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PROCEEDINGS OF THE NINETEENTH ANNUAL MEETING
OF THE
BERKELEY LINGUISTICS SOCIETY
February 12-15, 1993

GENERAL SESSION
and
PARASESSION
ON
SEMANTIC TYPOLOGY
AND
SEMANTIC UNIVERSALS

Berkeley Linguistics Society
Berkeley, California, USA
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edited by
Joshua S. Guenter
Barbara A. Kaiser
Cheryl C. Zoll

Berkeley Linguistics Society
# TABLE OF CONTENTS

Table of Contents .......................... v
Table of Contents of BLS 19S .......... x
Preface ..................................... xi

## GENERAL SESSION

Causative Structures in French: Word Order Following *Faire, Laisser* and *Forcer*
MICHEL ACHARD ................................ 1

Two Rules or One... or None? [ATR] in Yoruba
DIANA ARCHANGELI AND DOUGLAS PULLEYBLANK ........... 13

There-Sentences and Inversion as Distinct Constructions:
A Functional Account
BETTY BIRNER AND GREGORY WARD .............. 27

The Mixed Discourse Genre as a Social Resource for Participants
MARY BUCHOLTZ ................................ 40

A Reanalysis of Long Distance Agreement in Urdu
MIRIAM BUTT ................................ 52

The Phonology and Phonetics of "Voiceless" Vowels
YOUNG-MEE YU CHO ................................ 64

Experiencers, Possessors, and Overlap Between Russian Dative and
u + Genitive
ALAN CIENKI ................................ 76

Prosodic Aspects of Broadcast News Register
COLLEEN COTTER ................................ 90

Javanese Adversatives, the 1-Advancement Exclusiveness Law, and
Mapping Theory
WILLIAM DAVIES ................................ 101

At, by, to, and Past: An Essay in Multimodal Image Theory
PAUL DEANE ................................ 112

On Genericity: A Case Study in Czech
HANA FILIP ................................ 125

What Studies of the Brain Can Tell Us About Language (if Anything)
and Vice-Versa
VICTORIA FROMKIN ......................... 143
Trigger Conditions and Nasal Harmony in Terena  
CHIP GERFEN  
159

Lexical Phonology and the Problem of Variation  
GREGORY R. GUY  
171

Mapping Phonological Structure to Phonetic Timing: Moras and Duration in Two Bantu Languages  
KATHLEEN HUBBARD  
182

Expletive Verb Marking in Abkhaz  
DAVID KATHMAN  
193

Verbal Compounding in Korean  
YOOKYUNG KIM  
205

Linking Constructions vs. Linking Rules: Evidence from French  
JEAN-Pierre Koenig  
217

Pauses in Face-to-Face and Telephone Conversations  
ANITA LIANG  
232

Gapping with Shared Operators  
JAMES D. MCCAWLEY  
245

Galician Nasal Velarization as a Case Against Structure Preservation  
FERNANDO MARTINEZ-GIL  
254

Defining the Affectedness Condition  
KAORU OHTA AND KUO-MING SUNG  
268

Speakin' and Spokin' in Jamaica: Conflict and Consensus in Sociolinguistics  
PETER PATRICK AND BONNIE McELHINNY  
280

The Areal Distribution of a Slavic Language Shift Feature  
PETER PETRUCCI  
291

An Aspectual Analysis of French Demonstrative Ce  
LISA REED  
300

Discourse Topic Continuity and Syntactic Reduction  
DINGXU SHI  
313

Asia Minor Greek: Contact Induced Change and Retention  
ELIZABETH SIKKENGA  
323

Orality and Markedness  
DONCA STERIADE  
334

The Conflict Promises/Threatens to Erupt into War  
ELIZABETH C. TRAUGOTT  
348
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>On the Semantics of Polysynthesis</td>
<td>361</td>
</tr>
<tr>
<td>EMMON BACH</td>
<td></td>
</tr>
<tr>
<td>A Noun is a Noun is a Noun — Or is it?</td>
<td>369</td>
</tr>
<tr>
<td>WILLIAM CROFT</td>
<td></td>
</tr>
<tr>
<td>A Typology in the Higher Order Unification Approach to Ellipsis: The Implications of Japanese Post-Verbal Expressions</td>
<td>381</td>
</tr>
<tr>
<td>KAZUHIKO FUKUSHIMA</td>
<td></td>
</tr>
<tr>
<td>Tagalog Semantics</td>
<td>390</td>
</tr>
<tr>
<td>DAVID GIL</td>
<td></td>
</tr>
<tr>
<td>Languages without Determiner Quantification</td>
<td>404</td>
</tr>
<tr>
<td>ELOISE JELINEK</td>
<td></td>
</tr>
<tr>
<td>Universals in the Semantics of the Diminutive</td>
<td>423</td>
</tr>
<tr>
<td>DAN JURAFSKY</td>
<td></td>
</tr>
<tr>
<td>Negation, Indefinites, and the Jespersen Cycle</td>
<td>437</td>
</tr>
<tr>
<td>WILLIAM A. LADUSAW</td>
<td></td>
</tr>
<tr>
<td>Universals of Construants</td>
<td>447</td>
</tr>
<tr>
<td>RONALD LANGACKER</td>
<td></td>
</tr>
<tr>
<td>An Optimality-Theoretic Typology of Case and Grammatical Voice Systems</td>
<td>464</td>
</tr>
<tr>
<td>GÉRALDINE LEGENDRE, WILLIAM RAYMOND, AND PAUL SMOLENSKY</td>
<td></td>
</tr>
<tr>
<td>Two Predicted Universals in the Semantics of Space</td>
<td>479</td>
</tr>
<tr>
<td>TERRY REGIER</td>
<td></td>
</tr>
<tr>
<td>How &quot;General&quot; are General Classifiers? (with Special Reference to ko and tsu in Japanese)</td>
<td>490</td>
</tr>
<tr>
<td>DAVID A. ZUBIN AND MITSUAKI SHIMOJO</td>
<td></td>
</tr>
<tr>
<td>Anaphora, Language Variation, and Language Universals</td>
<td>503</td>
</tr>
<tr>
<td>EDWARD KEENAN</td>
<td></td>
</tr>
<tr>
<td>(this paper printed out of alphabetical order)</td>
<td></td>
</tr>
</tbody>
</table>

