Many achievement predicates (with meanings such as 'cut', 'break') behave similarly, though often producing plural Patient

<sup>3</sup> For simplicity, I use only Clark's phonemic transcriptions, not the Cyrillic orthography.

interpretations.

Event-internal pluractionals also occur with verbs of other Aktionsart classes. However, they almost never apply to accomplishments, or to achievements which involve a run-up phase before their final transition (such as ‘die’). When they do, they pluralize only the process phase of the event, usually producing a conative interpretation. Garrett (2001) notes this pattern in Latin:

- (13) Latin (Garrett 2001)
- |           |                         |            |                        |
|-----------|-------------------------|------------|------------------------|
| aduenire  | ‘arrive’                | aduentare  | ‘approach’             |
| consulere | ‘consult, decide upon’  | consultare | ‘deliberate’           |
| noscere   | ‘get to know, find out’ | noscitare  | ‘examine, investigate’ |

I suggest that the relevant generalization here is that event-internal pluractionals pluralize single-phase events. Events which are internally complex (such as accomplishments, consisting of a process phase and a final change of state) must undergo some sort of coercion in order to conform to this requirement.

#### **2.4. Typical Multiplicity**

Events which are typically repeated are more likely to occur with event-internal pluractional meaning. This includes event types such as breathing, coughing, knocking or digging, as in the Kayardild example in (14).

- (14) Kayardild (Evans 1995:290)
- |         |           |                     |                                                                    |
|---------|-----------|---------------------|--------------------------------------------------------------------|
| ngawija | ‘breathe’ | ngawi-nyawi-ja      | ‘pant’                                                             |
| kurdala | ‘stab’    | kurdala-kurdala-tha | ‘digging (lit. ‘stabbing’) in the sand to find eggs <sup>4</sup> ’ |

#### **2.5. Common Endpoint**

Event-internal repetition has a common goal or endpoint. For instance, knocking on a door (as might be described by the pluractional verb *prkwhprkwrh(s-)* in Yurok, from (8) above) involves repetition with a single, specific goal. In the case of repeated action on a single Patient argument, there is a natural endpoint when the Patient is fully affected. For example, the pluractional of the Yup’ik verb *naveg-* ‘to break’ (from (4) above) means ‘to wreck’, and the pluractional event has a natural completion when the Patient is fully wrecked.

#### **2.5. Summary**

These characteristics often co-occur, and may be taken to define the typical context for event-internal pluractional interpretations. Two of the characteristics are apparently essential: in order for repetitions to be treated as the phases of a single event, they must occur in temporal or spatial proximity and must not be

---

<sup>4</sup> I am grateful to Claire Bowerm for pointing out that the meaning of this reduplicated verb is literally ‘stab repeatedly’, since a pointed stick is used to dig in the sand for eggs.

distributed over Agents. The other characteristics are general tendencies: the prototypical event-internal pluractional pluralizes a semelfactive-type event, and one which commonly occurs in multiple repetitions, often with a specific final boundary. However, the behavior of event-internal pluractionals when combined with accomplishment predicates appears to be consistent across languages.

Looking at the effect of these characteristics together, it can be seen that event-internal pluractionals prototypically describes repetition which has three main properties: familiarity; internal homogeneity (small parts with no complex internal structure, no large gaps between repetitions, no distribution across different Agents); and well-defined external boundaries (common goal or completion). I suggest that these characteristics are what permits the grouping of multiple parts into a complex whole.

A process of forming complex wholes from discrete perceptual entities is well-known in the study of visual perception. In the next section I examine the principles of grouping outlined by Gestalt psychologists and consider their possible relationship to the distinction between event-internal and event-external pluractionals.

### 3. Gestalt Laws of Grouping

I suggest that event-internal pluractionals involve a cognitive process of grouping, parallel to the process of grouping in visual perception described in Gestalt psychology (cf. Wertheimer 1923, Koffka 1935). The Gestalt psychologists identified several characteristics which determine the visual grouping of stimuli into a single entity. These include the “laws” of similarity, proximity, common fate, closure, good continuation and familiarity. A simple explanation and illustration of each of these principles is given below, followed by a comparison to the characteristics favouring event-internal pluractional interpretations.

#### a. Proximity

Objects which are close together in the visual field will be grouped together more readily than objects which are further apart. The following picture tends to be seen as three columns rather than three rows, since vertical proximity of adjacent objects is greater than horizontal proximity.



#### b. Similarity

Objects which are similar will be grouped together more readily than objects which are dissimilar. The following array is therefore perceived to contain an inverted v-shape consisting of zeros.

*Plurality of Events in Language and Perception*

(16)            1 1 1 1 0 1 1 1 1  
                  1 1 1 0 1 0 1 1 1  
                  1 1 0 1 1 1 0 1 1  
                  1 0 1 1 1 1 1 0 1  
                  0 1 1 1 1 1 1 1 0

c. Closure

Stimuli are grouped together if they tend to complete some closed region. Perceivers fill in gaps in incomplete figures. For example, it is easy to perceive a triangle in the arrangement of shapes in (17).

(17)                             $\wedge$   
  
                                   $\sphericalangle$              $\triangleright$

d. Good continuation

Objects tend to be grouped together when they produce a continuous line or curve, usually without abrupt changes. For instance, an X is viewed as two intersecting diagonal lines rather than as two v-shapes in opposite orientations.

e. Common fate

Objects which move or function together are grouped together. For example, (18a) is seen as a line consisting of four objects. However, if two objects (even if not adjacent) move in one direction and two in another, as in (18b), the line is perceived as being divided into two smaller groups.

(18)            a.  $\square \square \square \square$   
  
                  b.  $\square \quad \square$   
                      $\square \square \square \square$   
                              $\square \quad \square$

f. Familiarity

An arrangement of objects which is familiar is more likely to be perceived as a single complex entity.

The laws governing grouping of objects tend to produce internally homogeneous, externally simple and clearly bounded structures, and give preference to structures which are familiar. These are exactly the same types of effects suggested to result from the common characteristics of event-internal pluractionals.

#### **4. Individuation of Events**

What has not yet been addressed is how the grouping or individuation of repetitions relates to the individuation of events from non-repetitive sequences. The problem of organizing perceived occurrences into events is quite similar to the problem of organizing perceptual stimuli in the visual field into objects. However, while literature on the perception of objects has focused on the factors favoring grouping, research on the perception of events has focused on the reverse: factors correlating with perceived event-boundaries. Drawing on findings from a range of studies on event individuation, Zacks and Tversky (2001) discuss characteristics which correlate with perceived event boundaries, some of which are summarized here.

##### **a. Perceptual discontinuity**

Studies show that subjects tend to segment events at points with the highest degree of perceptual discontinuity, i.e. maximal change in physical features of the action (Zacks and Tversky 2001:7). For example, Newton et al. (1977) found a correlation between degree of change in position of an actor and perceived event-boundaries. It follows from this finding that periods of action with relatively high perceptual continuity are likely to be grouped together. As suggested in section 2, event-internal pluractionals tend to refer to events which are internally relatively homogeneous (i.e. repetitions with a high level of perceptual continuity).

##### **b. Unpredictability**

Sequences of occurrences are divided into larger segments if they are familiar or predictable (Zacks and Tversky 2001:8). As predictability decreases, subjects divide streams of action into smaller units (Newton 1973). In the cases studied, these are not repeated events. However, the behavior of event-internal pluractionals suggests that, when presented with sequences of repetitions, subjects are more likely to group into a single event those which are normally or predictably repeated (i.e. which are familiar as a sequence of repetitions). This is a typical characteristic of event-internal pluractionality.

##### **c. Change in perceived goal**

Subjects place event boundaries at points of perceived change in goal (Zacks 2004, Wilder 1978a, 1978b). This finding mirrors the tendency noted above for event-internal pluractionals to refer to repetitions with a common goal or completion. Repetitions are more likely to be grouped together if they form an event with a clear completion, and this is reminiscent of the Gestalt principle of closure.

In summary, I have argued that the kinds of factors which appear to influence grouping in the two domains are very similar in nature. They are similar enough that it seems reasonable to suggest they instantiate the same general cognitive process: the creation of complex (grouped) entities from multiple stimuli.

## 5. The Semantics of Grouped and Ungrouped Pluralities

In this section, I will suggest one way in which the proposed distinction between grouped and ungrouped events may be incorporated into an existing account of plurality, adapting the analysis of Landman (1996, 2000).

Landman assumes three types of individuals: singular, plural and group. Groups (like singular individuals) are atomic, and are formed by applying a group-formation operator ( $\uparrow$ ) to a plural. On this view, collective NP interpretations involve groups, while distributive interpretations are plurals.

By extending this three-way distinction to events, it is possible to account straightforwardly for the pluractional contrast.

On Landman's account, the distinction between collective and distributive predication is reduced to a difference between singular and plural predication (Landman 1996:428):

- (19) **singular predication** applies a basic predicate to an atomic (singular or group) individual  
**plural predication** applies a plural predicate distributively to a plural sum of such atomic individuals

At the same time, Landman argues that the distinction between singular and plural predication is a distinction between thematic and non-thematic predication: a basic singular predicate is one whose argument fills a thematic role. Plural predicates have special, non-thematic "plural roles". These are sums of thematic roles: a plural agent is the sum of the agents of the atomic parts of a plural event. For example, on its collective reading, a sentence like *John and Bill lifted the piano* contains a singular predicate with an atomic (group) agent whose parts are John and Bill. The group as a whole fills the thematic role of agent, and neither of the individuals John or Bill by himself fills the thematic role. On the distributive reading, John and Bill are separate agents of the atomic carrying events, and together they fill a non-thematic plural role of the verb *carry*.

Pluractional verbs, I propose, have the same semantic distinction as plural NPs. Event-internal pluractionals are groups, while event-external pluractionals are true plurals.

- (20) a. An event-external plural is a plural event ( $e$ ) consisting of proper subparts (events)  $e_1, \dots, e_n$   
b. An event-internal plural is a "group atom", an event ( $e$ ) whose ungrouped counterpart ( $\downarrow e$ ) has proper subparts  $e_1, \dots, e_n$

The behavior of event-internal and event-external pluractionals with respect to pluralization of arguments fits nicely with such an account. Event-external pluractionals, as plural events, may combine with plural (distributive) arguments, producing an interpretation in which individual events are distributed across individual participants. Event-internal pluractionals, on the other hand, function as

atomic predicates with true thematic roles. Plural arguments can only be interpreted as collective (group).

## 6. Conclusions

In this paper I have explored a semantic distinction between two types of plural actional meaning. I have suggested that this distinction reflects two major ways of construing repetition: either as a complex, internally plural event (event-internal plurality) or as an ungrouped set of events (event-external plurality). The same grouping operation appears to be at work in the distinction between collective and distributive interpretations of plural NPs, and is also evident in the processes of visual grouping described in the work of Gestalt psychologists, as well as in the parallel (or, rather, mirror image) research on event individuation. I take these findings as broadly consistent with a view of grammar as grounded in general cognitive abilities (cf. Langacker 1987) and of conceptual structure as emerging from perceptually-based symbols (cf. Barsalou 1999, 2003). The convergence in findings from cross-linguistic data and cognitive psychology should underscore the value of exploring these connections further, e.g. in investigating the perception of repeated actions.

## References

- Barsalou, Lawrence W. 1999. Perceptual symbol systems. *behavioral and Brain Sciences* 22:577-609
- Barsalou, Lawrence W., Kyle Simmons, Aron K. Barbey and Christine D. Wilson. 2003. Grounding conceptual knowledge in modality-specific systems. *TRENDS in Cognitive Science* 7(2):84-91
- Clark, Larry. 1998. *Turkmen Reference Grammar*. Otto Harassowitz Verlag.
- Cusic, David Dowell. 1981. Verbal Plurality and Aspect. Ph.D. diss., Stanford University.
- Dressler, Wolfgang. 1968. Studien zur verbalen Pluralität. Wien: Verlag der Österreichischen Akademie der Wissenschaften.
- Foley, William A. 1991. *The Yimas Language of New Guinea*. Stanford, CA: Stanford University Press.
- Garrett, Andrew. 2001. Reduplication and Infixation in Yurok: Morphology, Semantics, and Diachrony. *International Journal of American Linguistics* 67:264-312.
- Garrett, Andrew. 2001. The origin of the Latin frequentative. Presented at the 20<sup>th</sup> East-Coast Indo-European Conference, Cornell University, June 2001.
- Garrett, Andrew, Juliette Blevins and Lisa Conathan. 2005. Preliminary Yurok Dictionary. Ms., University of California, Berkeley.
- Jacobson, Steven A. 1984. *Yup'ik Eskimo Dictionary*. Alaska Native Language Center, University of Alaska.

*Plurality of Events in Language and Perception*

- Karlsson, Fred. 1999. *Finnish: an essential grammar*. London, New York: Routledge.
- Kimball, Geoffrey D. 1991. *Koasati Grammar*. Studies in the Anthropology of North American Indians. Lincoln, NE: University of Nebraska Press.
- Koffka, Kurt. 1935. *Principles of Gestalt Psychology*. New York: Harcourt, Brace, and World.
- Landman, Fred. 1996. Plurality. In Shalom Lappin, ed., *The Handbook of Contemporary Semantic Theory*. Oxford: Blackwell.
- Landman, Fred. 2000. *Events and Plurality*. Dordrecht: Kluwer.
- Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar Vol. 1: Theoretical Prerequisites*. Stanford, CA: Stanford University Press.
- Michotte, A. E. 1946/1963. *The perception of causality*. Translated by T. R. Miles and E. Miles. New York: Basic Books.
- Nedjalkov, Igor. 1997. *Evenki*. London, New York: Routledge.
- Newton, Darren. 1973. Attribution and the Unit of Perception of Ongoing Behavior. *Journal of Personality and Social Psychology* 28(1):28-38
- Newton, Darren, Gretchen Engquist and J. Bois. 1977. The Objective Basis of Behavior Units. *Journal of Personality and Social Psychology*, 35:847-862.
- Wertheimer, Max. 1923. Laws of Organization in Perceptual Forms. First published as Untersuchungen zur Lehre von der Gestalt II, in *Psychologische Forschung* 4:301-350. Translation published in Ellis, W. 1938. *A Source Book of Gestalt Psychology* pp. 71-88. London: Routledge and Kegan Paul.
- Wilder, D. A. 1978a. Effect of Predictability on Units of Perception and Attribution. *Personality and Social Psychology Bulletin* 4:281-284.
- Wilder, D. A. 1978b. Predictability of behaviors, goals, and unit of perception. *Personality and Social Psychology Bulletin*, 4:604-607.
- Xrakovskij, Viktor S. ed. 1997. *Typology of iterative constructions*. Lincom Studies in Theoretical Linguistics, 4. München: Lincom Europa.
- Yu, Alan. 2003. Pluractionality in Chechen. In *Proceedings of the 37<sup>th</sup> annual meeting of the Chicago Linguistic Society*.
- Zacks, Jeffrey M. 2004. Using Movement and Intentions to Understand Simple Events. *Cognitive Science* 28:979-1008.
- Zacks, Jeffrey M. and Barbara Tversky. 2001. Event structure in perception and conception. *Psychological Bulletin* 127(1):3-21

University of California, Berkeley  
Department of Linguistics  
1203 Dwinelle Hall  
Berkeley, CA 94720-2650

tess\_wood@earthlink.net



## The Effects of Lexical Frequency and Stress on Coarticulation

GWANHI YUN

*University of Arizona, Tucson*

### 0. Introduction

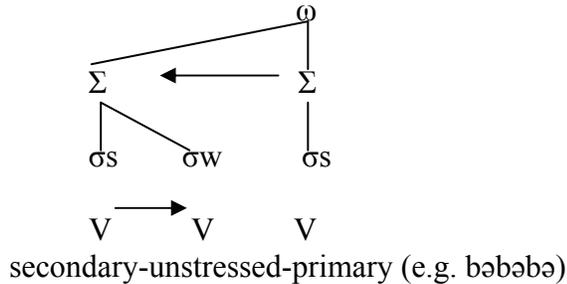
It has increasingly been observed that lexical frequency plays a significant role in English phonology (vowel reduction: Fidelholtz 1975, Hooper 1976; lexical diffusion: Bybee 2002; cyclic stress: Hammond 2004). For example, high-frequency words undergo more word-initial vowel reduction in closed syllables as in (1a) (Fidelholtz 1975). In addition, medial vowel elision occurs to a greater extent in relatively high-frequency words than in low-frequency words as in (1b) (Hooper 1976, Bybee 2002). Furthermore, fixed phrases show more regular rhythmic alternation than less fixed phrases as in (1c) (Lieberman and Prince 1977, Hayes 1984, Hammond 1988). High-frequency words also exhibit more medial clash-based de-stressing and vowel reduction for secondary stressed vowels than low-frequency words as in (1d) (Hammond 2005). Lastly, phrases with high transitional probability are more likely to undergo palatalization than those with low transitional probability as in (1e) (Bush 2001).

- |     |    |                |     |              |             |
|-----|----|----------------|-----|--------------|-------------|
| (1) | a. | astrónomy      | vs. | gàstrónomy   |             |
|     |    | mistáke        | vs. | mistóok      |             |
|     | b. | mém(o)ry       | vs. | *mamm(o)ry   | vs. mámmory |
|     |    | núrs(e)ry      | vs. | *curs(o)ry   | vs. cúrsory |
|     | c. | bámbòo cúrtain | vs. | bàmbóo fénce |             |
|     | d. | trànsformátion | vs. | èxàltátion   |             |
|     |    | informátion    | vs. | àttèstátion  |             |
|     |    | trànsportátion | vs. | òstèntátion  |             |
|     | e. | did you        | vs. | had you      |             |

However, there have been very few studies on how word frequency or degree of stress affects inter-gestural timing relations such as in vowel-to-vowel (V-to-V) coarticulation. In this paper, we report new findings from acoustic experiments investigating how word frequency is related to the degree of V-to-V coarticulation and how degrees of stress affect the degree of V-to-V coarticulation in English.

According to articulatory phonology, coarticulation has been defined as “patterns of coordination, between the articulatory gestures of neighboring segments, which result in the vocal tract responding at any one time to commands for more than one segment” (Manuel 1987:179). Put simply, coarticulation is coproduction, referring to the temporal co-occurrence or overlap in the articulation of two (or more) gestures (Browman and Goldstein 1989, Byrd 1996:210). With respect to the effect of stress on V-to-V coarticulation, Magen (1984) showed that carryover coarticulation occurs from stressed vowels to unstressed vowels within the foot in English and Japanese. In addition, Magen’s (1997) acoustic study revealed that bidirectional coarticulation takes place in English centering on unstressed vowels, as illustrated in (2).

(2) Bidirectional coarticulation



As seen above, primary stressed vowels influence secondary stressed vowels across unstressed vowels, and secondary stressed vowels affect unstressed vowels within the same foot. Magen’s study has two important implications with respect to the directionality and domain of V-to-V coarticulation. First, vowels with a higher degree of stress affect vowels with a lower degree of stress. Second, coarticulation occurs even across foot boundaries. However, my research is different from Magen’s (1984, 1997) studies in that it attempts to see how vowels with different degrees of stress can be resistant to coarticulation from unstressed vowels. Furthermore, I employed real English words rather than hypothetical words like Magen (1997). Thus, this research will reveal new ways to see the directionality of coarticulation as well as the degree of resistance to coarticulation with respect to the effect of stress.

**1. Goals**

This study has three goals. First, we attempt to see whether/how much lexical frequency affects fine phonetic details at the subphonemic level such as the degree of coarticulation. The second goal is to look into whether/how much stress affects resistance to coarticulation. The last objective is to explore the possibility that different intergestural timing relations can be represented in the lexicon.

## 2. Lexical Frequency and Degree of V-to-V Coarticulation

### 2.1. Ultrasound Experiments

To seek an answer for whether word frequency directly influences the degree of coarticulation, a preliminary articulatory experiment was conducted. Since high-frequency words show more efficiency in production than low-frequency words (Bybee 2002), it is reasonable to speculate that intergestural timing organization is more variable and is more likely to be overlapped between vowels in high-frequency words than in low-frequency words. Thus, the following hypothesis is proposed:

- (3) “*Frequency-strengthened intergestural timing relations*” hypothesis  
 The degree of V-to-V coarticulation may be stronger in high-frequency words than in low-frequency words.

To test this hypothesis, one native speaker of English participated in the production of English words. The subject was an adult male in his 30s. Two- and three-syllable words containing  $V_1CV_2$  sequences and identical foot structure were used as stimuli.  $V_1$  varied among back/front low/mid vowels such as /a, æ, ɔ, ʌ/, and the intervening consonants varied among labials, alveolars, and velars.  $V_2$  was either /i/ or /ɪ/. The materials were randomly selected from the Brown corpus (with 1,026,604 words). Low-frequency words have counts ranging from 1-50, while high-frequency words have counts above 50, as illustrated in (4). The numbers in parentheses after each word refer to the token frequency of each word.

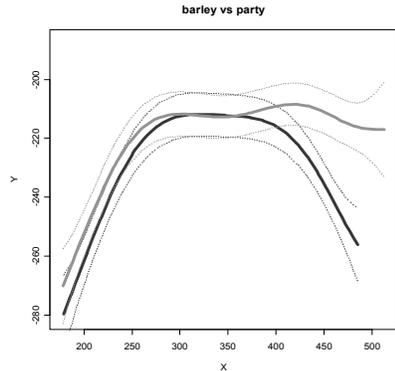
| (4) | $V_1V_2$ | Low-frequency (1-50)       | High-frequency (50-400) |
|-----|----------|----------------------------|-------------------------|
|     | a-i      | barley (6) / bobby (25)    | party/army (132)        |
|     | a-ɪ      | cottage (19)               | college (271)           |
|     | æ-i      | alley (8)                  | carry (88)              |
|     | æ-ɪ      | savage (22)                | average (132)           |
|     | ʌ-i      | cunning (5)                | cutting (69)            |
|     | ɔ-i      | longing (10) / sausage (2) | morning (214)           |

Both high- and low-frequency words were displayed on a monitor in front of the subject in the carrier phrase “Please say \_\_\_\_ to me.” Each word was uttered three times. A total of 21 tokens were produced for each word, and in all, 63 of their recorded images were analyzed. The height (or frontness) of the tongue body was measured on the basis of ultrasound images recorded as digital video. In order to quantify the tongue shape, Palatoglossatron was used (Baker 2006), and to get statistical results, smoothing spline ANOVA was used (Davidson 2005).

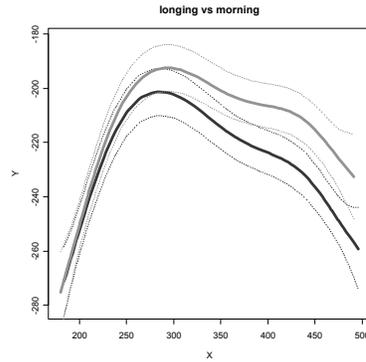
Since it is difficult to see the relative backness of the tongue body from one picture, average tongue body lines were obtained for statistical analysis as illustrated in (5) (Davidson 2005). The thick lines refer to the tongue body position of back vowels in low-frequency words, and the thin lines to the tongue body of

back vowels in high-frequency words. The left side of each graph shows the tongue back or root, while the right side shows the tongue front or tip.

(5) a. barley vs. party



b. longing vs. morning



As expected, the low or mid vowels in high-frequency words such as *party*, *cutting*, and *morning* were, interestingly, articulated significantly higher and fronter than those in low-frequency words such as *barley*, *cunning*, and *longing* along some part of the tongue body. Only a pair such as *bobby-army* showed an exceptional pattern. That is, stronger anticipatory coarticulation of  $V_1$  from  $V_2$  occurred in high-frequency words than in low-frequency words. These results support the hypothesis that intergestural timing relations between vowels are more overlapped in high-frequency words than in low-frequency words.

In order to confirm these articulatory results, acoustic experiments were conducted by measuring F1 and F2 values, which will be shown in next section.

## 2.2. Acoustic Experiments: F1/F2 Coarticulation

To test the “frequency-strengthened intergestural timing relations” hypothesis in (3), four native speakers of English participated in the production of English words. They were all in their 20s; three were females, and one was male. The same stimuli used in the ultrasound experiments were uttered five times. F1/F2 values of low or mid vowels were compared between high-frequency words and low-frequency words in order to see how high/front the vowels are articulated. In total, 105 tokens were analyzed, and F1/F2 values were measured at three time points in  $V_1$  of the  $V_1CV_2$  sequences (i.e. onset, middle, offset) in Praat (Boersma and Weenink 2001). We expected that F1 values of  $V_1$  (e.g. back vowels) would be lower in high-frequency words than in low-frequency words as a result of stronger anticipatory coarticulation from  $V_2$  (e.g. /i/) with respect to vowel height. Furthermore, it was expected that F2 values would be higher in high-frequency words than in low-frequency words as a result of stronger coarticulation effects in terms of the backness of  $V_1$ s.

A one-factor ANOVA revealed that the frequency effect on the degree of V-to-V coarticulation was significant as illustrated in (6) ( $p < 0.05$ ). As predicted, F1s of  $V_1$  such as back vowels /a, ɔ, ʌ/ were significantly lower in high-frequency

*Lexical Frequency, Stress, and Coarticulation*

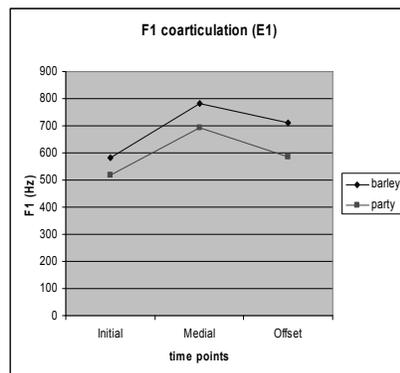
words than in low-frequency words. Furthermore, F2s of the same back vowels were higher in high-frequency words than in low-frequency words. These results indicate that V<sub>1</sub> underwent stronger anticipatory coarticulation from V<sub>2</sub> in high-frequency words than in low-frequency words.

(6) Frequency effects: within-subjects ANOVA

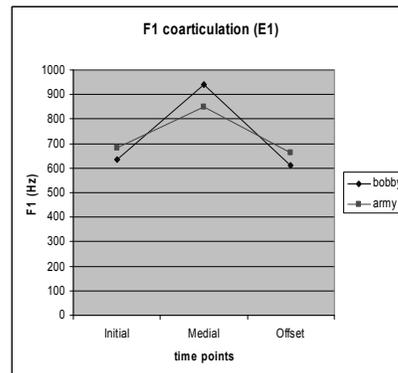
|          | F1 (Hz) |           |            |                 |
|----------|---------|-----------|------------|-----------------|
|          | Mean    | Std. Dev. | Difference | <i>p</i> -value |
| Lo-Freq. | 877     | 174.45    |            | <i>p</i> < 0.05 |
| Hi-Freq. | 765     | 226.82    | -111.7     |                 |
|          | F2 (Hz) |           |            |                 |
| Lo-Freq. | 1559    | 371.38    | 135.9      | <i>p</i> ≤ 0.05 |
| Hi-Freq. | 1695    | 469.86    |            |                 |

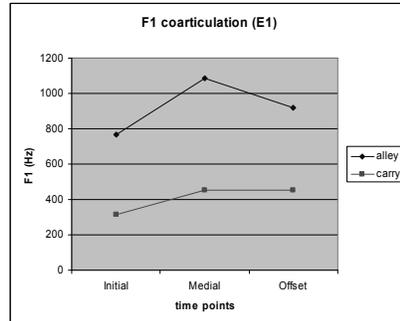
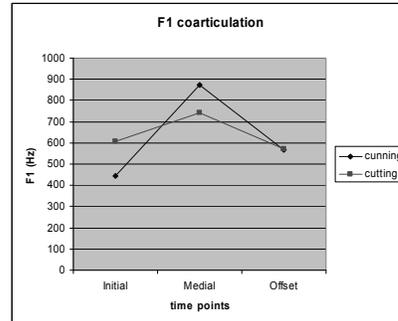
Overall, the results support the proposed hypothesis, showing that a V<sub>1</sub> such as a back vowel is articulated further front and higher in high-frequency words than in low-frequency words due to the influence of a V<sub>2</sub> such as /i/. However, since (6) shows F1/F2 coarticulation only at the midpoint of V<sub>1</sub>, F1 values were measured at the initial and offset points in order to check for consistent patterns during the whole production of V<sub>1</sub> in V<sub>1</sub>CV<sub>2</sub> sequences. The whole ranges of F1 in a V<sub>1</sub> such as a back vowel were lower in high-frequency words than in low-frequency words as illustrated in (7). The thin lines with a lower F1 range refer to the stream of F1 in V<sub>1</sub> of high-frequency words, while the thick lines with a higher F1 range refer to the stream of F1 in V<sub>1</sub> of low-frequency words. In particular, (7a), (7b), and (7c) show that stronger anticipatory coarticulation began from the onset or midpoint of V<sub>1</sub>. An interesting implication here is that speakers plan to produce V<sub>2</sub> even while they are producing V<sub>1</sub> in a V<sub>1</sub>CV<sub>2</sub> sequence (Whalen 1990). Furthermore, as seen in the pair *alley* vs. *carry* (7c), when V<sub>1</sub> was a front vowel, F1 of V<sub>1</sub> showed a greater difference than in the other pairs.

(7) a. barley vs. party



b. bobby vs. army



c. alley vs. carryd. cutting vs. cunning

The results above also confirm Öhman's (1966) 'dual mode' idea that VCV sequences are realized by means of an underlying V-to-V articulatory mode, with a superimposed consonantal gesture. In brief, they support the hypothesis that high word frequency causes greater gestural overlap than low word frequency.

### 3. Stress Effects on Resistance to Coarticulation

#### 3.1. Ultrasound Experiments

Preliminary articulatory experiments were conducted with ultrasound to answer the following question: does the degree of stress affect the degree of or resistance to coarticulation? Magen's (1985, 1997) studies focus on the directionality of V-to-V coarticulation with respect to stress differences, whereas I attempt to reveal the effect of stress differences on the degree of V-to-V coarticulation. Another difference lies in that my investigation focuses on whether even unstressed vowels affect primary and/or secondary stressed vowels in English.

It is known that since primary stressed vowels show longer duration and higher amplitude than secondary stressed vowels, they are more resistant to coarticulation, and therefore intergestural timing organization between a primary stressed vowel and the following vowel is less overlapped than between a secondary stressed vowel and the following vowel (Edward et al. 1991). This basic reasoning leads us to propose the following hypothesis:

(8) "*Stress-dependent intergestural timing relations*" hypothesis

The degree of V-to-V coarticulation may be stronger in secondary stressed vowels than in primary stressed vowels.

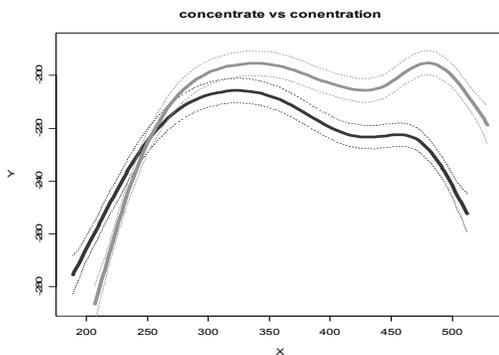
This hypothesis predicted that a  $V_1$  with secondary stress would be articulated higher than one with primary stress because of stronger anticipatory coarticulation from an unstressed  $V_2$ , and that F1 values of  $V_1$  with secondary stress would be lower than those of  $V_1$  with primary stress. To test this hypothesis, three- and four-syllable words containing  $V_1CV_2$  sequences were employed.  $V_1$  varied among back low /a/ and front low and mid vowels /æ, ε/, while  $V_2$  alternated between a reduced vowel /ə/ and a high back vowel /u/, as illustrated in (9).

*Lexical Frequency, Stress, and Coarticulation*

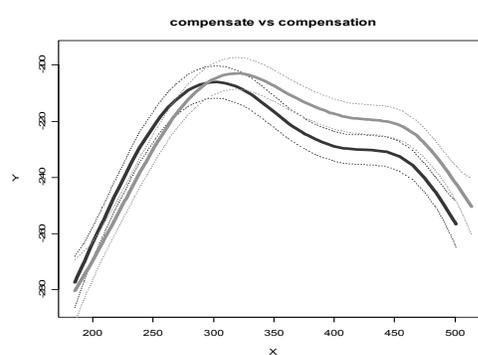
| (9) | VV type | $\acute{v}$ -v       | $\grave{v}$ -v |
|-----|---------|----------------------|----------------|
|     | a-ə     | <u>o</u> peràte      | òperàtion      |
|     |         | c <u>o</u> mpensàte  | còmpensàtion   |
|     |         | c <u>o</u> ncentràte | còncentràtion  |
|     | a-u     | d <u>o</u> ccument   | dòccumentàtion |
|     |         | p <u>o</u> pulàte    | pòpulàtion     |
|     | æ-ə     | <u>a</u> nécdòte     | ànécdótal      |
|     | ε-ə     | d <u>e</u> mônstràte | dòmônstràtion  |

Tongue body height was compared between when  $V_1$  was a primary stressed vowel vs. a secondary stressed vowel to see the degree of anticipatory coarticulation from  $V_2$ . The articulatory results from ultrasound pictures showed that secondary stressed vowels were articulated significantly higher than primary stressed vowels as a result of stronger anticipatory coarticulation from the following unstressed vowel, as illustrated in (10).

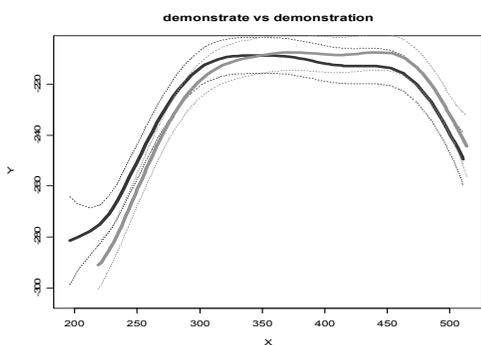
(10) a. concentràte vs. còncentràtion



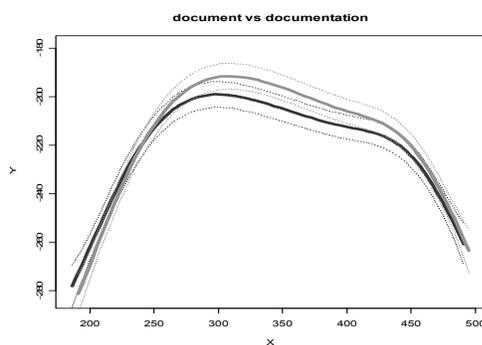
b. compensàte vs. còmpensàtion



c. demônstràte vs. dòmônstràtion



d. doccument vs. dòccumentàtion



As seen above, the thick lower lines refer to the tongue body position of primary stressed vowels, and the thin upper lines to that of secondary stressed ones. These preliminary articulatory results have several interesting implications. First, they confirm that primary stressed vowels are more resistant to coarticulation than

secondary stressed vowels. Second, they indicate nevertheless that even primary and secondary stressed vowels undergo anticipatory coarticulation from following unstressed vowels. Third, they support the “stress-dependent intergestural timing relations” hypothesis, showing that intergestural timing relations are more overlapped between secondary stressed vowels and unstressed vowels than between primary stressed vowels and unstressed ones.

Acoustic experiments were conducted to confirm the articulatory finding of a significant degree of coarticulation only at one time point. The next section describes the experiments and results.

**3.2. Acoustic Experiments: F1/F2 Coarticulation**

In this acoustic experiment, the same four subjects as in the previous acoustic experiments participated in the production of the words in (9). F1/F2 values of low and mid vowels were compared between primary stressed vowels and secondary stressed vowels in order to see how high the vowels are articulated. In total, 160 tokens were analyzed, and F1/F2 values were measured at three time points of V<sub>1</sub> in V<sub>1</sub>CV<sub>2</sub> sequences (i.e. onset, middle, offset) in Praat.

A one-factor within-subjects ANOVA revealed that the effect of stress was significant for F1 differences ( $p < 0.05$ ), but not for F2 differences ( $p > 0.05$ ), as illustrated in (11). These results indicate that secondary stressed vowels were articulated higher than primary stressed vowels because of a stronger influence from the following unstressed vowels. The lack of distinctive influence with respect to backness is due to the fact that most of the vowels for V<sub>1</sub> and V<sub>2</sub> are back vowels and thus the likelihood of influence from them is very slight.

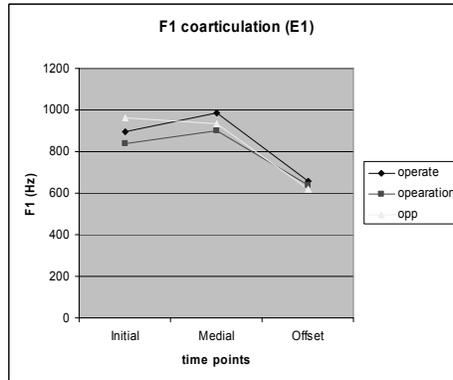
(11) Stress effects on F1/F2 between primary and secondary stressed vowels

|                  | F1 (Hz) |           |            |                 |
|------------------|---------|-----------|------------|-----------------|
|                  | Mean    | Std. Dev. | Difference | <i>p</i> -value |
| Primary Stress   | 825.3   | 150.6     | 43.7       | $p < 0.05$      |
| Secondary Stress | 781.5   | 149.1     |            |                 |
|                  | F2 (Hz) |           |            |                 |
| Primary Stress   | 1506.8  | 335.9     | -60.7      | $p > 0.05$      |
| Secondary Stress | 1567.6  | 322.1     |            |                 |

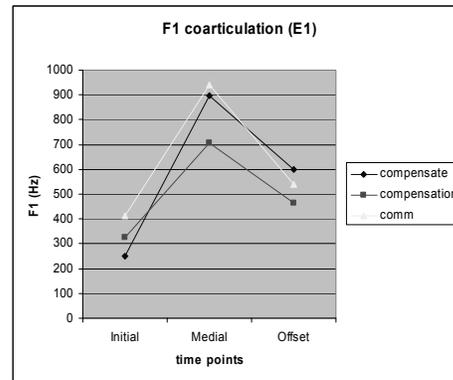
As seen in (11), the pattern of differences in the degree of anticipatory coarticulation at the midpoint of V<sub>1</sub> supports the “stress-dependent intergestural timing relations” hypothesis. Next, to confirm these results, the changes in F1 values in V<sub>1</sub> were obtained. The results showed that F1 values at the midpoint and offset points of secondary stressed V<sub>1</sub> were significantly lower than those of primary stressed V<sub>1</sub> ( $p < 0.05$ ), as illustrated in (12). Interestingly, these findings indicate that the effect of resistance of V<sub>1</sub> to anticipatory coarticulation from V<sub>2</sub> already started during the production of V<sub>1</sub> in V<sub>1</sub>CV<sub>2</sub> sequences.

*Lexical Frequency, Stress, and Coarticulation*

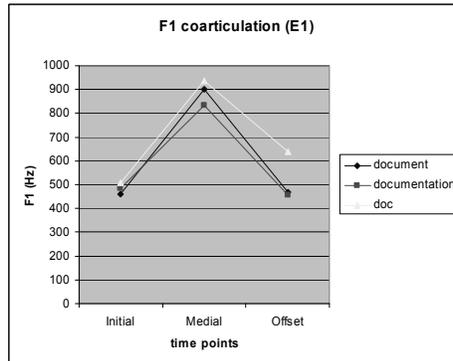
(12) a. operate vs. operation



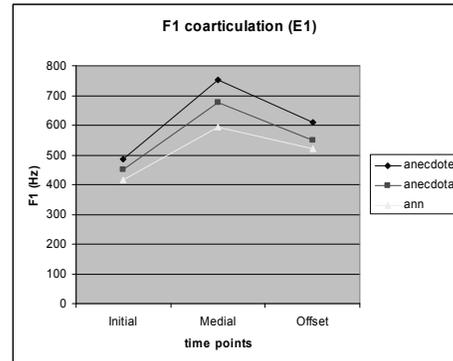
b. compensate vs. compensation



c. document vs. documentation



d. ancedote vs. ancedotal



Overall, the acoustic results, especially F1 values, confirm the articulatory results, showing that primary stressed vowels are less influenced by following unstressed vowels than secondary stressed vowels. In summary, both articulatory and acoustic findings indicate that lexical stress affects the degree of vowel coarticulation or resistance to coarticulation. They also show that even unstressed vowels affect primary and secondary stressed vowels in terms of vowel height.

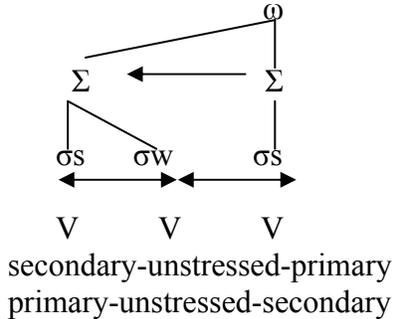
#### 4. Discussion

First, both articulatory and acoustic experiments showed that the degree of V-to-V coarticulation is more prominent in high-frequency words than in low-frequency words. Interestingly, the results indicate that frequency affects the subphonemic level (fine phonetic details), as well as segment-internal vowel reduction and suprasegmental rhythmic patterns. There are two possible explanations for frequency effects. First, according to exemplar theory, “reduction is the result of the automation of linguistic production” (Bybee 2002). That is, since high-frequency words involve the repetition of neuromotor patterns, production becomes more efficient, which causes an increase in overlaps of gestures and a decrease in their magnitude. It is reasonable to apply this idea to the greater

gestural overlap between vowels in high-frequency lexical items. Second, frequency effects on the degree of coarticulation might be due to formal constraints (Pater 2000, Hammond 2004). If we assume that intergestural timing relations are represented in the input, more prominent coarticulation in high-frequency words can be accounted for by a ranking such as IDENT(GesturalTiming)-LF » OVERLAP(Gestures) » IDENT(GesturalTiming). Or, assuming intergestural timing relations in the output, a ranking such as OVERLAP(GesturalTiming)-HF » IDENT(GesturalTiming) » OVERLAP(Gestures) can be resorted to. Both formal approaches depend on frequency-sensitive faithfulness or markedness constraints which specify intergestural timing relations in the input or output.

Next, both articulatory and acoustic experiments showed that primary stressed vowels are more resistant to (anticipatory) coarticulation than secondary stressed vowels because the former shows more robust articulatory and acoustic properties than the latter (Magen 1984, 1997). Another important contribution of my study is the finding that even unstressed vowels affect primary and secondary stressed vowels, though the degree is different. Thus, concerning the directionality of V-to-V coarticulation in English, I propose an extended model of bidirectionality of coarticulation, i.e. a revised schema of Magen (1997).