The following papers were presented at the conference but do not appear in this volume:

Stress and Syllable Structure in English Quantitative Metrics
KRISTIN HANSON
Grammaticalization-in-Progress: The Spanish Present Perfect as a Hodiernal Past
SCOTT SCHWENTER

How a Judge’s Voir Dire Can Teach a Juror What to Say
ROGER SHUY
TABLE OF CONTENTS FOR
SPECIAL SESSION
TO BE FOUND IN BLS 19S

SPECIAL SESSION

The clitic/agreement split: Asymmetries in Choctaw person marking
GEORGE AARON BROADWELL AND JACK MARTIN

The syntax of discourse functions in Fox
AMY DAHLSTROM

Mapping transitive voice in Halkomelem
DONNA B. GERDTS

The syntax of Tzotzil auxiliaries and directionals: the grammaticalization of
"motion"
JOHN B. HAVILAND

Diversity in morpheme order in several Alaskan Athabaskan languages:
Notes on the gh-qualifier
JAMES KARI

Hixkaryana word order
MARVIN KRAMER

(4 x 4) -3 = Seneca
JORDAN LACHLER

Argument status and constituent structure in Chalcatongo Mixtec
MONICA MACAULAY

Prosodic determinants of syntactic form: Central Pomo constituent order
MARIANNE MITHUN

The syntax and semantics of pronominal clitics in Coastal Carib
SHAUN O'CONNOR

Nonconfigurationality and discontinuous expressions in Panare
DORIS L. PAYNE

Paradigmatic and syntagmatic mechanisms for syntactic change in Athapaskan
KEREN RICE AND LESLIE SAXON

Syntax vs. morphology: A chicken and egg problem
RICHARD RHODES
PREFACE

We present to you the proceedings of the Nineteenth Annual Meeting. The February conference featured a Parasession on Semantic Typology and Universals and the fourth Special Session. This year's topic was Syntactic Issues in Native American Languages and those papers appear in our companion volume, BLS 19S. As always, we are grateful to those who helped in pulling off the conference, among them Laura Buszard-Welcher, Susanne Gahl, Kathleen Hubbard, Chris Johnson, Jeri Moxley, David Peterson, Laurel Sutton, Lionel Wee, and Bill Weigel. We wish to thank Kevin Moore especially for the coffee and danish. We hope you really love BLS 19.

1992-93 BLS Officers
Joshua S. Guenter
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GENERAL SESSION
CAUSATIVE STRUCTURES IN FRENCH: WORD ORDER FOLLOWING FAIRE, LAISSER, AND FORCER

Michel Achar
U.C. San Diego

0. The problem.

This paper is concerned with word order in causative constructions in French. These constructions are presented in (1)-(3).

(1) a. Marie fait pleurer Jean
   b. *Marie fait Jean pleurer
      'Mary makes John cry'

(2) a. Marie laisse pleurer Jean
   b. Marie laisse Jean pleurer
      'Mary lets John cry'

(3) a. *Marie force à partir Jean
   b. Marie force Jean à partir
      'Mary forces John to leave'

Notice that with faire in (1a), the infinitive immediately follows the causative verb. The logical subject of the infinitive follows the infinitive. Crucially, it cannot precede the infinitive as shown in (1b). This type of construction is traditionally referred to as having a post-verbal subject (Kayne 1975). It will be called the VV construction here. With forcer in (3), the logical subject of the infinitive must follow the causative verb and precede the infinitive as in (3b). These structures present cases of pre-verbal subjects, which is the usual case for French. I shall refer to these structures as VOV constructions. Both these structures may occur after laisser. VV is illustrated in (2a), VOV in (2b).\(^1\)

The problem posed by these causative structures is twofold. It is necessary first to account for the post verbal position of the logical subject of the infinitive in the faire cases, and secondly, to explain the presence of the two constructions following laisser. This paper is especially concerned with the variation in the laisser cases.

1. Previous accounts.

Most of the research dealing with causative constructions has been concerned with accounting for the existence of the VV construction syntactically. Following Kayne (1975), the traditional generative syntax account of causative structures has been based on the idea of Predicate Raising. For example, the D-structure of (1a) is given in (4), and its S-structure is given in (5):

\[^1\]
Predicate Raising is triggered by the causative verb. It is obligatory with faire, blocked with forcer, and optional with laisser and the perception verbs.