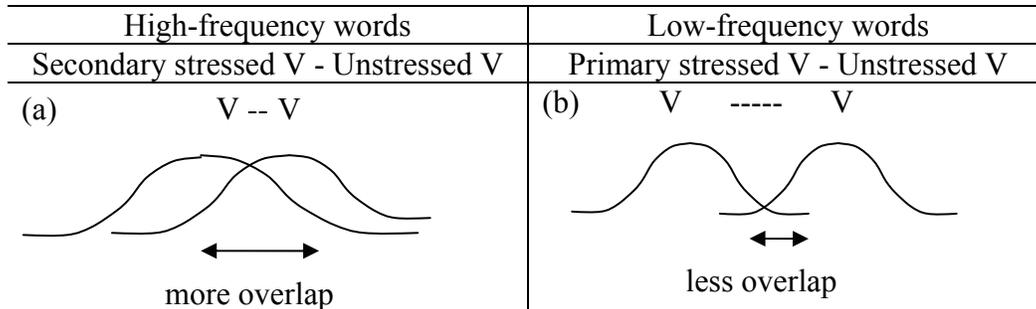
(13) Extended model of bidirectionality of coarticulation



Here we also need to speculate about why stress differences cause such distinctiveness in the degree of coarticulation. One reason may lie in the phonetic realization of stronger stressed vowels. Primary stressed vowels allow less intergestural overlap than secondary stressed vowels because their acoustic properties also involve longer duration, higher amplitude, and/or higher F0 (Edwards et al. 1991). Another reason might be stress-sensitive constraints such as IDENT-FOOT(GesturalTiming), which demands that fixed intergestural timing relations within a foot should be identical in the output, assuming that the different intergestural timing relations are stored in the lexicon.

Based on the experimental results regarding the different intergestural timing relations, I propose the following gestural representations, which reflect lexical frequency and stress effects on V-to-V coarticulation as illustrated in (14).

(14) Intergestural timing relations



The experimental results in this study make some contributions. First, they provide more evidence that abstract intergestural timing relations can be incorporated into formal grammar. Second, they open a way to enrich output representations, reflecting approximate articulatory properties much closer to actual output pronunciation.

**5. Conclusions**

This study showed that the degree of V-to-V coarticulation is highly conditioned both by lexical frequency and stress to some extent. Furthermore, it suggests that phonetic or lexical representation can incorporate the degree of intergestural timing relations either in the output or in the input, in case we assume an exemplar model or a formal constraint-based model (Cho 1998, Gafos 2002).

**References**

Browman, Catherine, and Louis Goldstein. 1989. Articulatory Gestures as Phonological Units. *Phonology* 6:201-252.

Bush, Nathan. 2001. Frequency Effects and Word-Boundary Palatalization in English. In J. Bybee and P. Hopper, eds., *Frequency and the Emergence of Linguistic Structure*. John Benjamins.

Bybee, Joan. 2002. Word Frequency and Context of Use in the Lexical Diffusion of Phonetically Conditioned Sound Change. *Language Variation and Change* 14:261-290.

Byrd, Dani. 1996. Influences on Articulatory Timing in Consonant Sequences. *Journal of Phonetics* 24:209-244.

Cho, Taehong. 1998. Intergestural Timing and Overlap in Korean Palatalization: An Optimality-Theoretic Approach. In D. Silva, ed., *Japanese/Korean Linguistics* 8:261-276. Stanford: CSLI Publications.

Davidson, Lisa. 2005. Comparing Tongue Shapes from Ultrasound Imaging Smoothing Spline Analysis of Variance. Ms., New York University.

Gwanhi Yun

- Edwards, Jan, Mary Beckman, and Janet Fletcher. 1991. The Articulatory Kinematics of Final Lengthening. *Journal of the Acoustical Society of America* 89:369-382.
- Fidelholtz, James. 1975. Word Frequency and Vowel Reduction in English. In *Proceedings of the Annual Meeting of the Chicago Linguistic Society* 11:200-213.
- Fowler, Carol. 1981. Production and Perception of Coarticulation among Stressed and Unstressed Vowels. *Journal of Speech and Hearing Research* 46:127-139.
- Gafos, Adamantios. 2002. A Grammar of Gestural Coordination. *Natural Language and Linguistic Theory* 20:269-337.
- Hammond, Michael. 1988. *Constraining Metrical Theory: A Modular Theory of Rhythm and Destressing*. New York: Garland.
- Hammond, Michael. 2004. Frequency, Cyclicity, and Optimality. In *Proceedings of the 2<sup>nd</sup> Seoul International Phonology Conference*. Seoul National University.
- Hayes, Bruce. 1984. The Phonology of Rhythm in English. *Linguistic Inquiry* 15:33-47.
- Hooper, Joan. 1976. Word Frequency in Lexical Diffusion and the Source of Morphophonological Change. In W. Christie, ed., *Current Progress in Historical Linguistics*, 96-105. Amsterdam: North Holland.
- Lieberman, Mark, and Alan Prince. 1977. On Stress and Linguistic Rhythm. *Linguistic Inquiry* 8:249-336.
- Magen, Harriet. 1984. Vowel-to-Vowel Coarticulation in English and Japanese. *Journal of the Acoustical Society of America* Supplement 75:S41.
- Magen, Harriet. 1997. The Extent of Vowel-to-Vowel Coarticulation in English. *Journal of Phonetics* 25:187-205.
- Manuel, Sharon. 1987. Acoustic and Perceptual Consequences of Vowel-to-Vowel Coarticulation in Three Bantu Languages. Ph.D. diss., Yale University.
- Öhman, Sven. 1966. Coarticulation in VCV Sequences: Spectrographic Measurements. *Journal of the Acoustical Society of America* 39:151-168.
- Pater, Joe. 2000. Non-Uniformity in English Secondary Stress: The Role of Ranked and Lexically Specific Constraints. *Phonology* 17:237-274.
- Whalen, Douglas H. 1990. Coarticulation is Largely Planned. *Journal of Phonetics* 18:3-35.

Gwanhi Yun  
Department of Linguistics  
PO Box 210028  
The University of Arizona  
Tucson, AZ 85721-0028

ghy@email.arizona.edu

# Deskewing the Searlean Picture: A New Speech Act Ontology for Linguistics

DIETMAR ZAEFFERER

*Ludwig-Maximilians-University, Munich*

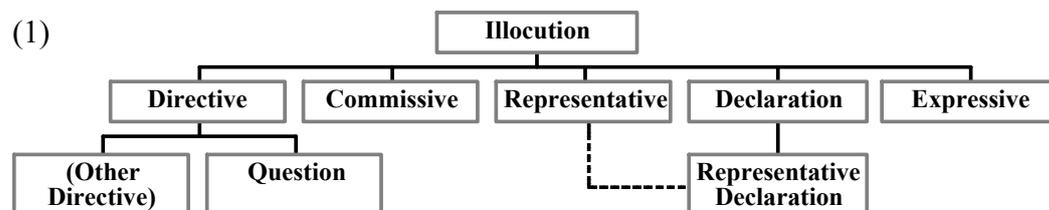
## 0. Introduction

The overall aim of this paper is to present a speech act ontology that is motivated by general assumptions about the nature of human language and implicational universals about the grammatical coding of illocutionary force (sentence mood markers). In particular, I want to show five things: first, that the Searlean picture is skewed in that it misrepresents universally attested distinctions, overemphasizes non-universal aspects of human language, and misses important generalizations; second, that a linguistically more fruitful picture can be developed on the basis of implicational universals that constrain the range of possible codings of sentence mood and other modalities; third, that this linguistic picture can be grounded on very few elementary and universally valid assumptions about the nature of human language and its functions; fourth, that this grammatically motivated reconstruction helps in analyzing intricate syntactic patterns that interrelate German clause types; and finally, that the Searlean picture can be embedded in the linguistic picture in such a way that nothing gets lost in the deskewing process that merits preservation.

## 1. A Classification of Illocutions:

### John Searle's Proposal of a Philosophical Picture

More than 30 years ago, Searle (1975) proposed a classification (initially called a taxonomy) of basic illocutions with five major categories and two subcategories which, slightly rearranged and represented in tree format, looks as follows:



The aim was to come up with a systematic picture of the most basic categories of illocutionary acts, i.e. of those types all other types would be subtypes of.<sup>1</sup>

### 1.1. How Systematic is the Searlean Picture?

At its time Searle's proposal constituted a tremendous step forward towards a principled terminology in speech act theory. It replaced the rather poorly defined classification outlined in the last lecture of Austin's *How to Do Things with Words* (Austin 1955) with a much more systematic account based on a decomposition of the notion of illocutionary force into its main factors. Searle found out that "there are (at least) twelve dimensions of variation in which illocutionary acts differ from one another" (1975:345): 1) point or purpose, 2) direction of fit, 3) expressed psychological state, 4) strength of the point, 5) status of participants, 6) relations to interests of participants, 7) relations to rest of discourse, 8) propositional content, 9) non-linguistic performability, 10) dependence on extra-linguistic institution, 11) possibility of performative use of describing verb, and 12) style. Although the resulting classification<sup>2</sup> pictured above and based mainly on the first three of these factors certainly represents a major improvement over its predecessor, upon closer scrutiny this account turns out to be less systematic than it looks.

### 1.2. Main Shortcomings of the Searlean Picture

There are at least nine respects in which Searle's proposal seems to be unsatisfactory. First, the top criterion point or purpose is ill-defined: there are always many purposes associated with an action, and even after narrowing down primary purposes the question remains open how these are to be identified. Second, the definitional value of both point and expressed psychological state is virtually eliminated at least with Representatives, whose point is to commit the speaker to the truth of the expressed proposition and whose expressed state is belief, by the claim that both are dimensions and that the "degree of belief and commitment may approach or even reach zero..." (Searle 1975:355). How can a belief or commitment with degree zero be identified? This leaves the words-to-world direction of fit as the only reliable definitional criterion. Similar problems arise with Directives and Commissives. Third, direction of fit is problematic itself, at least in its usual characterization (cf. Sobel and Copp 2001). Fourth, the classification is not a partition: its categories are neither pair-wise disjoint nor jointly exhaustive. Fifth, it disregards implicational universals of sentence mood, which is by definition that part of clause typing that indicates illocutionary force. Sixth, it destroys the integrity of the questions by subsuming them under the Directives: although canonical questions may be special cases of Directives, not all questions are. Seventh, it attributes a role and weight to Commissives, Declara-

---

<sup>1</sup> The dotted line between Representative and Representative Declaration indicates that the latter is a subcategory not only of Declaration, but in a way, also of Representative.

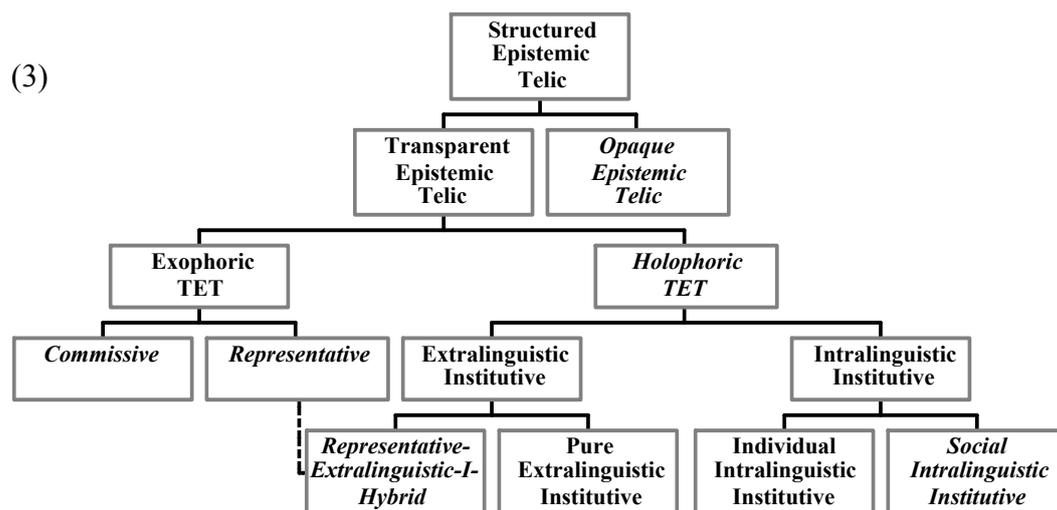
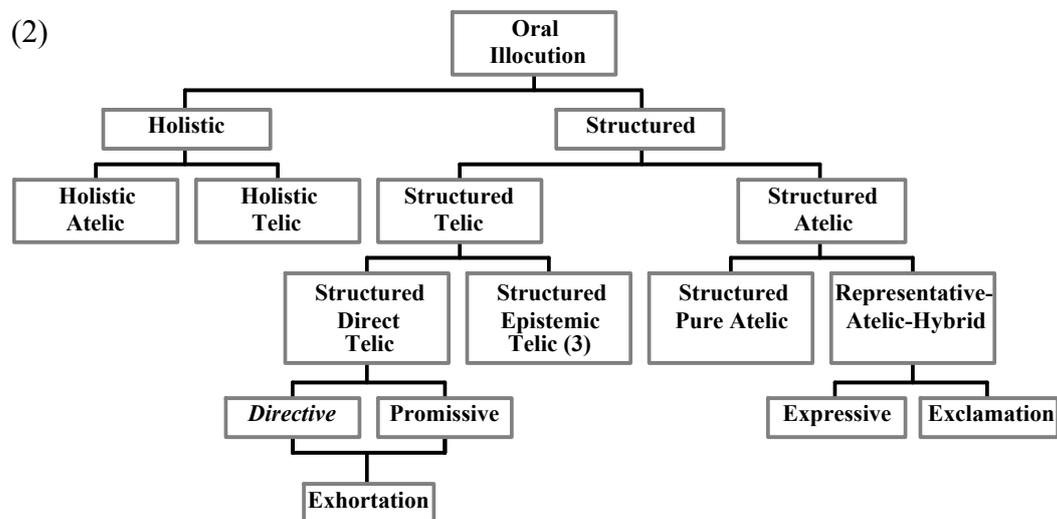
<sup>2</sup> There have been two changes from the first publication to the second (and later ones): in the title, *Taxonomy* was replaced by *Classification*, and in the text *Representatives* was substituted by *Assertives*.

tions, and Expressives that is poorly motivated. Eighth, it is incomplete in that it leaves no room for exclamations. Finally, quinary branching in a classification is always a good reason for double-checking if there are no possible higher distinctions that have been overlooked.

2. A Taxonomy of Illocutions:

The Grammar-Based Approach to a Linguistic Picture

Figures (2) and (3) show the new picture to be discussed below (the sub-tree dominated by the Structured Epistemic Telic node has been exported for display reasons). Those nodes in the figures that correspond to nodes in figure (1) are labeled in italics.



One motivation for the new taxonomy, which is an enriched and considerably improved successor to the one proposed in Zaefferer (2001), comes from hypotheses about implicational universals of sentence mood marking (cf. Hengeveld et al. 2007, König and Siemund 2007, Pak et al. 2005). Each branching of this tree corresponds to both a classification criterion and an assumed universal. Starting from the root, the most relevant criteria and universals (U) are:

- (A) Structure: presence of an overt distinction between sentence mood meaning and propositional content. An oral illocution is structured if its form reflects the force-content distinction, and holistic otherwise. U: if a language has structured illocutions, then it has holistic illocutions as well.
- (B) Telicity: presence of a volitional attitude aiming at a specific stage transition. An oral illocution is telic if its sentence mood meaning expresses such an attitude, and atelic otherwise. U: if a language has telic illocutions, then it has atelic illocutions as well. (Atelic holistics are interjections like *Wow!*, telic holistics interjections like *Hist!*)
- (C) Epistemicity: presence of an epistemic attitude layer between the volition and the propositional content. A telic illocution is epistemic if its expressed volition aims at such an attitude towards the content, and direct if it aims at the content itself. U: if a language has epistemic illocutions, then it has direct illocutions as well.
- (D) Promissivity: presence of a direct volitional attitude towards propositional content that exclusively characterizes a course of action of the agent. A direct telic illocution is promissive if its expressed volition aims at such content, it is directive if its expressed volition aims at content that exclusively characterizes a course of action of the addressee, and it is exhortative if its expressed volition aims at content that characterizes a joint course of action of the agent and the addressee. U: if a language has promissive illocutions, then it has exhortative illocutions, and if it has exhortative illocutions, then it has directive illocutions as well.
- (E) Opacity: property of a characterization of an epistemic attitude that specifies only the dimension of variation of its content. An epistemic telic illocution is opaque if its expressed volition aims at such partially specified propositional content; it is transparent if its expressed volition aims at fully specified content. U: if a language has opaque epistemic telic illocutions, then it has transparent epistemic telic illocutions as well.
- (F) Holophoricity: property of the propositional content of a given illocution that is present exactly if this content refers to the whole illocution it is part of. An epistemic telic illocution is holophoric if its expressed volition aims at an epistemic attitude towards propositional content that refers to the whole embedding illocution, else it is exophoric. U: if a language has holophoric epistemic telic illocutions, then it has exophoric epistemic telic illocutions as well.

Note that telic and epistemic illocutions involve the presence of modal operators, which by definition come in pairs of dual counterparts. The strong telic modal is volition, and its weak counterpart is toleration (absence of preventing volition); the strong epistemic modal is knowledge, and its weak counterpart is non-exclusion (absence of excluding knowledge). Interestingly, only the strong epistemic attitude can be characterized both transparently and opaquely; the weak epistemic attitude allows only for transparent characterization.

### **3. An Ontology of Illocutions: Grounding the Linguistic Picture**

#### **3.1. Basic Hypotheses about Human Language and Its Core Functions**

To turn a hierarchy of categories or taxonomy into an ontology, it is necessary to embed its definitions in a coherent account of the whole domain. Here is a rough outline of such a conceptualization. To begin with, it seems safe to assume that there are three elementary kinds of language use that can be characterized roughly as follows (*l*-association means here some language-specific association relation that is based both on convention and intention):

- (A) covert active language use, which consists in unperceivable pre-motor activity that triggers *l*-associated mental events;
- (B) overt active language use, which consists in perceivable motor activity that makes *l*-associated mental events inferable; and
- (C) receptive language use, which consists in perception of motor activity and inference of *l*-associated mental events.

This derives the following two core functions of language use:

- (i) mind activating and structuring with (A) and (B) above; and
- (ii) mind sharing, i.e. co-activating and co-structuring, with (B) and (C).

Assuming that there are four major kinds of mind sharing (cf. Zaefferer 2007), namely (a) attention sharing, (b) emotion sharing, (c) goal sharing, and (d) knowledge sharing, we get some support for the linguistic picture of section 2: whereas type (a) is relevant for all illocutions in that it introduces shared topics, type (b) is relevant mainly for atelic illocutions, type (c) is relevant for telic illocutions, and type (d) is relevant for epistemic illocutions.

#### **3.2. A Cognitively Viable Concept of Propositional Contents**

##### **3.2.1. Cognitived Austinian Propositional Contents**

A considerable part of the inspiration for the new picture came from the observation that there is much more interaction between kinds of propositional content and illocutionary forces than is generally assumed. To cash in on that insight it proved helpful to replace the usual possible-world modeling of propositions by something capable of doing a better job in guiding analytic intuition. Based on ideas from Austin (1950) and Barwise and Etchemendy (1987), I have developed the notion of cognitived Austinian propositional content, or CAP for short (cf. Zaefferer 2006).

Formally, a CAP is an ordered pair  $\langle s, T \rangle$ , where  $s$  is a mentally represented situation token and  $T$  is a mentally represented situation type. An applied CAP, or ACAP for short, is an ordered pair  $\langle t, p \rangle$ , where  $t$  is a situation token and  $p$  is a CAP. If  $P$  with  $P := \langle t, \langle s, T \rangle \rangle$  is an ACAP, we call  $t$  the topic of  $P$ ,  $s$  the token of  $P$ , and  $T$  the type of  $P$ .

### 3.2.2. Reconciling Categoriality and Gradience of Truth via Decomposition

The structure of ACAPs permits a decomposition of the venerable notion of truth into an internal and an interface component. Internally, we call an ACAP congruent if its token is of its type, and incongruent otherwise. Congruence is categorial and models the intuition that in a congruent ACAP, the type is *true of* the corresponding token. Concerning the interior-exterior interface, we call an ACAP ‘matching’ to the degree its token corresponds to its topic and ‘mismatching’ in the absence of such a correspondence. Thus, match is gradient and models the intuition that in a matching ACAP the token is more or less *true to* the corresponding topic (for the *true to-true of* distinction, cf. Austin 1950).

### 3.2.3. A Little Typology of Propositional Contents

Now we are in a position to distinguish between different kinds of propositional contents. We stipulate that a *blueprint proposition* is congruent by definition (it is a definition of a goal). It can be felicitously used in a direct telic if its applications are mismatching in all alternative continuations, i.e. without the telic being performed. It has been successfully used in a direct telic to the degree its token matches the topic of its application in the real world. This is why direct telics are not said to be true, but rather more or less well realized.

In contrast, a *picture proposition* can be congruent or incongruent. It can be used only in a transparent epistemic and can be evaluated in two ways: either it is assumed to be congruent and then the degree of match of the corresponding application can be stated, or its application is assumed to match to a given degree and then congruence can be checked.

Finally, a *near-proposition* is defined as having an empty token; therefore, the question of congruence does not arise. It can be felicitously used as top propositions only in an opaque epistemic. Note that once a near-proposition is applied by building a token that more or less matches the topic, it becomes a congruent or incongruent picture proposition, if possibly open parameters in its type are fixed.

## 3.3. A Fresh Look at Directions of Fit

For the new picture, the following four kinds of direction of fit have proved more helpful than Searle’s two (or four, including the double and the empty case): MR-match (mind-to-reality) occurs in perception and the formation of sufficiently matching applied picture propositions; RM-match (reality-to-mind) in intentional action, including the more or less true realization of blueprint propositions; MM-match (mind-to-mind) in all kinds of mind sharing, including the trustful interpre-



- (6) [Maria weiß,] ob Peter nach Rom fliegt. ‘[Maria knows] if Peter to Rome flies.’  
 (7) [Maria weiß,] dass Peter nach Rom fliegt. ‘[Maria knows] that Peter to Rome flies.’

#### 4.1.2. Non-Canonical Clauses

But there are also, more peripherally, verb-final root (8)-(10) and verb-initial embedded clauses (11) (PART glosses an emphatic particle):

- (8) Ob Peter nach Rom fliegt? ‘If Peter to Rome flies?’  
 (9) Dass Peter nach Rom fliegt! ‘That Peter to Rome flies!’  
 (10) Dass du ja nach Rom fliegst! ‘That you PART to Rome fly!’  
 (11) [Ich hoffe,] Peter fliegt nach Rom. ‘[I hope] Peter flies to Rome.’

### 4.2. Explaining the Properties of Non-Canonical Clause Types

#### 4.2.1. Gain of Force through Insubordination: Verb-Final Root Clauses

Truckenbrodt (2006) aims at a uniform explanation based on the absence of finite morphology in C, but he admits that exclamative uses are outside the scope of his approach. Given the functional heterogeneity – (8) raises the question without expecting an answer, (9) expresses amazement, (10) insists on the compliance with an order, and there are some more – an alternative seems preferable:

- (O) Orphan theory of verb-final root clauses

(O) claims that verb-final root clauses still show the effect of different matrix clauses with speaker subjects which are gone forever – not hidden by ellipsis, but roughly recoverable as expressing wondering, amazement, and insistence, respectively (other attitudes are possible) – and which determine, together with the type of the content (near-proposition (8), picture propositions (9), blueprint proposition (10)), the different non-canonical forces of these clauses. Thus, (O) is able to account for the functional heterogeneity of verb-final root clauses.

#### 4.2.2. Loss of Force through Subordination: Verb-Initial Dependent Clauses

Whereas all V2-clause embedding matrices also embed VL-clauses (cf. (11) and (12)), the inverse does not hold (cf. (13) and (14)), and worse, modified V2-embedders may lose this ability (cf. (15)):

- (12) Ich hoffe, dass Peter nach Rom fliegt. ‘I hope that Peter to Rome flies.’  
 (13) Ich bezweifle, dass Peter nach Rom fliegt. ‘I doubt that Peter to Rome flies.’  
 (14) \*Ich bezweifle, Peter fliegt nach Rom. ‘I doubt Peter flies to Rome.’  
 (15) \*Ich hoffe nicht, Peter fliegt nach Rom. ‘I do not hope Peter flies to Rome.’

I think that Truckenbrodt (2006) is on the right track in trying to explain the embeddability restrictions on V2-clauses by force effects: whereas canonical subordinates suffer complete loss of force, non-canonical subordinates keep at least some of their force and this imposes constraints on the embedders. Gärtner’s proto-force absorption hypothesis says that V2-clauses come with an assertive

proto-force, which in the absence of an embedder turns into a full force, whereas in the presence of an embedder it has to be absorbed (entailed) by it. The problem with the approach is that it is unclear what an assertive proto-force is and how, for instance, an epistemic attitude can be entailed, e.g. by hope.

The picture outlined above suggests a more satisfying account:

(W) Weak epistemic layer theory of embedded V2-clauses

(W) says that in embedded V2-clauses, (a) only the epistemic layer of the transparent epistemic telic force remains, and (b) the epistemic attitude is only a weak one (lack of excluding knowledge, or 'nexclusion' for short). Hoping  $p$  entails nexcluding  $p$ ; therefore, (11) is ok. Not hoping or doubting  $p$  does not entail nexcluding  $p$  (although it may implicate it); therefore, (14) and (15) are out. Note that neither (O) nor (W) would be derivable from the old picture.

### **5. Relating the New Picture to the Old One**

Looking back, we are now in a position to determine the reason for the skew in the old picture that has been removed in the new one. The undeniable merits of Searle's picture come from the fact that it is a fairly adequate picture of the major illocutionary acts, at least for a prototypical Western culture where commitments and obligations play a central role. But major illocutionary acts and basic illocutionary acts are not the same, and if we compare the two pictures it seems reasonable to assume that the major skewing factor is what Barwise and Perry (1983:38) have called the fallacy of misplaced information. This will become clear in the following section where the definitions of the nodes in (1) will be compared with those of their (italicized) counterparts in (2) and (3).

First, let us have a look at Directives. According to Searle, an illocution with propositional content  $p$  is a Directive if it is an attempt with the degree of strength  $x$  by the agent to get the addressee to realize  $p$ . According to the new picture, a Directive is a structured direct telic with propositional content that characterizes exclusively an action of the addressee. This is in line with data like those from Korean that show that in this language, promissive, exhortative, and directive speech acts can be coded by sentences that differ minimally in the choice of the sentence-final particle (*-ma*, *-ca*, or *-la*, respectively) and the person features of their subjects, and which apart from that constitute a single clause type (Pak et al. 2005). If we take this formal commonality seriously, then we should see it as an indicator for a functional common denominator. This is obvious in the new picture (a volitional attitude with goals that differ only in who controls their attainability), but it is hard to see how it could be developed from the old one.<sup>3</sup>

---

<sup>3</sup> The obvious inadequacy of analyzing promises as requests to oneself, i.e. attempts to get oneself to do something, caused Searle to reject this idea (1975:356).

The terms in which Searle couches his criticism of the new definition show that he does not sufficiently appreciate the significant distinction between volition and desire:

The utterance “Come” does more than just express a desire that the hearer come, as is shown by the fact that she [the speaker] might consistently say “Of course, Max, I *want* you to come, but I am not actually asking or requesting you to come”. If his account were right it would be impossible to express such a desire without thereby issuing a directive, but there are lots of examples to show that this is wrong. (Searle 2001:289)

I think his argument goes through, but it relies crucially on the fact that wanting is underspecified with respect to the abovementioned distinction and therefore can be used to express also mere desire. So his example cuts just the other way around: it assumes that the speaker could not consistently say *Of course, Max, I said to you ‘Come’ and I meant it, but I was not actually asking or requesting you to come*. The new definition explains this inconsistency by saying that an unmarked utterance of an imperative expresses a volitional attitude towards the content. Given that volition, in contrast to desire, entails reachability of its target with the available means, it will be hard for Max to argue *OK, she has expressed that she aims at my coming and assumes that to be within her reach, but that does not mean she is trying to get me to come*.

Next, let us compare the definitions of the Representatives. According to Searle’s definition, the point of a Representative is to commit its speaker with the degree of strength  $x$  to the truth of the propositional content, whereas the new picture entails that whoever performs a Representative licenses the inference that he aims at activated knowledge of the propositional content. Since the intended possessor of this knowledge is not specified, this entails a nice account of an example that Searle rightly produced as an argument against an earlier version of the new picture: it is consistent to say *I don’t care whether you assume that it is raining, all the same it’s raining* (Searle 2001:288). This is at odds with the earlier version (Zaefferer 2001) which analyzed Representatives as aiming at the assumption of the content by the addressee, but not with the current version, which entails that, given that the intended possessor of the knowledge cannot be the addressee, it must rather be the speaker himself, and which secondarily invites the inference that the addressee is intended to infer this (*Whether or not you accept it, I know it*).

Searle’s analysis of Representatives as commitments to the truth of their content provides an especially clear illustration of the fallacy of misplaced information: commitments result from the agent’s responsibility for the possible consequences of an action, be it linguistic or something else. When the air traffic controller utters *The runway is clear*, he is strongly committed to the truth of what he says because he could cause the death of hundreds of people, and when the shop customer replies *I am fine* to the cashier’s routine question, she is not committed at all to the truth of this Representative, although she licenses the inference

### *Deskewing the Searlean Picture*

that she aims at activated knowledge that she is doing fine, but in view of the pertinent social conventions this knowledge is easily devaluated.

The label Declaration from the old picture has been replaced by holophoric transparent epistemic telic (holophoric TET for short) in the new one, and again this indicates a reconceptualization. Although Searle's defining characteristic of this class, "that the successful performance of one of its members brings about the correspondence between the propositional content and reality" (1975:358), has been adopted, both his assumption of a double direction of fit and his claim that a successful performance results in "some alternation in the status or condition of the referred to object or objects" (1975:358) are rejected. The propositional content of a holophoric TET is congruent by definition, and in case of a successful performance, it is matching as well. In that case, there is also a mind-to-mind fit, which explains why the relevant reality can only be social or individual institutional reality. Cases like *This is a reminder that the use of cell phones is not permitted on our flights* are problematic for Searle's claim because it is not clear what the change of state of the referent could be, but they are not so for the new picture.

Another shortcoming of the old picture is the non-disjointness of its categories. An especially clear case is what Searle calls Expressives, speech acts characterizable in English by verbs like *thank, congratulate, apologize, condole, deplore, and welcome*. The purpose of Expressives is "to express the psychological state specified in the sincerity condition about a state of affairs specified in the propositional content" (Searle 1975:356). The examples show that this is quite misleading: although the propositional content of *I apologize for stepping on your toe* includes a specification of the state of affairs the relevant attitude is about (that I stepped on your toe), the complete content rather characterizes what the agent is doing in making his utterance. Since the propositional content refers to the whole act it is a proper part of, this is a clear case of a holophoric transparent epistemic telic, i.e. an illocution that aims at activated knowledge of the proposition that the agent apologizes for stepping on the addressee's toe, which is congruent by definition, and which is matching exactly if the apology is performed. Given that apologies are an intralinguistic social institution, they illustrate the reallocation of Searle's Expressives to the rightmost node at the bottom of (3). This concludes the comparison of selected nodes of the two pictures.

I hope to have shown that the skew of the Searlean picture results from his failure to distinguish between basic illocutionary force as expressed by sentence mood and canonical illocutionary force as expressed by the given mood in default situations. Consequently, a deskewed picture can be obtained by assuming rather lean sentence mood meanings that can easily be strengthened in default situations to yield canonical forces, but which also serve to account for other forces in virtue of their compatibility with different, non-default situations.

## References

- Austin, John L. 1950. Truth. *Proc. of the Aristotelian Society*. Supp. vol. xxiv.
- Austin, John L. 1955. *How to Do Things with Words*. Oxford: Clarendon Press.
- Barwise, Jon, and John Etchemendy. 1987. *The Liar: An Essay in Truth and Circularity*. Oxford: Oxford University Press.
- Barwise, Jon, and John Perry. 1983. *Situations and Attitudes*. Cambridge, MA: MIT Press.
- Hengeveld, Kees, et al. 2007. Basic Illocutions in the Native Languages of Brazil. *Advances in Functional Discourse Grammar: Alfa – Revista de Lingüística* 51(2):73-90.
- König, Ekkehard, and Peter Siemund. 2007. Speech Act Distinctions in Grammar. In Timothy Shopen, ed., *Language Typology and Syntactic Description, Volume I: Clause Structure*, 276-324. Cambridge: Cambridge University Press.
- Pak, Miok, Paul Portner, and Raffaella Zanuttini. 2005. What Korean Promissives Tell Us about Jussive Clause Types. *Abstracts for CSSP 2005*.
- Searle, John R. 1975. A Taxonomy of Illocutionary Acts. In Keith Gunderson, ed., *Language, Mind, and Knowledge*, 344-369. Minneapolis: University of Minnesota Press. [Reprinted as: A Classification of Illocutionary Acts, *Language in Society* 5:1-23.]
- Searle, John R. 2001. Modals and Illocutionary Forces: Reply to Zaefferer. *Revue Internationale de Philosophie* 216 Searle – *With His Replies*, 286-290.
- Sobel, David, and David Copp. 2005. Against Direction of Fit Accounts of Belief and Desire. *Analysis* 61(1):44-53.
- Truckenbrodt, Hubert. 2006. On the Semantic Motivation of Syntactic Verb Movement to C in German. *Theoretical Linguistics* 32(3):257-306.
- Zaefferer, Dietmar. 2001. Deconstructing a Classical Classification: A Typological Look at Searle's Concept of Illocution Type. *Revue Internationale de Philosophie* 216 Searle – *With His Replies*, 209-225.
- Zaefferer, Dietmar. 2006. Conceptualizing Sentence Mood: Two Decades Later. In P. Brandt and E. Fuß, eds., *Form, Structure, and Grammar: A Festschrift Presented to Günther Grewendorf on Occasion of His 60th Birthday*, 367-382.
- Zaefferer, Dietmar. 2007. Language as Mind Sharing Device: Mental and Linguistic Concepts in a General Ontology of Everyday Life. In A. Schalley and D. Zaefferer, eds., *Ontolinguistics: How Ontological Status Shapes the Linguistic Coding of Concepts*, 189-222. Berlin: Mouton de Gruyter.

Dietmar Zaefferer  
Ludwig-Maximilians-University, Munich  
Institut für Theoretische Linguistik  
Schellingstr. 7  
D-80799 München

zaefferer@lmu.de

**PARASESSION:  
THEORETICAL APPROACHES TO  
ARGUMENT STRUCTURE**



# Predicting the Productivity of Argument Structure Constructions

JÓHANNA BARÐDAL

*University of Bergen / University of California, Berkeley*

## 0. Introduction

Productivity has been a much-debated concept within morphology and word formation for years, while syntactic productivity has received little attention in the research community. In mainstream syntax the concept of syntactic productivity is focused on speakers' ability to generate and understand sentences never encountered before. This notion of productivity captures what has been labeled 'linguistic competence' within the generative paradigm, but does not address the interesting question of how case and argument structure constructions are extended to new verbs. A usage-based construction grammar that takes argument structure constructions to exist at different levels of schematicity offers an account of that. I argue that productivity is a function of type frequency and coherence (i.e. internal consistency) and that the productivity of argument structure constructions is predictable from their type frequency and semantic coherence, and an inverse correlation between the two. Such a view offers a unified account of the complexity of the productivity concept, including the relation between the different subconcepts of productivity, i.e. those of regularity, generality, and extensibility. Also, facts of different degrees of productivity as well as analogy fall out directly from this approach.

## 1. The Concepts of Productivity

In my work on the productivity of argument structure constructions, I have found that the concept of productivity is a highly complex and multi-faceted one (Barðdal 2000:23-5, 2008). Not only are the terms *productive* and *productivity* used in many different senses in the linguistic literature, but there are at least three different subconcepts of the productivity concept around (cf. Barðdal 2008:Ch. 2). Consider the following statements, all from Bybee (1995):

In this section and the next, I will argue that default status or productivity is not necessarily associated with source-oriented rules. (Bybee 1995:444)

Clahsen and Rothweiler present considerable evidence that the productive or regular affix for past-participles in German is the *-t* affix ... Thus they claim that the determinant of productivity or regularity is not type frequency. (Bybee 1995:435)

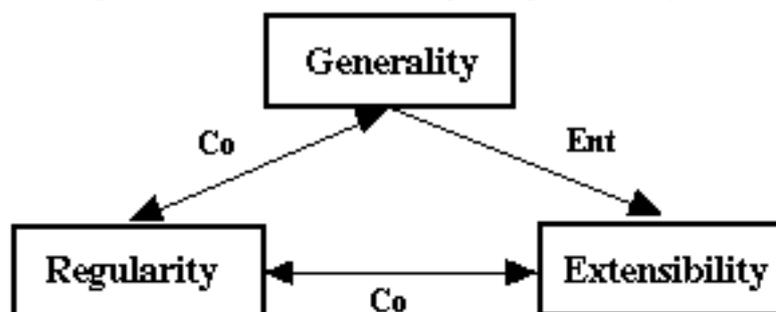
... certain classes of verbs within the irregulars show some degree of productivity – that is, the ability to be extended to new items. (Bybee 1995:426)

The first quote above illustrates that productivity has been equated with default status in the literature, but default status is generally considered a consequence of how open or general a pattern is. In the second quote, *regular* is used synonymously with *productive*. In the third quote, productivity is defined as the ability of a pattern to be extended to new items. The use of the terms *productive* and *productivity* in the three quotes above are by no means unique in the literature. I have found these terms used in at least nineteen different senses in the linguistic literature alone (Barðdal 2008:Ch. 2), and all nineteen can be related in one way or another to the concepts of generality, regularity, and extensibility. This suggests that the productivity concept consists of at least three different subconcepts, namely the following:

1. Productivity as GENERALITY
2. Productivity as REGULARITY
3. Productivity as EXTENSIBILITY

The reason that these three concepts have become associated with productivity is presumably that they all co-occur in the largest and most productive categories discussed in the literature. Consider, for instance, regular past-tense formation in English, materialized with the dental suffix *-ed*. Approximately 96% of all English verbs form past tense with this suffix (Ragnarsdóttir, Simonsen, and Plunkett 1999). This past-tense formation is also the one extended most to both new and nonce verbs, and the one that has attracted most verbs from other patterns in the history of English. This pattern is totally regular, with the suffix *-ed* attached to the stem. There are, moreover, no semantic, morphological, or phonological constraints on which verbs can form past tense in this way. Hence, this is a completely general pattern. Therefore, in the category of regular verbs in English all three subconcepts of productivity – REGULARITY, GENERALITY, and EXTENSIBILITY – are combined.

Figure 1. The three subconcepts of productivity



The relation between the subconcepts can be modeled as in Figure 1 above. The most regular patterns in a language are usually also the most general patterns. Hence, these two properties are often concomitant with each other, represented with *Co* in Figure 1 for ‘concomitance relation’. The most regular pattern is also the one that is most extended to either new or existing items in a language, exactly as the most extensible pattern is usually the most regular pattern. REGULARITY and EXTENSIBILITY are therefore concomitant with each other, even though they are not logically dependent on each other. The most general pattern is usually also the most extensible pattern, whereas extensible patterns need not be the most general ones. This is indicated with *Ent* for ‘entailment relation’ in Figure 1. In other words, GENERALITY entails EXTENSIBILITY, whereas EXTENSIBILITY does not presuppose GENERALITY, as restricted patterns can also be extended to new or existing items, although they are extended much less than non-restricted patterns. In the next section, I will show that the REGULARITY and the GENERALITY subconcepts can be treated as derivatives of the EXTENSIBILITY concept of productivity.

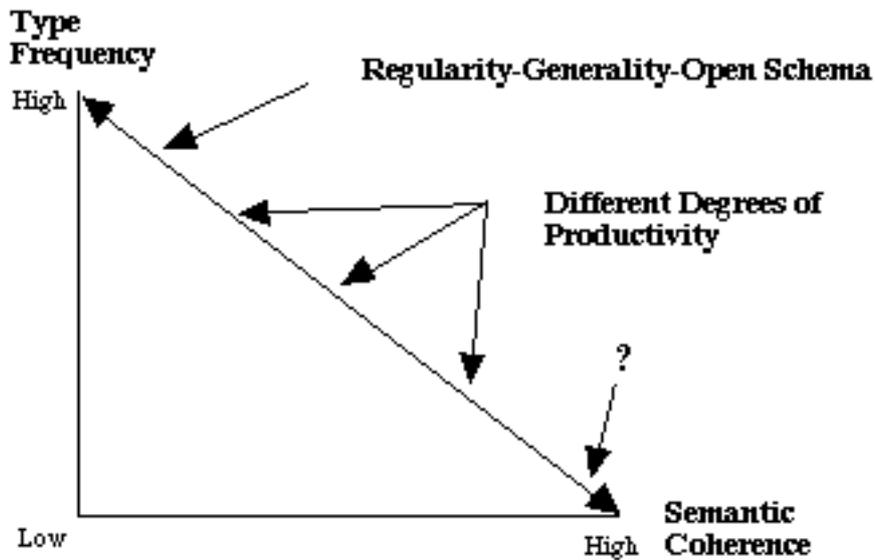
## **2. Predicting Productivity**

Following Bybee (1995) and Clausner and Croft (1997), I assume that productivity is a function of type frequency and coherence, i.e. internal consistency, and that there is an inverse correlation between the two. For a category that is high in type frequency, this means that only a low degree of internal consistency across its items is needed for the category to be extended. Categories of intermediate type frequency have to be more coherent than high type-frequency categories in order to be extended to new items. Finally, categories that are low in type frequency must show the highest degree of internal consistency across their items in order to be extended to new types. This can be represented graphically as in Figure 2 below, where the vertical axis stands for type frequency and the horizontal one for coherence, in this case semantic coherence, as argument structure constructions are regarded as semantically defined (form-meaning correspondences) in a usage-based construction grammar (Goldberg 1995; Barðdal 2001a, 2001c, 2004, 2006; Barðdal and Molnar 2003; Croft 2001, 2003). Observe that high type-frequency patterns are located at the upper leftmost end of the productivity cline in Figure 2, as the patterns highest in type frequency also show the lowest degree of coherence, exactly because of their high type frequency. Patterns lower in type frequency will be located lower on the vertical axis, and the higher the degree of coherence found across their instantiating items, the closer they are to the productivity cline going from the upper leftmost corner to the lower rightmost corner in Figure 2.

What, then, about the lower rightmost end of the productivity cline in Figure 2? How does productivity manifest itself there? Obviously, the lowest possible type frequency is only *one*, and the highest possible degree of semantic coherence is *full synonymy*. In other words, only one item will be needed as a model for the extensibility of a pattern to a new lexical item, if the degree of semantic coherence

is high enough. Such a process is usually labeled ‘analogy’ in the linguistic literature and considered as fundamentally different from productivity (cf. Bauer 2001:93). On the present approach, however, full productivity and analogy are two sides of the same coin, not different in ontological status but in degree. I return to this issue in section 3 below.