In a Relational Grammar account, the VV construction is produced by the rule of Clause Union, which, according to Aissen and Perlmutter (1983: 379) 'makes all dependents of the embedded verbs into dependents of the matrix verb'. The RG solution posits a reorganization of the clause where the initial subject of the complement structure becomes a term of the matrix clause. Clause Union is a product of specific properties of certain verbs, called Union Triggers. Faire is an obligatory Union trigger, laisser and the perception verbs are optional Union triggers, and forcer is not a trigger verb.

The Predicate Raising and the Clause Union solutions successfully account for the surface post-verbal position of the logical subject of the infinitive in the VV construction. However, both analyses encounter one major difficulty. Since they treat the choice between the VV or the VOV constructions following laisser and the perception verbs as a mere structural option, they can offer little insight into the possible motivations for that choice. However, as it will be shown in this paper, the distribution of the two structures is not unconstrained, but motivated by semantic factors.

The main claim developed in this paper is that the syntactic behavior of causative structures is motivated by their semantics, and the only way to capture and express that motivation is to treat VV and VOV as two separate meaningful constructions. The investigation of the meaning of VV and VOV will be conducted using the concepts developed by the theory of Cognitive Grammar (Langacker 1987, 1991). The recognition of the semantic import of each construction will enable us to examine several issues which so far have received very little attention within the literature. In particular, the parameters which determine the selection of the VV and VOV constructions following laisser will be brought to light and investigated.


The first step in the analysis is to investigate the semantic import of the VV and VOV construction. I will show that the difference in meaning between them is due to the different construals they impose on a particular base in the sense of Langacker (1987).

2.1 One event or two.

With a causative main verb, the sentence profiles the subject's role with respect to some event or process in the world. This represents the base relative to which the constructions' meaning is established. The choice by the speaker to
describe the scene using the VV or VOV construction reflects a particular way of structuring that base, i.e. imposing a specific image on it. Investigating the meaning of each construction therefore amounts to defining the specific type of construal it imposes on the event designated by the complement. We can do this in several ways. First, speakers have intuitions about the meaning of the constructions. A possible paraphrase of VOV in (2) could be: 'Mary lets John do something, and that something is crying'. A possible paraphrase of VV could be: 'Mary lets something happen, and that something is John crying'. Secondly, valuable information about the meaning of the constructions can be gained through close observation of their structure.

The Relational Grammar account briefly presented earlier offers interesting insight into the structural description of the two constructions. Recall that the VV construction is monoclausal, since Clause Union has applied, while the VOV construction remains biclausal (contains two verbs and their arguments). This structural information is crucial in determining the meaning of the two constructions. If we take the schematic value of a clause as presenting a single event, with the verb (single or complex) profiling that event, the VV construction instantiates that schema, whereas the VOV construction does not. We can therefore say that the VV construction presents the scene construed as a single event, whereas the VOV construction construes it as two events. The structure of each construction is given in figures 1 and 2:

**Figure 1. VOV**

**Figure 2. VV**

VOV in figure 1 has the semantic structure described in Langacker (1991: 410). Its trajector is the energy source, its primary landmark is the trajector of the subordinate V2 process and that process, taken as a whole, functions as a secondary landmark. The trajector and the primary landmark function as e-sites for nominals which are respectively identified as subject and direct object. The secondary landmark is likewise an e-site, elaborated by an infinitival complement. Taking (2b) as an illustration, the main clause subject Marie elaborates the trajector of the causative verb. The logical subject of the infinitive Jean elaborates the primary landmark of that verb. The result process pleurer functions as a secondary landmark of the causative verb.
The VV construction in figure 2 takes a process as complement but does not give particular focal status to any participant in that process. The landmark of the causative verb is the result process, the participant in that process is not profiled at that level of organization. At the composite level, the logical subject of the infinitive is the landmark of the complex verb, and thus identified as the direct object of that verb. Taking (1a) as an example, the infinitive pleurer elaborates the landmark of the causative verb. At the composite level, the logical subject of the infinitive, Jean, elaborates the landmark of the complex process and is therefore identified as its direct object.

The analysis presented here relies heavily on the idea that a specific scene can be construed as one event, with a complex verb, or as two separate events, each with their separate process. It still leaves open, however, the question of identifying the conditions which facilitate the construal of a particular scene as one or two events. I will show that two related parameters are of crucial importance here: i) the role of the logical subject (the causee) with respect to the infinitival process, and ii) the nature of that process.

2.2 Role of the causee: notion of energy source.

Looking at figure 1, we notice that in the VOV construction, the causee has a dual status. It is profiled as the primary landmark of the causative verb, and is also simultaneously the trajector of the infinitival process. Since the notions of trajector and landmark are associated with the functions of subject and object respectively, we can say that in a VOV construction, the causee is at the same time subject-like and object-like. This dual status implies a certain amount of semantic tension between the two thematic roles of agent and patient which respectively go along with its status as subject and object. In contrast, the causee in a VV construction does not have dual status. It is only profiled at the composite level, where it is the landmark of the complex verb. Its status is thus simply object-like. The semantic tension which exists between the two roles potentially played by the causee is crucial to the selection of a particular construction. The more agent-like the causee is with respect to the infinitival process, the more difficult it will be to construe it as strictly patient-like with respect to the main structure. It will be shown that with laisser, the causees which appear in the VOV construction are precisely those which are more agentive with respect to the infinitival process.