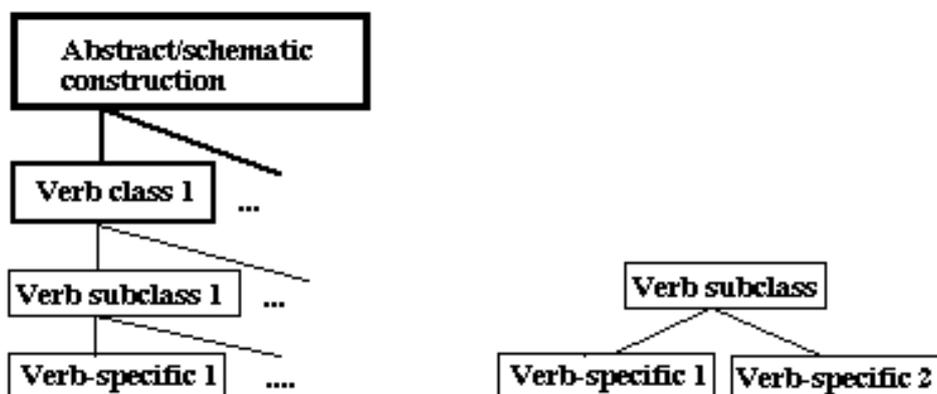
**Figure 2.** The inverse correlation between type frequency and coherence



Observe that at the top of the productivity cline where we find the most extensible categories, we also find the most general and the most regular categories in languages. Hence, not only does the present model of productivity based on the EXTENSIBILITY concept provide us with the cline from full productivity via different degrees of productivity to analogical extension, the subconcepts of REGULARITY and GENERALITY can also be derived from it.

I assume, moreover, that constructions exist at different levels of schematicity in the schematicity-lexicality continuum (Croft 2003; Barðdal 2000, 2001a, 2004, 2006). The lowest level consists of concrete, lexically filled instantiations of the construction; the next level above that contains verb subclass-specific constructions; the next level contains verb class-specific constructions; and the level above contains event-type constructions, etc. Hence, every level above the lowest, most concrete level is an abstraction across the items of the level below. The lowest level contains the most lexical and semantic information, whereas the highest, most schematic level contains the least lexical and semantic information. This is the most abstract level, hence the term ‘schematic’. This organization of argument structure constructions is given in Figure 3 below for two argument structure constructions differing in type frequency and hence in the number of intermediate levels, as well as in their highest level’s degree of schematicity.

Figure 3. Different levels of schematicity and, thus, productivity



Observe that on this bottom-up approach, the highest level of schematicity is derived from the lower levels. That is, as every level is an abstraction of its subordinate level, each construction's highest level is dependent on the number of intermediate levels. These in turn are highly dependent on the type frequency of each construction. To give an example, compare the type frequency of the ditransitive construction in English with that of the transitive construction. Goldberg (1995: 129) lists 69 ditransitive verbs divided across nine semantic verb classes. This means that there are at least 69 verb-specific constructions of the ditransitive construction in English and at least nine verb subclass-specific constructions. Some of the nine verb classes belong more closely together semantically than others. For instance, verbs of giving, ballistic motion, and bringing all entail that the agent successfully causes the recipient to receive the moved object. Verbs of creation and obtaining both entail intended transfer (Goldberg 1995:37-9). This means that the verb class-specific constructions are only six, as some of the verb subclass-specific constructions are subsumed under the more abstract verb class-specific constructions. All the six verb class-specific constructions are based on the notion of transfer; hence, the ditransitive construction's highest and most schematic level only contains information about the event type 'transfer'.<sup>1</sup>

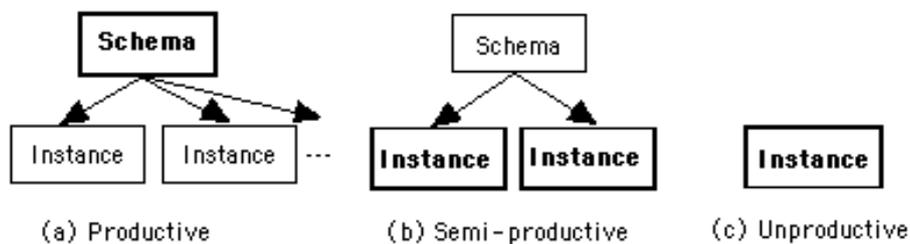
Compare now the ditransitive construction with the ordinary transitive. Although I am not aware of any counts of the type frequency of the transitive construction in English, I have carried out a count of the type frequency of the transitive construction in Icelandic. A simple count based on a bilingual Icelandic-English dictionary yields 2,119 verbs (see Table 1 below). This is probably the lowest possible estimate of the type frequency of the transitive construction in Icelandic, and there is no reason to assume that there are any fewer transitive verbs in English. A type frequency of approximately 2,100 yields around 2,100

<sup>1</sup> See, however, Barðdal (2007) for a comparative analysis of the ditransitive construction in Germanic, where it is argued that the semantic scope of the ditransitive stretches far beyond the notion of transfer, not only in Icelandic, Mainland Scandinavian, and German, but also in English.

verb-specific constructions at the bottom of the schematicity-lexicality continuum; hence, the verb subclass-specific constructions are bound to be considerably more than nine for the transitive. This also means that there are many more intermediate levels of schematicity found for the transitive than the ditransitive, and the event-type level will denote many more event types than only transfer. Thus, the transitive construction's highest level of schematicity is bound to be considerably higher and more schematic than the highest level of the ditransitive. The proportion between the transitive and the ditransitive may thus correspond approximately to the proportions between the two hypothetical constructions in Figure 3. As a consequence, the transitive construction should be much more productive than the ditransitive, as the former exists at a much higher level in the schematicity-lexicality continuum. In other words, the productivity of each construction is a derivative of the construction's highest level of schematicity.

Clausner and Croft (1997) take productivity to be predictable not from a construction's highest level of schematicity, but from its most entrenched level. They suggest a representation of gradient productivity as in Figure 4 below:

**Figure 4.** Gradient productivity on Clausner and Croft's (1997:271) approach

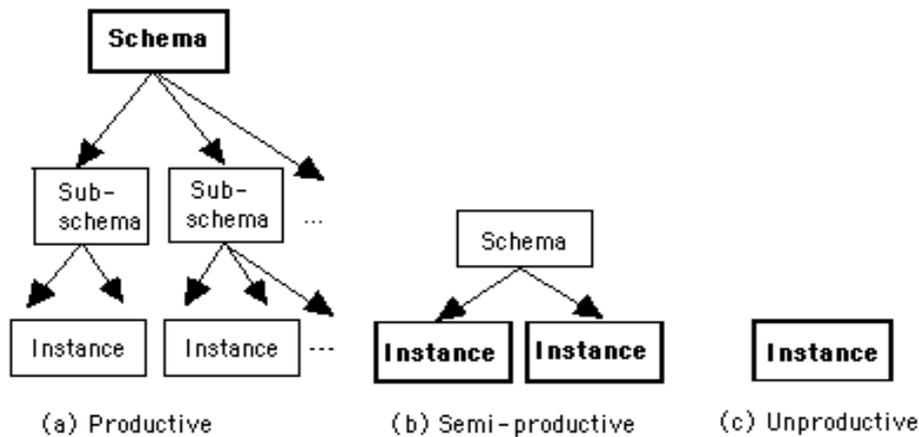


To give an example, consider English past-tense formation again. The regular past-tense formation with the dental suffix *-ed* is definitely the highest one in type frequency, which in practice means a highly entrenched schema and full productivity (4a). The irregular past-tense formation with vowel change in the stem is very low in type frequency, although the instances are very high in token frequency (4b). This means that it is not the schema that is entrenched but the instances, resulting in low productivity. Finally, suppletive forms, like *go-went*, are completely idiosyncratic; thus, they do not form a schema and are as such unproductive (4c). Hence, it is the most entrenched level of schematicity that is the best predictor of productivity; if it is the schema the pattern will be productive, whereas if it is the instances the pattern will be unproductive.

While I agree with Clausner and Croft, and Bybee, in principle, I disagree with them on which factor is predictive of productivity. They argue that it is each construction's most entrenched level, while I claim that it is each construction's highest level of schematicity. On their view, the irregular past-tense formation in English is only semi-productive because the instances are so high in token frequency, which in turn means that it is the lowest verb-specific level that is en-

trenched and not the higher schematic level. In contrast, I argue that the irregular past-tense formation is low in productivity because its highest level of schematicity is much lower than that of the regular past-tense formation. Hence, I believe that the gradience of productivity is better represented as in Figure 5.

**Figure 5.** Gradient productivity on the present approach



This figure better captures the fact that the differences in type frequency found for highly productive vs. semi-productive patterns also entail the existence of intermediate schematic levels for the more productive pattern, which again results in a higher level of schematicity for highly productive constructions, but a lower level of schematicity for semi-productive constructions. Hence, the difference between highly productive and semi-productive patterns is not necessarily a difference in the entrenchment of a super-ordinate level, but rather a difference in both the type frequency of the two constructions and in the levels of schematicity at which they exist. This last fact, that a schema's type frequency and its degree of schematicity are to a large extent concomitant with each other, at least for high type-frequency constructions, is not adequately represented in Figure 4.

I now turn to the productivity of case and argument structure constructions in Icelandic.

### **3. Productivity of Argument Structure Constructions**

In order to study the productivity of argument structure constructions, I have collected verbs from the area of information technology borrowed into Icelandic. I mostly confine my material to the borrowings I found at the discussion forum for Icelandic Mac users. Only transitive argument structure constructions are included, but as is well known, Icelandic has several case-marking patterns for two-place predicates, including Nom-Acc, Nom-Dat, and Nom-Gen (cf. Barðdal 2001b:51-6). These borrowings are listed in (1) and (2) below (spelling original):

- (1) **Nom-Acc:** *archive-a* ‘archive’, *battla* ‘battle’, *biddsslappa* ‘bitchslap’, *blasta* ‘blast’, *bojkotta* ‘boycott’, *builda* ‘build’, *bomba* ‘bomb’, *branda* ‘brand’, *browsa* ‘browse’, *bösta* ‘bust’, *compilera* ‘compile’, *copy-a* ‘copy’, *digga* ‘dig’, *döbba* ‘dub’, *editera* ‘edit’, *erasa* ‘erase’, *fila* ‘like’, *fixa* ‘fix’, *flexa* ‘flex’, *formatta* ‘format’, *fótósjoppa* ‘photoshop’, *gúggla* ‘google’, *hakka* ‘hack’, *hössla* ‘hustle’, *kidda* ‘kid’, *krakka* ‘crack’, *logga* ‘log’, *massa* ‘finish with style’, *meisa* ‘spray with tear gas’, *modda* ‘modify’, *mounta* ‘mount’, *muffa* ‘bang’, *mönnsa* ‘munch’, *offa* ‘off’, *óna* ‘own’, *paira* ‘pair’, *partiona* ‘partition’, *patcha* ‘patch’, *peista* ‘paste’, *pinga* ‘ping’, *plögga* ‘plug’, *próðúsera* ‘produce’, *prógrammera* ‘program’, *publisha* ‘publish’, *rfe]nta* ‘rent’, *releasa* ‘release’, *rendera* ‘render’, *resetta* ‘reset’, *resolva* ‘resolve’, *restora* ‘restore’, *rippa* ‘rip’, *rokka* ‘rock’, *skrat-sa* ‘scratch’, *skvassa* ‘squash, break’, *slamma* ‘slam’, *ssh-a* ‘shh’, *stúðera* ‘study’, *supporta* ‘support’, *sörfa* ‘surf’, *synca/synkrónisera* ‘synchronize’, *tagga* ‘tag, write’, *testa* ‘test’, *tóka* ‘smoke hash’, *trimma* ‘trim’, *up-data* ‘update’, *upgreida* ‘upgrade’, *verifya* ‘verify’ ...
- (2) **Nom-Dat:** *adda* ‘add’, *blasta* ‘blast’, *bomba* ‘bomb’, *bundla* ‘bundle’, *convertera* ‘convert’, *downloada* ‘download’, *deleta* ‘delete’, *de-multiplexa* ‘de-multiplex’, *dumpa* ‘dump’, *droppa* ‘drop’, *ejecta* ‘eject’, *expandera* ‘expand’, *exporta* ‘export’, *farta* ‘fart’, *innstalla/innstallera* ‘install’, *krassa* ‘crash’, *msna* ‘MSN’, *mökka* ‘contaminate’, *neimdroppa* ‘namedrop’, *offa* ‘off’, *parkera* ‘park’, *peista* ‘paste’, *poppa* ‘deliver when popping by’, *pósta* ‘post’, *publisha* ‘publish’, *releasa* ‘release’, *resolva* ‘resolve’, *restarta* ‘restart’, *rippa* ‘steal’, *sjera* ‘share’, *slamma* ‘slam’, *starta* ‘start’, *statta* ‘stat, duplicate’, *streyma* ‘stream’, *tilta* ‘tilt’, *umba* ‘be agent for’, *unzippa* ‘unzip’, *uploada* ‘upload’, *untara* ‘unzip’ ...

It is worth pointing out that the verbs assigned the Nom-Dat construction are not verbs whose object is necessarily human, as is the case with many dative-marked arguments in the world’s languages. In fact, only two of the borrowed Nom-Dat verbs select for a human argument, namely *msna* ‘communicate with somebody through MSN’ and *neimdroppa* ‘namedrop’:

- (3) Leiddinlegt að msna fólki sem situr við hliðina á mér.  
boring to MSN people.DAT who sit with side on me  
‘It is so uninteresting to MSN people who sit beside me.’
- (4) Þú sýnir ekki einu sinni sóma þinn í að neimdroppa mér.  
you show not one time honor your in to namedrop me.DAT  
‘You don’t even have the decency to namedrop me.’

The remaining Nom-Dat verbs select for ordinary non-human objects. Also, since most of these verbs are borrowed from English, which does not have a morphological dative, these verbs have not been borrowed together with their source language’s verb-specific argument structure constructions, which would otherwise be a possibility (cf. Barðdal 2001b:132-3). Prior research on 15<sup>th</sup>-century Icelandic has shown the same tendency for borrowed verbs, namely that the dative object is

### *Predicting the Productivity of Argument Structure*

not necessarily human (Barðdal 1999). Hence, dative case-marking of ordinary non-human objects is certainly not new in Icelandic.

Of the 107 borrowed verbs listed in (1)-(2) above, Icelandic speakers assign the Nom-Acc construction to 68 verbs and the Nom-Dat construction to 39. The proportion between the Nom-Acc and Nom-Dat is thus less than 2:1, which is certainly unexpected given that the dative is not reserved for human arguments. A question arises as to what the proportion between the type frequencies of Nom-Acc and Nom-Dat constructions is otherwise in Icelandic. I have elsewhere (Barðdal 2008:Ch. 3) carried out two counts of the transitive construction in Icelandic. One is based on the lexical entries in a recent bilingual Icelandic-English dictionary (Hólmarsson, Sanders, and Tucker 1989), and the other is based on a corpus of 40,000 running words from six different genres of Modern Icelandic texts (cf. Barðdal 2001b). The results are presented in Table 1 below:

**Table 1.** Nom-Acc and Nom-Dat in various counts of Icelandic

|         | Dictionary Count |        | Corpus Count |        | Borrowed Verbs |        |
|---------|------------------|--------|--------------|--------|----------------|--------|
|         | N                | f      | N            | f      | N              | f      |
| Nom-Acc | 1,381            | 65.2%  | 303          | 61.7%  | 68             | 63.6%  |
| Nom-Dat | 738              | 34.8%  | 188          | 38.3%  | 39             | 36.4%  |
| Total   | 2,119            | 100.0% | 491          | 100.0% | 107            | 100.0% |

Observe that the figures for the borrowed verbs are in conformity with both the absolute figures from the dictionary count and the relative figures from the corpus count. Nom-Acc verbs are around 62-65%, and Nom-Dat verbs around 35-38%. The type frequency of both the Nom-Acc and the Nom-Dat construction is thus reflected in the type frequency of borrowed verbs. In other words, the productivity of the two constructions matches their type frequency in Modern Icelandic.

An analysis of the semantic range of the transitive construction in Icelandic only based on the 303 Nom-Acc and 188 Nom-Dat predicates occurring in the corpus of Modern Icelandic texts reveals that Nom-Acc verbs divide across 46 semantic verb classes and the Nom-Dat across 33 verb classes. Due to space limitations I cannot lay out the semantic structure of these constructions in a graphically coherent way here, but I refer the reader to Barðdal (2008:Ch. 3). At the highest schematic level, i.e. the event-type level, the Nom-Acc construction consists of at least six basic humanly relevant notions, i.e. MAKING, MOVEMENT, AFFECTEDNESS, COGNITION/EMOTION, CHANGE, and LOCATION. Each of these in turn consumes between two and twelve verb class-specific constructions, and one of the verb class-specific constructions under COGNITION/EMOTION can be divided into several verb subclass-specific constructions. In contrast, the Nom-Dat construction only subsumes three event-type constructions, i.e. CHANGE, COGNITION/EMOTION, and SUPERIORITY. There are also several Nom-Dat verb class-specific constructions which do not fall under any of these labels, nor do they make up an event type of their own. The Nom-Dat construction thus does not exist at as high a schematic level as the Nom-Acc construction.

Notice that some of the general event-type categories are shared across the Nom-Acc and the Nom-Dat, e.g. COGNITION/EMOTION and CHANGE, which are found for both the Nom-Acc and the Nom-Dat construction. However, the subclasses are not necessarily the same for both constructions. The Nom-Acc verbs in (1) above belong to the following narrowly circumscribed semantic classes: verbs of attaching, attempting, building, cognition and mental activity, creation and re-shaping, (means of) cutting, (de)limitation, destruction, displaying, producing, dwelling and keeping in place, emotion, feeding and consumption, (means) of gaining, increasing and strengthening, human manipulation, meeting and uniting, non-translational motion, physical affectedness, possession, catching and termination, (means of) traveling, and (interactive) verbal behavior.

The Nom-Dat verbs in (2) above belong to the following narrowly circumscribed semantic classes: verbs of destruction, division, starting and finishing, increase and decrease, losing, (caused) motion, non-translational motion, organizing, stealing, (means of) verbal communication, and changing. As evident from the lists in (1)-(2), some verbs are in fact listed twice, i.e. as taking both Nom-Acc and Nom-Dat. In those cases there is a clear difference in both semantic construal and subconstruction of the relevant argument structure construction. Consider the following two examples of *bomba* ‘bomb’:

- (5) Þá voru Kanarnir að bomba Júgóslava. *Affectedness*  
 then were Americans to bomb Yugoslavians.ACC  
 ‘Then the Americans were bombing the Yugoslavians.’
- (6) Mér tókst að bomba tannkremi í augað á mér. *Caused-Motion*  
 me.DAT managed to bomb toothpaste.DAT into eye on me  
 ‘I managed to bomb toothpaste into my eye.’

In (5) *bomba* denotes affectedness, whereas in (6) it is used in the caused-motion construction, where the moved object is in the dative case (cf. Barðdal 2003).

Finally, consider the following example:

- (7) Vörubíllinn donaði uppi í brekkunni.  
 truck.the dawned up in slope.the  
 ‘The truck ended up/was forgotten on the slope.’

In this example the English verb *dawn* has been borrowed into Icelandic and used as a particle verb *dona uppi* on the basis of the Icelandic particle verb *daga uppi*, which here means ‘end up somewhere/be forgotten’. The predicate *daga uppi* consists of the simple verb *daga* meaning ‘dawn’ and the locative particle *uppi* ‘up’, originally used in reference to night trolls who were caught by daylight. Obviously, if one is a night troll and is caught by daylight, one does not constitute a threat to the environment anymore, and hence one may simply end up somewhere and gradually be forgotten. Observe, moreover, that the predicate *daga uppi* ‘be

caught by daylight, be forgotten' is a lexicalized idiom whose meaning is non-compositional and not derivable from the meaning of the parts. This is an idiosyncratic set phrase; hence, the formation of the predicate *dona uppi* is not based on a pattern, rule, or a super-ordinate schema, but on the already existing *daga uppi* and that alone. In other words, *dona uppi* is formed on the basis of the Icelandic expression *daga uppi*, where we find the lowest possible type frequency, i.e. *one*, and the highest possible degree of semantic coherence, i.e. *full synonymy*. This is therefore a clear-cut example of analogy, located at the bottom of the productivity cline in Figure 2 above.

In this section I have presented examples of three argument structure constructions in Icelandic: the Nom-Acc construction, which is a semantically open, high type-frequency construction; the Nom-Dat construction, which is a semantically more restricted construction of intermediate type frequency; and finally a specific example of a new particle verb with a very specific meaning, based on only one model verb. These three cases represent three points on the productivity cline, i.e. full productivity, intermediate productivity, and low productivity.

#### **4. Conclusions**

The extensibility of argument structure constructions is a function of their type frequency and semantic coherence, and an inverse correlation between the two. The current approach to syntactic productivity focusing on the EXTENSIBILITY concept offers a unified account of productivity since it captures different degrees of productivity ranging from highly productive patterns to various intermediate degrees of productivity to low-level analogical modeling. The REGULARITY and the GENERALITY concepts can also be derived from this analysis.

#### **References**

- Barðdal, Jóhanna. 1999. Case and Argument Structure of Some Loan Verbs in 15th Century Icelandic. In I. Haskå and C. Sandqvist, eds., *Alla tiders språk: En vänskrift till Gertrud Pettersson november 1999*, 9-23. Lund: Institutionen för nordiska språk.
- Barðdal, Jóhanna. 2000. Case Assignment of Nonce Verbs in Icelandic. *SKY Journal of Linguistics* 13:7-28.
- Barðdal, Jóhanna. 2001a. The Perplexity of Dat-Nom Verbs in Icelandic. *Nordic Journal of Linguistics* 24:47-70.
- Barðdal, Jóhanna. 2001b. *Case in Icelandic: A Synchronic, Diachronic and Comparative Approach*. Lund: Department of Scandinavian Languages.
- Barðdal, Jóhanna. 2001c. The Role of Thematic Roles in Constructions? Evidence from the Icelandic Inchoative. In A. Holmer, J.-O. Svantesson, and Å. Viberg, eds., *Proceedings of the 18th Scandinavian Conference of Linguistics 2000*, 127-37. Lund: Department of Linguistics.

- Barðdal, Jóhanna. 2003. Case and Argument Structure of Novel Verbs of Communication in Icelandic. In L.-O. Delsing, C. Falk, G. Josefsson, and H. Á. Sigurðsson, eds., *Grammar in Focus: Festschrift for Christer Platzack 18 November 2003*, Vol. II, 25-35. Lund: Department of Scandinavian Languages.
- Barðdal, Jóhanna. 2004. The Semantics of the Impersonal Construction in Icelandic, German and Faroese: Beyond Thematic Roles. In W. Abraham, ed., *Focus on Germanic Typology*, 105-37. Berlin: Akademie Verlag.
- Barðdal, Jóhanna. 2006. Construction-Specific Properties of Syntactic Subjects in Icelandic and German. *Cognitive Linguistics* 17(1):39-106.
- Barðdal, Jóhanna. 2007. The Lexical and Semantic Range of the Ditransitive Construction in the History of (North) Germanic. *Functions of Language* 14(1):9-30.
- Barðdal, Jóhanna. 2008. *Productivity: Evidence from Case and Argument Structure in Icelandic*. Amsterdam: John Benjamins.
- Barðdal, Jóhanna, and Valéria Molnár. 2003. The Passive in Icelandic – Compared to Mainland Scandinavian. In J. Hetland and V. Molnár, eds., *Structures of Focus and Grammatical Relations*, 231-60. Tübingen: Niemeyer.
- Bauer, Laurie. 2001. *Morphological Productivity*. Cambridge: Cambridge UP.
- Bybee, Joan. 1995. Regular Morphology and the Lexicon. *Language and Cognitive Processes* 10(5):425-55.
- Clausner, Timothy C., and William Croft. 1997. Productivity and Schematicity in Metaphors. *Cognitive Science* 21(3):247-82.
- Croft, William. 2001. *Radical Construction Grammar: Syntactic Theory in Typological Perspective*. Oxford: Oxford University Press.
- Croft, William. 2003. Lexical Rules vs. Constructions: A False Dichotomy. In H. B. Cuyckens, Th. Berg, R. Dirven, and Kl.-U. Panther, eds., *Motivation in Language: Studies in Honour of Günter Radden*, 49-68. Amsterdam: John Benjamins.
- Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.
- Hólmarsson, Sverrir, Christopher Sanders, and John Tucker. 1989. *Íslensk-ensk orðabók: Concise Icelandic-English Dictionary*. Reykjavík: Íðunn.
- Ragnarsdóttir, Hrafnhildur, Hanne Gram Simonsen, and Kim Plunkett. 1999. The Acquisition of Past Tense Morphology in Icelandic and Norwegian Children: An Experimental Study. *Journal of Child Language* 26:577-618.

Jóhanna Barðdal  
Department of Linguistic, Literary and Aesthetic Studies  
University of Bergen  
P.O. Box 7805  
N-5020 Bergen, Norway

johanna.barddal@uib.no

## Constrained Flexibility in the Extension of Novel Causative Verbs

ANN BUNGER and JEFFREY LIDZ

*Northwestern University and University of Maryland*

### 0. Introduction

Whenever we learn a novel word, whatever its grammatical category, what we are learning is a label for a whole category of things in the world. The word *dog*, for example, refers not to an individual dog, but to the whole set of dog-like things in the world. Likewise, the word *jump* refers not to a single instance of jumping, but to an entire category of jumping events. A large literature has grown up around the kinds of categories that children assign to novel nouns, asking, for example, whether a novel count noun refers to a particular individual, to a basic level category, or to a superordinate category (e.g. Markman 1993, Waxman 1990). The corresponding questions have not been asked, however, about novel verbs, i.e. what categories of events a novel verb can be extended to include.

It is well established that there are systematic regularities in the mapping between verb meaning and verb syntax, such that verbs that refer to similar event types, i.e. verbs that have similar meanings, can occur in similar sentence structures (e.g. Carter 1976, Gruber 1965, Jackendoff 1990, Levin 1993). We know, for example, that only verbs that label a change of state can occur in the so-called causative-inchoative alternation, illustrated by the sentences in (1). Note that the verb *bounce* can be used both in a transitive frame (1a) and in an unaccusative intransitive frame (1b), but that *hit* cannot (2). The discrepancy between these two patterns of use is due to the fact that only *bounce* labels some change of state undergone by the ball; on the contrary, in (2a) it's Sammy that does the hitting, not the ball.

- (1) a. Michael Jordon bounced the ball.  
b. The ball bounced.
- (2) a. Sammy Sosa hit the ball.  
b. \*The ball hit.

Theorists and researchers in a range of disciplines have suggested that very early event representations may encode features that map directly onto linguistic



that aren't constituents (e.g. Rappaport Hovav and Levin 1998). So, for example, single verbs can label any of these individual subevents of the causative, or they can label the entire event, but languages don't have verbs that encode, for example, something like a means subevent and a result subevent that aren't causally related.

The broad goal of the research described here was to examine the constraints that guide language learners in their acquisition of novel verbs. To address this issue, we sought to gain a more precise idea of the different ways that two-year-olds are willing to use single verbs to encode the subparts of a causative event by investigating two more specific questions. First, we wanted to find out how children of this age are willing to package information about causative events into verbs, i.e. whether they would be willing to accept any combinations of the subparts of a complex causative as the meaning of a single verb, or whether they, like adults, would be constrained by something like the constituency constraint.

Second, we wanted to find out how flexible the world-to-word mapping is for verbs labeling causative events, i.e. how specific children are about the event features they're encoding when they're acquiring a novel verb. So, for example, when they see a girl dribbling a ball and hear it described with a novel verb like *pimming*, we want to know whether *pimming* has to mean something very specific like 'cause to bounce by hitting', or whether the semantic identity of the means and result subevents might be underspecified, with alternate meanings like 'cause to bounce by performing some unspecified action' or even 'cause to move in some unspecified way by performing some unspecified action'.

To investigate these questions, we designed two experiments using the preferential looking paradigm (e.g. Golinkoff et al. 1987, Spelke 1979). Experiment 1 explores children's flexibility in encoding the semantic content of the means subpart of a causative, and Experiment 2 explores their flexibility in encoding the semantic content of the result subpart.

## **1. Experiment 1: Means Subevent**

### **1.1. Design**

The participants in Experiment 1 consisted of 24 two-year-olds (six boys and six girls in each experimental condition) ranging in age from 22;7 (months;days) to 26;1 (mean 23;29). All were being raised in English-speaking homes.

The stimuli consisted of short live-action videos depicting human actors interacting with inanimate objects. Each trial consisted of two phases: familiarization and test. During the familiarization phase, participants saw a video of some causative event in which an actor caused a change of state in an inanimate object, e.g. a girl making a ball bounce by hitting it repeatedly with a tennis racquet. Each showing of the event was accompanied by a digitally synchronized auditory event description that included a novel verb. This event-description pairing was shown four times (for six seconds each time) and on both sides of a large projection screen: first once on each of the left and right sides of the screen, and then twice on both sides simultaneously.

There were two experimental conditions differing between subjects, which were distinguished by the syntactic frame in which the novel word was presented during familiarization. Participants in the unaccusative condition heard the novel verb used in an unaccusative intransitive sentence like *The ball is pimming*, and participants in the transitive condition heard the novel verb used in a transitive sentence like *The girl is pimming the ball*.

Between the third and fourth presentations of the causative event, participants saw a six-second contrast event in which the actor was engaged in a noncausative activity involving the inanimate object. In the case of the causative event involving the girl and the ball, for example, the contrast event consisted of the girl holding the ball in her hands and moving it back and forth in an arc across the screen. The contrast event was accompanied by an auditory event description that also incorporated the novel verb, but that made it clear that the event encoded by the novel verb was not happening.

Each participant saw four different familiarization sequences, each with a different causative event described using a different novel verb. A complete list of the causative events and their accompanying contrast events is given in (5). Novel verbs were repeated twice during each familiarization sequence, for a total of ten presentations each.

(5) Familiarization and contrast events

| Novel verb   | Causative event                                             | Contrast event                  |
|--------------|-------------------------------------------------------------|---------------------------------|
| <i>grek</i>  | girl turns crank attached to light; light bulb turns on     | girl puts light on her head     |
| <i>blick</i> | boy pumps bike pump attached to garden flower; flower spins | boy waves flower back and forth |
| <i>pim</i>   | girl hits ball with tennis racquet; ball bounces            | girl swings ball back and forth |
| <i>lorp</i>  | boy hits ring tower with stick; tower rocks back and forth  | boy turns tower over and over   |

In the test phase of each trial, participants were shown two new events, presented simultaneously on opposite sides of the screen, and the auditory stimulus directed them to find the action labeled by the novel verb presented during familiarization. Both of the test events involved the person and objects presented during familiarization, but they differed in which of the subparts of the familiarized causative event were repeated. One of the test events was a causative

*Flexible Extension of Novel Causative Verbs*

event that differed from the familiarization event in the means of causation (New Means test event) and the other was an event in which no causation occurred, but both the means and the result presented during familiarization were repeated (No Cause test event). In both test events, then, the result subevent was the same as that presented during familiarization, but in the New Means test event, the means by which that result was brought about was changed and in the No Cause test event, the means and the result subevents were both repeated, but they were no longer causally related. A schematic depiction of a representative trial, including specific examples of test events, is given in (6).

(6) Representative trial: Experiment 1, unaccusative condition

| Phase           | Left side of screen                                               | Right side of screen                                                      | Audio track                                                                              |
|-----------------|-------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Familiarization | girl bounces ball by hitting it with a racquet                    | black screen                                                              | Look! The ball is pimming. Do you see the ball pimming?                                  |
|                 | black screen                                                      | girl bounces ball by hitting it with a racquet                            | Wow! The ball is pimming. Do you see the ball pimming?                                   |
|                 | girl bounces ball by hitting it with a racquet                    | girl bounces ball by hitting it with a racquet                            | Yay! The ball is pimming. Do you see the ball pimming?                                   |
| Contrast        | (centered)<br>girl waves ball from side to side                   |                                                                           | Oh no! Now the ball is not pimming. The ball is not pimming.                             |
| Familiarization | girl bounces ball by hitting it with a racquet                    | girl bounces ball by hitting it with a racquet                            | Yay! Now the ball is pimming. Do you see the ball pimming?                               |
| Test            | <u>New Means</u><br>girl bounces ball by hitting it with her hand | <u>No Cause</u><br>girl waves racquet but does not hit ball; ball bounces | Oh look, they're different. Do you see pimming? Do you see pimming? Where's pimming now? |

Stimulus videos were presented on a projection screen suspended from the ceiling of a dark room. Participants were tested individually, seated approximately six feet from the screen, and were free during the experiment to sample the contents of the entire screen. Attention to the stimuli was recorded using a digital video camera situated just below the screen, and these recordings were coded for direction of the participant's visual fixation during the test phase. An ANOVA was performed to test for differences in mean visual fixation to the New Means and No Cause test events across experimental conditions.

## **1.2. Results and Discussion**

In essence, the goal of this experiment is to find out whether two-year-old children would be more willing to extend the meaning of the novel verb presented during familiarization to refer to an event that is of the same event type as the familiarization event (i.e. a causative event), but that differs in the semantic content of the means subevent, or to an event that is of a completely different event type than the familiarization event (i.e. not a causative event), but that matches the familiarization event in perceptually salient ways. The relevant question to ask when examining these data, then, is which of the test events participants were willing to accept as an extension of the meaning of the novel verb presented during familiarization. Previous studies using the preferential looking paradigm have shown that children tend to look longer at a scene that matches the speech stimulus. In this experiment, then, we expect participants to look longer at the test event that they were willing to label with the novel verb presented during familiarization.

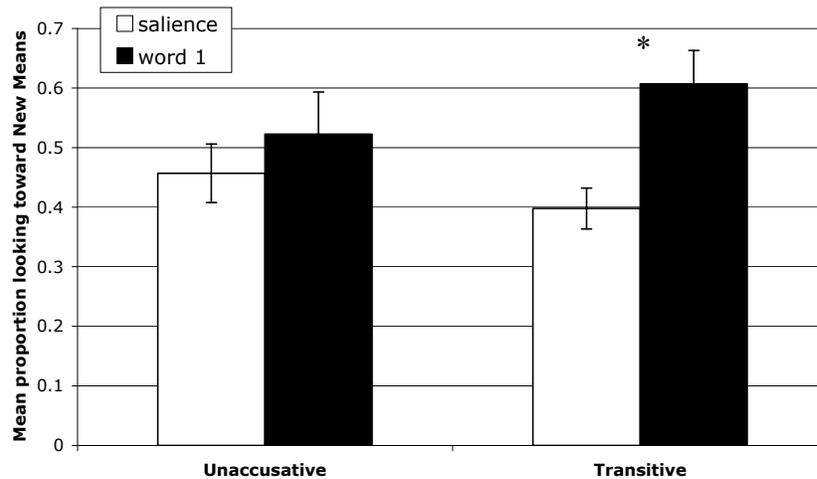
Previous work in syntactic bootstrapping has demonstrated, furthermore, that the meaning that two-year-old children assign to a novel verb is heavily influenced by the syntactic frame in which that novel verb is presented. Given this effect, we expect to find differences in patterns of looking across conditions that reflect the mapping between verb meaning and verb syntax.

The figure in (7) depicts the mean proportion of looks by participants in each condition toward the causative New Means test event. Data are presented from a two-second salience period at the beginning of the test phase and from a two-second window around the first mention of the novel verb in the test audio. During the salience period, participants have not yet heard the novel verb repeated, and so looking patterns during this time just reflect baseline preferences for the two test events. Looking patterns around the first mention of the novel verb, on the other hand, should reflect the interpretation that participants have assigned to it.

## Flexible Extension of Novel Causative Verbs

### (7) Mean visual fixation at test: Experiment 1

\*In the transitive condition, attention to test events was significantly different during salience vs. at the first mention of the novel word in the test audio.



When asked to find the test event that could be labeled by the novel verb presented during familiarization, participants in the unaccusative condition showed no significant preference for either test event ( $p=0.45$ ). This result is not surprising if we consider that in English, the verb in an unaccusative intransitive frame invariably labels the result of a causative event: compare the novel verb *pimming* (8a) to the verbs in (8b), each of which we understand as a description of some change of state being undergone by the ball.

- (8) a. The ball is pimming.  
b. The ball is bouncing/spinning/rolling.

In this experiment, the result subevent presented during familiarization was present in both of the test events, and so both of the test events should have provided an adequate match for the novel unaccusative verb. We can take the lack of preference in this condition, then, as a sign that these participants interpreted the novel verb presented in an unaccusative intransitive frame as a label for just the result of a causative event.

Participants in the transitive condition, on the other hand, showed a significant increase in their preference for the causative New Means test event when asked to find the referent of the novel verb ( $p=0.004$ ). Note that unlike the unaccusative frame, a transitive frame does not provide an unambiguous cue for the meaning of a novel verb (9a): the verb in a transitive frame can label either just the means subevent of a causative, like *hit* (9b), or it can label an entire causative event, like *dribble* (9c).

- (9) a. The girl is pimming the ball.  
b. The girl is hitting the ball.  
c. The girl is dribbling the ball.

The preference that participants in this experiment show for the New Means test event, then, can be taken as further evidence that children of this age are biased to interpret verbs in a transitive frame as causatives (Lidz et al. 2003). Note, however, that participants chose to extend the meaning of the novel verb to include causative test events that differed from the familiarization events in the means by which that causation was brought about. This suggests that children of this age permit some flexibility in the semantic content they assign to the means subevent of a causative representation.

## 2. Experiment 2: Result Subevent

In Experiment 1, we observed that two-year-olds grouped two of the subparts of a causative representation together, i.e. the cause and result subparts, when extending the meaning of a novel transitive verb, and that they allowed for flexibility in the identity of the means subevent. What we didn't know was whether this was the only possibility for grouping the subparts, or whether if they were given the opportunity, children of this age would also be willing to group the means and cause subparts together without identifying a specific result. If so, this might suggest that what they've learned about these verbs is that they label causative events of some type, with no commitment to the identity of the means or the result subevents. The goal of our second experiment was to explore this possibility by investigating two-year-olds' flexibility in encoding the semantic content of the result subpart of a complex causative.

### 2.1. Design

A total of 24 two-year-olds (six boys and six girls in each experimental condition) ranging in age from 22;12 to 25;25 (mean 23;28) participated in Experiment 2. All were being raised in English-speaking homes, and none had participated in Experiment 1.

This experiment also employed the preferential looking paradigm. Participants were presented with exactly the same causative familiarization events accompanied by novel verbs that were used in Experiment 1, and at test they were asked to determine which of two new events could also be labeled by the novel verb. Experiment 2 differed from Experiment 1 in two ways: first, in the syntactic frames used to present novel verbs during familiarization, and second, in the combinations of subparts of the familiarized causative event that were repeated in the test events.

In this experiment, participants were assigned either to an unergative condition in which they heard the novel verb used in an unergative intransitive sentence like *The girl is pimming* or to a transitive condition in which they heard the novel verb used in a transitive sentence like *The girl is pimming the ball*.

*Flexible Extension of Novel Causative Verbs*

Recall that in Experiment 1, both test events included the same result subevent presented in the familiarized causative, but they varied in whether that change of state was caused or not. In Experiment 2, both test events include the familiarized means activity, but they vary in whether that activity is still a means of causation. Participants were given the option of extending the novel verb to refer either to a causative event that differed from the familiarization event only in the change of state undergone by the object (New Result test event) or to the same No Cause test events that were presented in Experiment 1. Specific examples of the test events that would follow the causative *pimming* event detailed in (6) are presented in (10).

(10) Test events: Experiment 2

| Phase | Left side of screen                                                    | Right side of screen                                                      | Audio track                                                                              |
|-------|------------------------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Test  | <u>New Result</u><br>girl deflates ball by hitting it with the racquet | <u>No Cause</u><br>girl waves racquet but does not hit ball; ball bounces | Oh look, they're different. Do you see pimming? Do you see pimming? Where's pimming now? |

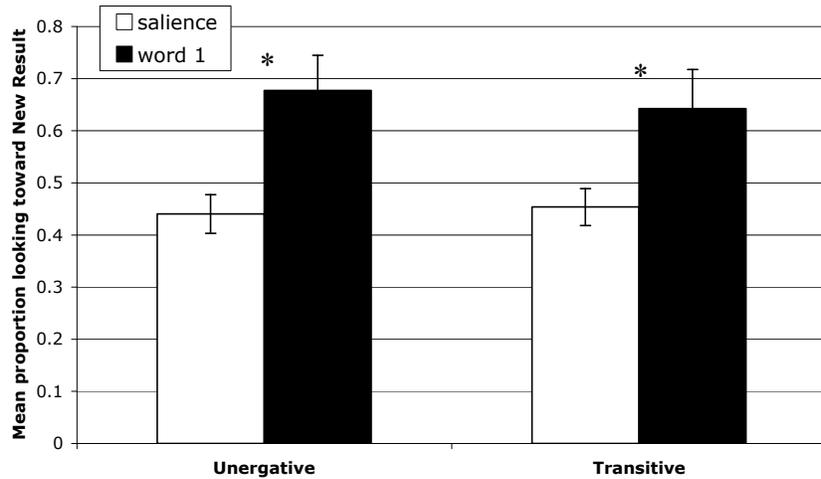
As in Experiment 1, attention to the stimuli was recorded using a digital video camera, and these recordings were coded for direction of the participant's visual fixation during the test phase. An ANOVA was performed to test for differences in mean visual fixation to the New Result and No Cause test events across experimental conditions.

**2.2. Results and Discussion**

Complementary to that of Experiment 1, the goal of Experiment 2 was to find out whether two-year-old children would be more willing to extend the novel verb presented during familiarization to refer to an event that is of the same (causative) event type as the familiarization event, but that differs in the semantic content of the result subevent, or to an event that is of a completely different event type than the familiarization event (i.e. it's not a causative event), but that matches it in easily observable ways. Again, our general prediction is that participants will look longer at the test event that they are willing to label with the novel verb presented during familiarization.

(11) Mean visual fixation at test: Experiment 2

\*In both conditions, attention to test events was significantly different during salience vs. at the first mention of the novel word in the test audio.



The graph in (11) depicts the mean proportion of looks toward the causative New Result test event during a two-second salience period and in the two seconds around the first mention of the novel word in the test audio. The results show that when asked to find the test event that could be labeled by the novel verb presented during familiarization, participants in both the unergative ( $p=0.005$ ) and the transitive ( $p=0.03$ ) conditions showed a significant preference for the causative test event. This suggests that participants in both of these conditions interpreted the novel verb as a label not for a specific subevent, but rather as a label for the entire causative event. Recall, moreover, that these two-year-olds chose to extend the meaning of the novel verb to include causative test events that differ from the familiarization events in the change of state induced by the causative agent. This suggests that children of this age permit some flexibility in the semantic content they assign to the result subevent of a causative representation.

**3. Conclusions**

Taken together, the results of these two experiments give us some initial insight into the categories of events that a novel verb can be extended to include. This study confirms, first, that two-year-olds can use cues from syntax to identify and label the subparts of an internally complex causative event. In Experiment 1, for example, when participants heard the novel verb in an unaccusative frame, they understood it to refer to just the result subevent of the complex causative, but when they heard it in a transitive frame, they understood it to refer to the entire causative event.