An agent can be defined as the energy source of a verbal process. When a causative scene is represented by the VOV construction, it is conceived as having two separate energy sources generating two separate activities. What the VOV construction encodes is the control exerted by the primary source of energy over the secondary source. Inherent to the VOV construction is a certain amount of direct interaction between the two energy sources which remain clearly separate. In the VV structure, the subject of the complex verb is the highly dominant energy source. The VV construction profiles only one activity which includes
both the causal and result processes in a single complex form. What the VV construction encodes is the control exerted by the main subject over the event as a whole, not over the source of energy itself. The distribution of the VV and VOV structures therefore depends in part on the causee's being considered a valid energy source for the infinitival process.

3. The VOV/VV alternation following *laisser*.

In light of the previous observations, I propose the following hypothesis. The VOV construction is felicitous following *laisser* only if the causee is construed as a valid energy source which generates (or at least sustains) the infinitival process. If not, the VV construction is selected.

3.1 Inanimate causees.

The hypothesis proposed above suggests a natural starting point. Since inanimate subjects are not prototypically agentive, we would expect that they will tend to be used in the VV construction. The data in (6)-(8) confirm this prediction.

(6) a. *J'ai laissé tomber mon stylo*
    b. ??*J'ai laissé mon stylo tomber*
       'I dropped my pen'

(7) a. *Le cuisinier a laissé brûler la viande*
    b. ??*Le cuisinier a laissé la viande brûler*
       'The cook let the meat burn'

(8) a. *J'ai laissé glisser mes skis*
    b. ??*J'ai laissé mes skis glisser*
       'I let my skis glide'

None of the causees in (6)-(8) can be considered an energy source which generates the infinitival process. In sentences (6) and (7), the causees are patients, at the receiving end of an energy chain, the origin of which is not expressed in the sentence. Their status as patients is not compatible with a VOV construction which would treat them as energy sources. The case in (8) is slightly different. The causee is not a patient but an instrument, designed to perform specific functions. Gliding is one of these functions, but the skis can hardly be viewed as generating the gliding.

The impossibility of considering the causees in (6)-(8) as energy sources generating the infinitival process accounts for their use in the VV construction. Inanimates can, however, occur in the VOV construction as the data in (9)-(11) indicate:
(9) a. J'ai laissé brûler le gratin
b. ??J'ai laissé le gratin brûler
'I let the casserole burn'

(10) a. J'ai laissé brûler le feu jusqu'à l'aube
b. J'ai laissé le feu brûler jusqu'à l'aube
'I let the fire burn until dawn'

(11) a. Mon voisin a encore laissé son réveil sonner pendant une heure
b. Mon voisin a encore laissé son réveil sonner pendant une heure
'My neighbor let his alarm clock ring for one hour again'

Note the difference between (9) and (10). Le gratin in (9) is a patient. Le feu in (10) is also inanimate, but it is not a patient. It has greater potential for generating (or at least sustaining) the process in the complement. Fires are not self-generated. They require outside energy sources: wood, oxygen, etc. However, in front of a healthy bonfire, we tend to forget the energy provided by outside elements. The momentum gathered by the fire gives it a life of its own, as if it were indeed self-generating. It is not the patient in the burning process, but rather is conceived as a full fledged energy source. It is therefore not surprising that it can appear in the VOV construction in (10).

When an entity is involved in a process over a long period of time, it becomes possible to consider it responsible for that process, even it merely performs a function it has been programmed for. In (11), the alarm clock only does what it has been set to do; however, after it has been ringing for some time, the clock can be considered responsible for the ringing. One of the cognitive capacities that we have is to give instruments designed to perform a certain process the ability to generate that process. We use that ability to convey communicative nuances. For instance, sentence (12) would be appropriate to describe the surrealists' technique of automatic writing, where the pen has a will of its own:

(12) Ils laissaient leur plume courir sur le papier à sa guise
'Vey let their pen run on the paper on its own'

The initial hypothesis is confirmed by the inanimate subject data. Apart from the special type of construal expressed in (10)-(12), they are more felicitous in a VV position, due to their lack of agentive qualities.

3.2 Animate causees.

Animate causees can very easily be part of either construction. In fact, outside a particular context, it is very difficult to prefer one over the other, as indicated in (13) and (14):
However, if the degree of agentivity of the causee can be evaluated, the differences between the two constructions can be teased apart. Consider the data in (15)-(18):

(15)  Jean laisse partir Marie quand il veut
      'John lets Mary leave whenever he wants'

(16)  ??Jean laisse Marie partir quand il veut
      'John lets Mary leave whenever he wants'

(17)  Jean laisse Marie partir quand elle veut
      'John lets Mary leave whenever she wants'

(18)  ?Jean laisse partir Marie quand elle veut
      'John lets Mary leave whenever she wants'

In (15)-(18), the adverbial modifiers quand il veut 'whenever he wants' and quand elle veut 'whenever she wants' increase the degree of agentivity of Jean and Marie respectively by attributing them a greater will of their own, and therefore an added capacity to initiate the subordinate process for Marie (or at least to choose the time of that process) or the causative process for Jean.

Permission represents a highly asymmetrical type of relationship. The increased control over the subordinate process given to Jean by the adverbial quand il veut decreases Marie's role in the accomplishment of that process. As a result, we expect that when the agentivity of the subject of the causative verb is increased, the causee will be construed as more object-like, and appear as part of the VV construction. This prediction is borne out, as illustrated in (15). Conversely, Jean's limitless power is incompatible with an image of Marie as the energy source responsible for the generation of the infinitival process, and hence incompatible with the VOV construction as illustrated in (16). With quand elle veut, which gives her greater validity as the energy source generating the infinitival process, the causee Marie very easily appears in the VOV construction, which stresses her subject-like role in relation to that process (17). Conversely, her active part in the generation of the infinitival process is not fully compatible with the object-like role she is confined to by the semantics of the VV construction. Although (18) cannot be said to be ungrammatical, it makes people uncomfortable. When they do accept it, they wonder who elle in quand elle veut is, as if they were reluctant to accept Marie and elle as coreferential because their
respective semantic roles are different. Note that this problem does not arise in (17).

The situation with animate causees once again goes in the direction predicted by our hypothesis. In the contexts where the causee is construed as an energy source with respect to the infinitival process, the VOV construction tends to be preferred.

3.3 Nature of the infinitival process.

It was said earlier that the nature of the infinitival process is relevant to the selection of VV or VOV. Consider the data in (19)-(20), where the question marks indicate a rather unexpected usage, although not strictly ungrammatical.

(19)   a. *La voiture laisse passer les piétons
   b. ??La voiture laisse les piétons passer
      'The car lets the pedestrians pass'

(20)   a. *Les grévistes ont laissé passer les coureurs du tour de France
   b. ??Les grévistes ont laissé les coureurs du tour de France passer
      'The strikers let the tour de France racers pass'

The data from (19)-(20) seem to go against the analysis given so far. Even though the causees are all humans, they seem to be more felicitously used in a VV construction. This result however is not so surprising if we consider the nature of the infinitival processes. Processes such as *tomber 'fall' and *passer 'pass' are very basic translations through space, for which the energy source is constant: gravity for *tomber, the momentum gathered by the entity in motion for *passer. Crucially, these verbs do not profile the initial generation of the process (unlike verbs such as *marcher 'walk' for instance), but only view the action in progress, once momentum has been gathered. It is therefore difficult to construe the entity involved in them as the energy source responsible for their generation, and hence use them in the VOV construction. Compare (21) and (22):

(21)   a. *Jean a laissé tomber Marie (du mur) sans essayer de la retenir
   b. ??Jean a laissé Marie tomber (du mur) sans essayer de la retenir
      'John let Mary fall (from the wall) without trying to stop her'

(22)  *Jean a laissé Marie sauter (du mur) sans essayer de la retenir
      'John let Mary jump (from the wall) without trying to stop her'

The subject of *sauter is more volitional (capable of initiative) than that of *tomber which is simply a patient. It is therefore easier to construe the causee in (22) as the legitimate energy source of that process.

To briefly recapitulate, this section has demonstrated that the distribution of causative structures following *laisser is semantically motivated. The most important factor in the selection of VV or VOV has been shown to be the
thematic role of the causee relative to the infinitival process. The more the causee can be considered an energy source with respect to the infinitival process, the more felicitous the use of the VOV construction will be. With certain processes, the difficulty of construing their causee as the energy source explains why they are more likely to occur with the VV construction.

4. *Faire* and *laisser* with transitive clauses.

When the VV construction is used with a transitive clause, the logical subject of the infinitive is marked either as a *par* 'by' complement or a *à* 'to' complement. For our purposes here, I will roughly characterize the meanings of *à* and *par* complements as benefactive and instrumental respectively (for a detailed semantic analysis of these complements, see for example Cannings and Moody (1978)). The difference in meaning is clearly visible in (23) and (24) (from Cannings and Moody 1978: 342):

(23) *Elle a fait obtenir le tableau à Jean-Jacques*
'She made Jean-Jacques get the picture'  
(24) *Elle a fait obtenir le tableau par Jean-Jacques*
'She made Jean-Jacques get the picture'

In (23), the picture necessarily ends up in Jean-Jacques' possession (benefactive). In (24), Jean-Jacques might have bought the picture for someone else (instrumental).

Any account which treats the alternation between the VV and VOV constructions following *laisser* as a structural option, i.e. without considering its semantic motivation, predicts that both constructions will be equally felicitous with *à* and *par* complements. It will be shown here that this is not the case, and that the type of analysis proposed earlier provides a viable explanation to the behavior of transitive clauses following *laisser*. Consider the data in (25)-(30):

(25) *Il a laissé Jacques lire la lettre*  
'He let Jack read the letter'
(26) a. *Il a laissé lire la lettre à Jacques*  
'He let read the letter to *by Jack'  
b. ??*Il a laissé lire la lettre par Jacques*  
(27) *Il a laissé les enfants manger le gâteau*  
'He let the children eat the cake'
(28) a. *Il a laissé manger le gâteau aux enfants*  
'He let eat the cake to *by the children'  
b. ??*Il a laissé manger le gâteau par les enfants*  
(29) *Le général a laissé ses soldats tuer des civils*  
'The general let his soldiers kill civilians'
(30) a. *Le général a laissé tuer des civils à ses soldats*
   b. ??*Le général a laissé tuer des civils par ses soldats*
   'The general let kill civilians to *by his soldiers'

The crucial point here is the difference in the role of the causee in the VOV and VV constructions. In the VOV construction, as illustrated in (25), (27) and (29), it is realized as a direct object. In the VV construction, as illustrated in (26), (28) and (30), it is realized as an oblique (instrumental or benefactive). As we have seen previously, the direct object in a VOV construction designates an entity that has a certain level of agentivity, and hence is capable of initiating the infinitival process. When a transitive clause follows *laisser*, the VOV construction is always felicitous because the subject of a transitive process is agentive by definition, and therefore matches up very well with a construction which recognizes its agentive value. In order to account for the data in (25)-(30), we now need to explain i) why *par* complements are infelicitous, and ii) why *à* complements are felicitous following *laisser*.