Our results suggest, furthermore, that two-year-old children are limited in the way that they can map verb meanings onto structural representations of events,

such that verbs can only encode subparts of the representation that correspond to possible structural representations. Recall that across both experiments we never saw an overall preference for the No Cause test events, in which the means and result subevents were repeated but were not causally related. This demonstrates that these participants were unwilling to extend the novel verb to refer to an event that includes subparts of the familiarization event that are not constituents.

Interestingly, however, we find that as long as that structural constraint is satisfied, two-year-olds can be flexible in the specificity of the semantic content they assign to their representation of the causative. What we've done in these experiments essentially is to ask these two-year-olds to extend a novel verb to refer to an event that conflicts with the familiarized causative in one of two ways. They have the choice of extending the verb to refer either (i) to an event that is still of the same conceptual type as the one presented during familiarization, i.e. one that is still a causative, but that differs in the identity of the means or result subevents, or (ii) to an event that is perceptually similar to the familiarized event, i.e. one that includes the same subevents, but that is of a different event type. What we have found is that they are willing to loosen their commitment to the semantics of an event, i.e. in what they will permit as the means or the result subevent of a causative, but not to the kind of event representation they have assigned to the verb, i.e. they still represent the meaning as causative. This kind of flexibility would be an extremely powerful tool for word learning, allowing children to refine their hypotheses about the meanings of words they are acquiring as they encounter new information about them in the world.

## References

- Bunger, Ann, and Jeffrey Lidz. 2004. Syntactic Bootstrapping and the Internal Structure of Causative Events. *Proceedings of the Annual Boston University Conference on Language Development* 28:74-85.
- Bunger, Ann, and Jeffrey Lidz. 2006. Constrained Flexibility in the Acquisition of Causative Verbs. *Proceedings of the Annual Boston University Conference on Language Development* 30:60-71.
- Carter, Richard. 1976. Some Constraints on Possible Words. *Semantikos* 1:27-66.
- Fisher, Cynthia. 1996. Structural Limits on Verb Mapping: The Role of Analogy in Children's Interpretations of Sentences. *Cognitive Psychology* 31:41-81.
- Gleitman, Lila. 1990. The Structural Sources of Verb Meanings. *Language Acquisition* 1:3-55.
- Golinkoff, Roberta M., Kathryn Hirsh-Pasek, Kathleen M. Cauley, and Laura Gordon. 1987. The Eyes Have It: Lexical and Syntactic Comprehension in a New Paradigm. *Journal of Child Language* 14:23-45.
- Gordon, Peter. 2004. The Origin of Argument Structure in Infant Event Representations. *Proceedings of the Annual Boston University Conference on Language Development* 28:189-198.

Ann Bunger and Jeffrey Lidz

- Gruber, Jeffrey. 1965. *Studies in Lexical Relations*. Ph.D. dissertation, MIT.
- Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: MIT Press.
- Landau, Barbara, and Lila R. Gleitman. 1985. *Language and Experience: Evidence from the Blind Child*. Cambridge, MA: Harvard UP.
- Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago.
- Lidz, Jeffrey, Henry Gleitman, and Lila Gleitman. 2003. Understanding How Input Matters: Verb-Learning and the Footprint of Universal Grammar. *Cognition* 87:151-178.
- Mandler, Jean M. 1992. How to Build a Baby: II. Conceptual Primitives. *Psychological Review* 99:587-604.
- Markman, Ellen M. 1993. Constraints Children Place on Word Meanings. In P. Bloom, ed., *Language Acquisition: Core Readings*, 154-173. Cambridge, MA: MIT Press.
- Naigles, Letitia. 1990. Children Use Syntax to Learn Verb Meanings. *Journal of Child Language* 17:357-374.
- Rappaport Hovav, Malka, and Beth Levin. 1998. Building Verb Meanings. In M. Butt and W. Geuder, eds., *The Projection of Arguments: Lexical and Compositional Factors*, 97-134. Stanford: CSLI.
- Spelke, Elizabeth S. 1979. Perceiving Bimodally Specified Events in Infancy. *Developmental Psychology* 15:626-636.
- Waxman, Sandra R. 1990. Linguistic Biases and the Establishment of Conceptual Hierarchies: Evidence from Preschool Children. *Cognitive Development* 5:123-150.

Ann Bunger<sup>1</sup>  
Department of Linguistics  
2016 Sheridan Road  
Northwestern University  
Evanston, IL 60208-0854

Jeffrey Lidz  
Department of Linguistics  
1401 Marie Mount Hall  
University of Maryland  
College Park, MD 20742-7505

abunger@northwestern.edu

jlidz@umd.edu

---

<sup>1</sup> This research was supported in part by National Institutes of Health grant R03-DC006829 to J. Lidz and by a Northwestern University Graduate Research Grant to A. Bunger. The authors wish to express their gratitude to the children and parents who participated in these experiments and to receptive audiences at Northwestern University, Boston University, and UC Berkeley.

## Argument Structure and Adjuncts: Perspectives from New Guinea

MARK DONOHUE

*Centre for Research on Language Change, Australian National University*

### 0. Background

It is widely assumed that arguments and adjuncts differ in that arguments are licensed by a predicate, while adjuncts are not. The nature and number of arguments is thus strictly delimited in a clause, while adjuncts are essentially unbounded. (1) and (2) demonstrate the restrictions placed on possible arguments by the predicate in English; in (1) the verb only allows for a subject, while in (2) the verb requires both a subject and a single object. (3) shows the lack of any such restrictions on adjuncts.

- (1) She slept (\*the cat) (\*the hot water).
- (2) She admired \*(the cat) (\*the hot water).
- (3) She washed the cat (with the hot water) (in the laundry room) (for her sister) (with her daughter) (yesterday).

We can effectively describe the allowed participants in clauses in English (and many other languages) as shown in (4) (terminology from Bresnan 2001).

- (4) Required: one SUBJECT  
(Lexically) specified by verb: one (or more) OBJECT(s), one OBLIQUE  
Unlimited, but not required: temporal reference, co-agent, beneficiary, instrument, location, source or goal (ADJUNCT(s))

A pattern is found in some languages of North-Central New Guinea in which there are restrictions on the number of participants in a clause. This can informally be stated as in (5).

- (5) Required: one subject (≠pro-drop)  
(Lexically) specified by verb: one object  
Optional: time reference  
Maximally one (per verb): co-agent, beneficiary, instrument, location, source or goal

This means that: (i) trivalent clauses are not licensed by single verbs; (ii) maximally one oblique or adjunct may be present for any one verb (and there is little, if any, difference between these two types of participants); (iii) an analysis in terms of positions in the clause, or case-marking differentiation, or even pragmatic positions, is not adequate to describe the data; (iv) we must simply specify firstly a restriction on the number of adjuncts in the clause, and secondly (and less strongly, for Skou) a conflation of the distinction between oblique and adjunct.

In the next section I shall present some brief background notes on the two languages, followed by data from One and Skou, in that order, presented separately. Following the data I shall discuss the implications of the data for considerations of argument structure.

### **1. Background on the Languages: Skou and One**

The two languages discussed here are spoken in North-Central New Guinea. Skou is a coastal language spoken immediately west of the Indonesia-Papua New Guinea border, while One is spoken inland to the east in Papua New Guinea.

One is a Torricelli language of the West Wapei group, spoken in various villages from the eastern Bewani mountains. The variety described here is Molmo One, spoken in the Pibi river valley by approximately 500 people (Laycock 1975, Crowther 2001, Sikale et al. 2002).

Skou is the westernmost language of the Macro-Skou family, spoken by about 700 people in three villages (Laycock 1975b; Donohue 2002, 2006, 2008). There are a number of broad similarities shared by the two languages: (1) verbs inflect for subject by monoconsonantal prefix, a feature of the area (prefixes are phonologically restricted to a defined set of verbs); (2) there is little case marking, only instruments being overt; (3) only valency-affecting processes are weak applicatives (restricted lexically); and (4) there are restrictions on the number of participants in a clause (both arguments and adjuncts). Despite the similarities, there are a number of striking differences between Skou and One: (1) Skou is SOV, while One is SVO; (2) Skou is tonal and (predominantly) monosyllabic, while One has weakly contrastive stress (verbs only) and is predominantly disyllabic; (3) Skou has a switch reference system, while One has a topic-driven coordination system; and (4) Skou makes extensive use of N+V complex predicates and has configurational NPs. The fact that, despite these differences, the two languages show such striking similarities in terms of their treatment of obliques/adjuncts suggests that the pattern described here pertains to a greater number of languages in the area as well, though documentation is so far lacking.

### **2. One**

The order of elements in the One clause is summarized in (6) (ignoring hierarchical structure in the clause). (7) and (8) show maximally ‘full’ clauses, demonstrating the relative positions described in (6). Raising tests and verbal prefixation uniquely identify subjects, and the ability to be cross-referenced on the verb as a suffix if 1SG uniquely identifies objects.

*Argument Structure and Adjuncts in New Guinea*

- (6) Time Subject (Adverb) Verb (Auxiliary) Object Oblique/Adjunct  
└─ instrument ─┘
- (7) *Time Subj V Obj Adjunct*  
 Nounke i em au nula=ne.  
 yesterday 1SG get sago tong=INSTR  
 'I got the sago with tongs yesterday.'
- (8) *Subj Adv V Oblique*  
 Wo puli flane pari ninkleli.  
 3SG wife quickly go.up garden  
 'His wife went to the garden.'

Only instruments are overtly case-marked, which have more positional variation than other adjuncts, being able to both follow (commonly) or precede (rarely) an object. (9) shows the relative freedom of position found with an instrument, and (10) demonstrates that locations are more restricted. The same is true for goals and sources.

- (9) a. Wo tere aila eko=ne.  
 3SG cut wood ax=INSTR  
 'He cut the wood with an ax.'  
 b. Wo tere eko ne aila.
- (10) a. Wo tere aila ninkleli.  
 3SG cut wood garden  
 'He cut the wood in the garden.'  
 b. \* Wo tere ninkleli aila.

Despite the positional freedom that instruments display, they cannot co-occur with a location or goal in the same clause, regardless of the relative order of the two adjuncts (or obliques), or whether the instrument precedes or follows a nominal object.

- (11) a. \* Wo tere aila eko=ne ninkleli.  
 3SG cut wood ax=INSTR garden  
 'He cut the wood with an ax in the garden.'  
 b. \* Wo tere aila ninkleli eko ne.  
 c. \* Wo tere eko ne aila ninkleli.

Similarly, though perhaps less surprisingly by virtue of their fixed and identical positions, goals or sources and locations cannot co-occur in the same clause, regardless of their relative ordering. (12) shows goal + location combinations, and (13) shows source + location combinations.

- (12) a. Wo pari Laurela.  
 3SG go.up Laurela  
 'He went up to Laurela.'

- b. Wo pari pleni po'u.  
 3SG go.up path steep  
 'He went up on a mountain path.'
- c. \* Wo pari Laurela pleni po'u.  
 d. \* Wo pari pleni po'u Laurela.
- (13) a. I te Wisoli.  
 1SG come.around Wisoli  
 'I come from Wisoli.'
- b. I te pleni po'u.  
 1SG come.around path steep  
 'I came on a mountain path.'
- c. \* I te Wisoli pleni po'u.  
 d. \* I te pleni po'u Wisoli.

Coding a traveled-through location as an instrument, a grammatical option in One, does not save the grammaticality of sentences such as (14b) or (14c).

- (14) a. Wo pari pleni po'u=ne.  
 3SG go.up path steep=INSTR  
 'He went up by a mountain path.'
- b. \* Wo pari Laurela pleni po'u ne.  
 c. \* Wo pari pleni po'u ne Laurela.  
 'He went up to Laurela by a mountain path.'

Clauses with beneficiary or recipient arguments show an obligatory reduction in surface participants to satisfy the strict restrictions on number of arguments in a clause. This accommodation can follow either of two strategies. In the first we see a form of 'dative lowering', in which the recipient or beneficiary is realized as the possessor of the object in the clause, as in (15) and (18). Alternatively, the three arguments can be shared between two verbs in a serial verb construction (SVC). In (16) *yani* subcategorizes for an agent and a theme, and the recipient is introduced as the oblique argument of *yi* 'go', while in (17) it subcategorizes for an agent (shared with *yupu*) and a recipient, and *yupu* introduces the theme as its object. In both cases each verb in the SVC subcategorizes for only two arguments. With beneficiary constructions *yupu* is not grammatical, as seen in (20).

- (15) Wo y-ani [NP i puli malma toma].  
 3SG 2/3SG-give NP i 1SG wife devil stone  
 'He gave my wife('s) money.'
- (16) Wo y-ani malma toma y-i i puli.  
 3SG 2/3SG-give devil stone 2/3SG-go 1SG wife  
 'He gave money to my wife.'
- (17) Wo y-upu malma toma y-ani i puli.  
 3SG 2/3SG-get.and.transact devil stone 2/3SG-give 1SG wife  
 'He gave money to my wife.'

*Argument Structure and Adjuncts in New Guinea*

- (18) Wo y-aro-le [NP apuwa tapi ama=enu ].  
 3SG 2/3SG-peel-ITER taro skin mother=GEN  
 ‘She’s peeling the taro for mum.’ (= ‘She’s peeling mum’s taro.’)
- (19) Wo y-aro-le apuwa tapi y-ani ama.  
 3SG 2/3SG-peel-ITER taro skin 2/3SG-give mother  
 ‘She’s peeling the taro for mum.’
- (20) \* Wo y-upu apuwa tapi y-aro-le y-ani ama.  
 3SG 2/3SG-get.and.transact taro skin 2/3SG-peel-ITER 2/3SG-give mother  
 ‘She’s peeling the taro for mum.’

The serialization strategy is frequently used to allow an adjunct to appear in an otherwise ‘saturated’ clause, providing rescue options for translations of clauses such as (11). In (21) we can see the use of *yem* ‘get’ serialized with *tere* to introduce an instrument, and in (22) *wae e* ‘be at’ introduces the source of the motion in an inherently temporally-sequenced serial verb construction.

- (21) Wo y-em eko tere aila ninkleli.  
 3SG 2/3SG-get ax cut wood garden  
 ‘He cut the wood with an ax in the garden.’ (monoclausal)
- (22) Meli n-ae n-e moren panteri Laurela.  
 children 3PL-sit 3PL-be house.LOC 3PL:ascend Laurela  
 ‘The children are going up to Laurela from the house.’

Co-agents (‘accompaniers’) are coded in relative clauses formed with the verb *ane* ‘and’.

- (23) [NP I [RC ane meli ]] n-emu apuwa.  
 1SG and children 3PL-get taro  
 ‘The children and I got the taro.’
- (24) [NP Meli [RC n-an(e)=i ]] n-emu apuwa.  
 children 3PL-and=1SG 3PL-get taro  
 ‘The children and I got the taro.’

When the discourse is such that there is no appropriate second verb to use to introduce a new participant, the main verb will be repeated in order to allow two oblique arguments, each licensed by a separate instance of the main predicate. In (25) we can see that the first instance of *palo* (itself appearing in the serial verb construction *fanta palo*) appears with a source oblique *tiroa* ‘from the rinser’, and in the second use the adjunct *mairop* is a goal, as well as being the object of *nal*.

- (25) (*Making sago*.) [When you rinse sago, the scrapings stop at the strainer ...]  
 ani sa ese fanta palo tiroa palo nal mairop.  
 sago.meat TOP FUT fall go.down rinser go.down fill catcher  
 ‘... and the sago meat goes down from the rinser to the catcher.’

Even in clauses that could license all the participants that are called for, a subject, object, and oblique/adjunct, we can observe a preference for the use of less argument-dense strategies (see DuBois 1987, DuBois et al. 2003, and Bickel 2003 for similar discussion on the limits to the number of NPs in clauses). In (26), taken from a dictionary definition of a deadfall trap, the proposition could have been expressed with a single clause, as in (27). Instead, the author chose to split the clause into two, with smaller NPs and a more ‘diffuse’, low-density information packaging strategy.

- (26) (*Making a deadfall trap*): (He) cuts some rattan and forms a loop with it, slipping the loop around and fastening it to the tree. Then ...]
- mala                      y-ona                      apa    sa    wala y-eri  
 child(=small part of tree) 2/3SG-hang.TR rattan TOP side 2/3SG-come.up  
 y-apa                      y-e                      tiri    ...  
 2/3SG-hang.INTR 2/3SG-be above  
 ‘... (he) hangs up the small side of the tree by the rattan and hangs it above [so that later when an animal goes past it will fall down on top of the animal and kill it].’
- (27)                      *Subj*                      *Obj*                      *Adjunct*<sub>location</sub>  
 (Wo) y-ona                      (aila) wala mala apa tiri.  
 3SG 2/3SG-hang.TR tree side child rattan above  
 ‘(He) hangs the small side of the tree on the rattan above.’

Some verbs subcategorize for a subject and an oblique, not a subject and an object; we have already seen verbs of motion that satisfy this subcategorization frame in (8), (12)-(14), and (16), but there are other predicates not involving motion with such ‘quirky’ patterns. The oblique is not case-marked in any manner different to that seen with ‘normal’ objects, nor is there any necessary difference in the verbal morphology employed. The obliques of these verbs are distinguishable from objects by their inability to appear with adjuncts in simple clauses, since the restriction on only one NP filling the role of oblique or adjunct per clause applies to them as well as motion verbs ((12)-(14)). Clauses headed by verbs with obliques rely heavily on serialization to achieve the expressivity of the more common subject-object clauses. In (28), the (complex) predicate *por ye* subcategorizes for a subject, *wo*, and an oblique, *mala* (compare with (12a)). An adjunct such as *ninkleli* may not be directly added to the clause, but may be mentioned in a relative clause, as shown in (29) (compare with (21) and (22)).

- (28) a. Wo por y-e mala.  
           3SG laugh 2/3SG-be child  
           ‘He laughed at the child.’  
       b. \* Wo por ye mala ninkleli.
- (29) Wo por y-e [NP mala [RC w-ae ninkleli ]].  
       3SG laugh 2/3SG-be child 2/3SG-sit garden  
       ‘He laughed at the child (who was) in the garden.’

*Argument Structure and Adjuncts in New Guinea*

The data we have seen so far shows that only one oblique is allowed per clause, and only one adjunct is allowed per clause; either an oblique or an adjunct may appear in a clause, but not both; and any clause that might be expected to be trivalent uses strategies to avoid a third argument. It could be argued that all of these restrictions simply reflect a really tight set of phrase structure conditions that allow for no doubling, and only one adjoined position. The non-co-occurrence of instruments and locations suggests that the factors involved are more complex than this — see the examples in (11), showing that an instrument, which shows relative freedom of position ((6)), cannot occur with a fixed-position location. Examining clauses with topical elements presents the evidence that a simple template is not enough to model the restrictions in the language.

Topicalization, optionally marked with *sa*, is another coding option for any participant in the clause (only in the event of the topic being an instrument is there any evidence of this being a dynamic process, the evidence being the optional postposition-stranding that is found with the instrumental clitic *ne*).

- (30) a. Wo (sa), \_\_\_ tere aila eko=ne.  
           3SG TOP \_\_\_ cut wood ax=INSTR  
           ‘HIM, (he) cut the wood with an ax.’  
       b. Aila (sa), wo tere \_\_\_ eko=ne.  
           wood TOP 3SG cut \_\_\_ ax=INSTR  
           ‘THE WOOD, he cut (it) with an ax.’  
       c. Eko (sa), wo tere aila \_\_\_ (ne).  
           ax TOP 3SG cut wood \_\_\_ (INSTR)  
           ‘AN AX, he cut the wood with (it).’  
       d. Ninkleli (sa), wo tere aila \_\_\_.  
           garden TOP 3SG cut wood  
           ‘(IN) THE GARDEN, he cut the wood (there).’

It might be thought that if an adjunct (or oblique) is coded in the preclausal topic position, the postverbal position would be ‘freed’ for another adjunct; this is not the case. One adjunct in the topic position does not license the appearance of a separate adjunct or oblique *in situ*, as can be seen in (31)-(33).

- (31) a. \* Eko (sa), wo tere aila \_\_\_ (ne) ninkleli.  
           ax TOP 3SG cut wood \_\_\_ (INSTR) garden  
           ‘AN AX, he cut the wood with (it) in the garden.’  
       b. \* Ninkleli (sa), wo tere aila eko=ne \_\_\_.  
           garden TOP 3SG cut wood ax=INSTR  
           ‘(IN) THE GARDEN, he cut the wood (there).’
- (32) a. \* Laurela (sa), wo pari pleni po’u(=ne) \_\_\_.  
           Laurela TOP 3SG go.up path steep(=INSTR) \_\_\_  
           ‘LAURELA, he went up to by/on a mountain path.’  
       b. \* Pleni po’u (sa), wo pari \_\_\_ Laurela.  
           path steep TOP 3SG go.up \_\_\_ Laurela  
           ‘(ON/BY) A MOUNTAIN PATH, he went up to Laurela.’

- (33) \* *Laurela (sa), wo por y-e mala* \_\_\_\_.  
 Laurelá TOP 3SG laugh 2/3SG-be child \_\_\_\_  
 '(At) LAURELA, he laughed at the child.'

The fact that, even when topicalized with no overt 'filler' in the post-object position, this position is not available to host another adjunct suggests that, rather than being phrase structure-dependent, there is simply a stipulation on the number of participants in a clause, including adjuncts as much as arguments. Adjuncts are not 'additional' to the clause, as is normally assumed, but can 'interfere' with the realization of arguments (and/or vice versa) just as much as other arguments can.

In the next section, I examine data from Skou, an unrelated language from the same broad geographic area in North-Central New Guinea. In Skou we can see similar restrictions on the appearance of adjuncts, though not quite as strict as in One, and similar evidence for the integration of arguments and adjuncts together in the clause.

### 3. Skou

We find a more complex phrase structure in Skou than One, with two positions for non-terms, testable by their position with respect to the auxiliary. The post-auxiliary position is used by locations, while the pre-auxiliary position hosts any other obliques or adjuncts. As with One, an (overtly marked) instrument shows positional variation, optionally appearing before the object (or following it). The difference between the two non-term positions is illustrated in (35) and (36).

- (34) Time Subject Object (Adverb) Verb non-term<sub>1</sub> Auxiliary location  


- (35) Goal: *Te te=y-atà te báng e ti.*  
 3PL 3PL=3PL-run 3PL.go beach 3PL.be 3PL.do  
 'They're running to the beach.' (Verb + BE + DO = continuous)

- (36) Location: *Te te=y-atà e ti báng.*  
 3PL 3PL=3PL-run 3PL.be 3PL.do beach  
 'They're running (around) on the beach.'

Many of the facts relevant to argument structure restrictions in Skou are identical to those in One, despite the many typological differences. As with One, instruments are less constrained than other adjuncts, and are overtly marked. In Skou an instrument may appear before an object, before the verb, or in the non-term<sub>1</sub> position.

- (37) a. *Ke rangwaue=pa rí ke=lé.*  
 3SG.NF ax=INSTR tree 3SG.NF=fell  
 'He felled the tree with an ax.'  
 b. *Ke rí rangwaue pa ke=lé.*  
 c. *Ke rí ke=lé rangwaue pa.*

*Argument Structure and Adjuncts in New Guinea*

The same restriction on co-occurrence of two non-terms in one clause that was seen in One also applies in Skou, with a minor relaxation: a preverbal (and overtly case-marked) instrument may co-occur with a postverbal oblique goal. The instrument must be preverbal for this to be grammatical, as seen in (38b-c).

- (38) a. ke      **tang=pa**      ke=ti                      **bàme**  
           3SG.NF canoe=INSTR 3SG.NF=3SG.NF.go village  
           ‘... he went to (our) village by canoe ...’  
       b. \* ke ke=ti **tang=pa** **bàme**  
       c. !\*ke ke=ti **bàme** **tang=pa**

Clauses are markedly less acceptable with a preverbal instrumental adjunct and a postverbal participant other than a goal oblique, though this is more acceptable than having two postverbal adjuncts.

- (39) a. !#Pe      **tàng=pa**      póweng pe=r-úe                      **pá.**  
           3SG.F blade=INSTR aibika 3SG.F=3SG.F-F.cut house  
           ‘She cut up the aibika with a knife in the house.’  
       b. \* Pe póweng pe=rú **tàng=pa** **pá.**  
       c. !\*Pe póweng pe=rú **pá** **tàng=pa.**

Even in Skou, in which there are two clearly separate postverbal positions (see (35) and (36)), they cannot be simultaneously filled by two different adjuncts. Even though *rangwaue=pa* and *lihi* clearly occupy separate structural positions (compare with (35) and (36)), the two adjuncts may not co-occur.

- (40) a. Ke      rí      ke=lé-lé                      **rangwaue=pa** li.  
           3SG.NF tree 3SG.NF=fell-RED ax=INSTR do  
           ‘He wants to fell the tree with an ax.’  
       b. Ke      rí      ke=lé-lé                      li **lihi.**  
           3SG.NF tree 3SG.NF=fell-RED do garden  
           ‘He wants to fell the tree in the garden.’  
       c. \* Ke rí ke=lé-lé **rangwaue=pa** li **lihi.**

Repair strategies allowing the coding of both an instrument and a location involve the use of serial verb constructions, or simply two clauses chained together (this difference is overtly marked in Skou).

- (41) Rangwaue ke=ké=**ko**                      rí      ke=lé                      (lihi).  
       ax                      3SG.NF=get=OBV tree 3SG.NF=fell garden  
       ‘He got an ax and felled the tree (in the garden).’

Just as in One, the predicate ‘give’ requires two verbs in an SVC, one to specify the theme and one to introduce the recipient. It is grammatical to code all three arguments in one clause, but it is considered ‘better’ discourse structure to have the object more distant from the postverbal material. (42) is an acceptable



- (47) **[kelambu]** te=r-i                      **li=ing a=pa,**  
 [mosquito.net] 3PL=3PL-PL.get.PL sea.side=the=INSTR  
 ‘They set up mosquito nets by the sea, ...’  
 (=pa is also used to code a topic-like function, in (46) and earlier (xiv), and same-reference across two clauses in (47), as well as being the instrumental case marker)

As with One, some predicates subcategories for <SUBJ, OBL>. In these cases the OBL is coded following the verb, and cannot occur with an adjunct (compare the predicate in (48) with (44)).

- (48) a. Ke      ke=fĩ                      **nĩ.**  
 3SG.NF 3SG.NF=bump.into 1SG  
 ‘He bumped into me.’  
 b. \* Ke      ke=fĩ                      **nĩ pá=ing a.**  
 3SG.NF 3SG.NF=bump.into 1SG house=the  
 ‘He bumped into me in the house.’
- (49) Ke      ke=k-e                      ti              **pá=ing a=pa**      ke=fĩ              **nĩ.**  
 3SG.NF 3SG.NF=3SG.NF-go.up 3SG.NF.go house=the=INSTR 3SG.NF=bump.into 1SG  
 ‘He went into the house and bumped into me (there).’

#### 4. Enriching Theories of Argument Structure

These data suggest that obliques, a subcategorized-for function, should be grouped with adjuncts, a non-subcategorized-for function (at least optionally). Rather than all the grammatical function labels of Bresnan (2001) being separate and distinct, we find the following distinctions can be motivated.

- (50) Subject ≠ Object ≠ Oblique<sub>Instrument</sub> ≠ Oblique/Adjunct; *but* Oblique = Adjunct

Adjuncts are not simply freely adjoined to a clause, the basic positions of which are determined in the argument structure of the predicate. The restriction is not simply a (phrase) structural restriction on positions. We must reevaluate the status and categories of adjuncts and arguments. Approaches such as Cinque (1999) present a model that is diametrically opposite to that suggested by these data; a multitude of functional projections would allow for multiple adjuncts. Are these functional projections more restricted in some languages than in others? This implies that functional projections are a parametrizable feature, and not a universal.

Simply declaring ‘obliques’ and ‘adjuncts’ to be separate GFs does not account for their mutual exclusion; the differential behavior of instruments in Skou is similarly left unexplained (though see Donohue and Donohue 2004). This implies that grammatical functions (or their structural equivalents in different frameworks) are as much a parametrizable feature as are more ‘surface’ phenomena such as case and agreement. Furthermore, it implies that grammatical functions other than arguments are subordinate to discourse-like constraints on argument realization (DuBois et al. 2003), and that an informed theory of argument

structure must pay as much attention to these discursal factors as it does to lexical factors.

## References

- Bickel, Balthasar. 2003. Referential Density in Discourse and Syntactic Typology. *Language* 79:708-736.
- Bresnan, Joan. 2001. *Lexical Functional Syntax*. Oxford: Basil Blackwell.
- Cinque, Guglielmo. 1999. *Adverbs and Functional Heads: A Cross-Linguistic Perspective*. Oxford University Press.
- Crowther, Melissa. 2001. All the One Language(s): Comparing Linguistic and Ethnographic Definitions of Language in New Guinea. B.A. thesis, Department of Linguistics, University of Sydney.
- Donohue, Cathryn, and Mark Donohue. 2004. On the Special Status of Instrumentals. In Miriam Butt and Tracy Holloway King, eds., *Proceedings of the LFG '04 Conference*, 209-225. Published online at <http://csli-publications.stanford.edu/site/ONLN.html>.
- Donohue, Mark. 2000. One Phrase Structure. In Keith Allan and John Henderson, eds., *Proceedings of ALS2k, the 2000 Conference of the Australian Linguistic Society*. University of Melbourne. Published online at <http://www.arts.monash.edu.au/ling/archive/als2000/proceedings.html>.
- Donohue, Mark. 2005. Configurationality in the Languages of New Guinea. *Australian Journal of Linguistics* 25:181-218.
- Donohue, Mark. 2006. Negative Grammatical Functions in Skou. *Language* 82(2):383-398.
- Donohue, Mark. 2008. Complex Predicates and Bipartite Stems in Skou. *Studies in Language* 32(2):279-335.
- DuBois, John W. 1987. The Discourse Basis of Ergativity. *Language* 63:805-855.
- DuBois, John W., Lorraine E. Kumpf, and William J. Ashby. 2003. *Preferred Argument Structure: Grammar as Architecture for Function*. Amsterdam: John Benjamins.
- Sikale, John, Melissa Crowther, and Mark Donohue. 2002. *Silla palla Molmo miri* [Molmo One dictionary]. Sandaun Province Department of Education and The University of Sydney.

Mark Donohue  
The Centre for Research on Language Change  
Australian National University  
Canberra, ACT 0200, Australia

[mark@donohue.cc](mailto:mark@donohue.cc)

## A Closer Look at Salish Intransitive/Transitive Alternations<sup>1</sup>

DONNA B. GERDTS and THOMAS E. HUKARI  
*Simon Fraser University and University of Victoria*

### 0. Introduction

Salish languages are noted for their “inchoative/causative” alternation: the inchoative forms are usually unmarked, while the corresponding causative verbs require the transitive suffix. This is demonstrated by the following Halkomelem data: *q̣aʔ* ‘get added’ in (1) contrasts with *q̣aʔ-t* ‘add it, put it in with’ in (2):<sup>2</sup>

(1) niʔ q̣aʔ kʷθə nə šeləmcəs ʔə kʷθə nə s-kʷu: kʷ.  
AUX add DT 1POS ring OB DT 1POS NM-cook  
‘My ring got into my cooking.’

(2) nem č q̣aʔ-t tʰə sqewθ ʔə tʰəń sləp!  
go 2SUB add-TR DT potato OB DT.2POS soup  
‘Go put the potatoes into your soup!’

Such examples seem to be a *prima facie* case for deriving the causative verb from its intransitive counterpart (à la Levin & Rappaport Hovav 1995). Indeed, Salish languages are “transitivizing” languages in the sense of Nichols et al. (2004), who looked at 18 intransitive/transitive pairs in 80 languages, including the neighboring Salish language Squamish, and rated them on the basis of whether the intransitive or the transitive alternant was morphologically marked. The verbs

---

<sup>1</sup> Halkomelem is a Central Salish language spoken by around one hundred elders in southwestern British Columbia. Data are based on fieldwork with Island Halkomelem speakers. We especially thank Ruby Peter and the late Arnold Guerin and Theresa Thorne for assistance with data. Thanks also to Sarah Kell and Kaoru Kiyosawa for research assistance, to Todd Peterson and Charles Ulrich for editing, and to SSHRC; Simon Fraser University; University of Victoria; Jacobs Fund; Phillips Fund; The Museum of Civilization, Ottawa; and the Canadian Consulate, Washington, D.C., for funding.

<sup>2</sup> The following abbreviations are used in glossing the data: APPL: applicative, ATTRIB: attributive, AUX: auxiliary, CNJ: conjunction, DT: determiner, EMPH: emphatic, FUT: future, LNK: linker, NM: nominalizer, OB: oblique, POS: possessive marker, Q: interrogative, SUB: subject, SSUB: subordinate subject, TR: transitive.

in question all have bare root intransitive alternants and marked transitive alternants in Halkomelem. However, this result is somewhat misleading because, in fact, all syntactically transitive constructions in Salish, i.e., those with two direct nominal or pronominal arguments, take transitive marking. This has led some Salish scholars, for example, Kuipers (1968), Hess (1973), Jelinek (1994), and Suttles (2004), to the viewpoint that all verb roots in Salish languages are intransitive and require the addition of transitive morphology in order to serve as transitive stems. However, there is an alternative view taken by some Salish scholars, including Gerdts (1988a), Gerdts & Hukari (1998), Nater (1984), and Thomason & Everett (1993): the transitive suffix is a verbal inflection that appears on bases that are already semantically transitive. It is that viewpoint that we seek to explore in this paper.

First, we review some information regarding intransitive roots in Section 1. Then, we explore the issue of transitivity from three perspectives. Section 2 shows that around one hundred verb roots that appear with the transitive suffix do not occur as a  $\emptyset$ -form intransitive. Section 3 shows that around forty  $\emptyset$ /transitive pairs show an unergative/transitive alternation, where the agent remains constant, rather than an inchoative/causative one, where the patient remains constant. Section 4 shows that many bare roots used unaccusatively seemed to be coerced into this frame by special semantics while the transitive alternants are more basic. We thus conclude that the Halkomelem data do not support the viewpoint that all roots are unaccusative or even that all roots are intransitive. Rather, Salish verb roots should be classified, like those in other languages, into intransitive and transitive roots.

### 1. Intransitive Roots

One way to explore the status of roots is to make a more complete survey of the  $\emptyset$ /*-t* pairs in the language, classifying them according to the semantic properties of the base. A project that we have been undertaking for the last twenty years is testing Halkomelem verb roots in combination with the various suffixes. So far we have identified 489 verb roots and tested them in combination with twelve suffixes (transitive, causative, reflexive, desiderative, etc.). We checked with speakers to see if forms were acceptable and asked for illustrative sentences. We also took materials from our elicitations, texts, dictionaries, and composed a database coded for argument realization and semantic nuances. Our survey shows that the transitive suffix *-t* can occur with 407 of the 489 roots in our sample (83%).<sup>3</sup>

In oft-cited examples of the  $\emptyset$ /*-t* alternations, such as those in Table 1, the  $\emptyset$  alternant is typically a state or process verb with an unaccusative frame. That is, the sole argument (syntactically, the subject) is semantically a patient/undergoer.

---

<sup>3</sup> The transitive suffixes are also used on bases that consist of more than a root. We have discussed the combinatorial properties of transitive suffixes elsewhere (see, especially, Gerdts 1988a) and limit the discussion here to cases where the suffix is attached directly to the root.

Salish Intransitive/Transitive Alternations

Table 1. Examples of Transitive *-t*

| Ø INTRANSITIVE     |                        | <i>-t</i> TRANSITIVE |                   |
|--------------------|------------------------|----------------------|-------------------|
| səq̣               | ‘get torn’             | sq̣et                | ‘tear it’         |
| ḳ <sup>w</sup> əl | ‘spill’                | ḳ <sup>w</sup> let  | ‘pour it’         |
| ḳ <sup>w</sup> əs | ‘burn’, ‘get hot’      | ḳ <sup>w</sup> esət | ‘burn it’         |
| çəỵx <sup>w</sup> | ‘get dry’              | çəỵx <sup>w</sup> t | ‘dry it’          |
| ləç                | ‘(container) get full’ | ləçət                | ‘fill it’         |
| ləṭ               | ‘flipped’              | ḷṭet               | ‘flip it’         |
| ləq̣ <sup>w</sup>  | ‘get wet’              | ḷq̣ <sup>w</sup> ət | ‘wet it’          |
| neç                | ‘be different’         | neçt                 | ‘change it’       |
| çəq̣ <sup>w</sup>  | ‘get pierced’          | çəq̣ <sup>w</sup> at | ‘pierce it’       |
| çəx̣ <sup>w</sup>  | ‘increase’             | çəx̣ <sup>w</sup> at | ‘add more to it’  |
| ləx̣ <sup>w</sup>  | ‘get covered’          | ləx̣ <sup>w</sup> at | ‘cover it’        |
| ləḳ <sup>w</sup>  | ‘break in two’         | ləḳ <sup>w</sup> at | ‘break it in two’ |
| ʔaḳ <sup>w</sup>  | ‘get hooked’           | ʔaḳ <sup>w</sup> ət | ‘hook it’         |
| tiq̣ <sup>w</sup>  | ‘get hit, bumped’      | tiq̣ <sup>w</sup> ət | ‘hit, bump it’    |

We see that the Salish data go far beyond the English *melt/melt* alternation (i.e. the inchoative/causative alternation) to include intransitive verbs that cannot spontaneously occur, but must have an external force (Haspelmath 1993). The robustness of this pattern, along with the distinctly un-English semantics, has led Davis (1997, 2000) to take the claim of intransitivity for Salish roots one step further: he posits that all roots are unaccusative.<sup>4</sup> Under his deep-unaccusativity approach, transitive verbs and unergative verbs are derived in the syntax. The transitive suffix is a *v* head that brings in an external argument, the agent. Unergative verbs are marked with a variety of suffixes that serve as a *v* head that both brings in an external argument and cancels the internal argument.

However, what we find in our data is that the claim for universal unaccusativity is not justified. As we show in this paper, there are several types of relationships between the bare root and the alternant with *-t*. Furthermore, when we use tests for establishing unaccusativity as laid out in Gerdts (1991) and Gerdts & Hukari (2001, 2006), we find surprisingly that only 54 out of 489 roots (11%) straightforwardly test to be unaccusative, divided into three semantic types as follows:<sup>5</sup>

STATE/TRANSITIVE

həli ‘be alive, living,’ ʔəx̣<sup>w</sup> ‘be hard,’ qəx̣ ‘much, lots,’ tq̣<sup>w</sup>a ‘be taut,’ ləq̣<sup>w</sup> ‘be wet,’ məs ‘decrease in size,’ ʔçə ‘close together,’ ʔpə ‘deep,’ p̣il ‘fill to brim,’ ḷec ‘dark,’ ḷəp̣ ‘flatten, flop’

<sup>4</sup> See Davis and Demirdache (2000) for a more refined version of this hypothesis. There verb roots are taken to be semantically “causative” but syntactically unaccusative. Our objections to positing that all roots are of one type are equally applicable to this revised hypothesis.

<sup>5</sup> These tests include the lack of a causative, a desiderative, and a limited control reflexive with an agentive reading.

PROCESS (SPONTANEOUS)/TRANSITIVE

lək<sup>w</sup> ‘break,’ meʔ ‘come off,’ yəx<sup>w</sup> ‘come undone, set free,’ ɔ̄wəl ‘cook, bake, ripen,’ k<sup>w</sup>es ‘get burnt, scald, injure by a burn,’ mɔ̄ə ‘get full of food,’ xəl ‘get hurt,’ ɔ̄is ‘get knotted,’ ɔ̄ay ‘get sick, die,’ liq<sup>w</sup> ‘get slack,’ cəɔ̄ ‘get surprised,’ sɔ̄e ‘tear,’ cɔ̄q<sup>w</sup>a ‘absorb,’ ləm ‘fold, hem,’ ləlq ‘soak, flood, (river) rise,’ lɔ̄q<sup>w</sup>a ‘take bark off,’ pɔ̄q<sup>w</sup>a ‘break,’ səlɔ̄ ‘twirl, swing,’ xk<sup>w</sup>a ‘wedge, get stuck,’ x<sup>w</sup>ay ‘die (plural),’ sik<sup>w</sup> ‘peel,’ caʔ ‘pull off a layer of clothing,’ tə ‘spread, open,’ tx<sup>w</sup>a ‘uncover,’ cən ‘lean against something,’ x<sup>w</sup>iq ‘cheer up’

EXTERNALLY CAUSED EVENT/TRANSITIVE

ɪ<sup>0</sup>as ‘get bumped,’ ɔ̄q<sup>w</sup>aq<sup>w</sup> ‘get clubbed,’ pas ‘get hit,’ ɪ<sup>0</sup>əx<sup>w</sup> ‘get washed,’ ɔ̄wəp ‘wrinkle, pleat,’ qəp ‘stick something to something,’ x<sup>w</sup>iq<sup>w</sup> ‘loop,’ qit ‘tie in the middle,’ ʔaq<sup>w</sup> ‘soak up, absorb,’ ʔaɔ̄q<sup>w</sup> ‘brush,’ ɪ<sup>0</sup>ek<sup>w</sup> ‘shine a light on,’ pah ‘blow on, blow out, inflate it,’ qem ‘bend,’ ɪ<sup>0</sup>is ‘nail,’ leʔ ‘put away,’ pšə ‘spit medicine,’ ɪ<sup>0</sup>əl ‘lose it all gambling’

The roots that test to be unaccusative (54) outnumber the roots that straightforwardly test to be unergative (33). The unergative roots split into two types, canonical unergatives, which do not form transitives with the suffix *-t*, and a small group of motion verbs, which do form transitives with *-t*.<sup>6</sup>

CANONICAL UNERGATIVES

cam ‘go uphill,’ hek<sup>w</sup> ‘recall to mind,’ həyeʔ ‘depart,’ k<sup>w</sup>iʔ ‘climb,’ lak<sup>w</sup> ‘fly,’ nem ‘go,’ ɔ̄lan ‘be forward,’ q<sup>w</sup>al ‘speak,’ tax<sup>w</sup> ‘bring down,’ tak<sup>w</sup> ‘go home,’ θət ‘say to,’ xih ‘growl,’ x<sup>w</sup>teʔ ‘go/come to,’ yays ‘work,’ ʔəmət ‘sit down/rise out of bed,’ ʔənəx<sup>w</sup> ‘stop,’ ʔa:l ‘get on vehicle,’ ʔeli ‘away, take away,’ ʔewə ‘come here,’ ʔitət ‘sleep,’ ta:l ‘go to middle of floor,’ xiw ‘sneak off, run away,’ he:wə ‘go away for a long time,’ k<sup>w</sup>ayək<sup>w</sup> ‘fish with line, gaff,’ ləne ‘go along a way,’ təy ‘pull (race) a canoe,’ lew ‘flee,’ tel ‘be like’

MOTION VERBS

le:l ‘go ashore; beach it,’ k<sup>w</sup>e:l ‘hide,’ ʔəxq ‘go out, get out,’ səlc ‘go around, surround,’ ɔ̄wim ‘disembark’

However, we did not find an overwhelming preponderance of unaccusative roots that we would expect under the deep unaccusativity hypothesis.

Furthermore, our research has revealed that half of the roots that have alternants with *-t* are “swingers.” That is, the bare root appears in either an unergative or an unaccusative frame, as required by the context. For example, the roots *pət<sup>ɔ̄</sup>* ‘sew’ and *pək<sup>w</sup>* ‘float’ behave unergatively with a human (or sentient) subject, denoting an action under the control of the agent NP (see (3) and (5)), but

<sup>6</sup> Some of these verbs take *-š* as a morphophonemic variant of *-t*.

*Salish Intransitive/Transitive Alternations*

they behave unaccusatively with inanimate objects, denoting an activity that the NP undergoes (see (4) and (6)).

- (3) ǰə́tə k<sup>w</sup>s pət<sup>θ</sup>-s ʔiʔ ʔeʔəθ ʔeʔ wəl sʔeʔʔq.  
say DT.NM sew-3SSUB CNJ AUX:DT again now outside  
'She said she was going to sew and now she's outside.'

- (4) niʔ pət<sup>θ</sup> k<sup>w</sup>θə qtewəstəns.  
AUX sew DT waistband  
'The waistband got accidentally sewn together.'

- (5) nem cən nəqəm-nəs ʔəw pək<sup>w</sup> ceʔ niʔ  
go 1SUB dive-APPL LNK surface FUT AUX  
ʔə t<sup>θ</sup> niʔ ʔamət s-q<sup>w</sup>əs = ʂeñ.  
OB DT AUX sit NM-submerge=foot

'I'm going to dive, and then I'll come out in front of the one that's got his leg in the water.'

- (6) naʔət wəl pək<sup>w</sup> t<sup>θ</sup> q<sup>w</sup>ley.  
AUX:DT now surface DT log  
'The log has floated up.'

This fact is not unexpected; work on unaccusativity cross-linguistically has shown that verbs in many languages easily switch from one type to another or that types have mixed properties (Levin & Rappaport Hovav 1995).

Given that global unaccusativity fails to be a semantically interesting hypothesis for Salish languages, we are led back to the question of whether positing intransitivity for all roots is at all insightful.

## 2. Transitive Roots

The first problem that arises for the intransitive root hypothesis is that not all verbs that occur with the *-t* suffix have a corresponding bare root alternate that can appear as a free-standing word. We find 93 of the 489 roots (19%) are like this. The following verbs are typical of this type:

ACTIVITIES INVOLVING MANIPULATING, MOVING, ACQUIRING, INGESTING, ETC.

√haʔx<sup>w</sup> 'steam bathe,' √hes 'ritual brushing,' √k<sup>w</sup>ey 'bathe in cold water,' √yək<sup>w</sup> 'scrub, rub together,' √yətq<sup>w</sup> 'scrub,' √yiç 'sand,' √xiç 'scratch,' √xəy 'beat,' √təyq 'move,' √qiç 'slide,' √yiq 'fell, tip over,' √qʔə; 'drop off,' √hik<sup>w</sup> 'rock,' √cəm 'pack on one's back,' √ʔit 'pack by the handle,' √šeʔ 'put on lap,' √ləq<sup>w</sup> 'tap, pat,' √k<sup>w</sup>eʔ 'drop it, let go, leave it alone,' √tan 'leave behind,' √xim 'grab,' √k<sup>w</sup>a 'grab and pull,' √mək<sup>w</sup> 'pick up off the ground,' √wen 'throw,'

√ʔim ‘step on,’ √ləl ‘bail it out,’ √maʔ ‘start a fire,’ √ʔiləq ‘buy it,’ √ʔk<sup>w</sup>a ‘peck,’ √k<sup>w</sup>ełq ‘pop, slam, snap,’ √ləq<sup>w</sup> ‘drink in one swallow,’ √i<sup>θ</sup>k<sup>w</sup>ə ‘eat, riddle (as pests do)’

VERBS OF COGNITIVE AND SOCIAL INTERACTION

√leq ‘whisper,’ √k<sup>w</sup>ełq ‘pop, slam, snap,’ √lem ‘look at,’ √yən ‘laugh at,’ √tqə ‘insult, jeer,’ √x̣tə ‘jinx,’ √x̣x<sup>w</sup>ə ‘beat (in a game, race),’ √naʔ ‘find s.o. dear, miss,’ √nan ‘take someone’s side, defend,’ √p̣x<sup>w</sup>a ‘keep quiet, calm down,’ √neh ‘name someone,’ √ṭih ‘ask him/her, beg,’ √ʔa: ‘call for, invite,’ √ya: ‘order,’ √cse ‘tell (to do),’ √k<sup>w</sup>əye ‘forbid,’ √ʔex<sup>w</sup>eʔ ‘give, share with’

These verbs have semantics typical of transitive verbs cross-linguistically, e.g., activity verbs involving a direct effect on the patient, often with an instrument; verbs involving the agent moving the patient; ditransitive verbs of giving, letting, and telling, etc. In fact, the simplest analysis to posit for these verbs is that the roots are transitive.

Such verbs show us two things. First, that some roots are, in fact, basically transitive. Second, that transitive marking, rather than functioning as a means of deriving transitive from intransitive forms, should be viewed as inflection on roots that are already semantically transitive.

**3. Unergative Verbs with Transitive Semantics**

A second problem for the intransitive root hypothesis comes from a class of verb roots that show a Ø/transitive alternation, but not of the expected pattern. The agent rather than the patient is the constant factor across the two constructions. Furthermore, even the intransitive alternate is semantically transitive: the oblique-marked NP is the semantic patient in the intransitive (a) examples corresponding to the direct object in the transitive (b) examples.<sup>7</sup>

(7) a. nem̩ čək<sup>w</sup>x̣ ʔə k<sup>w</sup>θə sce:ɬən!  
 go fry OB DT salmon  
 ‘Go fry some salmon!’

b. nəwə-s nem̩ čək<sup>w</sup>x̣-t t<sup>θ</sup>ə səplil!  
 you-NM go fry-TR DT bread  
 ‘You go fry the bread!’

(8) a. nem̩ lə təw̩ šəyq ʔə t<sup>θ</sup>ə x̣θəm ʔə k<sup>w</sup> laʔən!  
 go EMPH bit look.through OB DT box OB DT plate  
 ‘Go look through the box for a plate!’

<sup>7</sup> More precisely, this is a particular kind of oblique-marked NP that we refer to as an oblique object (Gerdts 1988a, Gerdts & Hukari 1998).

*Salish Intransitive/Transitive Alternations*

- b. nem təw šəyq-t                      ʔə ləqʷə ʔə kʷθə šxʷʔaʔtʰəsəm!  
 go bit look.through-TR DT suitcase OB DT towel  
 ‘Go look through the suitcase for a towel!’
- (9) a. šʷəm ʔə č ʔiʔ ləpʰi⁰ ʔə ʔə tēməkʷ-s tʰə kʷsəc?  
 can Q 2SUB and slurp OB DE egg-3POS DT trout  
 ‘Can you slurp up the trout eggs?’
- b. scəwət kʷs ləpʰi⁰-t-s θə qeq tʰə  
 know.how DT.NM slurp-TR-3POS DT baby DT  
 šcyəmən-aʔl nutəls.  
 Chinese-ATTRIB noodles  
 ‘The baby knows how to slurp up the Chinese noodles.’

This is a significant class of verbs: 35 of the 489 verb roots (7%) exhibit this pattern. They are as follows:

SEMANTICALLY TRANSITIVE WITH OBLIQUE OBJECT

liš ‘bite and tear it apart,’ qʷəls ‘boil,’ səwq ‘seek,’ ʔeməq ‘return, give back,’ čəkʷš ‘fry,’ kʷəlc ‘gut it,’ lip ‘strip slices off,’ mai ‘aim,’ qeñ ‘steal from,’ šəm kʷ ‘pop in mouth,’ šəyq ‘ransack, go through looking,’ tel ‘half-drying fish,’ xʷikʷ ‘brush close by,’ šikʷ ‘gnaw,’ štekʷ ‘carve,’ qeləc ‘spin (wool, etc.),’ calaʔl ‘borrow,’ weq ‘dig,’ ləñ ‘weave,’ ləpʰi⁰ ‘slurp it up,’ melq ‘forget,’ nəwən ‘will it to,’ šəʔə ‘propose,’ kʷukʷ ‘cook it,’ štekʷ ‘carve,’ ləñ ‘weave,’ has ‘blow on it,’ ləpʰi⁰ ‘joke with someone,’ qəmaʔ ‘nurse,’ sem ‘sell,’ tem ‘guess,’ šlas ‘eat, dine,’ tʰəmš ‘peek at, peer at,’ tʰaqʷ ‘suck on,’ nəpəc ‘send, mail, hitch ride’

Like the verb roots in the previous section, these verbs denote semantically purposeful actions, often activities that require some duration. We have no explanation for why these verbs appear in the oblique object construction while the verbs in the previous section do not. Nevertheless, both groups of verbs seem to denote transitive events.

**4. Bare Root is Unaccusative but Semantically Transitive**

A third problem for the intransitive root hypothesis comes from a class of verbs that might at first seem like classic unaccusatives, since they appear in intransitive clauses where the sole argument is the patient. The following are typical examples:

- (10) *nem* *ʔə* *ceʔ* *θimaʔ* *θə* *sqʷi:lməxʷ* *ʔi* *ʔəñ* *šəncəʔ*  
 go Q FUT freeze DT blackberry AUX 2POS pick  
 ‘Are you going to freeze the blackberries you picked?’  
 [Lit: ‘Are the blackberries that you picked going to go freeze?’]
- (11) *ʔi* *ceʔ* *ʔə* *təʔi* *kʷs* *taʃʷ-s* *kʷθə* *sənixʷəl*  
 AUX FUT OB here DT.NM beach-3POS DT canoes  
*ʔəw* *kʷeyələs*.  
 LNK tomorrow  
 ‘You will beach the canoes over here tomorrow.’  
 [Lit: ‘The canoes will be beached here tomorrow.’]
- (12) *nem* *ceʔ* *pələc* *θəñ* *swetə* *kʷəñs* *cəyxʷ-t*.  
 go FUT turn.inside.out DT.2POS sweater DT.2POS dry-TR.  
 ‘You will turn your sweater inside out to dry.’  
 [Lit: ‘Your sweater will be turned inside out when you dry it.’]
- (13) *ʔəy* *kʷs* *qiq-s* *tʰə* *qeq* *ʔəwə* *kʷɪ* *ʔiʔ* *ʃaʔ*.  
 good DT-NM bind-3POS DT baby not EMPH and stop.cry  
 ‘You’d better bind the baby that hasn’t stopped crying.’  
 [Lit: ‘It’s good for the baby that hasn’t stopped crying to be bound.’]

However, this construction is highly marked semantically. That is, while the transitive alternants of these verbs are easily used in a variety of contexts, the intransitive verbs are used only in a construction that we call the pseudo-transitive imperative. It functions as a polite or indirect imperative. As seen in the English translation that speakers give for such examples, the agent is implied. It is usually translated as second person singular or plural, but occasionally a first person hortative. The sentence is usually framed in the future (10)–(12), as a question (10), or with the higher predicate *ʔəy* ‘good’ (13). Furthermore, the construction allows the motion auxiliary *nem* ‘go,’ which is otherwise limited to clauses where there is an agent that can move (Gerdts 1988b).<sup>8</sup> For example, in (10) and (12) above, it is the implied second person agent that is thought to be moving.

We were actually surprised to find that a fair number of verbs roots (38 out of 489 or 8%) appear in the pseudo-transitive imperative construction:

#### PSEUDO-TRANSITIVE IMPERATIVES

*kʷcə* ‘shout at, use a sharp tone with,’ *kʷθə* ‘lie down (a quadruped), crouch,’ *kʷše* ‘number,’ *ləʃʷ* ‘cover,’ *pələc* ‘turn inside out, turn over,’ *taʃʷ* ‘beach,’ *taʔ* ‘pull apart,’ *θəyq* ‘uneven, staggered,’ *ʃθe* ‘jerk,’ *yaʃ* ‘rub,’ *yeʔ* (*yaʔ*) ‘paddle

<sup>8</sup> There is one exception to this condition on animacy: the subject of verbs expressing natural events such as the tide going out or the moon setting can take motion auxiliaries.

*Salish Intransitive/Transitive Alternations*

backward,' qəlp 'curl, bend,' θimaʔ 'freeze,' λ̥q̥wə 'wrap up, tidy up,' t̥aʔ 'dampen,' x<sup>w</sup>k<sup>w</sup>a 'pull, pull the slack up,' ʔiyeʔq 'change,' lte 'flip,' peʔ 'skim cream off milk, flatten,' qəyeʔ 'take out,' ʔaləχ 'collect,' λ̥əpχ 'scatter it, spread it, broadcast,' qəyt̥ 'bring together,' q<sup>w</sup>ay 'scrape, singe a canoe,' saʔ 'suck,' səyt̥ 'tickle him/her,' šak<sup>w</sup> 'bathe,' šem 'dry, smoke,' taləχ<sup>w</sup> 'send away, chase away,' wet̥ 'knit; pry with a tool,' χcə 'figure out,' čx<sup>w</sup>a 'more, add more to it,' θəyχ 'stoke, rake,' təlqiʔ 'soak,' t̥θek<sup>w</sup> 'pinch,' yəλ̥q̥ 'paint,' məlx<sup>w</sup> 'rub oil on it, grease it'

In many cases, the English equivalents are transitive verbs, though in some cases there are also unaccusative counterparts in English. Again, we have no explanation for why these verb roots differ from the roots in the previous two sections. However, the best analysis for them is that these roots are basically transitive rather than unaccusative in Halkomelem, since the transitive alternants are semantically neutral.

**5. Conclusion**

In sum, roots that take the transitive suffix fall into two types: those where the bare root can easily appear in an unaccusative frame and those that cannot. Typical unaccusative verbs denote processes, with or without an implied external force, and also a handful of states. Those that are not easily classified as unaccusative include a small group of motion verbs, bare roots that appear in an unaccusative frame only in a pseudo-transitive imperative, bare roots that appear in an unergative frame with an oblique-marked object, or those that cannot appear as bare roots at all. These roots are probably best analyzed as being semantically transitive, as the transitive rather than the intransitive alternant (if there is one) seems to be more basic. We summarize our results in Table 2:

Table 2: The semantics of roots taking the transitive suffix

|                                   | UNACCUSATIVE | UNERGATIVE | TRANSITIVE |
|-----------------------------------|--------------|------------|------------|
| STATE                             | 12           | —          | —          |
| SPONTANEOUS PROCESS               | 26           | —          | —          |
| EXTERNAL FORCE                    | 38           | —          | —          |
| MOTION VERBS                      | —            | 5          | —          |
| PSEUDO-TRANSITIVE                 | —            | —          | 38         |
| UNERGATIVE WITH<br>OBLIQUE OBJECT | —            | —          | 35         |
| TRANSITIVE                        | —            | —          | 47         |
| TOTAL                             | 76           | 5          | 121        |

This table gives information on 201 of the 407 roots that allow *-t*. The other 206 roots are “swingers,” exhibiting mixed properties, as discussed in the introduction. Leaving the indeterminate ones aside, we can still say that any

hypothesis that tries to put all the roots into a single class is un insightful for the Halkomelem data. At least some of the roots are transitive, and, as discussed in Section 1, some appear to be unergative.

In other words, Halkomelem probably exhibits the normal tripartite system: there are three major verb classes—unaccusative, unergative, and transitive—and these map to three different syntactic structures.<sup>9</sup> An unaccusative-based syntactic architecture is overly simplistic and provides no insight into the lexical complexities of verb classification in Salish.

Alternatively, we might heed Piñón's (2001a, 2001b) warning against naively taking the morphology at face value. Under his "least common denominator" analysis (cf. Parsons 1990), verb stems are neutral (or alternating) with respect to argument structure. Both transitive and intransitive verbs are built from these neutral verb stems, rather than one being derived from the other. Moreover, the derivation is lexical and therefore subject to conditions on the semantics of event structure (Levin & Rappaport Hovav 2005, and references therein). The neutral approach to alternations not only has cross-linguistic appeal, given the variety of morphological marking patterns found within and across languages (Haspelmath 1993), but also makes sense for Salish, where a unidirectional analysis turns out not to be as promising as it might initially appear, as we have discussed herein.

Whether we posit three distinct classes of roots and then sort out which class or classes a particular root belongs to, or we posit neutral roots and then give the rules for building types of verbs from them, we are left with the task of trying to make sense of the semantics of verb classes. This paper is one step in this enterprise.

## References

- Davis, Henry. 1997. Deep Unaccusativity and Zero Syntax in St'át'imcets. In Amaya Mendikoetxea and Myriam Uribe-Etxebarria, eds., *Theoretical Issues at the Morphology-Syntax Interface*, 55–96. Bilbao: *Supplements of the International Journal of Basque Linguistics and Philology*.
- Davis, Henry. 2000. Salish Evidence on the Causative-Inchoative Alternation. In Wolfgang U. Dressler, Oskar E. Pfeiffer, Markus Pöchtrager, and John R. Rennison, eds., *Morphological Analysis in Comparison*, 25–60. [*Current Issues in Linguistic Theory* 201.] Amsterdam: John Benjamins.
- Davis, Henry, and Hamida Demirdache. 2000. On Lexical Verb Meanings: Evidence from Salish. In Carol Tenny and James Pustejovsky, eds., *Events as Grammatical Objects*, 97–142. Stanford, CA: CSLI Publications.
- Gerdts, Donna B. 1988a. *Object and Absolutive in Halkomelem Salish*. New York: Garland.

---

<sup>9</sup> See Levin & Rappaport Hovav (2005) for a survey of how this is accomplished in various theories.

*Salish Intransitive/Transitive Alternations*

- Gerdts, Donna B. 1988b. Semantic Linking and Relational Structure in Desideratives. *Linguistics* 26:843–872.
- Gerdts, Donna B. 1991. Unaccusative Mismatches in Halkomelem Salish. *International Journal of American Linguistics* 57:230–250.
- Gerdts, Donna B., and Thomas E. Hukari. 1998. Inside and Outside the Middle. *Papers for the 33rd International Conference on Salish and Neighboring Languages*, Seattle, Washington, 166–220.
- Gerdts, Donna B., and Thomas E. Hukari. 2001. The Dual Structure of Halkomelem Motion Verbs. *Proceedings of WAIL 2000*, Santa Barbara Working Papers in Linguistics, Vol. 10, 33–46.
- Gerdts, Donna B., and Thomas E. Hukari. 2006. From Agent-oriented Modality to Aspect in Halkomelem. Paper presented at SSILA, Albuquerque, New Mexico.
- Haspelmath, Martin. 1993. More on the Typology of Inchoative/Causative Verb Alternations. In Bernard Comrie and Maria Polinsky, eds., *Causatives and Transitivity*, 87–120. Amsterdam: John Benjamins.
- Hess, Thomas M. 1973. Agent in a Coast Salish Language. *International Journal of American Linguistics* 29:89–97.
- Jelinek, Eloise. 1994. Transitivity and Voice in Lummi. *Papers for the 29th International Conference on Salish and Neighboring Languages*, Pablo, Montana.
- Kuipers, Aert H. 1968. The Categories Verb-Noun and Transitive-Intransitive in English and Squamish. *Lingua* 21:620–626.
- Levin, Beth, and Malka Rappaport Hovav. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge, MA: MIT Press.
- Levin, Beth, and Malka Rappaport Hovav. 2005. *Argument Realization*. Cambridge, UK: Cambridge University Press.
- Nater, Hank F. 1984. *The Bella Coola Language*. [Mercury Series, Ethnology Service Papers 92.] Ottawa: National Museum of Man.
- Nichols, Johanna, David A. Peterson, and Jonathan Barnes. 2004. Transitivity and Detransitivizing Languages. *Language Typology* 8:149–211.
- Parsons, Terence. 1990. *Events in the Semantics of English: A Study in Subatomic Semantics*. Cambridge, MA: MIT Press.
- Piñón, Christopher. 2001a. A Finer Look at the Causative-Inchoative Alternation. In Rachel Hastings, Brendan Jackson, and Zsófia Zvolenszky, eds., *Proceedings of Semantics and Linguistic Theory* 11. Ithaca, NY: CLC Publications, Cornell University.
- Piñón, Christopher. 2001b. Modelling the Causative-Inchoative Alternation. *Linguistische Arbeitsberichte* 76:273–293. University of Leipzig.
- Suttles, Wayne. 2004. *Musqueam Reference Grammar*. Vancouver: UBC Press.
- Thomason, Sarah, and Daniel Everett. 1993. Transitivity in Flathead. *Papers for the 28th International Conference on Salish and Neighboring Languages*, Seattle, Washington, 317–344.

Donna B. Gerdts and Thomas E. Hukari

Donna B. Gerdts  
Department of Linguistics  
Simon Fraser University  
Burnaby, BC V5A 1S6  
Canada

[gerdts@sfu.ca](mailto:gerdts@sfu.ca)

Thomas E. Hukari  
Department of Linguistics  
University of Victoria  
Victoria, BC V8W 3P4  
Canada

[hukari@uvic.ca](mailto:hukari@uvic.ca)

## The States in Changes of State

ANDREW KOONTZ-GARBODEN  
*Stanford University*

### 0. States and the causative/inchoative alternation

The morphological typology of words denoting non-causative and causative COS predicates, as in (1a,b) respectively (i.e., the causative/inchoative alternation) has been relatively well studied in the typological literature (Nedjalkov and Silnitsky 1973, Croft 1990, Haspelmath 1993).<sup>1</sup>

- (1) a. The vase broke. b. Kim broke the vase.

One of the main findings of this body of research is that there is no single direction of morphological derivation from causative to inchoative or inchoative to causative. Instead, words naming different kinds of events tend to show different directions of derivation (Croft 1990, Haspelmath 1993, Levin and Rappaport Hovav 1995). COS events that generally come about spontaneously, such as *freezing* events, for example, tend to be lexicalized as inchoatives, with the causative being derived, as shown for Swahili in (2).

- (2) Swahili *freezing* events (Haspelmath 2005, 5)  
a. ganda (intransitive) b. gand-**isha** (transitive)

In contrast, events that tend not to come about spontaneously, such as events of *breaking*, are generally lexicalized as causatives, with the inchoative derived as shown again for Swahili by the data in (3).

- (3) Swahili *breaking* events (Haspelmath 2005, 5)  
a. vunja (transitive) b. vunj-**ika** (intransitive)

---

<sup>1</sup> Above all, I acknowledge the collaboration of the members of the community-based Ulwa Language Project, Karawala, RAAS. I am also indebted to Tom Green, Nubia Ordoñez, Guillermo Mclean, Melvin James Olegario, Elena Benedicto, and IPILC-URACCAN for facilitating my work with the Ulwa Language Project. BLS-32 audience members, Beth Levin, Peter Sells, Paul Kiparsky, Judith Tonhauser, Itamar Francez, Ashwini Deo, Philip Hofmeister, and John Beavers have all offered comments which have moved the work along. Financial support for the research reported here was provided in part by a Fulbright-Hays Dissertation Research Abroad Fellowship, Graduate Research Funds from the Department of Linguistics at Stanford University, and an NSF Small Grant for Exploratory Research (NSF Grant BCS-0004437, P.I. Beth Levin).

In what follows, I show that in addition to how the COS event is brought about (spontaneously or not), another factor that impacts the encoding of COS events is the nature of the state underlying the change of state. This is demonstrated primarily on the basis of data from Ulwa (Misumalpan), which show that COS events based on particular kinds of states (Dixon’s 1982 *property concepts* or adjectival states), are treated differently from other kinds of COS events (e.g., *break-type* COS events). Data from a number of other languages further suggest that it is not only in Ulwa that the nature of the state in a COS event has an impact on the encoding of the COS event. Instead, in a number of other unrelated languages, COS events based on adjectival states are, as in Ulwa, encoded differently from *break-type* COS events. This distinction has not been previously recognized—most discussions of the event structure of the causative/inchoative alternation make no distinction between deadjectival COS events and other COS events (Dowty 1979, Levin and Rappaport Hovav 1995, Piñon 2001), while some explicitly treat deadjectival and other types of COS events (e.g., *break-type*) on a par with one another (Parsons 1990, Baker 2003, Embick 2004). The findings suggest that COS events need to be distinguished on the basis of whether they are lexicalized as eventive eventualities (as with *break-type* eventualities) or whether the COS event is instead derived from the stative eventuality underlying the (derived) COS event, as in the case of change into adjectival state events.

I begin by discussing the privileged crosslinguistic status of adjectival states. I then examine deadjectival verbs and *break-type* verbs in the context of Ulwa verb class morphology. Next, I outline an analysis of the observed contrast in the encoding of COS events, proposing that it follows from differences in lexicalization. I then point toward data from other languages that suggest the highlighted contrast to be crosslinguistically robust.

### 1. Adjectival states as a privileged class of states

Two empirical observations suggest that adjectival states, the kinds of stative notions in (4) that Dixon (1982, 2004) refers to as *property concepts*, are a privileged class of stative predicates crosslinguistically.

(4) Dixon’s classes of adjectival states (Dixon 2004, 3ff.)

|                         |                                                 |
|-------------------------|-------------------------------------------------|
| <b>dimension</b>        | big, small, long, tall, short, wide, deep, etc. |
| <b>age</b>              | new, young, old, etc.                           |
| <b>value</b>            | good, bad, lovely, atrocious, perfect, etc.     |
| <b>color</b>            | black, white, red, etc.                         |
| <b>phys. prop.</b>      | hard, soft, heavy, wet, rough, strong, etc.     |
| <b>speed</b>            | fast, quick, slow, etc.                         |
| <b>human propensity</b> | jealous, happy, kind, clever, generous, etc.    |

First, in a survey of languages with small inventories of adjectives, where many stative notions are instead lexicalized as nouns or verbs, Dixon (1982) found that no matter how small a class of adjectives a language has, if it has any adjectives

at all, the class includes notions of *dimension*, *age*, *value*, and *color*. Crosslinguistically, as languages have progressively larger classes of adjectives, *physical property*, *speed*, and *human propensity* notions are also included in the class (see also Stassen 1997). Secondly, the names given to these stative eventualities are always morphologically simple, regardless of lexical category (Koontz-Garboden 2005, 2006a, Koontz-Garboden and Levin 2005). These facts suggest that adjectival states are a privileged lexical semantic class crosslinguistically. Given this observation, then, it might not be surprising to find that changes into these kinds of states are encoded differently from other types of COS events, in particular changes into states which are not in this privileged class.

## 2. Two classes of change of state verbs in Ulwa

Data from Ulwa, an endangered Misumalpan language spoken by approximately 350 people in the village of Karawala on Nicaragua's Atlantic coast, confirm the suspicion that COS events based on adjectival states are treated differently from changes into states that are not in the core Dixonian class. I show this by contrasting the behavior of deadjectival verbs and *break*-type verbs, drawing on data from eleven months of my own fieldwork in 2004–2005 and from Green (1999).

I begin by laying out the facts of the Ulwa system of verb class suffixes. I then show that in this context, COS events based on different kinds of states receive different kinds of encoding. I follow this by an analysis which is built on the idea that change into adjectival state events are built on adjectival state roots, while *break*-type COS events are built on eventive roots.

### 2.1. Ulwa verb class suffixes

Ulwa verbs are divided into four major morphological classes according to the suffix that appears following the verbal root: *-da-*, *-pa-*, *-wa-*, and *-ta-*. The data in (5) illustrate verbs of each of these four classes, showing that while *-da-* and *-wa-* verbs are intransitive (5a,c), there exist both transitive (5b,d) and intransitive (5e,f) verbs in the *-pa-* and *-ta-* classes. (Infixes are glossed with <>.)<sup>2</sup>

- (5) a. As-ki-na ya andih birh-d-ida.  
shirt-<1SING> DEF already tear-DA-3SING.PAST  
'My shirt has already torn.'
- b. Asna ya birh-p-i yâ-t-ah.  
cloth DEF tear-PA-PROX 1SING.OBJ-TA-2SING.IMP  
'Tear the cloth and give it to me.'

<sup>2</sup> Although Hale and Salamanca (2002) briefly acknowledge that there are not only transitive *-pa/ta-* verbs, but intransitive as well, their analysis is built around the idea that *-pa-* and *-ta-* are transitivizers, an idea that (5e,f) show cannot be correct. In fact, Green's (1999) dictionary lists approximately one hundred *-pa/ta-* class intransitive verbs, many of whose intransitivity I have verified.

- c. Arak-ki-bus bah-w-ida.  
gun-<1 SING> break-WA-3SING.PAST  
'My gun broke.'
- d. Wahai-ki arak-ki-bus bah-t-ida.  
brother-1 SING gun-<1 SING> break-TA-3SING.PAST  
'My brother broke my gun.'
- e. Kimby ya madi laih babar-p-ida.  
Kimby DEF now TOP thin-PA-3SING.PAST  
'Kimby has become thin.'
- f. Kung-ki-mak pupuh-t-ida, yapa bahangh sip  
lip-<1 SING> swell-TA-3SING.PAST that so possible  
wui-pa-sing.  
whistle-PA-1 SING.NEG  
'My lip is swollen, and so I cannot whistle.'

The generalization, then, captured by the table in (6) is that any verb that is transitive will be in the *-ta/pa-* class. For intransitive verbs, however, there are four possibilities for what class a meaning could fall into.

- (6) An overview of the transitivity of Ulwa morphological verb classes

|             | intransitive | transitive |
|-------------|--------------|------------|
| <i>-da-</i> | yes          | no         |
| <i>-wa-</i> | yes          | no         |
| <i>-pa-</i> | yes          | yes        |
| <i>-ta-</i> | yes          | yes        |

## 2.2. The morphological classes of COS verbs in Ulwa

Data presented in the following two sections show that in the context of the Ulwa verb class system, change into adjectival state events are encoded differently from *break*-type COS events, which are not based on the Dixonian adjectival states.

### Change into adjectival state verbs

COS verbs related to core adjectival states with few exceptions have intransitive verbs in either the *-ta-* or the *-pa-* class, as illustrated by the table in (7).

- (7) Adjectives with associated intransitive COS verb

| adjective | gloss | Dixon class       | intrans COS verb class |
|-----------|-------|-------------------|------------------------|
| auhka     | fat   | physical property | ta                     |
| babarka   | thin  | physical property | pa                     |
| sikka     | big   | dimension         | wa                     |
| itukwana  | big   | dimension         | wa                     |
| bisika    | small | dimension         | pa                     |

*The States in Changes of State*

|         |                      |           |    |
|---------|----------------------|-----------|----|
| tubakka | thick/dense          | dimension | ta |
| siuka   | grown/mature (fruit) | age       | ta |
| yamka   | good                 | value     | pa |
| dutka   | bad                  | value     | ta |
| pauka   | red                  | color     | ta |
| pihka   | white                | color     | ta |
| baraska | black                | color     | pa |
| puputka | brown                | color     | ta |
| lalahka | yellow               | color     | ta |

The first observation, revealed by the table in (7), is that deadjectival verbs always have adjectives based on the same roots. This may seem a tautologous observation for a class called “deadjectival”, but it is nevertheless important. As shown below, this is not necessarily the case for COS verbs based on non-adjectival states.

Next, some of these verbs participate in the causative/inchoative alternation, such as *auhnaka* ‘to become fat’ in (8). Noteworthy, however, is the fact that there is no change in verb class associated with the alternation—both the inchoative in (8a) and the causative in (8b) are in the *-ta-* class.

(8) *auhnaka* ‘to become fat’

- a. Kasnaka dî-ka mah-ka kas-ring laih  
 food thing-3SING much-ADJ eat-3SING.IRR if  
 auh-ta-ring.  
 fat-TA-1SING.IRR  
 ‘If I eat a lot I will become fat.’
- b. Sû-ki-lu auh-t-ikda.  
 dog-<1SING> fat-TA-1SING.PAST  
 ‘I fattened my dog up.’

Other change into adjectival state verbs fail to participate in the causative/inchoative alternation, lacking the causative variant, as illustrated for the verb *babarnaka* ‘to become thin’ in (9).

(9) *babarnaka* ‘to become thin’

- a. Sûlu as watah yang katka babar-p-ida bahangh  
 dog INDEF have 1SING but thin-PA-3SING.PAST so  
 wal-ta-sing.  
 want-TA-1SING.NEG  
 ‘I have a dog that has become thin, so I no longer want him/her.’
- b. \* Yang raupi sù-ki-lu babar-p-ikda, kanas auhka  
 1SING SUBJ dog-<1SING> thin-PA-1SING.PAST more fat-ADJ  
 dai bahangh.  
 PAST.COP so  
 ‘I thinned my dog up because he was so fat.’

In summary, deadjectival verbs have adjectives based on the same roots, the verbs are in the *-ta/pa-* classes, and sometimes participate in the causative/inchoative alternation, though without a change in morphological class.

**Break and cooking-type COS verbs**

In contrast to what was just seen for deadjectival verbs which have intransitives in the *-ta/pa-* classes, intransitive verbs based on states that don't fall into Dixon's core class, exemplified by Levin's (1993) *break* and cooking verbs, have intransitive verbs that tend to be in the *-da-* or the *-wa-* classes, as shown for the infinitival forms of such verbs in (10) and (11).

(10) Infinitival forms of some intransitive *break* verbs

bah-**wa**-naka 'break', pil-**da**-naka 'chip', sah-**wa**-naka 'crack', dak-**wa**-naka/dak-**da**-naka 'rip/snap', sah-**wa**-naka 'split', birh-**da**-naka 'tear, rip, shred', kalh-**da**-naka 'crush/break', lis-**da**-naka 'split/cleave', suih-**da**-naka 'break, snap off', tak-**da**-naka 'chip, flake off, peel', turu-**da**-naka 'flake (skin)', buk-**da**-naka 'chip/crack (e.g. lips)'

(11) Infinitival forms of some intransitive cooking verbs

lah-**wa**-naka 'boil', dâ-**wa**-naka 'burn/bake'

Another point of contrast with deadjectival verbs is that the *break*-type and cooking type verbs consistently participate in the causative/inchoative alternation *with a difference in the morphological class of the two variants*, as illustrated for the verb *bah(wa)naka* 'break' in (12), where the intransitive variant in (12a) is in the *-wa-* class with the transitive variant in (12b) in the *-ta-* class.

- (12) a. Tulh-ki                    ya    wauh-d-i    bah-w-ida.  
 machete-1 SING DEF fall-DA-SS break-WA-3 SING.PAST  
 'My machete fell and broke.'
- b. Aaka baka-ka            ul-niki                    pan-ka  
 this child-3 SING write-1 SING.INF stick-3 SING  
 bah-t-ida.  
 break-TA-3 SING.PAST  
 'This child broke my pen/pencil.'

The *break* and cooking verbs also contrast with the deadjectival verbs in that adjectives based on the same roots as *break*-type and cooking verbs are generally not attested. For example, although there is a verb *lahwanaka* 'boil', there is no associated adjective \**lahka* with a meaning related to the verb based on the same root.

In summary, *break*-type verbs are built on roots that do not generally also form adjectives. Further, they consistently participate in the causative/inchoative alternation with a morphological difference between causative, which is in *-ta/pa-*, and inchoative, which is in *-da/wa-*. This contrasts with the situation for the deadjectival verbs, which have intransitives in the *-pa/ta-* classes. These observations lead

to the question whether there is any difference between these morphological classes that might shed light on why deadjectival intransitives and *break*-type transitives are in the *-pa/ta-* classes while *break*-type intransitives are in the *-da/wa-* classes.

### 2.3. A bit more about Ulwa verb class morphology

It turns out that there is a difference in the extent to which *-pa/ta-* verbs and *-da/wa-* verbs consistently show their thematic markers in verbal paradigms. In infinitival paradigms, *-pa/ta-* verbs fail to show their thematic marker at all, as shown in (13a). Verbs in the *-da/wa-* classes, on the other hand, consistently show their verb class marker throughout the infinitival paradigm, as shown in (13b).

#### (13) Infinitival paradigms

a. *-pa-* class *sangnaka* ‘to spoil; to cause to become green’

|       |           |          |             |
|-------|-----------|----------|-------------|
| 1sing | sang-niki | 1pl.excl | sang-nikina |
|       |           | 1pl.incl | sang-nini   |
| 2sing | sang-nama | 2pl      | sang-namana |
| 3sing | sang-naka | 3pl      | sang-nakana |

b. *-da-* class *birhdanaka* ‘to become torn’

|       |                       |          |                         |
|-------|-----------------------|----------|-------------------------|
| 1sing | birh- <b>da</b> -niki | 1pl.excl | birh- <b>da</b> -nikina |
|       |                       | 1pl.incl | birh- <b>da</b> -nini   |
| 2sing | birh- <b>da</b> -nama | 2pl      | birh- <b>da</b> -namana |
| 3sing | birh- <b>da</b> -naka | 3pl      | birh- <b>da</b> -nakana |

Similarly, in finite paradigms, while *-pa/ta-* class verbs fail to show their verb class marker in the first person inclusive and the third person plural, as shown in (14a), *-da/wa-* class verbs consistently show their verb class marker throughout the paradigm, as shown in (14b).

#### (14) Finite paradigms

a. *-pa-* themed *sangnaka* ‘to spoil; to cause to become green’

|       |                       |          |                         |
|-------|-----------------------|----------|-------------------------|
| 1sing | sang- <b>pa</b> -yang | 1pl.excl | sang- <b>pa</b> -yangna |
|       |                       | 1pl.incl | sang-wai                |
| 2sing | sang- <b>pa</b> -yam  | 2pl      | sang- <b>pa</b> -yamna  |
| 3sing | sang- <b>pa</b> -i    | 3pl      | sang-dai                |

b. *-da-* themed *birhdanaka* ‘to become torn’

|       |                       |          |                         |
|-------|-----------------------|----------|-------------------------|
| 1sing | birh- <b>da</b> -yang | 1pl.excl | birh- <b>da</b> -yangna |
|       |                       | 1pl.incl | yak birh- <b>da</b> -i  |
| 2sing | birh- <b>da</b> -yam  | 2pl      | birh- <b>da</b> -yamna  |
| 3sing | birh- <b>da</b> -i    | 3pl      | birh- <b>da</b> -dai    |

Thus, while *-da/wa-* class verbs consistently show their verb class marker throughout the paradigm, this is not so for *-pa/ta-* class verbs, suggesting that these classes are fundamentally different from one another. Further, while *-da/wa-* verbs are consistently intransitive, *-pa/ta-* verbs vary in transitivity. Assuming some treatment of the verb class markers as affixes (cf. Hale and Salamanca 2002), while *-da/wa-*

suffixation is both found throughout the paradigm and has a consistent semantic outcome—intransitivity—neither is the case for *-pa/ta-* suffixation, which neither appears throughout the paradigm nor has a consistent semantic outcome, there being both transitive and intransitive verbs in these classes. These facts suggest that while *-da-* and *-wa-* are derivational affixes operating on a root yielding some semantically altered stem with fixed intransitivity, *-pa/ta-* are something else, possibly part of the person/number/finiteness inflectional morphology.

In the context of the encoding of COS events in Ulwa, then, the observation is that while intransitive verbs in the *-da/wa-* classes, including intransitive *break*-type verbs, are based on derived stems, intransitives in the *-pa/ta-* classes, including intransitive deadjectival verbs, are not (see Koontz-Garboden 2006b for an additional argument to this effect).

#### 2.4. Summary of the Ulwa facts

The table in (15) summarizes the facts of Ulwa discussed in the previous sections.

(15) *Break* versus deadjectival verbs in Ulwa

|              | adj | inchoative                 | causative                  |
|--------------|-----|----------------------------|----------------------------|
| deadjectival | yes | <i>-pa/ta-</i> (underived) | <i>-pa/ta-</i> (underived) |
| <i>break</i> | no  | <i>-da/wa-</i> (derived)   | <i>-pa/ta-</i> (underived) |

First, while deadjectival intransitives are in the *-pa/ta-* morphological verb classes, *break*-type intransitives are in the *-da/wa-* classes. The difference between these morphological classes is such that deadjectival intransitives are underived while *break*-type intransitives are derived. Further, *break*-type transitives fall into the *-pa/ta-* class, showing that in their underived form, they are causative. Next, *break*-type verbs consistently participate in the causative/inchoative alternation, with the intransitive variant in the derived *-da/wa-* classes. Finally, there are adjectives based on the roots forming deadjectival verbs, while there are no adjectives based on the roots forming *break* verbs. In the following section, I suggest the outlines of an analysis of the lexical semantics of Ulwa roots and Ulwa derivational operations that captures these facts.

### 3. Toward an analysis

The core theoretical assumption that the analysis of the highlighted contrasts rests on is the Monotonicity Hypothesis (MH), the idea that word formation processes add, but do not delete meaning (Kiparsky 1982, Rappaport Hovav and Levin 1998, Koontz-Garboden 2005, 2006a, in prep.). Given this idea, the roots underlying deadjectival verbs must be stative—while change into adjectival state verbs can be derived from states monotonically, states cannot be so derived from changes of state; a derivation from change of state to state would necessarily involve the deletion of change semantics, inconsistent with the MH. The lexical semantics of the root underlying the deadjectival verb *auhnaka* ‘fatten’, then, would be as in (16a), where *x* ranges over ordinary individuals and *s* over stative eventualities. In

contrast, roots underlying *break*-type verbs are causative and eventive, as in (16b), where  $e$  ranges over eventive eventualities,  $v$  ranges over eventualities more generally (whether stative or eventive), and  $\theta$  is an unspecified theta role, determined in part by the nature of the causing eventuality  $v$ .

- (16) a. denotation of the root *auh*- ‘fat’ =  $\lambda x \lambda s [fat(s,x)]$   
 b. denotation of the root *bah*- ‘break’ =  $\lambda y \lambda x \lambda e [\exists v \exists s [CAUSE(v,e) \wedge \theta(v,x) \wedge BECOME(e,s) \wedge THEME(s,y) \wedge \neg whole(s)]]$

Given the lexical semantics in (16b), the MH predicts that there should not be adjectives based on these roots, since such a derivation would involve the deletion of causative and change of state semantics (i.e., to get from something like (16b) to something like (16a)). As discussed above, this prediction is borne out. Further, the treatment of the root as causative captures the fact that verbs based on such roots are causatives as underived *-ta/pa-* class verbs. Concerning the intransitive *-da/wa-* variants of *break*-type verbs, I treat the *-da/wa-* suffixes as anticausativizers, with anticausativization semantically being a kind of reflexivization operation (Chierchia 2004). This is discussed in detail in Koontz-Garboden (in prep.), who further shows the reflexivization analysis to be consistent with the MH.

The core of the analysis rests on two simple ideas: the MH and a contrast in the lexicalization of roots. Change into adjectival state verbs are built on roots that are lexicalized as states, while *break*-type COS verbs are built on roots that are lexicalized as (two argument) events. Given the contrast in lexicalization, many of the observed differences in behavior between the two classes follow from the MH.