Unlike an agent, an instrumental cannot be construed as initiating a process. Rather, it is simply the means by which the process gets carried out. Note that *par* complements are perfectly felicitous following *faire*, as shown in (31):6

(31) *Le général a fait tuer des civils par ses soldats*
   'The general made his soldiers kill civilians'

Since it establishes the responsibility of its subject for the accomplishment of the infinitival process, *faire* is not incompatible with the use of instruments to achieve that goal. The soldiers in (31) are instruments in the hands of the general, used to carry out a process conceived and designed by him alone. Their use is conceptually similar to John's use of the hammer in the sentence *John broke the window with a hammer*.

The instrumental interpretation of the causee in a transitive clause following *laisser* is infelicitous because the subject is only a potential agent, who merely reacts to an on-going situation. The causee cannot be considered a mere instrument because there is no true energy source to put that instrument to use. This explains the oddity of (30). The sentence presents the soldiers as instruments. However, the absence of a true source of energy in the sentence poses them as the generators of the killing. They are therefore much more felicitous in a VOV construction which accommodates their initiative (agentivity). The specific force dynamic orientation of *laisser* makes it difficult for a transitive clause to be used in a VV instrumental (*par*) construction. The VOV construction is highly favored because it treats the causee as a valid energy source for the infinitival process.

The same type of analysis also shows why the benefactive (*à*) complements are semantically compatible with *laisser* and the VV construction.
A possible meaning for a benefactive construction is that the person who inherits something shows some inclination for receiving that thing. In the context of *laisser* and the VV construction, it is very easy to construe the causee as willing to initiate the infinitival process. This is fully consistent with the status of the subject of *laisser* as a potential agent. Its non-interference in the desire expressed by the causee is perceived as some sort of reward for the latter. The use of a VOV or VV construction profiles different aspects of the causee. In the VOV construction, its status as the initiator of the infinitival process is emphasized. In the VV construction, its status as a recipient of a favor is profiled. This is illustrated by the difference between (27) and (28a). In (27), the children do not necessarily have permission to eat the cake. The main subject simply does not interfere with their involvement in the infinitival process. In (28a), we can easily imagine that the cake was saved (or reserved) for the children. Even though in both sentences the children end up performing the eating, only in (27) are they construed as the initiators of the infinitival process.

5. Conclusion

This paper has demonstrated that the observed variation following *laisser* is semantically motivated. The VOV construction is preferred if the causee can be considered a valid energy source with respect to the infinitival process. If not, the VV construction is preferred. With certain processes, the difficulty of construing their causee as the energy source explains why they most felicitously occur in the VV construction. Finally, consideration of the meanings of the two causative constructions, as well as their compatibility with different main verbs, has enabled us to explain the different reactions of *faire* and *laisser* to the presence of *par* complements. This constitutes strong evidence that the choice of VV or VOV following *laisser* is determined by semantic factors.

**Notes**

* I would like to thank Kathleen Carey, Rich Epstein, and Kimberly Kellogg for their help. All errors and shortcomings remain of course my own.

1. The verbs of perception such as *voir* 'see', *regarder* 'watch', *écouter* 'listen', *entendre* 'hear', *sentir* 'smell' can also be followed by both constructions. The specific problems posed by these verbs are considered in Achard (in progress).

2. This is also true of more recent accounts of causatives in the Government Binding framework. See for instance Reed (1991) where *faire* only subcategorizes for a CP complement, whereas *laisser* and the perception verbs also subcategorize for a VP small clause.
3. A notable exception is Hyman and Zimmer (1976) who consider some of the data presented here from a discourse perspective. I see no fundamental incompatibility between the two types of approaches.

4. The type of methodology developed in this paper can also account for the distribution of causative structures with *faire* and *forcer* by invoking the respective semantic incompatibility of the VOV construction with *faire*, and the VV construction with *forcer*. This issue is considered in more detail in Achard (in progress).

5. The tests for the monoclausality of the VV construction and the biclausality of VOV are not presented here, for the sake of brevity. They include clitic climbing, negation in the downstairs clause, and adverb placement. For additional information about these tests, see Aissen and Perlmutter (1983).

6. *Faire par* is usually considered to be a separate construction. In generative analyses, it is analyzed as involving a passive in the complement clause (Kayne 1975). This does not, however, explain why this structure is felicitous with *faire* and infelicitous with *laisser*.

REFERENCES


1 Introduction

The distribution of [ATR] in Yoruba raises a startling paradox: three crucially ordered rules are necessary, yet the first and third are formally identical. (Schlindwein 1987a makes this observation for Yoruba; see also Schlindwein 1987b). The standard solution for such puzzles is an appeal to cyclicity: in Yoruba such an appeal fails for the rules are all relevant at the earliest lexical level and apply to underived as well as derived forms. We propose that the Identity Paradox is not a morphosyntactic effect, but rather is an artifact of viewing rules as independent statements, sequentially ordered. Abandoning the notion that systematic phonological relations are to be expressed by rules applying in an ordered fashion, we resolve the observed paradox through optimization (aka Harmonic Grammar) (Prince & Smolensky 1991a,b, 1992, 1993, Archangeli & Pulleyblank [henceforth A&P] in press).