#### 4. Supporting data from other languages

It is not only in Ulwa that these kinds of contrast in behavior between deadjectival and *break*-type verbs are observed. Indeed, across a number of other languages, deadjectival verbs are derived from morphologically simple state denoting words, while *break*-type verbs are morphologically simple as COS events. Additionally, *break*-type verbs lack corresponding simple adjectives (a fact suggesting they are not derived from the states underlying the COS events). To take one example, the data in (17) and (18) from Megerdooimian (2002) show this kind of contrast in Eastern Armenian. While *-anal* derives a non-causative COS from an adjectival state and *-ats-* a causative COS from this, there appear to be no simple adjectives associated with *break*-type verbs. Instead, the morphologically simple form names a causative COS, with the non-causative COS being derived by an anticausative operation, marked with *-v-*.

(17) Eastern Armenian deadjectival verbs (Megerdooomian 2002, 98)

| adjective          | non-causative COS     | causative COS                 |
|--------------------|-----------------------|-------------------------------|
| layn (wide)        | layn.anal (widen)     | layn.ats.nel (widen)          |
| čor (dry)          | čor.anal (dry)        | čor.ats.nel (dry)             |
| metz (big)         | metz.anal (grow)      | metz.ats.nel (grow, bring up) |
| arag (fast, quick) | arag.anal (quicken)   | arag.ats.nel (accelerate)     |
| čaq (fat)          | čaq.anal (become fat) | čaq.ats.nel (fatten)          |
| sev (black)        | sev.anal (blacken)    | sev.ats.nel (blacken, darken) |

(18) Eastern Armenian *break*-type verbs (Megerdooomian 2002, 98)

| adjective | causative COS            | non-causative COS           |
|-----------|--------------------------|-----------------------------|
| –         | k’ot’Rel (break)         | k’ot’R.v.el (break)         |
| –         | epel (cook)              | ep.v.el (cook)              |
| –         | poxel (change)           | pox.v.el (change)           |
| –         | šarjel (move)            | šarj.v.el (move)            |
| –         | xort’ak’el (sink, drown) | xort’ak’.v.el (sink, drown) |

Additionally, I have observed similar kinds of contrasts in Tongan (Churchward 1953, 1959), O’odham (Hale and Keyser 1998, 92,95), Pima (Smith 2006), Greek (Alexiadou and Anagnostopoulou 2004, 124-125), Hebrew (Doron 2003, 56, 61–62), Quechua (Cusihuaman 1976, Weber 1989), and Warlpiri (Hale and Keyser 1998). This suggests a crosslinguistic tendency for this kind of contrast in behavior between verbs with these kinds of meanings, a fact which I believe to be the results of (i) the nature of the semantics of word formation (constrained by the MH) and (ii) differences in lexicalization of roots (states versus COS events).

## 5. Concluding remarks

I have shown, largely on the basis of data from Ulwa, an endangered Misumalpan language that deadjectival verbs and *break*-type verbs differ from one another in fundamental ways. First, there are morphologically simple adjectives based on the roots underlying deadjectival verbs, while there are not for the roots underlying *break*-type verbs. Additionally, only *break*-type verbs consistently have causatives. Finally, intransitive *break*-type verbs and deadjectival verbs fall into different morphological verb classes, the former derived, the latter underived. This contrast, I believe, follows from both local differences in lexicalization and a more global constraint on the semantics of word formation (monotonicity). Regardless of analysis, however, the facts discussed clearly show that deadjectival and *break*-type verbs behave differently from one another, contra many analysis that treat them identically (e.g., Dowty 1979, Parsons 1990, Levin and Rappaport Hovav 1995, Piñón 2001, Baker 2003, Embick 2004). This area, then, is ripe for further theoretical exploration.

## References

- Alexiadou, Artemis and Elena Anagnostopoulou. 2004. Voice Morphology in the Causative-Inchoative Alternation: Evidence for a Non-unified Structural Analysis of Unaccusatives. In A. Alexiadou, E. Anagnostopoulou, and M. Everaert, eds., *The Unaccusativity Puzzle*, 114–136. Oxford: Oxford University Press.
- Baker, Mark C. 2003. *Lexical Categories: Verbs, Nouns, and Adjectives*. Cambridge: Cambridge University Press.
- Chierchia, Gennaro. 2004. A Semantics for Unaccusatives and its Syntactic Consequences. In A. Alexiadou, E. Anagnostopoulou, and M. Everaert, eds., *The Unaccusativity Puzzle*, 22–59. Oxford: Oxford University Press.
- Churchward, C. Maxwell. 1953. *Tongan Grammar*. London: Oxford University Press.
- Churchward, C. Maxwell. 1959. *Tongan Dictionary: Tongan-English and English-Tongan*. London: Oxford University Press.
- Croft, William. 1990. Possible Verbs and the Structure of Events. In S. Tsonatzidis, ed., *Meanings and Prototypes*, 48–73. London: Routledge.
- Cusihuaman, Antonio. 1976. *Gramática Quechua: Cuzco-Collao*. Lima, Perú: Ministerio de Educación, Instituto de Estudios Peruanos.
- Dixon, R.M.W. 1982. *Where Have All the Adjectives Gone? And Other Essays In Semantics and Syntax*. The Hague: Mouton.
- Dixon, R.M.W. 2004. Adjective Classes in Typological Perspective. In R. Dixon and A. Y. Aikhenvald, eds., *Adjective Classes: A Cross-linguistic Typology*, 1–49. Oxford: Oxford University Press.
- Doron, Edit. 2003. Agency and Voice: The Semantics of Semitic Templates. *Natural Language Semantics* 11:1–67.
- Dowty, David. 1979. *Word Meaning and Montague Grammar*. Dordrecht: Reidel.
- Embick, David. 2004. On the Structure of Resultative Participles in English. *Linguistic Inquiry* 35(3):355–392.
- Green, Thomas Michael. 1999. *A Lexicographic Study of Ulwa*. Ph.D. diss., Massachusetts Institute of Technology.
- Hale, Kenneth L. and Samuel Jay Keyser. 1998. The Basic Elements of Argument Structure. In *Papers from the UPenn/MIT Roundtable on Argument Structure and Aspect*, 73–118. Cambridge, MA: MITWPL.
- Hale, Kenneth L. and Danilo Salamanca. 2002. Theoretical and Universal Implications of Certain Verbal Entries in Dictionaries of the Misumalpan Languages. In W. Frawley et al., ed., *Making Dictionaries*, 25–59. Berkeley, CA: University of California Press.
- Haspelmath, Martin. 1993. More on the Typology of Inchoative/Causative Verb Alternations. In B. Comrie and M. Polinsky, eds., *Causatives and Transitivity*, 87–120. Amsterdam: John Benjamins.
- Haspelmath, Martin. 2005. Universals of Causative Verb Formation. LSA Institute class handout, August 2, 2005.

- Kiparsky, Paul. 1982. Word-formation and the Lexicon. In F. Ingeman, ed., *Proceedings of the 1982 Mid-America Linguistic Conference*.
- Koontz-Garboden, Andrew. 2005. On the Typology of State/Change of State Alternations. *Yearbook of Morphology* 2005:83–117.
- Koontz-Garboden, Andrew. 2006a. Aspectual Coercion and the Typology of Change of State Predicates. Ms., Stanford University.
- Koontz-Garboden, Andrew. 2006b. Two Classes of Intransitive Verbs in Ulwa. Paper presented at 2006 Annual Meeting of the Society for the Study of the Indigenous Languages of the Americas. Albuquerque, NM.
- Koontz-Garboden, Andrew. In prep. *States, Changes of State, and Monotonicity*. Ph.D. diss., Stanford University.
- Koontz-Garboden, Andrew and Beth Levin. 2005. The Morphological Typology of Change of State Event Encoding. In G. Booij, E. Guevara, A. Ralli, S. Sgroi, and S. Scalise, eds., *Online proceedings of the Fourth Mediterranean Morphology Meeting (MMM4) Catania, 21-23 September 2003*, 185–194. Università degli Studi di Bologna. <http://morbo.lingue.unibo.it/mmm/mmm4-proceedings.php>.
- Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago, IL: University of Chicago Press.
- Levin, Beth and Malka Rappaport Hovav. 1995. *Unaccusativity: At the Syntax-Lexical Semantics Interface*. Cambridge, MA: MIT Press.
- Megerdooomian, Karine. 2002. *Beyond Words and Phrases: A Unified Theory of Predicate Composition*. Ph.D. diss., University of Southern California.
- Nedjalkov, V.P. and G.G. Silnitsky. 1973. The Typology of Morphological and Lexical Causatives. In F. Kiefer, ed., *Trends in Soviet Theoretical Linguistics*, 1–32. Dordrecht: D. Reidel.
- Parsons, Terence. 1990. *Events in the Semantics of English: A Study in Subatomic Semantics*. Cambridge, MA: MIT Press.
- Piñón, Christopher. 2001. A Finer Look at the Causative-inchoative Alternation. In R. Hastings, B. Jackson, and Z. Zvolenszky, eds., *Proceedings of Semantics and Linguistic Theory XI*, 346–364. Ithaca, NY: CLC Publications.
- Rappaport Hovav, Malka and Beth Levin. 1998. Building Verb Meanings. In M. Butt and W. Geuder, eds., *The Projection of Arguments: Lexical and Compositional Factors*, 97–134. Stanford, CA: CSLI.
- Smith, Marcus. 2006. Canalization of Causative Derivations. Presented at 2006 meeting of LSA, Albuquerque, NM.
- Stassen, Leon. 1997. *Intransitive Predication*. Oxford: Oxford University Press.
- Weber, David. 1989. *A Grammar of Huallaga (Huánuco) Quechua*. Berkeley, CA: University of California Press.

*The States in Changes of State*

Andrew Koontz-Garboden  
Stanford University  
Department of Linguistics  
Margaret Jacks Hall, Bldg. 460  
Stanford, CA 94305-2150

[andrewkg@csl.stanford.edu](mailto:andrewkg@csl.stanford.edu)



## Complementation by Construction

LAURA A. MICHAELIS

*University of Colorado at Boulder*

### 1. Introduction

Where does a verb's frame come from? According to an emerging consensus, the source is 'top down' scene construal rather than 'bottom up' lexical projection (Goldberg 1995, 2006, Kaschak & Glenberg 2000, 2002, Partee & Borschev 2007, Michaelis & Ruppenhofer 2001). For example, as shown in (1-3), monovalent activity verbs like *melt* and *sparkle*, which have nothing intrinsically to do with location, can appear in the 'locative inversion' pattern, resulting in what Bresnan (1994) calls an 'overlay' of the locative-theme frame:

- (1) In Maria's sticky hand **melted** a chocolate-chip ice-cream cone. (Birner & Ward 1998: 193)
- (2) And in this lacey leafage **fluttered** a number of grey birds with black and white stripes and long tails. (Levin & Rappaport Hovav 1995: 226)
- (3) Down at the harbor there is teal-green clubhouse for socializing and parties. Beside it **sparkles** the community pool. (*Vanity Fair*, 8/01)

In (1-3), the verb appears to describe what an entity is doing while in its location (melting, fluttering, sparkling) rather than a location state *per se*. Looking at a similar class of examples in Russian, Partee & Borschev (2007:158) observe, "[o]ne could say that THING and LOC are roles of the verb [be] 'be', but it is undoubtedly better to consider them roles of the participants of the situation (or state) of existing or of being located". They go on to point out that the situation of existing involves not only a location state but also a particular perspective on that state, which they describe through an analogy to vision:

In an existential sentence, the LOC is chosen as the perspectival center; [the sentence asserts] of the LOC that it has THING in it. [...] An existential sentence is analogous to the way a security camera is fixed on a scene and records whatever is in that location. (Partee & Borschev 2007:156)

The security-camera metaphor aptly captures the stylistic effect of the locative-inversion pattern, but if we take it seriously we have to acknowledge that word meaning and syntactic meaning are a good deal more similar than traditional models of syntax would care to admit. Like a word, a syntactic pattern may be conventionally associated with a highly elaborated semantic frame, including a perspectival one. This is the view taken in construction-based syntax, as described by Goldberg (1995, 2002, 2006) and others. Goldberg argues that argument-structure patterns are constructions that denote situation types, and, therefore, that a verb's meaning and combinatory potential might change to fit the meaning of a given construction (Goldberg 1995, 2002, 2006, Michaelis & Ruppenhofer 2001, Michaelis 2004). The construction-based model of argument structure proposed by Goldberg is integrative rather than projection-based: verb meanings are combined with construction meanings via a fixed number of semantic relations (including *instance*, *means* and *manner*) and the set of arguments licensed by the construction may properly include that licensed by the verb with which the construction is combined, as in (4-5):

- (4) Most likely they were fellow visitors, just **panting** up to the sky-high altar out of curiosity. (L. Davis, *Last Act in Palmyra*, p. 28)
- (5) When a visitor passes through the village, young lamas stop picking up trash to mug for the camera. A gruff 'police monk' **barks** them back to work. (*Newsweek* 10/13/97)

In (4), *pant*, a verb that otherwise licenses only a single argument, appears with two: it denotes the *manner* of the directed-motion event denoted by the construction. In (5), *bark*, another otherwise monovalent activity verb, has two additional arguments, a direct object and an oblique expression that indicates direction; in this context, the verb denotes the *means* by which a metaphorical caused-motion event, denoted by the construction, occurs. Rather than presuming a nonce lexical entry for *pant* in which it means 'move toward a goal while panting' and for *bark* in which it means 'move something from one place to another by barking', the constructionist presumes that the verbs in (4-5) mean what they always mean; arguments not licensed by the verb are licensed by the construction with which the verb combines. The constructional model of verbal syntactic variability is therefore more parsimonious than a lexicalist one: using a small number of argument-structure constructions, it limits the number of lexical entries needed for each verb.

The problem, however, is that the patterns that we use for creating phrases are not supposed to denote anything: they combine symbols rather than being symbols themselves. In other words, there is no compositional model of sentence meaning in which patterns of word combination are intrinsically meaningful. It is easy to understand why. In such models, sentences are licensed by rule-to-rule pairs, each of which consists of a context-free phrase-structure rule and a rule composing the semantics of the mother from the semantics of the daughters. By

### *Complementation by Construction*

changing the syntactic associations in a string of words one can change what the word string means, but not what the words in that string mean. An analogy to number sequences makes this clear: if we change the associations within an arithmetic sequence like  $2 \times (3 + 4)$  so as to create the sequence  $(2 \times 3) + 4$ , we change what the sequence denotes (from 14 to 10), but not what the numbers themselves denote. If the rules of syntactic combination do not add conceptual content to that contributed by the words, they should not be able to alter the combinatory potential of words.

In order to preserve a compositional model of sentence meaning, one might choose to view valence augmentation and other construal-based semantic effects on verbs as the products of lexical derivations that build up complex event structures from simpler ones. A model of this nature is proposed by Rappaport Hovav & Levin (1998) (henceforth, RHL; see also Levin 2000). Unlike the construction-based model outlined above, the RHL model is based on lexical projection; as they put it: “Many aspects of the syntactic structure of a sentence—in particular, the syntactic realization of arguments—are projected from the lexical properties of the verbs” (RHL: 97). Each of a verb’s syntactic frames is associated with a distinct verb meaning, although every verb has one basic class membership. An implication of this model is that most verbs are polysemous, and many highly polysemous. Since RHL presume (in accordance with Pinker (1989) and others) that the only syntactically relevant component of verb meaning is aspectual meaning, the more aspectual representations a verb has the more syntactic variation it will display, and vice versa. To represent verb meaning and semantic operations on verb meaning, RHL propose (a) a set of Aktionsart-based schemas and (b) an operation that augments one such schema up to another one. Both the schemas and the augmentation operation are independently motivated; they appear, for example, in the transition network used by Moens & Steedman (1988) to model aspectual type-shifts triggered by verb morphology. An example of one such shift is given in (6):

(6) Mary was winning the race (when she was tripped by Zola).

In (6) we see that the progressive construction, which seeks a durative event as its daughter, can combine with a verb denoting a momentaneous event (*win*) and in so doing create a construal in which winning is preceded by a preparatory process. In terms of the Moens & Steedman analysis, the progressive operator applies to the process phase of a culminated process (i.e., an accomplishment verb) that is derived from a culmination (i.e., an achievement verb) via augmentation (i.e., the addition of an activity representation or ‘run-up process’). In the RHL model, verbs meanings are represented by the set of event-structure templates given in Table 1. In these representations, variables represent participants licensed by the event-structure template and capitalized italic terms enclosed in angled brackets represent idiosyncratic meaning components contributed by whatever verb combines with the template:

Table 1. Event Structure Templates (Rappaport Hovav & Levin 1998)

| Aktionsart Class | Semantic Representation                                           |
|------------------|-------------------------------------------------------------------|
| State            | [x <STATE> ] e.g., <i>shine</i>                                   |
| Activity         | [x ACT <MANNER>] e.g., <i>skip</i>                                |
| Achievement      | [BECOME [x <STATE>]] e.g., <i>sink</i>                            |
| Accomplishment   | [[x ACT <MANNER>] CAUSE [BECOME y <STATE>]]<br>e.g., <i>build</i> |
| Accomplishment   | [x CAUSE [BECOME y <STATE>]] e.g., <i>break</i>                   |

The valence of the verb may be lower than, higher than or equal to the number of argument slots in the template. Argument roles licensed by event-structure templates are referred to as *structure participants* while those licensed only by the verb are referred to as *constant participants*. According to the RHL account, activity verbs like *chew* or *sweep* are structurally intransitive: the second argument is a lexically licensed (constant) participant that does not fuse with any role of the activity event-structure template. RHL propose two argument-realization conditions on verb-template unification:

- (7) a. **Argument realization condition 1:** Each structure participant must be realized by an XP.  
 b. **Argument realization condition 2:** Each XP must correspond to a subevent.

According to the condition given in (7a), which will be the focus of our attention in section 3.1, the second argument of an activity verb need not be realized, as in *She chewed thoughtfully*, while the second argument of an accomplishment verb must be realized: *\*They hammered flat*. The RHL model preserves a strict version of compositionality, in which all conceptual content comes from the lexicon (Jackendoff 1997). In addition, the RHL model successfully factors syntax out of lexical entries, leaving the linking of participant roles to grammatical functions to morphosyntactic realization principles.

In this paper, however, I will discuss four classes of phenomena that suggest that verbs have the arguments that they do because they combine with constructions, not because they undergo semantic operations. I will also sketch a formal model of argument-structure constructions that captures the effects at issue. It is based on Sign-Based Construction Grammar (SBCG), a model developed by Fillmore et al. (forthcoming). I will also give some hints about how speech-error data lend support to constructionists. The linguistic phenomena that that I will discuss are as follows:

- **Valence variation.** The full range of verb-valence variability, including null complementation, cannot be described by augmentative operations on event structure of the type described by RHL.
- **Weird sisterhood.** Many verb frames specify sisterhood relations that are not predicted by the general-purpose constituency rules that combine heads and complements and heads and specifiers (known, respectively, as the Head-Complement Rule and the Specifier-Head Rule in Head-Driven Phrase Structure Grammar).
- **Quantification of argument NPs.** Stating constraints on quantifier scope in certain argument structures and explaining ‘operator-free’ nominal type coercion requires recourse to semantic frames, including quantifier frames.
- **Paradigmatic effects.** Certain constraints on argument realization appear to be the effects of one argument-structure construction overriding another (Zwicky 1994).

This paper will be structured as follows. In the following section, section 2, I will describe the foundations of SBCG. In section 3 I will discuss the four classes of phenomena enumerated above. In section 4 I will discuss a study of syntactic speech errors (Raymond 2000) which bolsters the claim that argument structure has a constructional basis.

## **2. Sign-Based Construction Grammar (SBCG)**

In SBCG, as described by Fillmore et al. *forthcoming*, the basic objects of grammatical description are signs. A sign can be thought of as a node in a syntactic tree to which certain syntactic and semantic properties accrue. However, signs are more accurately described as feature structures that specify values for the attributes listed in (8-11):

- (8) SYN is used to distinguish signs from one another. Its values are the features CAT and VAL(ENCE). The value of CAT is a syntactic category. The VAL feature represents the objects with which a given sign can combine. The VAL value of pronouns, proper nouns and most common nouns is an empty list. The VAL value of a verb is its combinatoric potential (e.g., the VAL value of a transitive verb is <NP, NP>).
- (9) SEM describes the meaning of a sign; its values are the features INDEX and FRAMES. INDEX is the extension of a sign. The FRAMES feature is used to enumerate the predications that together specify the meaning of a sign. Among the frames that we will consider here are *quantifier frames*. For example, the meaning of the indefinite article *a* in English is represented by means of an existential quantifier frame.
- (10) FORM is used to specify the morphological properties of a given sign; the value of FORM is a (possibly empty) list of morphological entities.
- (11) CONTEXT is used to specify features of context that are relevant to the interpretation and use of a given sign.

The subtypes of sign are *word*, *lexeme* and *phrase*. Signs are licensed in two ways: by a lexical entry or by a construction. Accordingly, the grammar is viewed as consisting of a lexicon—a finite set of lexical descriptions (descriptions of feature structures whose type is either *lexeme* or *word*) and a set of constructions. Constructions build phrases (e.g., VP), words (e.g., the third-person singular form of the lexeme *laugh*) and lexemes (e.g., the causative lexeme corresponding to the inchoative lexeme *boil*); they do this by pairing a mother (MTR) with one or more daughters (DTR(S)). Put differently, constructions license *constructs*, linguistic objects consisting of a mother sign that dominates a daughter sign or signs. Figure 1 gives an example of a lexeme sign licensed by a lexical entry:

Figure 1. A Lexeme Sign

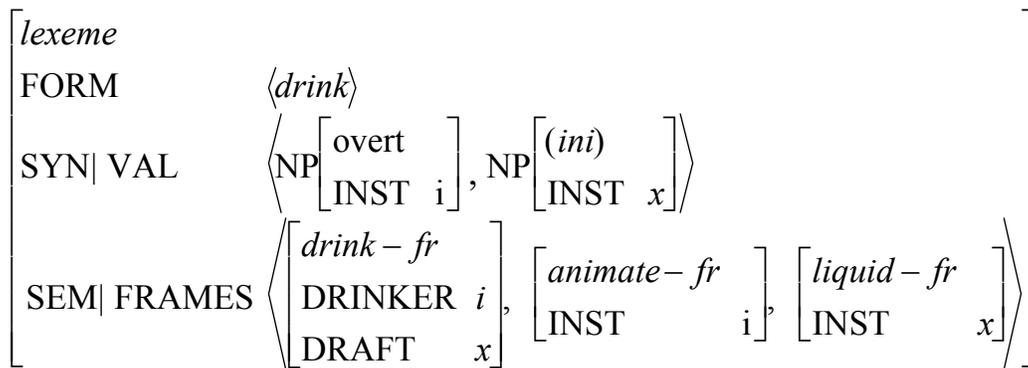
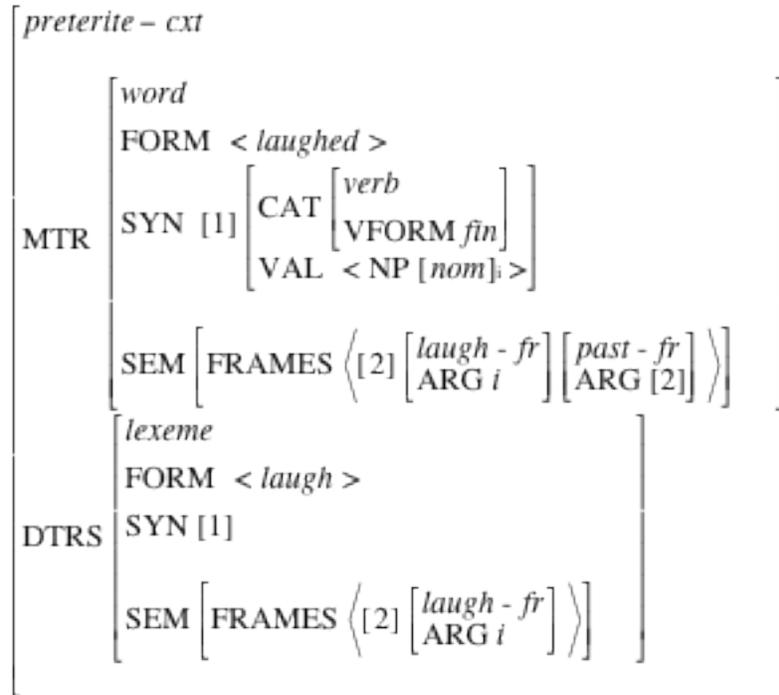


Figure 1 shows the English lexeme *drink*. The semantic properties of this lexeme are represented by a series of frames (e.g., the frame abbreviated as *drink-fr*). Frames are used to capture the requirement that the drinker be animate and that the consumed item be a liquid. The combinatoric properties of this lexeme are represented in its valence set, which includes two noun phrases—the first of which is coindexed with the ‘drinker’ participant in the drink semantic frame and the second of which is coindexed with the ‘draft’ participant in the drink frame. In addition, each valence member (or valent) is tagged with a feature that represents its instantiation properties: the first valent (the subject NP) is obligatorily instantiated, while the second is optionally null instantiated. As indicated, the second valent, when null instantiated, has an indefinite or, equivalently, existential interpretation. For example, sentence (12) means something like ‘She drank some liquid substance from a plastic mug’ (Fillmore 1986):

- (12) She **drank** from a plastic mug.

Figure 2 shows an inflectional construct licensed by the preterite construction, an inflectional construction that yields past-tense word forms of a verb lexeme (in this case, the lexeme *laugh*):

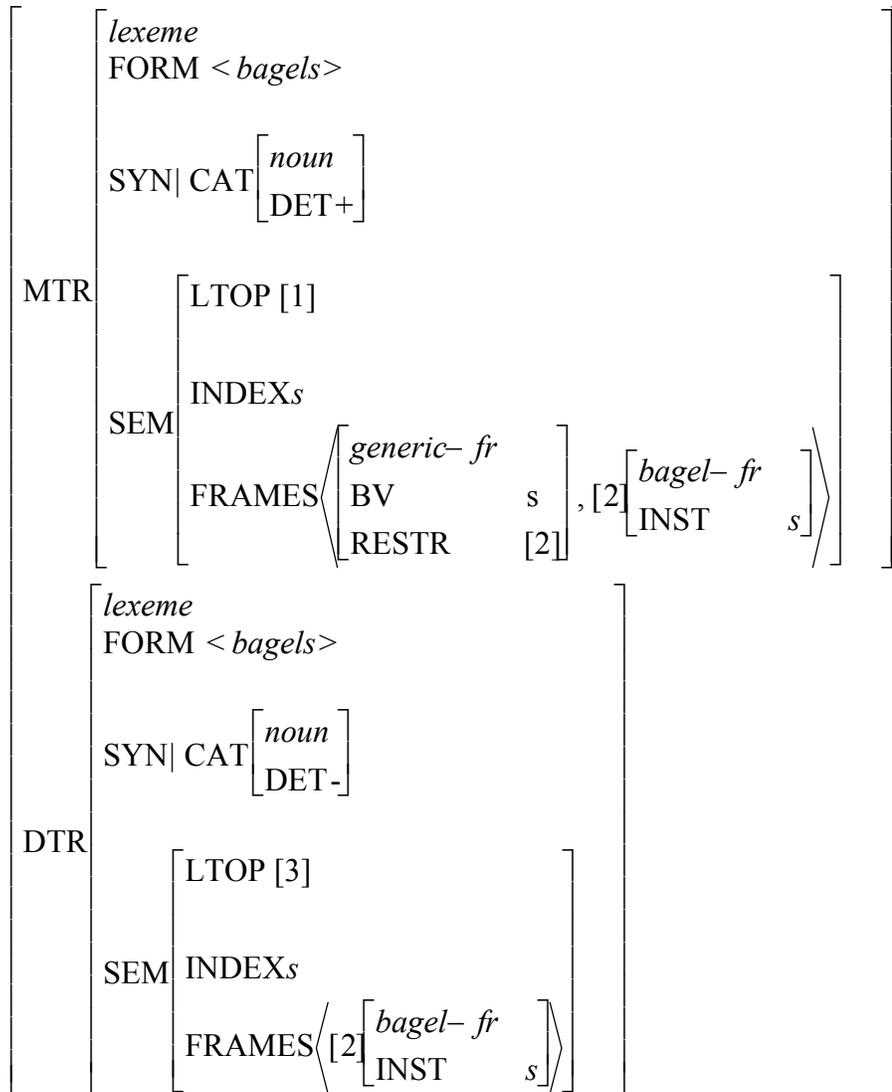
Figure 2. An Inflectional Construct



As an inflectional construct, this construct has a word as mother and a lexeme as daughter. The two occurrences of the tag [1] indicate that the SYN values of mother and daughter are identical. The past-tense meaning contributed by the construction is represented by the frame labeled *past-fr* in the mother's frame set. The single argument of this frame is the frame expressed by the verb lexeme (i.e., the *laugh-frame*), as indicated by the two occurrences of the tag [2] in the MTR.

Figure 3 shows a derivational construct of a type that will recur in our discussion of the quantification of argument NPs in section 3.3 below:

Figure 3. A Derivational Construct



As in all derivational constructs, both MTR and DTR are lexemes. This particular construct is licensed by an English construction that Fillmore et al. (forthcoming) refer to as the *Bare Noun Pumping* construction. Bare Noun Pumping yields determinerless plural NPs capable of occupying grammatical-function positions, as in (13-14):

- (13) **Bagels** are boiled.
- (14) We served **bagels**.

Bare nominal expressions can serve as arguments insofar as they receive quantified interpretations. In (13), for example, the bare plural noun *bagels* is inter-

puted as expressing universal quantification over individuals of the type *bagel*, while in (14) it is interpreted as expressing an existentially quantified aggregate (in terms of Chierchia 2003). This means the bare nominal construction must supply a quantifier that would otherwise be supplied by a determiner. In fact, it appears that there must be two derivational constructions for bare plurals in English: one that provides for generic quantification of undetermined noun phrases and another that provides for existential quantification of undetermined noun phrases. The nominal construct in Figure 3 is licensed by the former construction; generic quantification is represented by the generic frame in the construction's MTR. The variable bound by the quantifier is represented as an argument of the quantifier frame (BV), as is the restriction on the range of the quantifier (RESTR). The use of the letter *s* to represent the bound variable is intended to capture its ontological type (aggregate or, equivalently, sum individual).

What we have seen of the SBCG formalism in this section is, I hope, sufficient to convey the scope of the model: constructions are used not only to represent the composition of phrases but also the realization of morphological categories (inflectional constructions) and the addition of semantic features (derivational constructions). In earlier implementations of construction-based syntax (Goldberg 1995, Fillmore & Kay 1993, Michaelis & Ruppenhofer 2001), some constructions were portrayed as nonbranching—that is, they could consist of a single sign. In these approaches, argument-structure constructions were treated along the lines of schematic verb entries with which verbs unified in order to ensure grammatical expression of their semantic roles. In SBCG, by contrast, constructions are uniformly two-level; a construction describes a particular pairing of a mother sign with one or more daughter signs. SBCG combines the information expressed by signs through two mechanisms: embedding and unification (lexical entries unify with DTRS). Derivational constructions capture the effect of lexical rules without entailing conservation of thematic structure (Michaelis & Ruppenhofer 2001: Chapter 1). As a partial description, a lexical entry permits multiple resolutions of unspecified feature values.

Common to all construction-based approaches is the idea that a verb's array of arguments, and the manner of each argument's realization, is determined by the argument-structure construction with which the verb combines. In this fundamental respect, construction-based models differ from lexicalist approaches like that of RHL, in which a verb's argument-licensing properties are determined by its Aktionsart representation and the morphosyntactic expression of its arguments by realization rules. The evidence to be reviewed in the following section will suggest that verb frames are not built up via operations on semantic structure but rather licensed by templates that constrain the syntax, semantics and discourse status of the arguments in quite detailed ways.

### 3. Evidence against an Aktionsart-driven Model of Argument Structure

In this section, as promised, we will discuss four lines of evidence which converge to suggest that a verb's argument structure is determined by the construction with which it combines rather than by its Aktionsart structure, derived or otherwise. The evidence comes from valence variability (3.1), the special-case nature of rules governing syntactic sisterhood relationships (3.2), quantification of argument NPs (3.3) and paradigmatic effects, including blocking effects (3.4).

#### 3.1. Valence Variability

The RHL model makes three predictions about null complementation (Ruppenhofer 2004: Chapter 4, this volume; Goldberg 2000, 2005). These are given in (15-17):

- (15) As nonstructural arguments, the second arguments of bivalent state, achievement and activity verbs should always be omissible.
- (16) Nonstructural participants are subject only to a recoverability condition based on prototypicality (RHL: 115); therefore all null complements should have existential (indefinite) interpretations.
- (17) As structural arguments, patient arguments of accomplishment verbs should never be omissible.

Each of these predictions proves false. First, as shown in (18-20), it is not the case that all bivalent state, achievement and activity verbs allow omission of their second arguments:

- (18) **State:** She resembles \*(Aunt Molly).
- (19) **Achievement:** I found \*(my watch).
- (20) **Activity:** We discussed \*(the issue).

Second, as shown in (21-24), null instantiated second arguments of verbs in these Aktionsart classes do not necessarily have an existential interpretation; such arguments often have anaphoric interpretations:

- (21) **State:** My feelings are similar (to yours).
- (22) **State:** I remember (that).
- (23) **Achievement:** I won (the race).
- (24) **Activity:** I prepared (for that event) for weeks.

Third, as observed by Goldberg (2005), patient arguments of accomplishment verbs are in fact omissible, despite the fact that that these are *ipso facto* structural arguments in the RHL model: verbs of emission/ingestion like *spit*, *swallow* allow omission of their patient arguments (as in, e.g., *He spit onto the sidewalk*) and, as shown in (25-27), almost any verb, including an accomplishment verb, allows

### Complementation by Construction

existential null complementation of its second argument in an iterated-event context:

- (25) Owls only kill (things) at night.
- (26) China produces (things) and the US imports (things).
- (27) She has never failed to impress (people).

Additional problematic aspects of the RHL model of null complementation are as follows. First, null-instantiated complements of *nonverbal* predicates, as exemplified by (28-30), simply remain unexplained, because such predicates presumably lack Aktionsart structure:

- (28) **Noun:** Make me a copy (of that).
- (29) **Preposition:** She walked over (here).
- (30) **Adjective:** I'm taller (than you).

Second, as pointed out by Ruppenhofer (this volume), null-complementation affordances of verbs are affected by context; when a motion verb is interpreted as denoting a path shape rather than actual movement, it does not generally allow omission of its landmark argument:

- (31) **Actual motion:** Where did she cross (the road)?
- (32) **Fictive motion:** Where does Highway 42 cross \*(Highway 287)?

Although fictive- and actual-motion verbs do differ aspectually (the former being stative and the latter dynamic), the null-complementation split in (31-32) is the reverse of the one predicted by the RHL model, which treats the second arguments of state verbs, but not accomplishment verbs, as omissible.

The flip side of valence reduction is valence augmentation, and this phenomenon too presents problems for an Aktionsart-driven model of argument structure. Recall from Table 1 that, in the RHL model, accomplishment verbs like *break* have the Aktionsart representation  $x$  CAUSE [*BECOME*  $y$  <STATE>]. Recall too principle (7b): Each XP must correspond to a subevent. Given these two conditions, we have no easy way to account for the well-formedness of (33-34):

- (33) She crumbled the crackers into the soup.
- (34) The snow broke the branches off the tree.

The above examples should be ungrammatical, because in each a directional expression (*into the soup* or *off the tree*) denotes a resultant state distinct from that entailed by the verb's Aktionsart representation (the resultant states of being crumbled and broken, respectively). These PPs therefore are XPs that do not correspond to a subevent, in violation of (7b). The facts in (33-34) are not, however, difficult for an integration-based model like Goldberg's to handle: the

verb denotes the means by which a causation-of-motion event, denoted by the construction, occurs. For example, in (33), crumbling is construed as the means by which the crackers are moved from one location (the agent) to another (the soup). An additional fact that suggests the relative independence of Aktionsart and argument structure is brought out by Michaelis & Ruppenhofer (2001) in their study of applicative formation in English and German: argument-structure patterns often underdetermine aspect. This is shown by (35) and its German translation (36):

- (35) They sailed the Caribbean in three months/for three months.  
(36) Sie besegelten die Karibik in drei Monate/drei Monatelang.

While one might be tempted to associate the applicative (locative object) pattern with accomplishment Aktionsart, insofar as the pattern implies ‘affectedness’, ‘coverage’ or ‘saturation’ of the location denoted by the object NP, the acceptability of both a durational adverbial (*for three months, drei Monatelang*) and a frame adverbial (*in three months, in drei Monate*) suggests that applicative verbs have both telic (accomplishment) and atelic (activity) construals. Whatever the meaning of the applicative pattern, it cannot be exclusively Aktionsart-based.

The constructional account of argument structure treats verb-valence variability as the product of constructional affordances rather than as following from a verb’s semantic representation. It does not, for example, recognize a class of ‘structurally intransitive’ verbs; instead, it presumes a set of derivational constructions that license null instantiation of arguments. These constructions effectively remove arguments from a verb’s valence list, while ensuring that the quantifier frame of the null-instantiated argument remains in the verb’s argument-structure list. In SBCG terms, the MTR’s semantic frames include the quantifier frame missing from the valence set of the DTR (Fillmore et al. *forthcoming*). Once we have such a construction, we can also use its FRAMES attribute to indicate whether a given null-instantiated argument is construed anaphorically, as in (21-24), or existentially, as in (25-27). An example of such a construction is the one that Goldberg (2005) views as licensing existentially interpreted null-instantiated theme arguments of emission verbs, e.g., *spit, sneeze*. Evidence for such a construction comes from coercion phenomena involving verbs of vision:

- (37) She frowned into the mirror.  
(38) She glanced over her shoulder.

As semelfactive verbs, neither *frown* nor *glance* licenses a directional argument; it is only via combination with the construction that licenses an existentially construed null-instantiated theme argument that these verbs may be augmented up to causation-of-motion verbs. Such augmentation involves a metaphorical construal of vision involving an ‘eye beam’ that moves from one location (the perceiver) to another (the percept). What might seem paradoxical—that a ‘subtraction’ con-

struction here adds an argument (a directional expression)—makes perfect sense on the constructional account: the construction that licenses null complementation of theme arguments of verbs of emission denotes an event of transfer, and therefore licenses a trivalent transfer frame. In addition to capturing such coercion effects, null-complementation constructions enable us to account for override effects involving null complementation restrictions on verbs. While, as observed above, accomplishment verbs do not license null-instantiated theme arguments when construed episodically, they do when construed iteratively, as shown in (25-27). This means that, as argued by Goldberg (2005) and Ruppenhofer (2004: Chapter 4), aspectual constructions like the existential perfect construction also carry constraints on argument instantiation, allowing indefinite null complementation in examples like (27). Constructions are exactly such complexes of syntactic and semantic constraints.

### 3.2. Weird Sisterhood

A number of argument-structure patterns involve sisterhood relations that are not licensed by the head-complement or specifier-head phrase-building rules. This suggests that argument licensing is not exclusively semantic, and that to describe argument licensing we need to include information about the syntactic categories of arguments. In this subsection, we will briefly look at three cases of weird sisterhood found in English: Nominal Extraposition, *Just because* and Hypotactic Apposition. Data are taken from two corpora of English telephone conversations that are available through the Linguistic Data Consortium ([www ldc.upenn.edu](http://www ldc.upenn.edu)): the Switchboard corpus (sw) or the Fisher corpus (fe).

#### 3.2.1. Nominal Extraposition.

In Nominal Extraposition, an exclamatory adjective, e.g., *amazing*, licenses an NP complement:

- (39) I know it's just it's unbelievable the different things that are happening in America today. (sw03982B)
- (40) I'll date myself a little bit but it it's remarkable the number of those things they need. (sw02392B)
- (41) I know. I love that game. It's amazing the words they come up with. (fe\_03\_08039A)

The pattern exemplified in (39-41) is idiosyncratic in two respects. First, adjectives are not case assigners and should not therefore license non-oblique NP complements. Second, this NP complement is interpreted as denoting a scalar degree (Michaelis & Lambrecht 1996). In (41), for example, the NP *the words they come up* stands in for a scalar expression like ‘the number of words they come up with’. The fact that the complement of *amazing* in (41) has a scalar interpretation follows from the fact that (41) is an exclamation, but the pairing of an exclamatory adjective with an NP sister that denotes a degree, metonymically

or otherwise, requires a construction that provides for this syntax and this meaning.

### 3.2.2. *Just Because*

In the *Just Because* construction, a negated epistemic verb, typically *mean*, licenses a finite clause subject introduced by *just because* (Bender & Kathol 2005):

- (42) Just because they use primitive means of doing things does not mean that they can't expand. (fe\_03\_06870A)
- (43) Just because they say it doesn't mean that's the only way to look at it. (fe\_03\_00135A)

Clausal subjects are ordinarily introduced by *that*, not a subordinating conjunction like *because*, so we cannot use the general-purpose constituency rule that pairs a specifier with a head to account for the pattern in (42-43). Instead, as Bender & Kathol argue, the grammar of English must contain an argument-structure construction that allows the verb *mean*, when negated, to license a clausal subject introduced by *just because*.

### 3.2.3. Hypotactic Apposition

When English speakers use a cataphoric demonstrative pronoun to announce forthcoming propositional content, they may do so by means of either the paratactic construction in (44) or the subordinating construction in (45-46), the latter of which Brenier & Michaelis (2005) refer to as Hypotactic Apposition:

- (44) That's what I've been telling you: you need to call.
- (45) That's the problem is that they just hate us so much and I never re- I never really realized. (fe\_03\_01019A)
- (46) That's the main thing is that I can't tell whether the thing is going to fit. (sw03729A)

In Hypotactic Apposition, the copula licenses two arguments that it would not license ordinarily: a clause containing a cataphoric pronoun and a clausal complement that is coreferential with the cataphoric pronoun contained in its clausal sister. This is not the licensing behavior of equational *be*, as found, e.g., in *The problem is that they just hate us so much*; it is the licensing behavior of the Hypotactic Apposition construction.

### 3.3.1. Argument Quantification

In quantifier-scope hierarchies, the quantifiers of topical and/or subject referents outscope those of nontopical and nonsubject referents (Ioup 1975, Kuno 1991). While these hierarchies capture robust cross-linguistic interpretive tendencies, they do not explain scope constraints in certain argument-structure patterns. The

### *Complementation by Construction*

two patterns that we will consider here are discussed in detail by Basilico (1998). They are the *creation* pattern, exemplified by (47) and the *transformation* pattern, exemplified by (48):

- (47) **Creation:** She made a paperweight from a rock.  
(48) **Transformation:** She made a rock into a paperweight.

In the Creation pattern either the theme argument or the source argument can have wide scope, as shown in (49-50):

- (49) **Wide scope theme argument:** Every oak grew out of a tiny acorn.  
(50) **Wide scope source argument:** An oak grew out of every acorn.

In the Transformation pattern, by contrast, the theme argument must scope the goal argument:

- (51) Every acorn grew into a beautiful oak.

We know this because (52) is semantically anomalous, as indicated by #:

- (52) **Wide scope theme argument:** #An acorn grew into every oak.

In (52), the theme argument is forced by the Transformation construction to have wide scope, and this creates a nonsensical sentence: we know that one acorn cannot produce many oaks. These scope facts cannot be said to follow from a semantic role hierarchy based on transconstructional relations like subject, because both the Creation pattern and the Transformation pattern map the theme argument to subject, as shown in (53-54):

- (53) **Creation:** An oak grew out of an acorn.  
(54) **Transformation:** An acorn grew into an oak.

Instead, the scope facts reflect the *pragmatic role* of the location argument in the Transformation pattern. The Creation pattern is pragmatically unmarked: it allows the source to be either topic or focus. This is shown in (55-56), where the points of prosodic prominence are indicated by small caps:

- (55) **Topical source argument:** An OAK grew out of it.  
(56) **Focal source argument:** That oak grew out of an ACORN.

The Transformation pattern, by contrast, is pragmatically marked. Its goal argument is necessarily interpreted as focal, as indicated by the ungrammaticality of (58), in which the goal argument is expressed by a pronoun, versus (57), in which the theme argument is topical:

- (57) **Topical theme argument:** The tiny acorn grew into an OAK.  
(58) **Topical goal argument:** \*A tiny ACORN grew into it.

The theme argument of the Transformation pattern is required to be a topic, as indicated by the ungrammaticality of (59):

- (59) **Focal theme argument:** \*A tiny ACORN grew into that old oak.

As a topic, the theme argument of the Transformation construction cannot readily be interpreted as nonspecific; this follows from Lambrecht's Topic Acceptability Hierarchy (Lambrecht 1994: 165-171): topical arguments, as predictable arguments in predications, tend strongly to be mutually identifiable participants for the interlocutors. Because it allows a nonspecific interpretation, the theme argument of the Transformation pattern cannot take narrow scope relative to the goal argument; this leads to the anomaly in (52) above. To represent such constraints we have to be able to characterize the arguments licensed by verbs in terms of their pragmatic roles, e.g., topic and focus. This is something that we can do in the valence sets of argument-structure constructions, but not in Aktionsart representations.

Another interpretive phenomenon that points up the need for argument structures to supply quantification is one that I will call *operator-free nominal coercion*. Nominal coercion is reinterpretation of a nominal in order to resolve conflict between the type required by an operator and the type of the nominal argument supplied (Jackendoff 1997). For example, the English partitive article *some* induces the interpreter to construe the noun *pillow* as denoting a mass rather than a bounded entity in *\*some pillow*. However, an operator-based model of nominal coercion only goes so far; it does not explain the interpretive effects evident in (60-61):

- (60) **Apple** dries easily.  
(61) You have **apple** on your shirt.

Neither *dry* nor *have* selects a mass-type second argument, so what can account for the portion or type reading of *apple* in these contexts? As discussed in section 2 above, arguments of verbs, whether phonetically instantiated or not, have to be quantified. This requirement is represented in SBCG by associating a quantifier frame with each of the verb's valence elements. In English, the primary means by which a common noun gets a quantified interpretation is through combination with a determiner. The only other way is through the Bare Noun Pumping Construction mentioned in section 2. As discussed there, this construction yields existentially and generically quantified interpretations of undetermined nouns. What triggers the use of this pumping construction? Simply put, it is the requirement that the nominal arguments of a predicator be quantified. Aktionsart representations do not contain quantifiers, but argument-structure constructions do. As

we saw in section 2, argument-structure constructions contain FRAMES among their semantic attributes. These frames include quantifier frames.

### 3.4. Paradigmatic Effects

Some combinatory constraints on argument-structures appear to be blocking effects. The frame [V PP] cannot express accompaniment to motion, but the frame [V *X's way* PP] can (Goldberg 1995, Croft 1991):

(62) She squinted \*(her way) into the garden.

Another paradigmatic effect is *override*: when two constructions combine, one construction can override the constraints of another (Zwicky 1994). In this section, I will suggest that certain patterns of argument realization are due to the override of lexical valence by an argument-structure construction.

As RHL observe, activity verbs license indefinite null complements: *eat, knit, sew, read*. Such verbs allow indefinite null complements in episodic contexts:

(63) I ate at lunchtime

(64) Did you read yesterday?

Other verbs do not allow null complementation in episodic contexts; we can safely say of these verbs that they do not lexically license existential null complementation:

(65) We discussed \*(some issues) last night.

(66) Did he impress \*(people)?

(67) They destroyed \*(things).

(68) Did they serve \*(things) cold?

But certain syntactic contexts can change verb affordances (Ruppenhofer 2004, this volume):

(69) **Existential perfect**: She has always impressed (people). Have you stolen (things) from me?

(70) **Habitual**: They discuss and discuss (things) but never seem to do anything. They destroy (things) and we rebuild (them).

(71) **Generic**: Speed kills (people).

(72) **Instructional, Imperative**: Heat (the item) thoroughly. Lift (this)!

(73) **Sentence focus in fictive-motion predications**: Even though a major ROAD goes by (there), no one disturbed me while I was taking photographs.

The fact that verbs' argument-realization requirements can be overridden by context shows again that a verb's syntactic frame is not determined solely by its

lexical entry, derived or basic; instead, it is determined by the construction with which it combines.

#### 4. Supporting evidence from frame-based speech errors

How are verb frames accessed? Influential psycholinguistic studies have proposed that access is incremental: each denotatum is assigned a grammatical role in the order that its discourse-salience dictates; for example, the discourse topic gets the *subject* role (Ferreira 1996, Bock & Levelt 1994). A competing model is competitive access, whereby functional relations are accessed as sets, in much the same way that lexemes are accessed. Clearly, a construction-based model of argument structure entails competitive access, and, as it happens, certain syntactic speech errors, called *syntactic splices*, suggest that verb-frame access is indeed competitive (Raymond 2000). Why? First, many error frames involve dummy elements, as in the following attested examples:

- (74) When you consider the greatest good, it's just better off to let them [children] do stuff. (Presumed target: *They're just better off if...*)
- (75) It's glad you've marshaled your evidence. (Presumed target: *I'm glad that...*)

If grammatical-function assignment relies on the relative discourse salience of an array of referents, there is no obvious explanation for the existence of splices like (74-75). If, however, verb-frame access is competitive, these examples are simply the result of failure to suppress the undesired frame. Second, many frame errors don't involve the incorrect encoding of any given argument but are instead amalgams of two incompatible sentence patterns:

- (76) **Raising spliced with extraposition:** They seem they know where the problem is.
- (77) **Relative clause spliced with conjunction:** To what extent am I responding to errors that I'm not conscious of it?
- (78) **VP ellipsis spliced with conjunction:** She was severely injured as well as her assistant was too.

The dual encoding of a single argument, e.g., they in (76), suggests that the speaker, rather than choosing the wrong grammatical encoding for the currently active referent, or the wrong verb, has simply superimposed one chunk of structure on top of another in the same way that she might output the error word *troublesome* by failing to suppress either *troublesome* or *problematic*. So syntactic speech errors lend some support to the constructionist's claim that words and syntactic patterns are stored in the same place and processed in the same way (Bates & Goodman 1997).

## 5. Conclusion

The evidence that we have reviewed here suggests that verbal argument structure is not derived from or ‘read off’ semantic representation. Verbs license the arguments that they do because they combine with constructions that (a) determine how each scene participant will be expressed syntactically, (b) provide quantifiers for each argument and (c) sometimes determine which argument will be topic and which focus. On this approach, semantic roles exist only in *theta frames* (e.g., causation of result and caused motion); there is no semantic role hierarchy of the type used to assign grammatical functions in most current accounts of argument structure, including RHL. As Fillmore & Kay (1995) point out, the semantic role hierarchy, despite its widespread currency, is a poor candidate for a linguistic generalization because it features combinations of semantic roles that no verb would ever license. Theta frames, by contrast, express only those semantic role sets that play a role in verb-valence descriptions. But no language user ever encounters a naked theta frame: the generalizations about semantic role combinations that speakers learn and use are theta frames *as expressed by morphosyntactic patterns*, and these morphosyntactic patterns, as we have seen contain a good deal of idiomatic information about meaning, use and form. In sum, the study of verbal argument licensing, like Bybee’s studies of the inflectional morphology (Bybee 2001), could be said to demonstrate that linguistic generalizations are simply not that general.

## References

- Basilico, David. 1998. Object Position and Predication Forms. *Natural Language and Linguistic Theory* 16:491-539.
- Bates, Elizabeth and Judith C. Goodman. 1997. On the Inseparability of Grammar and the Lexicon: Evidence from Acquisition, Aphasia and Real-time Processing. *Language and Cognitive Processes* 12:507–584.
- Bender, Emily and Andreas Kathol. 2005. Constructional Effects of Just Because...Doesn't Mean... In C. Chang, M. Houser, Y. Kim, D. Mortensen, M. Park-Doob and M. Toosarvandani eds., *Proceedings of the Twenty-Seventh Annual Meeting of the Berkeley Linguistics Society*. Berkeley, CA: Berkeley Linguistics Society.
- Birner, Betty J. and Gregory Ward. 1998. *Information Status and Noncanonical Word Order in English*. Amsterdam/Philadelphia: John Benjamins.
- Bock, Kay and Willem Levelt. 1994. Language Production: Grammatical Encoding. In M.A. Gernsbacher, ed., *Handbook of Psycholinguistics*, 945-984. San Diego, CA: Academic Press.
- Brenier, Jason M. and Laura A. Michaelis. 2005. Optimization via Syntactic Amalgam: Syntax-Prosody Mismatch and Copula Doubling. *Corpus Linguistics and Linguistic Theory* 1:45-88.

- Bresnan, Joan. 1994. Locative Inversion and the Architecture of Universal Grammar. *Language* 70:72–131.
- Bybee, Joan. 2001. *Phonology and Language Use*. Cambridge: Cambridge University Press.
- Chierchia, Gennaro. 2003. Language, Thought and Reality after Chomsky. Ms. University of Milan-Bicocca.
- Croft, William. 1991. *Syntactic Categories and Grammatical Relations*. Chicago: University of Chicago Press.
- Ferreira, Victor 1996. Is it Better to Give than to Donate? Syntactic Flexibility in Language Production. *Journal of Memory and Language* 35:724-755.
- Fillmore, Charles J. 1986. Pragmatically Controlled Zero Anaphora. *BLS* 12:95-107.
- Fillmore, Charles J. and Paul Kay. 1995. *Construction Grammar*. Unpublished ms., University of California, Berkeley.
- Fillmore, C. J., P. Kay, L. A. Michaelis and I. A. Sag. forthcoming. *Overt and Covert Nominals in English: A Constructional Approach*. Stanford: CSLI Publications.
- Goldberg, Adele. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.
- Goldberg, Adele. 2001. Patient Arguments of Causative Verbs can be Omitted: The Role of Information Structure in Argument Distribution. *Language Sciences* 23:503-524.
- Goldberg, Adele. 2002. Surface Generalizations: An Alternative to Alternations. *Cognitive Linguistics* 13:327-356.
- Goldberg, Adele. 2005. Constructions, Lexical Semantics and the Correspondence Principle: Accounting for Generalizations and Subregularities in the Realization of Arguments. In N. Erteschik-Shir and T. Rapoport, eds., *The Syntax of Aspect*, 212-236. Oxford: Oxford University Press.
- Goldberg, Adele. 2006. *Constructions at Work: The Nature of Generalization in Language*. Oxford: Oxford University Press.
- Ioup, Georgette. 1975. Some Universals for Quantifier Scope. In J. Kimball, ed., *Syntax and Semantics* 4:37-58. New York: Academic Press.
- Jackendoff, Ray. 1997. *The Architecture of the Language Faculty*. Cambridge, MA: MIT Press.
- Kaschak, Michael and Arthur Glenberg. 2000. Constructing Meaning: The Role of Affordances and Grammatical Constructions in Language Comprehension. *Journal of Memory and Language* 43:508-529.
- Kaschak, Michael and Arthur Glenberg. 2002. Grounding Language in Action. *Psychonomic Bulletin and Review* 9:558-565.
- Kuno, Susumo. 1991. Remarks on Quantifier Scope. In H. Nakajima, ed., *Current English Linguistics in Japan*, 261-287. Berlin: Mouton de Gruyter.
- Lambrecht, Knud. 1994. *Information Structure and Sentence Form*. Cambridge: Cambridge University Press.

*Complementation by Construction*

- Levin, Beth and Malka Rappaport Hovav. 1995. *Unaccusativity*. Cambridge, MA: MIT Press.
- Michaelis, Laura A. 2004. Type Shifting in Construction Grammar: An Integrated Approach to Aspectual Coercion. *Cognitive Linguistics* 15:1-67.
- Levin, Beth. 2000. Aspect, Lexical Semantic Representation and Argument Expression. *BLS* 26: 413-429.
- Michaelis, Laura A. and Josef Ruppenhofer. 2001. *Beyond Alternations: A Construction-Based Approach to the Applicative Pattern in German*. Stanford: CSLI Publications.
- Michaelis, Laura A. and Knud Lambrecht. 1996. Toward a Construction-Based Model of Language Function: The Case of Nominal Extraposition. *Language* 72:215-247.
- Moens, Marc and Mark Steedman. 1988. Temporal Ontology and Temporal Reference. *Computational Linguistics* 14:15-28.
- Partee, Barbara H., and Vladimir Borschev. 2007. Existential Sentences, BE and the Genitive of Negation in Russian. In K. von Stechow and I. Comorovski, (eds.), *Existence: Semantics and Syntax*. Berlin: Springer Verlag. 147-190
- Pinker, Steven. 1989. *Learnability and Cognition*. Cambridge, MA: MIT Press.
- Rappaport Hovav, Malka and Beth Levin. 1998. Building Verb Meanings. In M. Butt and W. Geuder, eds., *The Projection of Arguments*, 97-134. Stanford: CSLI Publications.
- Raymond, William D 2000. Toward a Theory of Grammatical Encoding in Speech Production: Evidence from Speech Errors. Ph.D. diss., University of Colorado at Boulder. [*University of Colorado Institute of Cognitive Science Technical Report 01-01*]
- Ruppenhofer, Josef. 2004. *The Interaction of Valence and Information Structure*. Ph.D. diss., University of California, Berkeley.
- Ruppenhofer, Josef. this volume. Fictive Motion and Null Instantiation.
- Zwicky, Arnold. 1994. Dealing out Meaning: Fundamentals of Grammatical Constructions. *BLS* 20: 611-25.

Laura Michaelis  
Department of Linguistics  
University of Colorado  
295UCB  
Boulder, CO 80309

michaeli@colorado.edu



## A Best-Fit Approach to Productive Omission of Arguments

EVA H. MOK and JOHN BRYANT

*University of California, Berkeley and International Computer Science Institute*

### 0. Introduction

Construction grammars (Fillmore, Kay, and O'Connor 1988; Goldberg 1995; Kay and Fillmore 1999) provide a framework for describing grammaticality in terms of both form and meaning constraints. On the meaning side, cognitive linguists have contributed many great insights into the conceptual structures necessary for understanding language, but challenges remain in developing a precise, formal representation of construction grammar that supports both detailed linguistic analysis and computational use.

One such challenge arises from pro-drop languages, which allow productive argument omission where arguments can be omitted without any markedness in use. Mandarin Chinese is one such example where both the subject and the object can be freely omitted. This phenomenon is commonplace in conversations, but has also been shown in written text (Li 2004; Yeh and Chen 2004).

In actual use, different arguments of a construction tend to be omitted at different rates. Additionally, our preliminary data in Mandarin suggests that even semantically related arguments are omitted differentially in different constructions. This data is difficult to properly account for, both linguistically and computationally, by a general principle of omission that is applied uniformly to all constructions.

For a theory of grammar to accurately account for such data, the grammar must incorporate construction-specific rates of argument omission. Unfortunately, specifying such parameters in most theories of construction grammar requires enumeration of all possible argument combinations as separate constructions within the grammar. This leads to not only an explosion of constructions but also a loss of generality. However, situating the grammar within a *best-fit* processing model allows us to avoid such pitfalls.

Intuitively, a best-fit processing model finds the interpretation of an utterance that fits the utterance best. More precisely, the model incrementally builds up a set of competing interpretations for an utterance, attending only to those interpretations that are most likely given the probabilistic syntactic, contextual, and

semantic constraints. Upon completion of the utterance, the model returns the interpretation (analysis) of a sentence that is most likely.

In this paper, we show that a best-fit sentence analysis model simplifies the representation of argument structure constructions in languages that freely omit arguments. Instead of requiring enumeration of every combination of legal arguments or appealing to some imprecise, underspecified omission principles, we incorporate argument omission rates into the argument structure constructions, and use these rates within the best-fit model. This allows the model to accurately reflect the argument omission data and preserves generality within the grammar.

### 1. Productive Omission of Arguments in Mandarin Chinese

To illustrate the nature of productive argument omission and its implication for a grammar formalism, we rely on examples of the ditransitive construction in Mandarin Chinese, which follows this basic pattern: it has a verb of transfer, a subject (the giver) and two objects (the recipient and the theme).

|       |          |           |       |
|-------|----------|-----------|-------|
| Subj  | Verb     | Obj1      | Obj2  |
| ↓     | ↓        | ↓         | ↓     |
| Giver | Transfer | Recipient | Theme |

We analyzed the basic version of this ditransitive construction which uses the verb *gei3* ('to give') and show below six utterances taken from the Tardif Beijing Corpus (Tardif 1993, 1996) in CHILDES (MacWhinney 2000), a corpus of caregiver-child interaction. These are used by the same caregiver in very similar situations, and some are essentially rephrasing of the prior utterance. Although (1) exhibits the construction without any argument dropping, all other argument combinations are also attested in the data, five of which are shown below. Brackets in the English gloss indicate the intended referent in the case of an omission.

- (1) ma1+ma gei3 ni3 zhei4+ge. 'Mother give you this (a toy).'  
 mother give 2PS this+CLS
- (2) gei3 wo3 le ao. '[You] give me [the pen], alright?'  
 give 1PS CRS EMP
- (3) ni3 gei3 yi2. 'You give auntie [the peach].'  
 2PS give auntie
- (4) gei3 a1+yi2 yi2+ge qu4 ao. '[You] Give auntie one (peach).'  
 give auntie 1+CLS away EMP
- (5) ao ni3 gei3 ya. 'Oh you give [auntie] [the peach].'  
 EMP 2PS give EMP



strong conclusion, argument omission appears to be a construction-specific phenomenon even in a language which allows productive omission of arguments. The goal of capturing these construction-specific regularities without resorting to the enumeration of constructions motivates the model we present in the remainder of this paper.

## 2. Embodied Construction Grammar (ECG)

In order to support both detailed linguistic analysis and computational use within the construction grammar framework, we rely on Embodied Construction Grammar (ECG) (Bergen and Chang 2005), a unification-based and computationally precise construction grammar formalism, for our work. Meaning is represented in ECG using *embodied schemas*, such as image schemas, frames, and action schemas; *constructions* link forms to these embodied schemas. The ECG schema and construction formalisms include mechanisms for expressing type constraints, ordering constraints, identification (unification) constraints, constituency and dependency relations.

Figure 3 shows how the ditransitive construction is represented in ECG, with ECG keywords in bold. The construction, named Active-Ditransitive-VP, has three **constituents**, which are a Verb and two NPs represented by the local names *v*, *obj1*, and *obj2* respectively. The **subcase** relation, which states that this Active-Ditransitive-VP is a subtype of Active-VP, is important in preserving compositionality between constructions: it enables a separate sentential or clausal construction to compose the Active-VP with a subject NP.

Figure 3. The active ditransitive VP construction and the transfer event.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>construction</b> Active-Ditransitive-VP<br/> <b>subcase of</b> Active-VP<br/> <b>constituents</b><br/> <i>v</i>: Verb<br/> <i>obj1</i> : NP<br/> <i>obj2</i> : NP<br/> <b>form</b><br/> <i>v</i><sub>f</sub> before <i>obj1</i><sub>f</sub><br/> <i>obj1</i>.f before <i>obj2</i>.f<br/> <b>meaning</b> : TransferEvent<br/> <i>self</i><sub>m</sub>.means ↔ <i>v</i><sub>m</sub><br/> <i>self</i><sub>m</sub>.recipient ↔ <i>obj1</i><sub>m</sub><br/> <i>self</i><sub>m</sub>.theme ↔ <i>obj2</i><sub>m</sub><br/> <i>self</i><sub>m</sub>.profiledParticipant ↔ <i>self</i><sub>m</sub>.giver</p> | <p><b>schema</b> TransferEvent<br/> <b>subcase of</b> Event<br/> <b>roles</b><br/> <i>profiledParticipant</i><br/> <i>means</i><br/> <i>giver</i><br/> <i>recipient</i><br/> <i>theme</i></p> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

The ordering constraints among these constituents are expressed in the **form** block, which states that the constituent *v* must appear in the sentence before *obj1*, and *obj1* before *obj2*. The meaning of this construction is a TransferEvent, whose **roles** are shown on the right in Figure 3. The Active-Ditransitive-VP construction links its constituents to roles in this TransferEvent in the **meaning** block through identification constraints denoted by ↔. The means of transfer is identified with

the meaning of the verb; the recipient is identified with the meaning of the first noun phrase (obj1), and the theme is identified with the meaning of the second noun phrase (obj2).

The composition of constructions in ECG is illustrated by Figure 4 with a simplified clausal construction combining an NP with a VP, of which Active-Ditransitive-VP is a subtype. The meaning of the resulting Subject-VP construction is an Event which is identified with the meaning of the verb phrase (vp); the profiledParticipant of this event is identified with the subject noun phrase (subj).

Figure 4. Composing an NP and a VP to form a Subject-VP construction in ECG.

|                                                            |
|------------------------------------------------------------|
| <b>construction</b> Subject-VP                             |
| <b>subcase of</b> S                                        |
| <b>constituents</b>                                        |
| subj: NP                                                   |
| vp : VP                                                    |
| <b>form</b>                                                |
| subj <sub>f</sub> before v <sub>f</sub>                    |
| <b>meaning</b> : Event                                     |
| self <sub>m</sub> ↔ vp <sub>m</sub>                        |
| self <sub>m</sub> .profiledParticipant ↔ subj <sub>m</sub> |

### 3. Best-Fit Sentence Analysis

While Embodied Construction Grammar is consistent with prevailing notions of construction grammar, what allows us to avoid enumerating constructions to handle the argument omission phenomenon is the leverage we get from our processing model. We have built a psychologically plausible construction-based sentence analyzer (Bryant 2004), called the analyzer for brevity. Given an ECG grammar, the analyzer takes a sentence in context and generates a meaning representation built out of embodied schemas, frames and the bindings between their roles. We refer to this interconnected set of schemas and frames as the *semantic specification* or *semspec*.

The analyzer is designed to be compatible with compelling psycholinguistic evidence (Narayanan and Jurafsky 2001) that people employ several quantitative measures in deciding among competing analyses. Once seeded with a grammar written in ECG, the analyzer incrementally processes an input sentence, integrating the situational and discourse context. Going word by word, the analyzer builds up competing interpretations by tracking syntactic, contextual, and semantic bindings, maintaining only the most likely interpretations that satisfy the constraints specified by the grammar. In the end, the analysis that not only satisfies all the constraints but also has the best fit is selected as the best interpretation of the sentence.

#### 3.1. Defining Best-Fit

The best-fit score of an analysis given an utterance is a probabilistic metric which combines syntactic, contextual, and semantic factors. The syntactic component

incorporates the combination of chosen constructions, their constituency relations and the argument omission probabilities. The argument omission probabilities are approximated by the omission rates obtained from corpus data, as we have done for the basic Active-Ditransitive-VP construction with the *gei3* ('to give') sentences and the basic Active-Caused-Motion-VP construction (not shown) with the *ge1* ('to put/ to place') sentences in Section 1.

The contextual component scores how well the referring expressions are resolved to items from context and how easily the omitted arguments are recovered from context. In some cases the omitted antecedent is present in the preceding discourse or the immediate situational context, while in other cases the omitted antecedent is presumed (e.g. in English, *Did you eat?* presumes a generic meal as the omitted argument to *eat*). This phenomenon is well captured by the distinction made in FrameNet<sup>1</sup> between definite and indefinite null-instantiated arguments, in that some verbs, such as *eat*, only require indefinite null-instantiation of its omitted arguments (Fillmore, Johnson, and Petruck 2003). Our best-fit scoring of contextual fit takes into account the definiteness requirements of different verbs in deciding whether or not to penalize for an omitted argument which is not available in context.

Finally, the semantic component scores the semantic bindings essentially by evaluating how well the frame roles are being filled. For example, when the Active-Ditransitive-VP construction is used in an analysis, the meaning denoted by its constituents (e.g. a person or a pen) are identified with various roles of the TransferEvent frame. In this case, the semantic fit reflects whether each role of the TransferEvent frame is filled with likely fillers.

With this best-fit scoring of analyses, argument omission is accommodated straightforwardly by the model by selecting the best analysis in all three respects: it has to fit well with the sentence constructionally, the omitted arguments have to be recoverable from context, and the role fillers of the semantic frames have to establish coherent meaning, whether they are supplied by language or by context.

### 3.2. Simulation-Based Understanding

The analysis process is a central piece in the framework of simulation-based understanding in the Neural Theory of Language (NTL) project (Feldman 2006). The simulation hypothesis states that the same neural circuitry employed for carrying out an action is also used for the purpose of understanding sensory input such as seeing an action and other cognitive tasks such as processing language and general reasoning. Within a simulation-based understanding framework, the active process of simulation enables the use of both linguistic input and general knowledge in making inferences that enrich the understanding of a sentence. Upon encountering an utterance, it is the analyzer that initiates the simulation by providing the simulator with a semspec. The overall architecture of the analyzer is shown in Figure 5.

---

<sup>1</sup> <http://framenet.icsi.berkeley.edu>



ditransitive construction is a lower 0.41<sup>2</sup>. By the syntactic fit measure, then, the omitted-theme analysis has a higher score.

#### 4.2. Contextual Fit

Intuitively, the best analysis for a sentence should make sense with respect to its context, and one aspect of this contextual match is that referring expressions in the sentence should be as grounded in the context as possible. This means that not only should overt arguments be resolved to elements in context, but omitted arguments should also be recovered from context as well. To calculate the contextual fit of a sentence, the analyzer must be supplied with both the discourse and situational contexts of each sentence.

In Example (3), the speaker (the mother) is directing the child to give a piece of peach to auntie (the investigator who did the recording). The three of them are the only people in the room, but among the child's surrounding is the peach that she may well be already holding in her hands and a table. While both the omitted-theme analysis and the omitted-recipient analysis contain the referring expression *yi2* ('auntie') which resolves well to the investigator in context, they differ in how well the omitted argument is recovered.

For the omitted-theme analysis, the peach is an obvious choice for the theme both because of its immediacy in the situation and its feasibility as a theme. As a result, this analysis thus scores rather high in its contextual fit. The omitted-recipient analysis, however, is ambiguous as to whether the child, the mother or the investigator should serve as the recipient. This ambiguity thus leads to a lower score for the omitted-recipient analysis.

#### 4.3. Semantic Fit

The semantic component of the best-fit scoring reflects the semantic coherence of each analysis based on the likelihood of the frame role fillers. The two competing analyses of Example (3) both identify the addressee (the child) with the giver of the TransferEvent frame, but they vary with respect to the fillers for the theme and recipient roles.

The omitted-theme analysis picks the investigator as the recipient and recovers the peach from context as the theme. By using resources such as FrameNet, our best-fit model is able to determine that a person is a good recipient, and a peach (or physical object) is a good theme. In the omitted-recipient analysis, on the other hand, the investigator is constructionally chosen as the filler for the theme, and either the mother or the investigator is chosen from context as the recipient. Either of them is a good recipient, but a person is an unlikely theme. As

---

<sup>2</sup> In the model, the likelihood of each analysis is calculated by taking into account the presence versus omission probabilities of all three arguments – the giver, the recipient and the theme. This calculation shows that the omitted-theme analysis is in fact almost three times as likely as the omitted-recipient analysis:

The omitted-theme analysis has a likelihood of  $(1-0.784)*(1-0.412)*0.66 = 0.08$

The omitted-recipient analysis has a likelihood of  $(1-0.784)*0.412*(1-0.66) = 0.03$

a result, the omitted-recipient analysis is assigned a lower semantic fit score than the omitted-theme analysis.

#### **4.4. Combining the Scores for the Best Fit**

The overall score of each analysis is obtained by combining all three component scores. Between the two competing analyses that we have considered here, the omitted-theme analysis is the obvious choice due to its higher scores in all three of the syntactic, contextual, and semantic components. Often, however, the choice among competing analyses is not so obvious. One analysis may have the best semantic fit, and yet a different analysis may have the best contextual fit. One major strength of our probabilistic best-fit scoring mechanism is in allowing the analyzer to weigh these different factors in determining the best analysis.

### **5. Implications and Conclusion**

Our running example of the ditransitive constructions in Mandarin Chinese demonstrates how a difficulty in grammar representation involving argument omission is resolved by situating the grammar within a best-fit processing model. Our data is particularly relevant because it is suggestive of construction-specific variations in omission patterns, which are difficult for traditional theories of grammar to represent precisely and elegantly. We thus put forth a view of grammar that sees the grammar as synergistic with process so that the burden of describing linguistic phenomena is shared by both.

Fundamental to the analysis process is the best-fit scoring mechanism that determines the appropriateness of an analysis in terms of syntax, the context, and semantics. With a minimal addition to the grammar representation, i.e. the argument omission probabilities for each construction, we let the analysis process determine the best analysis for each sentence and avoid having to enumerate in the grammar all the possible omission patterns and their individual contextual constraints.

In addition to using cross-linguistic data to further validate our model of best-fit analysis, two directions in our current work are applying best-fit analysis to our model of language understanding and to our model of grammar learning in pro-drop languages. With our current efforts we hope to better understand how the argument omission probabilities interact with compositionality, and how they can be learned.

### **References**

- Bergen, Benjamin. K., and Nancy Chang. 2005. Embodied Construction Grammar in simulation-based language understanding. In J.-O. Östman and M. Fried, eds., *Construction Grammars: Cognitive Groundings and Theoretical Extensions*. Philadelphia, PA: John Benjamins.

- Bryant, John. 2004. Recovering Coherent Interpretations Using Semantic Integration of Partial Parses. *3rd workshop on Robust Methods in Analysis of Natural Language Data*. Geneva, Switzerland.
- Feldman, Jerome A. 2006. *From Molecule to Metaphor: A Neural Theory of Language*. Cambridge, MA: MIT Press.
- Fillmore, Charles J., Christopher R. Johnson, and Miriam R.L. Petruck. 2003. Background to Framenet. *International Journal of Lexicography* 16 (3):235-250.
- Fillmore, Charles J., Paul Kay, and Mary Catherine O'Connor. 1988. Regularity and Idiomaticity in Grammatical Constructions: The Case of Let Alone. *Language* 64:501-538.
- Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.
- Kay, Paul, and Charles Fillmore. 1999. Grammatical Constructions and Linguistic Generalizations: The What's X Doing Y? Construction. *Language* 75 (1):1-33.
- Li, Wendan. 2004. Topic Chains in Chinese Discourse. *Discourse Processes* 27 (1):25-45.
- MacWhinney, Brian. 2000. *The CHILDES Project: Tools For Analyzing Talk*. Third Edition. Mahwah, NJ: Lawrence Erlbaum Associates.
- Narayanan, Sridhar, and Daniel Jurafsky. 2001. A Bayesian Model Predicts Human Parse Preference and Reading Times in Sentence Processing. *Neural Information Processing Systems*. Vancouver, BC.
- Tardif, Twila. 1993. Adult-to-Child Speech and Language Acquisition in Mandarin Chinese, Yale University.
- Tardif, Twila. 1996. Nouns Are Not Always Learned before Verbs: Evidence from Mandarin Speakers' Early Vocabularies. *Developmental Psychology* 32:492-504.
- Yeh, Ching-Long, and Yi-Chun Chen. 2004. Zero Anaphora Resolution in Chinese with Shallow Parsing. *Journal of Chinese Language Computing*.

Eva H. Mok  
University of California Berkeley  
International Computer Science Institute  
1947 Center Street Suite 600,  
Berkeley, CA 94704

John Bryant  
University of California Berkeley  
International Computer Science Institute  
1947 Center Street Suite 600,  
Berkeley, CA 94704

[jbryant@icsi.berkeley.edu](mailto:jbryant@icsi.berkeley.edu)  
[emok@icsi.berkeley.edu](mailto:emok@icsi.berkeley.edu)

## Some Remarks on the Morphosemantics of Multiple Causative Sequences

TYLER PETERSON

*University of British Columbia*

### 0. Introduction

There is a diverse array of languages which employ more than one morpheme dedicated to causation. This is not surprising considering the numerous complexities involved in encoding a causative event and all of the linguistic domains it implicates, such as animacy, transitivity, lexical semantics, eventivity, and pragmatics (Shibatani 1976b, 2001; Shibatani and Pardeshi 2002; Dixon 2000). There is a subset of those multiple morphological causative languages in which the causatives can occur simultaneously in a fixed sequence on a verb stem. An example of this is found in the Tsimshian language, Gitksan (Rigsby 1986; Tarpent 1987), and Tarascan, a Mesoamerican isolate (Maldonado & Nava 2002). Whereas English (1) expresses indirect causation analytically, both Gitksan (2) and Tarascan (3) can achieve indirect causation synthetically through the morphology of ‘stacking’ causatives on the verb:

(1) *English*            ‘[Bill had [Gwen frighten Clara]]’

(2) *Gitksan*<sup>1</sup>  
gwin-si-xpts’axw-t=s    t=Bill=t    Clara ‘as    Gwen  
CAUS-CAUS-fear-3=CASE DET=G.=DET Clara    PREP    Gwen  
‘Bill had Gwen frighten Clara’

(3) *Tarascan*  
Eratzini ché-ra-tara-s-Ø-ti                            Yuyani-ni    Adrianu-ni  
Eratzini fear-CAUS-CAUS-PERF-PRES-IND.3    Yuyani-OB    Adrian-OB  
‘Eratzin had Yuyani frighten Adrian’ (Maldonado & Nava 2002: 181)

---

<sup>1</sup> Special thanks to my Gitksan language consultants, Doreen Jensen, Barbara Sennott and Gwen Simms. Data which is not cited is from original fieldwork, which was supported by The Phillips Fund for Native American Research and the Jacobs Research Fund, awarded to the author. All errors, omissions and misinterpretations of secondary data are mine.

An investigation of these constructions tests a hypothesis which states that, in languages which utilize complex causative sequences, the causative morphemes are uniquely sensitive to the semantics of the stem they attach to along two parameters: (i) the eventuality of the stem, and (ii) the control and/or volitionality of the causee in cases of indirect causation. This generalization has its roots in Dixon (2000:62), who proposes a set of nine partially independent parameters governing causation cross-linguistically, two of which are relevant to this discussion: first, morphological causatives may distinguish between states and actions; second, they may encode degrees of control, volition and affectedness of the causee.

There are two points of interest that come out of this study. This first is that morphology alone cannot be relied upon for the semantic interpretation of multiple-sequence causative structures. This is evident in Gitksan where there are potential mismatches between morphological structure and semantic interpretation when multiple causatives are involved. Secondly, other factors such as animacy and the valency of a predicate to which a causative morpheme attaches might be expected to play an important role in the formation of complex causatives constructions; however, neither appear to be a reliable indicator in predicting the distribution of stacked causatives in these two languages. Tarascan also presents its own challenge, where the causative morpheme *-tara*, shown in example (3), can only attach to a stem that has already undergone causativization.

Ultimately, multiple-sequence causative constructions reflect the interaction of stative/eventive and volitional/non-volitional distinctions in the causative event they designate. These two notions converge on the subject, and it is shown that complex causative formation is sensitive to the type of subject projected by the verb stem: different causatives select for unaccusative states, which lack a subject; unergative events, in which the subject has the volitionality of an ‘actor’; or transitive events, which have agent subjects (Perlmutter 1978; Burzio 1986).

### 1. Simplex Causatives

Both Gitksan and Tarascan have rich causative morphology which allows them to synthetically derive both direct and indirect causation, as well as degrees in between. This section describes and compares the distribution of simplex causatives in Gitksan and Tarascan in terms of what accounts for them: their semantic orientation in terms of the state/action continuum, and the degree of volition or control of the causee. This is schematized in Table 1:

*Table 1: Gitksan and Tarascan Causatives*

|                 | <i>Gitksan</i> | <i>Tarascan</i> | <i>Event type</i> | <i>Volition of the Causee</i> |
|-----------------|----------------|-----------------|-------------------|-------------------------------|
| <i>Direct</i>   | si-            | -ku-            | STATES            | (No volition)                 |
| ↓               | -in            | -ra-            | EVENTS            | Some volition                 |
| <i>Indirect</i> | gwin-          | -tara-          | ACTIONS           | Most volition                 |

*Some Remarks on the Morpho-semantics of Multiple Causative Sequences*

A note of terminology must be made in this regard: I will reinterpret Dixon's (2000:62) state/action distinction in terms of STATES and EVENTS, assuming the basic criteria for distinguishing between them. States are unaccusative (atelic) predicates, while events are non-states (Bach 1986). Events may be processes or more simple events, consisting of either unergative or transitive (telic) predicates. ACTIONS are considered subtypes of events, containing the two distinct events that are typically associated with indirect causation: the CAUSING EVENT and CAUSED EVENT (Shibatani 1976). This is also where the highest degree of independence between the subject of the causing event and the subject of the causee event occurs. Maximum volition is also ascribed to the causee subject, as the two events may have little or no temporal or physical overlap (Shibatani 2002). Control refers to the control a subject has over the event or activity denoted by the verb, while volition refers to the degree of 'willingness' the subject has (Dixon 2000:62). While these two notions are crucially distinct in languages such as Korean and Bolivian Quechua, this does not appear to be the case in Gitksan and Tarascan. Therefore, I will use them interchangeably.

**1.1. States, and direct causation**

The Gitksan causative *si-* is a verbal prefix which adds one argument to intransitive, (mostly) stative predicates: *si-* added to a nominal means to 'cause X to be in state of existence, process or procure by one's action the affected object signified by the nominal.' (see Belvin 1997:37 for the same characterization of Nisgha's causatives; Rigsby 1986:350-1), while *si-* added to an adjective yields an event that causes someone to be in the state X:

- (4) a. **si-**'anaax n'iiy'                      b. **si-**maay' n'iiy'  
       CAUS-bread 1sg                            CAUS-berries 1sg  
       'I made bread.'                            'I picked berries.'
- (5) a. 'al'ax=t Gwen                      b. **si-**'al'ax-ə-t=s                      t=Clara=t Gwen  
       angry=DET Gwen                      CAUS-angry-TR-3=CASE DET=C.=DET G.  
       'Gwen is angry'                            'Clara made Gwen angry.'  
       'Clara angered Gwen.'

The causative suffix *-ku* in Tarascan roughly corresponds to Gitksan *si-*, as both function to introduce an agentive participant, a causer, having direct contact with the patient (Maldonado & Nava 2002:166). Both take stative complements that transform those states into change of state verbs, yielding a simple event. Compare (5) with (6).

- (6) a. Eratzini yurhu-tsi-s-∅-ti  
       Eratzin drip.down-MDL-PERF-PRES-IND.3  
       'Eratzin is slender' (M&N 2001: 166)

- b. Wantanhiata yurhu-s-**ku**-s-Ø-ti Eratzini-ni  
 Sorrow drip.down-MDL-CAUS-PERF-PRES-IND.3 Eratzin-OBL  
 ‘Sorrow made Eratzin skinny’ (M&N 2001: 166 ex. 24)

In all of these cases, the subject of the embedded caused events, paraphrased in English as a small clause *Gwen angry* and *Eratzin slender*, is assumed to act with minimal to no volition, as would be expected with patient arguments.

The Tarascan causatives *-ra* and *-ta* may also attach to states, yielding a typical inchoative/causative alternation: *takusi ura-pi-s-Ø-ti* ‘The cloth is white’ becomes *Valeria ura-pi-ra-s-Ø-ti* ‘Valeria whitened the cloth’<sup>2</sup>

### 1.2. Events, direct/indirect causation and the emergence of volition

In Gitksan the causative suffix *-in* adds one argument to unergative predicates, functioning to make someone *X* by one’s (own) hand or action (Belvin 1997; Rigsby 1986:341-3). This can have the effect of deriving direct causation, as the English translation of the example in (7) shows. The original unergative subject, *the horses*, has been demoted to a patient argument, typical of direct causation, and is naturally presumed to be acting with minimal or no volition. However, (8) represents a case of indirect causation, and this is where we can observe the emergence of volition on the part of the subject of the embedded event, *Gwen*, whose control over the embedded event is determined by the circumstances of the event.

- (7) a. kuxw=hl kyuwatan      b. kuxw-’**in**-y’=hl      kyuwatan  
 run=DET horses      run-CAUS-1sg=DET horses  
 ‘The horses ran away.’      ‘I chased the horses run away.’
- (8) a. xsit t=Gwen      b. xsit-’**in**-t=s      t=Bill=t      Gwen  
 vomit DET=Gwen      vomit-CAUS-3=CASE DET=B.=DET Gwen  
 ‘Gwen vomited’      ‘Bill made Gwen vomit’

A similar situation is found in Tarascan: however, the potential degrees of volition or control are overtly encoded by morphology. Causative *-ra* and *-ta* are verbal suffixes which attach to events to yield events with a degree of volition of the subject introduced by the causative.<sup>3</sup> (9a) is a simple event. In (9b), *-ra* simply states that the fish was caught, while *-ta* in (9c) indicates a greater degree of control the subject introduced by the causativizer has over the event: this fish was not simply caught, but nailed to the wall (Maldonado and Nava 2001:172).

<sup>2</sup> There are some cases of *si-* attaching to an intransitive verb. However, Belvin (1995) reports that these are marginal or non-productive.

<sup>3</sup> It should also be mentioned that *-ku*, *-ra* and *-ta* encode spatial/locative properties in addition to causativization. See Maldonado and Nava’s (2001: 172-173) detailed examples and discussion.



When attached to a transitive predicate, the causee is demoted to an oblique while the direct object remains and the causer assumes the subject position. The causee is optional as an oblique, but when expressed, it must act with a high degree of volitionality. Because of this volitionality, *gwin-* cannot be used with unaccusative predicates, as in (14):

- (13) a. hlo'oxs-ə-t=s      t=Gwen=hl      hlit  
 kick-TR-3=CASE    DET=G.=DET    ball  
 'Gwen kicked the ball'
- b. **gwin**-hlo'oxs-ə-t=s      t=Bill=hl      hlit    ('as    Gwen)  
 CAUS-kick-TR-3=CASE    DET=B.=DET    ball    PREP    Gwen  
 'Bill had Gwen kick the ball'
- (14) a. t'ugwantxw=hl    ts'ak'  
 fall=DET              plate  
 'The plate fell' (adapted from Belvin 1997: 40)
- b. \***gwin**-t'ugwantxw-ə-t=s    t=Gwen=hl    ts'ak'  
 CAUS-fall-TR-3=CASE    DET=G.=DET    plate  
 'Gwen had the plate fall' (adapted from Belvin 1997: 40)

By comparing *gwin-* to *si-* and *-in*, we see that *gwin-* can only link a subject to a state or event through an intermediary agent, thus deriving a clear case indirect causation similar to English *have* (Belvin 1997). The situation is similar in Tarascan, which has the causative morpheme *-tara* dedicated to encoding causation in its most indirect form (Maldonado & Nava 2002:176). However, *-tara* is unique in that it requires the presence of other causativization morphology before it can apply. This serves as a convenient point of entry in discussing multiple, complex causative sequences in both Tarascan and Gitksan.