The argument is organized along the lines of the preceding paragraph, demonstrating the problem first and then turning to the optimization account.

2 Distribution of [ATR] in Yoruba: Order

Standard Yoruba has seven oral vowels on the surface: [i, e, e [ɛ], a, o [ɔ], o, u]. High vowels do not participate in harmony and cooccur with the full range of vowels (ide ‘brass’, èbi ‘guilt’, idè ‘type of game’, ebi ‘hunger’, etc.); the advanced nonhigh vowels [ɛ, o] and the retracted nonhigh vowels [e, a, o] cooccur with members of their own set, but do not cooccur (except as indicated shortly) with members of the opposite set (ègè ‘dirge’, ègé ‘cassava’, *ège, *ège, etc.).

Although the facts as so far described are consistent with either [+ATR] or [-ATR] being active in the phonology of Yoruba, facts concerning low vowels require an active [-ATR] value. Constraining with the inertness of the advanced value of high vowels, the retracted value of a low vowel causes any preceding mid vowel to similarly retract (ègba ‘whip’, *ègba). The effect of the [-ATR] value of low vowels is strictly directional: although only [-ATR] mid vowels may precede a low vowel, both [-ATR] and [+ATR] vowels may follow a low vowel, as lexically appropriate (agbe ‘type of bird’, ègbè ‘farmer’). Following A&P (1989, in press), the systematically retracted property of low vowels is accounted for by a rule of [-ATR] Insertion; to account for the retracted value of preceding mid vowels, we posit a right-to-left rule of [-ATR] Spread.

The harmonic pattern with mid vowels can be incorporated into this analysis as follows: "retracted" morphemes are distinguished from "advanced" morphemes by the presence of a floating [-ATR] specification as part of their underlying entry. Where present, this free [-ATR] value links from right to left to the first available nonhigh vowel, and then feeds into the directional harmony rule motivated for low vowel cases thereby bringing about harmony between all mid vowels. That the direction of the association process is strictly right-to-left can be seen in morphemes with two mid vowels separated by a high vowel: in such forms, it is only the rightmost mid vowel that can be [-ATR] (èbútè ‘harbour’, èlùbò ‘yam flour’, *èlubo, *èlubo, etc.); see (8a).

Note that the impossibility of the forms like *èlubo also demonstrates the importance of the Obligatory Contour Principle (OCP) in Yoruba (8a). Since high
vowels cannot be targeted by harmonic spreading, and if all lexical [-ATR] specifications are floating, then two retracted vowels separated by a high vowel (putative *elubo) could only be derived by two underlyingly floating [-ATR] tokens, a representation that is correctly ruled out by the OCP.

We conclude that the grammar crucial for an account of Yoruba harmony has three components all of which are subject to the OCP: lexical features associate (Link), low vowels become systematically retracted (Insert), nonhigh vowels preceding retracted vowels become retracted themselves (Spread). Because Standard Yoruba [ATR] harmony is presented in detail elsewhere (A&P 1989, in press), our goal here is not to motivate the basic analysis, but to focus on those points crucial to the Identity Paradox. The first point to be demonstrated is the ordering of the three rules, Link, Insert, and Spread.

Consider first the ordering of Link and Spread (1a). Link associates a lexically specified floating token of [-ATR] to the rightmost nonhigh vowel. Spread extends the domain of the linked [-ATR] to nonhigh vowels on the left. (A form with no floating [-ATR] is shown in (1b) for comparison.)

(1)  

<table>
<thead>
<tr>
<th>a.</th>
<th>-ATR</th>
<th>-ATR</th>
<th>-ATR</th>
<th>b.</th>
<th>-ATR</th>
</tr>
</thead>
<tbody>
<tr>
<td>μ</td>
<td>μ</td>
<td>μ</td>
<td>μ</td>
<td>μ</td>
<td>μ</td>
</tr>
</tbody>
</table>

UR      LINK     SPREAD  UR

Because Link precedes, and therefore feeds, Spread, strings of mid vowels come to have a single [ATR] value (2). Were Spread to precede, and therefore counterfeed, Link, the unattested *e...ε would be expected.

(2) LINK precedes SPREAD

a. ẹgẹ ‘cassava’  
    ẹkẹ ‘forked stick’  
    èẹẹ ‘row’  

b. ègẹ ‘dirge’  
    èkẹ ‘lie’  
    èẹẹ ‘cat’

Given standard approaches to phonological analysis, the Insert [-ATR] rule must also precede Spread since, like Link, the rule that inserts [-ATR] feeds the rule that spreads [-ATR].

(3)  

<table>
<thead>
<tr>
<th>-ATR</th>
<th>-ATR</th>
<th>+1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>μ</td>
<td>μ</td>
<td>μ</td>
</tr>
<tr>
<td>μ</td>
<td>μ</td>
<td>μ</td>
</tr>
</tbody>
</table>

UR   INSERT   SPREAD

The effect of ordering Spread after Insert (the feeding order) is that mid vowels are [-ATR] when to the left of low vowels. Were the ordering reversed, Spread before Insert (counterfeeding), the unattested *e...a would be predicted.