## 2. Complex Causative Sequences

In both Gitksan and Tarascan, the causative morphemes introduced in the previous section can be combined in order to derive more complex causatives. This morphological complexity directly reflects the increasing complexity in event composition (events/states/action) and semantic control (non-volitional/volitional) of the causee.

### 2.2. Tarascan

The Tarascan causative morpheme *-tara* is similar to *gwin-* in denoting indirect causation. However there is a restriction on its distribution: similar to *gwin-*, *-tara* cannot apply to unaccusative stems (although *gwin-* can attach to unerga-

*Some Remarks on the Morpho-semantics of Multiple Causative Sequences*

tives), and it also requires the presence of another causative *-ku*, *-ta* or *-ra* to satisfy its selectional requirements, as seen in (15) and (16):

- (15) a. \*urhu-**tara**-ni  
grind-CAUS-INF  
'Make someone grind something' (Maldonado & Nava 2002: 176)
- b. urhu-**ra-tara**-ni  
grind-CAUS-CAUS-INF  
'Make someone grind something' (Maldonado & Nava 2002: 176)
- (16) a. Yuyani arha-cha-**ku**-s-∅-ti Adrianu-ni  
Yuyani open-mouth-CAUS-PERF-PRES-IND.3 Adrian-OB  
'Adrian frightened Yuyani' (Maldonado & Nava 2002: 181)
- b. Eratzini arha-cha-**ku-tara**-s-∅-ti Yuyani-ni Adrianu-ni  
Eratzini open-mouth-CAUS-CAUS-PERF-PRES-IND.3 Y.-OB A.-OB  
'Eratzin had Yuyani frighten Adrian' (Maldonado & Nava 2002: 181)

State/event causatives *-ku*, *-ta* or *-ra* cannot occur simultaneously on the predicate, but one of them must form a stem with the verb before *-tara* can apply, thus yielding the morphological template [[V{-*ku*, *-ta*, *-ra*}-*tara*].

In order to explain the specialization of *-tara* in only attaching to already previously causativized stems, we must follow through on the hypothesis that morphological causativization reflects increasing event complexity and control of the causee subject, and couple it with the selectional restrictions of the individual causatives established above. Thus, we should be able to analyze *-tara* as sub-categorized for taking only event complements. This immediately explains (16), where the (assumed to be) state *open mouth*, must be turned into an event by *-ku* in order to serve as a legitimate stem form *-tara*. However, this has an important implication in that language: we would be forced to claim that Tarascan has only stative (unaccusative) verb roots. Because *-tara* can't apply to simple transitives, such as *gwin-* in Gitksan, even transitive events must always be derived. Given the data I've reviewed, this implication is likely not to hold in Tarascan.

An alternative approach is that, while basic eventivity is relevant (*-tara* can never attach to states), *-tara* is specialized for the sub-type of events, called ACTIONS. Maldonado & Nava (2002) present a detailed discussion of the causative *-tara*, explaining that it 'introduces an extra participant (the causer), letting the actual performer of the action (the causee) function as the second most prominent participant' (p.178). They also go on to explain that *-tara* is unspecified for volition: it introduces a causer distant enough that the causee subject has almost complete control over the caused event. This is what distinguishes ACTIONS from EVENTS: *-tara* introduces ACTIONS, which take events as complements. The morpho-semantics of this in Tarascan is represented in (17):

- (17) [[ V-STATES/EVENTS *-ku, -ta, -ra* ] ACTIONS *-tara* ]]

### 2.1. Gitksan

Unlike Tarascan, Gitksan causative morphemes can freely combine to form more complex stems, as long as they satisfy their respective selectional restrictions: *si-* selects for states, *-‘in* and *gwin-* for events. The stative/eventive sensitivity in causative formation is evident from the Gitksan example in (2): as with *-tara*, the causative *gwin-* can only attach to an EVENT and not a STATE, such as *fear*. This event is derived by the causative morpheme *si-*, which takes a state, such as *fear*, and yields a suitable event stem for *gwin-* to attach to. However, unlike *-tara*, *gwin-* can attach to plain, underived events (cf. (13)).

Volition interacts with eventivity in a non-trivial fashion, as both converge on the semantic characteristics of the subject. Both *gwin-* and *-‘in* can attach to events derived by *si-*. However, these two morphemes encode different subclasses of events: ACTIONS, which are denoted by *gwin-*, are events where the causee exerts a higher degree of volition than in simple EVENTS, which are denoted by *-‘in*. Put another way, in (18) the causee may or may not be interpreted as volitional, while in (19) it must be. This is represented in the *-‘in / gwin-* alternation in (18) and (19):

- (18) **si-xpts’axw-‘in-t=s**      t=Gwen=t    Bill ‘as    Mary  
 CAUS-fear-CAUS-3=CASE    DET=J.=DET    Bill    PREP    Mary  
 ‘Gwen made Bill afraid of Mary’
- (19) **gwin-si-xpts’axw-t=s**      t=Gwen=t    Bill ‘as    Mary  
 CAUS-CAUS-fear-3=CASE    DET=J.=DET    Bill    PREP    Mary  
 ‘Gwen had Mary frighten Gwen’

In (20), *-‘in* attaches to the transitive predicate *use*, forming a suitable stem for the extra ‘layer’ of indirect causation, achieved by *gwin-* which introduces an external causer:

- (20) **gwin-hooy-‘in-t=s**      t=Bill=hl    k’utaats’=hl    hlkutk’ihlkw    ‘as    Mary  
 CAUS-use-CAUS-3=CASE    DET=B.DET    coat=DET    coat                  PREP    M.  
 ‘Bill had Mary make the child use a coat’ (adapted from Belvin 1995: 41)

The most complex case is where all three morphological causatives appear on the verb. In these cases, the selectional restrictions of all the causative morphemes must be met: *si-* derives an event, which serves a suitable stem for *‘in*. In the example in (21), this forms the direct causative *teach*. This is then a suitable stem for indirect causation, provided by *gwin-*.

*Some Remarks on the Morpho-semantics of Multiple Causative Sequences*

- (21) **gwin-si-wilaa-'in-t=s**                      t=Bill=hl    Gitksan-imx    'as    Gwen  
 CAUS-CAUS-know-CAUS-3=CASE    DET=B.=hl    Gitksan-lang.    PREP    G.  
 'Bill had Gwen teach the Gitksan language'  
 'Bill had Gwen make someone into the state of knowing Gitksan'

Both *-in* and *gwin-* encode event causation, with *gwin-* encoding a subtype of events, ACTIONS, which are distinguished from regular events in that they assign a higher degree of volition to the causee subject than in plain *-in* EVENT causation. From this, a morpho-semantic template emerges for Gitksan complex causation:

- (22) [*gwin-* ACTION [[*si-* STATE-V ] EVENT *-in* ]]

Notice that ACTION causation is morphologically adjacent to STATE causation, and both STATE and EVENT causation are adjacent to the verb root. This presents a case of a potential morphology-semantics mismatch: the interpretation of multiple morphological causatives is driven not by morphological factors, but rather by eventuality of the stem it attaches to. A clear example is (20), which must be interpreted as *having someone make someone use something*, and not *make someone have someone use something*.

**3. In Sum**

Both simplex and complex causative formation in Gitksan and Tarascan are sensitive to (i) the eventivity of the stem they attach to, and (ii) the degree of volitionality assigned to the causee of the embedded causative event. However, what is notable is that these languages diverge slightly in their orientation towards these two parameters: Tarascan makes more productive use of the notion of control, as reflected in its rich causative lexicon distributed across the two eventualities, and less so to the eventuality of the predicate. Gitksan, on the other hand, is sensitive to both the eventuality of the predicate they attach to, and the volition of the causee. This is summarized in Table 2, which shows the distribution of causatives with relation to eventivity, and Table 3, where the notion of causee volition is correlated with the indirect/direct causative continuum:

*Table 2: Causatives in Selecting Eventualities*

| STATES   |                                     | EVENTS          |              |
|----------|-------------------------------------|-----------------|--------------|
|          |                                     | SIMPLE          | ACTIONS      |
| Gitksan  | <i>si-</i>                          | <i>-in</i>      | <i>gwin-</i> |
| Tarascan | <i>-ku, (-ra, -ta)</i> <sup>4</sup> | <i>-ra, -ta</i> | <i>-tara</i> |

<sup>4</sup> From the data available to me, I'm unable to firmly conclude whether *-ra, -ta* can also attach to states. It's plausible they might, as Maldonado and Nava (2001: 182) claim that *-ra, -ta* may also participate in direct causation.

*Table 3: Degree of Causation (adapted from Maldonado & Nava 2001:182)*

| DIRECT CAUSATION |                      | INDIRECT CAUSATION   |                      |
|------------------|----------------------|----------------------|----------------------|
|                  |                      | <i>Less Volition</i> | <i>More Volition</i> |
| <i>Gitksan</i>   | <i>si-, -'in</i>     | <i>-'in</i>          | <i>gwin-</i>         |
| <i>Tarascan</i>  | <i>-ku, -ra, -ta</i> | <i>-ta, -ra</i>      | <i>(-ta), -tara</i>  |

Tarascan *-ku, -ra, and -ta*, and Gitksan *si-* take stative (unaccusative) complements to derive simple events, deriving cases of direct causation. Both Gitksan *-'in* and Tarascan *-ra* and *-ta* take event complements (unergatives or transitives) and can derive either direct or indirect causation. Gitksan has only one causative morpheme *-'in* which has a wider interpretation than Tarascan in terms of both direct and indirect causation and volition (cf. (7) and (8)), which is determined by the context. Tarascan overtly represents this scale of volition through the use of distinct morphemes *-ra*, and *-ta*. The causatives *gwin-* in Gitksan, and *-ta* and *-tara* in Tarascan designate complete indirect causation: the causee subject is assumed to be acting with maximal volitionality. They also select event complements to yield a subtype event, ACTIONS.

In the formation of complex causatives sequences, these selectional requirements hold, and in both languages they derive more complex event types from simpler ones. the causatives *-'in* and *gwin-* can only take EVENT complement and not STATE ones, unless they are inherently eventive (i.e. unergatives and transitives) or derived through the application of *si-*. The restriction is even tighter in Tarascan, as *-tara* can only apply to derived events through previous causativization. We can characterize this in terms of the following continuum in (23), where ACTIONS embed EVENTS which embed STATES:

(23) ACTION → EVENT → STATE

This continuum is reminiscent of the *chain of causality* as discussed by DeLancey (1985; 1986), adapted in (24):

(24) VOLITION → EVENT → RESULTING STATE

(24) represents a series of stages of a single event: an act of VOLITION causes an overt EVENT, which in turn causes a (resulting) STATE. Although not concerned with causation directly, DeLancey analyzes the evidential and perfective/imperfective system of Lhasa Tibetan as morphologically distinguishing between direct knowledge of an EVENT and knowledge of a RESULTING STATE of an event. Neither of these forms encodes the VOLITION stage, which would constitute direct knowledge of the ultimate cause of the event, which is morphologically encoded separately. Volition is implicated in this because EVENT evidentiality cannot encode any control over the event. If any volition is involved on the part of the speaker, they must have direct knowledge of it. When no volition is

*Some Remarks on the Morpho-semantics of Multiple Causative Sequences*

involved, the originating cause is not subject to perception, whereas the actual event of the resulting state may be so.

Although the stages in (23) and (24) are not entirely isomorphic, as volition and events actually overlap in causation, the basic concept holds: volition is always required to accomplish a desire or wish. No decision on the part of the agent/actor to perform an act – volition – can be made without the agent’s initial perception of the desire or wish (DeLancey 1985a:5).

Note that in both Tarascan and Gitksan, other parameters such as transitivity and animacy could be expected to condition the selectional restrictions of either simplex or complex causatives. Transitivity is clearly not a factor, as EVENT causatives such as Gitksan *-in* and *gwin-*, and Tarascan *-ta*, *-ra*, and *-tara* can attach to either transitives or intransitives. Rather, it is the eventivity of the stem, and in particular, the presence of subject which accounts for this fact. Intransitive verbs divide into two groups: unaccusative verbs introduce a theme argument in object position, while unergatives and transitives introduce an actor/agent in subject position. Event causatives require a subject, projected by either an unergative or transitive verb. Conversely, this is what rules out causative morphemes such as *si-* from selecting events, and ‘action’ causation such as *-tara* and *gwin-* from selecting unaccusatives.

Also, animacy also does not appear to play a role, as can be seen in (23), where an inanimate causer is introduced by *in*.

- (25) a. *wok* n’iiy’                      b. *wok-in=hl*                      *pils* n’iiy’  
      sleep 1sg                              sleep-CAUS=DET                      pills 1sg  
      ‘I slept’                                ‘The pills put me to sleep.’

**4. Multiple Causative Sequences in Other Languages**

Dixon (2000:59-61) reports other languages (see references therein) which allow sequences of causatives. These include languages in which a causative may be reduplicated to render a more specialized, intensive reading, such as in Swahili or Oromo, or a causative of a causative, such as in Capanawa, Kabardian, Hungarian and Turkish. But of relevant interest here are languages such as Nivkh and Apalai, which employ multiple causatives applied to the same stem.

In Nivkh, one morphophonemic and two causativizers, *-u* and *-gu*, may apply to a verb root to derive both direct and indirect causation: *t’oz-* ‘go out (i.e. fire); *zoz-u* ‘put out’; *t’oz-gu* ‘let something go out; *zoz-u-gu* ‘make someone put something out’. Apalai could be considered similar to Gitksan and Tarascan, as the causative morpheme *-ma-* is added to the unergative verb *eat* to yield direct causation in *feed*. This serves as a suitable complement for the indirect causativizer *-po-* to apply: *otuh-* ‘eat’ (intrans.); *otuh-ma-* ‘feed someone/make someone eat’; *otuh-ma-po-* ‘have someone feed someone/make someone eat’.

Both of these languages are suitable candidates for testing the hypothesis presented here: languages that utilize causative sequences are sensitive to the eventuality of the stem, and control and/or volitionality of the causee subject.

## References

- Bach, E. 1986. The Algebra of Events. *Linguistics and Philosophy* 9:5-16.
- Belvin, R. 1997. The Causation Hierarchy, Semantic Control and Eventivity in Nisgha. In A. Mendikoetxea and M. Uribe-Etxebarria eds., *Theoretical Issues at the Morphology-Syntax Interface*, 35-53. Bilbo: Univ. del País Vasco
- Burzio, L. 1986. *Italian Syntax. A Government and Binding Approach*. Dordrecht: Reidel.
- DeLancey, S. 1985. Agentivity and Syntax. In *Papers from the Parasession on Causatives and Agentivity at the Twenty-First Regional Meeting, Chicago Linguistic Society*, 1-12.
- DeLancey, S. 1986. Evidentiality and Volitionality in Tibetan. In W. Chafe and J. Nichols, eds., *Evidentiality: The Linguistic Coding of Epistemology*, 203-13. Ablex.
- Dixon, R.M.W. 2000. A Typology of Causatives: Form, Syntax and Meaning. In R.M.W. Dixon & A. Y. Aikhenvald, eds., *Changing valency. Case Studies in Transitivity*, 30-83. Cambridge: Cambridge University Press.
- Maldonado, Ricardo and E. Fernando Nava. 2002. Tarascan Causatives and Event Complexity. In M. Shibatani, ed., *The Grammar of Causation and Interpersonal Manipulation*, 157-195. Amsterdam: John Benjamins
- Perlmutter, D. M. 1978. Impersonal Passives and the Unaccusative Hypothesis. In *Proceedings of the Fourth Annual Meeting of the Berkeley Linguistics Society*, 157-189.
- Rigsby, B. 1986. *Gitksan Grammar*. Ms., University of Queensland, Australia.
- Shibatani, M. 1976b. The Grammar of Causative Constructions: A Conspectus. In M. Shibatani, ed., *Syntax and Semantics 6: The Grammar of Causative Constructions*, 1-40. New York: Academic Press.
- Shibatani, Masayoshi. 2002. Some Basic Issues in the Grammar of Causation. In M. Shibatani, ed., *The Grammar of Causation and Interpersonal Manipulation*, 1-22. Amsterdam: John Benjamins.
- Shibatani, Masayoshi & P.Pardeshi 2002. The Causative Continuum. In M. Shibatani, ed., *The Grammar of Causation and Interpersonal Manipulation*, 85-126. Amsterdam: John Benjamins.
- Tarpen, M.-L. 1987. *A Grammar of the Nisgha Language*. Ph.D. diss., University of Victoria.

Tyler Peterson  
Department of Linguistics, University of British Columbia  
1866 Main Mall, Buchanan E270  
Vancouver, British Columbia V6T 1Z1  
Canada

tylerrp@interchange.ubc.ca

## Semantic Combinatorial Processes in Argument Structure: Evidence from Light-Verbs

MARIA M. PIÑANGO<sup>1</sup>, JENNIFER MACK<sup>1</sup>, and RAY JACKENDOFF<sup>2</sup>

<sup>1</sup>*Yale University and* <sup>2</sup>*Tufts University*

### 1. Introduction

Any theory of how language is internally organized and how it interacts with other mental capacities must address the fundamental question of how syntactic and lexico-semantic information interact at one central linguistic compositional level, the sentence level. With this general objective in mind, we examine “light-verbs”, so called because the main thrust of the semantic relations of the predicate that they denote is found not in the predicate itself, but in the argument structure of the syntactic object that such a predicate licenses. For instance, in the sentence *Sue made a dash across the road*, the character of the event expressed by *make a dash* is determined not so much by the main predicate *make* as by the object DP *a dash*. This situation defines the verb *make* as a light-verb, and the combination of the verb and the argument structure of its object as a “light-verb construction”. Their behavior therefore lies at the interface between syntactic and lexico-semantic representation (e.g., Jespersen 1954, Jackendoff 1974, Cattell 1984, Grimshaw and Mester 1988, Baker 1989, Jun 2003, Culicover and Jackendoff 2005).

Here, we seek to chart the time-course of interpretation of light-verbs, and through doing so, compare two possible ways it might take place. The first is a *lexical* approach, according to which the light-verb interpretation is fully listed as an idiom in the lexicon (i.e., a case of logical polysemy). The second is a *compositional* approach, according to which light-verb constructions are built “in real time”, as it were; that is, the resulting interpretation of the light-verb construction arises out of the local syntactic and semantic context of the predicate and its object. We hypothesize that if the construction of light-verb interpretation is lexicalized in nature, it should be observable during real-time comprehension as soon as it is licensed. However, if, as the compositional approach suggests, the light-verb construction’s interpretation is built online from the argument structures of the light-verb and the nominal, it should be observable only some time after having been licensed, in the form of computational cost.

Determining where the light-verb construction lies in this theoretical divide can thus shed light on the larger question of the nature of argument structure, and ultimately on the nature of the connection between syntactic and semantic representation.

The paper is organized as follows: First, we present a more detailed description of light-verbs and the light-verb construction. Second, we discuss the processing considerations that lead to the specific hypothesis pursued here. Third, we present a corpus analysis and the results of two real-time comprehension experiments that test our hypothesis. We conclude with a discussion of where our findings fit in the representation of the syntax-semantics correspondence.

## 2. The Representation of Light-Verbs: Argument Sharing

Consider the following contrast

- (1) The man *took a cup*.
- (2) The man *took a walk*.

Both sentences show the same basic phrase structure representation:

[DP [<sub>VP</sub> V DP]]. The way the meanings of their parts are combined, however, is different. In sentence (1), the interpretation arises straightforwardly from the meaning of the lexical items involved: *take* licenses two syntactic arguments which map directly onto the semantic roles of <agent, theme> in a one-to-one correspondence. In sentence (2), *take* again licenses two syntactic arguments. The subject is still <agent>, but the object is not a <theme>. Rather, the semantic argument structure of the complement (*a walk*, a deverbal noun, has been allowed to activate the argument structure of its source verb *to walk*, <agent>; this semantic role is *identified with* or *fused with* or *shared with* the agent role of the main verb, thus giving rise to the attested interpretation THE MAN WALKED.

Thus the interpretation of (2) is strictly compositional: the interpretation of the light-verb+object composite must be viewed as the combination of the argument structure of the main predicate with the argument structure of the predicate's object. But crucially, this interpretation has come at a cost: the semantic roles activated and the syntactic arguments onto which they are mapped are no longer in the canonical one-to-one correspondence seen in (1). We take this observation to be necessary for any kind of account of light-verb interpretation, and we use the label "argument sharing" to denote this process.

Summarizing, argument sharing refers to the process whereby the semantic system combines at least two sets of arguments by matching as best it can their independent properties. So, if the usual use of *take* shown in (1) has the argument structure (3), where syntactic and semantic arguments match, then argument sharing in *take a walk* might be schematized as in (4). (Note that the light-verb stipulates the *syntactic* role *object* without a corresponding thematic role, and the nominal stipulates *thematic* roles without corresponding syntactic roles. See Culicover and Jackendoff 2005 for a related account.)

- (3) take <subject=agent<sub>1</sub>, object=theme<sub>2</sub>>
- (4) take <subject=agent<sub>1</sub>, object<sub>2</sub>>  
+ walk<sub>2</sub> <agent<sub>3</sub>>  
→ [take a walk]<sub>VP</sub> <subject=agent<sub>1,3</sub>>

For a more complex case, we may contrast the canonical use of *get* in (5) (*John got a book from Bill*) with the light-verb use in (6) (*John got an order from Bill to finish the proposal*).

- (5) get <subject=goal<sub>1</sub>, object=theme<sub>2</sub>, from NP=source<sub>3</sub>>
- (6) get <subject=goal<sub>1</sub>, object<sub>2</sub>, from NP=source<sub>3</sub>>  
+order<sub>2</sub> <agent/source<sub>4</sub>, goal<sub>5</sub>, action<sub>6</sub>>  
→ [get an order]<sub>VP</sub> <subject=goal<sub>1,5</sub>, object<sub>2</sub>, agent/source<sub>4</sub>, action<sub>6</sub>>

Two main implications follow from this approach to light-verb interpretation: 1) the absence of the expected one-to-one correspondence between semantic representation and its corresponding morphosyntactic structure need not always be a cause of ungrammaticality; 2) the conditions on argument sharing are formal (i.e., capturable in terms of a lexico-semantic structure), not necessarily the result of lexico-conceptual biases created over experience (i.e., world-knowledge).

From a real-time comprehension perspective, argument sharing describes light-verb interpretation in terms of a potentially measurable process with predictable parsing-based consequences. If argument sharing takes place in real time, its implementation should be more costly to the processing system, as it entails a step above and beyond that which must be carried out in the interpretation of the *non-light* counterparts.

However, before this last implication can be explored further, we must check on the frequency distribution of the light-verb construction. For if light-verbs take longer to process, it might just be because they are of lower frequency in use. We need to defuse this possible objection.

### 3. Dissociating “Idiomatic” from “Compositional” Processes: Corpus Analysis

If argument sharing is compositional, it is built during real-time sentence formation. From this perspective, it is only a more complex instantiation of normal semantic role assignment. Alternatively, light-verb constructions might be stored in the lexicon, with composite argument structures of the sort in the lower lines of (4) and (6). On this view, argument sharing is noncompositional in real time: it is a fully lexicalized (i.e., idiomatic) “re-arrangement” of the argument structure of a predicate+argument composite. In this case, there should be no extra processing cost associated with light-verb constructions beyond normal lexical access for idioms.

In order to tease these two potential accounts apart, we must examine the possibility that if the prediction of extra processing cost is borne out, it is not for the irrelevant reason that there is a basic sense-frequency difference between light-verb constructions and non-light verb counterparts. To this end, we carried out a corpus analysis of light *senses* using the Brown Corpus of Written American English (Francis and Kucera 1964, Hofland et al. 1999). The search was carried out using the following criteria: 1) all verbal forms of a set of potential light-verbs had to be included, 2) each occurrence had to be analyzed within its local context (approximately 15-20 words on either side), 3) *light* senses counted could only be those that had a non-*light* counterpart.

These criteria yielded the following sense classification for the set of verbs chosen:

- *Light* senses, containing argument sharing between the verb and its object, e.g., "She changed ends and *took a swipe* at John ..."
- *Dark* senses like (1) and (3), containing a verb with its expected argument structure but no argument sharing, e.g., "I *took the pint bottle* from my pocket and ..."
- *Other category* senses, which include alternative senses of the verb as in: "It *took a tragedy* to bring things to a head" (where *take*= REQUIRE)
- Clearly idiomatic (i.e. non-compositional) uses such as "He *took heart*."

The results for all verbs examined (a total of 11) reveal that the *light* sense is used more frequently than the *dark* counterpart [ $\text{Mean}_{\text{Light}} = 223$  (261),  $\text{Mean}_{\text{Dark}} = 165$  (164),  $t_{(10)} = .62$ ,  $p = .27$ ]. These findings thus suggest that even if there is the hypothesized extra processing suggested by a compositional view of argument sharing, the *light* sense of a predicate occurs with at least as great a frequency as the *dark* sense counterpart. Consequently, any observation of increased processing cost during comprehension cannot be attributed to a sense-frequency artifact. This clears the way for our experimental question regarding the time-course of argument sharing, to which we now turn.

#### **4. The Processing of Light-Verbs: Charting the Time-Course of the Implementation of Argument Structure**

To formulate our predictions for the composition of argument sharing, we are guided by well-supported notions about the comprehension system. The comprehension process is incremental, and semantic composition that is not directly supported by syntax can be detected in the form of delayed increased processing load. Such a load is not observed in syntactically transparent circumstances, that is, in circumstances where semantic representation has a direct morphosyntactic correlate.

Initial reported evidence strongly supports this hypothesis (Piñango et al. 1999, Todorova et al. 2000, McElree et al. 2001, Piñango et al. 2005, Piñango et al. in press). These reports show that certain types of enriched composition (e.g.,

aspectual, complement and argument coercion) can be isolated during the course of normal comprehension; this process is detected as a “computational cost” to the processing system.

The basis of the processing approach is as follows: the temporal location of this increase in load is 250-300 milliseconds after a lexical semantic combinatorial operation has been licensed. This observation fits in well with other evidence concerning the time course of combinatorial semantic processing (e.g., Swinney and Smith 1994). Although information concerning potential argument structure configurations seems to be available soon after hearing the verb in a sentence (e.g., Shapiro et al. 1987, 1989), the deployment of such information in thematic role assignment appears to follow a slower-developing, longer-lasting real-time course than do syntactic operations. For instance, in a cross-modal task, Boland (1996) reports this pattern: syntactic anomaly influences naming response time significantly earlier than does meaning-based anomaly. McElree & Griffith (1995), using a judgment task, similarly report violations of thematic role structure to be detected *later* than syntactic violations in the course of sentence processing. Even though these previous studies address mainly lexical as opposed to compositional semantics, and even though they capitalize on the detection of violations, they point to a clear and detectable difference between syntactic and semantic operations *as comprehension unfolds*, thus validating the present approach. This means that, if the compositional approach is correct, light-verb interpretation (in the form of argument sharing) should be detected during sentence processing – as delayed increased processing load.

#### **4.1. Methods**

Design and Procedure. Our current experimental design makes use of the dual task interference paradigm. In this task, sentences are presented auditorily to subjects. At a certain point in each sentence, a letter string (probe), totally unrelated to the sentence, is presented visually. At this moment, the subject is required to make a lexical decision for that probe, i.e., to decide whether or not the letter string forms a word in English. The dependent measure is the reaction time (RT) to this decision. The key assumption underlying the task is that a hypothesized processing load involved in the comprehension of one of the conditions will “interfere” with the processes associated with executing the lexical decision task. This interference will be revealed in a higher RT for that condition over its counterparts. In the present case, the factor hypothesized to cause higher processing load is the presence of argument sharing.

For all three conditions, two positions are probed: right at the end of the matrix object DP, which we refer to as the Licensing Condition (LC), and 300 milliseconds *after* the end of the matrix object (LC+300). The RT to the lexical decision is taken to be an indicator of the processing load at the post-object position of the *light* condition as opposed to the *dark* and *heavy* counterparts.

Stimuli. Twenty-five triads of experimental sentences were constructed. Each triad contained a *light* condition such as (7), where a verb and its nominal object must share their argument structures; a *dark* condition such as (8), in which the same verb occurs but with a canonical argument structure; and a *heavy* condition such as (9), in which the same *nominal* occurs, but in a canonical argument structure construction with no argument sharing.

- (7) *Mr. Olson gave an order last night to the produce guy* (light)
- (8) *Mr. Olson gave an orange last night to the produce guy* (dark)
- (9) *Mr. Olson typed an order last night for the produce guy* (heavy)

Verbs were selected on the basis of the corpus analysis, yielding a set of triads where the frequency of the *light* sense is systematically higher [ $\text{Mean}_{\text{Light}} = 263.2$  (275.1),  $\text{Mean}_{\text{Dark}} = 192.2$  (171.5),  $t_{(24)} = .65$ ,  $p = .26$ ]. Verbs were also matched for raw frequency and length (in terms of both letters and syllables).

Sentential objects (e.g., *order/orange*) were also matched for frequency and length (letters and syllables), giving always an advantage to the object of the *light* condition. This was done so that if there were any processing facilitation due to frequency, it would give the advantage to the sentences with verbs requiring argument sharing, thus blunting the effect we hypothesized – higher processing load for the *light* condition sentences. Objects were all one or two syllables long. Whenever possible, they were also paired for phonological content of the first syllable to ensure that the post-object position (Licensing Condition) would be as close to the “real” LC as possible (i.e., to align the point during the sentence where the probe appears with the point in comprehension of the object when the content of the lexical item is fully retrieved).

On the idea that formulaic light-verb constructions may in fact be stored in the lexicon, and this would predict a lower RT than the dark/heavy conditions, throughout the creation of the *light* condition, we sought to avoid idiomatic uses of the “light” constructions.

Twenty-five triads of visual probes, to be aligned with the 25 pairs of experimental sentences, were constructed. The probes were selected so as not to be related to the content of the sentence in any meaningful way. To ensure interference, probes were constructed with a variety of manner of articulation features. Probes were also matched for frequency and number of letters. Probes were left on the screen for 400 milliseconds.

An additional 225 sentences and probes were constructed as foils. One hundred and twenty-five sentences were assigned nonword probes constructed to conform to orthographic and phonotactic rules of English, and the remaining seventy-five sentences were assigned probes made up of legitimate words of the English language. Probe position in all filler sentences was randomly varied to lessen expectations on the part of the subjects.

Two final scripts containing a total of 300 sentences were constructed, each encoding a counterbalanced experimental sentence ordering. All 75 experimental

sentences were matched to word probes. Of the 225 filler sentences, 75 were matched to word probes, and 150 were matched to nonword probes. Within each of the scripts, the experimental sentences were set up in a quasi-random order, with the constraint that the *light* sentence of the pair should precede the *dark/heavy* counterpart about half of the time and the *dark/heavy* condition precede its *light* counterpart the other half. Probes of filler sentences were ordered in such a way that no more than three consecutive sentences had a nonword probe.

Construction of the final script (containing both experimental and filler sentences) was guided by the constraint that there be at least one filler between any two experimental sentences and that there be three filler sentences at the beginning of the script, always avoiding any type of block distribution.

All sentences were digitized at 22,000 samples per second. Probes were triggered using TEMPO (Motta et al. 2000-2004), software developed in our lab for the implementation of cross-modal techniques.

For the *light* vs. *dark* contrast, two experimental lists of probe words were created to use with these sentences. For each experimental position (LC vs. LC+300), half of the subjects were presented with one pair of probes and sentences, and the other half were presented with the same pair of sentences but with the probes exchanged. The intention behind this was that any potential facilitation caused by an unforeseen probe-sentence connection would be detectable by a post hoc interaction analysis between probes and sentences.

Sentence-probe pairs were kept constant in the *heavy* condition in order to minimize subjects' exposure to the whole set of experimental sentences. We reasoned that if any effect observed between the *light* and *heavy* conditions were to arise from the probe itself, such an effect should be observed in both LC and LC+300 positions. Finally, probe frequency was controlled in the *light/heavy* contrast. However, any difference in frequency was made to systematically favor the *light* condition (i.e.,  $H < L \& D$ ), so as to make any accumulated facilitation effect from probe frequency work against our predictions.

Subjects. A total of forty subjects (twenty subjects per position) were tested in this experimental series. All were monolingual speakers of English with normal or corrected-to-normal vision and hearing (by their own report).

#### **4.2. Predictions**

Our hypothesis that argument sharing is compositional and semantic in nature makes two specific predictions: 1) the compositional nature of argument sharing predicts that it should be visible as processing *cost*, as it demands computations above and beyond those required in the *dark* and *heavy* counterparts; and 2) the semantic nature of this process predicts that the cost of argument sharing should not be visible until some time after licensing; that is, at the LC+300 position. This is so because semantic composition is built at least partly on the basis of syntactic composition, so the results of semantic compositionality are expected to be

observable in a protracted manner with respect to the morphosyntactic representation on which it is built (e.g., McElree and Griffith, 1995, Piñango et al. 1999, 2005). In summary, our hypothesis about light-verbs in combination with well-known observations about the processing of semantic composition predict that the cost of argument sharing will be reflected in a statistically significant higher RT only at the LC+300 position to the lexical decision for the *light* condition over the *dark* and *heavy* conditions.

### 4.3. Results

Subjects responded at ceiling levels (with a success rate of 89.5%) to the comprehension questions, indicating that they consistently attended to and understood the experimental sentences.

There were no group by condition interaction effects observed neither at LC [ $F(1,36) = .000$ ,  $p = .998$ ] nor at LC+300 [ $F(1,36) = .001$ ,  $p = .979$ ] positions. This indicates that any potential factor that could have facilitated or interfered in the processing of the experimental sentences was successfully controlled in our design.

There were two criteria for data exclusion: 1) incorrect or non-existent responses – when a subject answered “no” to an experimental word probe, or failed to respond at all, and 2), delayed responses – when the reaction time for a given item fell outside three standard deviations from the subject’s mean RT for that condition. These criteria resulted in the exclusion of 7.7% of the total data set, distributed equally across the three conditions.

At LC, a subjects-based paired *t*-test indicated that reaction times were significantly higher in the *dark* condition than in the *light* condition:  $\text{Mean}_{\text{Dark}} = 634.43$  ms (82.34 ms) vs.  $\text{Mean}_{\text{Light}} = 619.15$  ms (82.84 ms) [ $t_{(19)} = -2.01$ ,  $p < .03$ , one-tailed]. This effect was not predicted, yet not completely unexpected given the frequency difference between object DP’s in the *light* vs. *dark* conditions: object DP’s in the *dark* condition were systematically less frequent – and therefore presumably more costly to process – than their *light* and *heavy* counterparts. In contrast, and consistent with our predictions, no difference was observed between the *light* and *heavy* conditions at this position:  $\text{Mean}_{\text{Heavy}} = 618.40$  ms (86.38 ms) vs.  $\text{Mean}_{\text{Light}} = 619.15$  ms (82.84 ms) [ $t_{(19)} = .112$ ,  $p = .456$  (one-tailed)].

Moving on to the LC+300 position, RTs for the *light* condition were numerically higher than RTs for the *dark* condition:  $\text{Mean}_{\text{Light}} = 664.44$  ms (115.43 ms) >  $\text{Mean}_{\text{Dark}} = 659.04$  ms (112.88 ms), [ $t_{(19)} = .634$ ,  $p = .267$  (one-tailed)]. Yet, this trend did not reach significance ( $p > .05$ ). Given the *light* << *dark* effect observed at the LC position, we take this trend to be indicative of a reversal in computational cost in the predicted direction, yet, one which did not have enough time to develop due to the previous frequency effect it had to overcome.

Focusing on the *light* vs. *heavy* contrast, a paired *t*-test (with subjects as the random variable) revealed a statistically significant difference (*light* >> *heavy*) at LC+300:  $\text{Mean}_{\text{Light}} = 664.44$  ms (115.43 ms) >  $\text{Mean}_{\text{Heavy}} = 645.51$  ms (104.2ms),

[ $t_{(19)}=2.46$ ,  $p=.012$ , one-tailed]. This effect was also obtained in the items-based analysis:  $\text{Mean}_{\text{Light}}= 666.62$  ms (43.30 ms) >  $\text{Mean}_{\text{Heavy}}= 647.30$  ms (40.14ms), [ $t_{(24)}=1.718$ ,  $p=.049$ , one-tailed]. This is consistent with our original hypothesis that argument sharing involves additional semantic composition.

## **5. Discussion and Conclusions**

The representation of argument sharing reveals that it is rooted in syntax and semantics. That is, it occurs in a *syntactic* compositional process, yet, it is triggered by the presence of a semantic roles-syntactic constituent mismatch. At least in English, it is morpho-syntactically opaque. It does not introduce new content; rather it “recycles” what is already there from the argument structures available (i.e., no new syntactic or semantic roles that do not already exist in the lexico-semantic representation are added to the sentential interpretation).

The processing of argument sharing further enriches our understanding of it by showing that it is carried out at a computational cost; an effect most clearly observed in the *light* vs. *heavy* contrast, which emerges 300 milliseconds after licensing. In line with previous findings on enriched composition, we take this computational cost to be a reflection of a lack of overt morphosyntactic support. We interpret its protracted time-course to reflect its purely semantic nature (even though its implementation takes place on the basis of syntactic composition).

This is an interesting outcome for linguistic theory. All descriptions of argument structure agree that it must reflect the number of possible syntactic constituents (subject, object, etc.) that have a corresponding *lexico-semantic* instantiation (agent, theme, etc.). However, current models of linguistic representation differ as to where the locus of this correspondence lies – as an intrinsic component of syntactic structure, as captured in *theta theory* (e.g., Chomsky 1981, 1995) or as a syntax-semantic interface component as captured in a variety of theoretical proposals such as *lexical conceptual structure* (e.g., Jackendoff 1990), *argument (a-)structure* (e.g., Bresnan 2001), and *semantic macrorole structure* (e.g., Van Valin and LaPolla 1997). Our present results are consistent with an interface approach to argument sharing, and consequently with an approach to semantic role instantiation that goes beyond syntactic structure.

Finally, in terms of the architecture of language, the results are also consistent with the view, implicit in some, but not all, models of language representation that the semantic system can carry out compositional processes of its own, independent of the combinatorial powers of syntax.

## **References**

- Baker, Mark. 1989. Object Sharing and Projection of Serial Verb Constructions. *Linguistic Inquiry* 20(4):513-553.
- Boland, Julie. 1996. The Relationship between Syntactic and Semantic Processes in Sentence Comprehension. Ms., Ohio State University.

- Bresnan, Joan. 2001. *Lexical-Functional Syntax*. Oxford: Blackwell Publishers.
- Cattell, Ray. 1984. *Composite Predicates in English*. Sydney: Academic Press.
- Chomsky, Noam. 1981. *Lectures on Government and Binding*. Dordrecht: Foris.
- Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- Culicover, Peter, and Ray Jackendoff. 2005. *Simpler Syntax*. Oxford: Oxford University Press.
- Francis, Winthrop, and Henry Kucera. 1964. *A Standard Corpus of Present-Day Edited American English*. Providence: Brown University.
- Grimshaw, Jane, and Armin Mester. 1988. Light Verbs and  $\theta$ -marking. *Linguistic Inquiry* 19(2): 205-232.
- Hofland, K., A. Lindebjerg, and J. Thunestvedt. 1999. *ICAME Collection of English Language Corpora*. Bergen, Norway: HIT Centre, University of Bergen, Norway.
- Jackendoff, Ray. 1974. A Deep Structure Projection Rule. *Linguistic Inquiry* 5(4):481-506.
- Jackendoff, Ray. 1990. *Semantic Structures*. Cambridge, MA: MIT Press.
- Jespersen, Otto. 1954. *A Modern English Grammar on Historical Principles*. London: Allen & Unwin and Copenhagen: Ejnar Munksgaard.
- Jun, Jong Sup. 2003. *Syntactic and Semantic Bases of Case Assignment: A Study of Verbal Nouns, Light Verbs, and Dative*. Ph.D. diss., Brandeis University.
- McElree, Brian, and Theresa Griffith. 1995. Syntactic and Thematic Processing in Sentence Comprehension: Evidence for a Temporal Dissociation. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 21:134-157.
- McElree, B., M. Traxler, M. Pickering, R. Jackendoff and R. Seely. 2001. Coercion in On-Line Semantic Processing. *Cognition* 78:B17-B25.
- Motta, G., F. Rizzo, D. Swinney and M. M. Piñango. 2000-2004. *Tempo 2.1: A Software for Reaction-Time and Imaging Testing*. Brandeis University, UCSD and Yale University.
- Piñango, M. M., A. Strom-Weber, and E. Zurif. 2005. Time-Course of Semantic Composition: The Case of Argument Structure Alternation (Argument Coercion). *Proceedings of the 18<sup>th</sup> CUNY Conference in Human Sentence Processing*.
- Piñango, M. M., E. Zurif, and R. Jackendoff. 1999. Real-Time Processing Implications of Aspectual Coercion at the Syntax-Semantics Interface. *Journal of Psycholinguistic Research* 28(4):395-414.
- Piñango, M. M., E. Zurif, A. Winnick, and R. Ullah. In press. The Time-Course of Semantic Compositionality: The Case of Aspectual Coercion. *Journal of Psycholinguistic Research*.
- Shapiro, L., E. Zurif, and J. Grimshaw. 1987. Sentence Processing and the Mental Representation of Verbs. *Cognition* 27: 219-246.
- Shapiro, L., E. Zurif, and J. Grimshaw. 1989. Verb Representation and Sentence Processing: Contextual Impenetrability. *Journal of Psycholinguistic Research* 18: 223-243.

*Combinatorial Processes in Argument Structure*

- Swinney, David, and Edward Smith. 1994. Temporal and Qualitative Decomposition of Plausible Reasoning. *Technical Report, Air Force Office Research*.
- Todorova, M., K. Straub, W. Badecker, and R. Frank. 2000. Aspectual Coercion and Online Computation of Sentential Aspect. *Proceedings of the Cognitive Science Society Annual Meeting*.
- Van Valin, Robert, and Randy LaPolla. 1997. *Syntax: Structure, Meaning, and Function*. Cambridge: Cambridge University Press.

Maria Mercedes Piñango  
Yale University  
Department of Linguistics  
P.O. Box 208366  
New Haven, CT 06520

Jennifer Mack  
Yale University  
Department of Linguistics  
P.O. Box 208366  
New Haven, CT 06520

Ray Jackendoff  
Tufts University  
Department of Philosophy  
Medford, MA 02155

maria.pinango@yale.edu  
jennifer.mack@yale.edu  
ray.jackendoff@tufts.edu