(4) INSERT precedes SPREAD

    ẹgba ‘whip’  
    ẹgẹ ‘weaver-bird’  

    ẹbà ‘food made from gàrì’  
    èrẹ ‘type of plant’

The discussion above motivates the partial orders, Link precedes Spread and Insert precedes Spread. The final step needed to lay out the ordering paradox is to demonstrate that Link precedes Insert. The critical case involves a low-mid vowel sequence combined with a floating [-ATR]. As the forms in (5) show, both
[-ATR] and [+ATR] mid vowels may occur to the right of a low vowel, accounted for under our analysis by whether the underlying representation contains a floating [-ATR], (5a), or contains no token of [-ATR], (5b).

(5) **LINK precedes INSERT**

<table>
<thead>
<tr>
<th></th>
<th>a. ajé ‘witch’</th>
<th>b. àfè ‘Spotted Grass-mouse’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>aberé ‘needle’</td>
<td>aberè ‘fruit used as a drug’</td>
</tr>
<tr>
<td></td>
<td>àgbè ‘farmer’</td>
<td>agbe ‘type of bird’</td>
</tr>
</tbody>
</table>

To derive both patterns without ad hoc conditions, Link must precede Insert. Applying the rules in this order gives wellformed derivations as in (6a). Column A demonstrates the case where a morpheme has a floating [-ATR] specification: first, the [-ATR] value links up from right to left; second, Insert adds [-ATR] to the low vowel, resulting in a single, multiply-linked [-ATR] specification (see A&P in press). This result is consistent with the OCP; to assume that Insert created a sequence of [-ATR] tokens would be to force the rule to violate the OCP, thereby weakening the OCP in general terms in spite of a complete absence of evidence for such a violation and weakening. Column B represents a morpheme without any morpheme-level [ATR] specification. Because the low vowel is initial, the only rule applicable is Insert.

(6)

<table>
<thead>
<tr>
<th></th>
<th>Column A</th>
<th>Column B</th>
<th>Column C</th>
<th>Column D</th>
<th>Column E</th>
<th>Column F</th>
</tr>
</thead>
<tbody>
<tr>
<td>UR</td>
<td>AJE</td>
<td>AFE</td>
<td>AJE</td>
<td>AFE</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-ATR</td>
<td></td>
<td>-ATR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LINK</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSERT</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LINK</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSERT</td>
<td></td>
<td></td>
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<td></td>
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</tr>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTPUT:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST:</td>
<td>NONE</td>
<td>NONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in (6b), applying Insert before Link would be unable to duplicate the correct results just witnessed. The problematic cases are those where a low vowel cooccurs with a morpheme-level [-ATR] value. If Insert were to add a token of [-ATR] to the representation, then whether this added token were to the right or to the left of the existing token of [-ATR] (presumably one or the other by
arbitrary stipulation), an OCP violation would result as seen in columns C and D respectively of (6b). Yet as argued in A&P (1989, in press) and sketched above, [ATR] obeys the OCP in Yoruba. If Insert were to apply in a manner consistent with the OCP, the resulting representation would have a single, “merged” [-ATR] token, as in column E of (6b); such merger would incorrectly bring about the neutralization of the two types of forms in (5), predicting the nonexistence of $a...e$ forms.

We conclude that Link must precede Insert, which in turn must precede Spread.

3 Properties of Link and Spread: the Identity Paradox

We now turn to the Identity Paradox, demonstrating that Link and Spread are formally identical. Our first observation is that the formal effect of both Link and Spread is to add an association line between [-ATR] and a vowel. In terms of the explicit framework developed in A&P (in press), both rules are characterized by the parameter values “Insert Path”. Each rule has additional properties: (i) featural conditions, (ii) values for two other parameters, Iteration and Direction. As the ensuing discussion shows, the two rules are identical for all such additional factors.

Consider first the Iterativity parameter. Iterative rules can apply to a successive string of targets while noniterative rules can apply only to a single target (see A&P in press). In the case of iterative linking, a rule scans across a string until the first eligible target, if any, is encountered; with noniterative linking, a rule stops after consideration of a single potential target. As shown in (7a), [-ATR] links to whichever mid vowel is the rightmost, skipping over a string of high vowels. Such behavior demonstrates that Link must be iterative.

Spread is also iterative, affecting a string of eligible targets, as shown in (7b). All mid vowels in a form undergo Spread: crucially, more than one mid vowel can be affected, cf. elegé ‘delicate’.

(7) ITERATIVITY

a. LINK

\[
\begin{array}{cccc}
\text{-ATR} & \cdots & \text{-ATR} & \cdots \\
\mu & \uparrow & \mu & \mu \\
2 & 1 & 3 & 2 & 1 \\
\end{array}
\]

<table>
<thead>
<tr>
<th>ilè</th>
<th>‘ground’</th>
<th>eři</th>
<th>‘Friday’</th>
<th>ělirí</th>
<th>‘type of tiny mouse’</th>
</tr>
</thead>
<tbody>
<tr>
<td>ité</td>
<td>‘nest’</td>
<td>ěří</td>
<td>‘evidence’</td>
<td>ěkiri</td>
<td>‘wild goat’</td>
</tr>
</tbody>
</table>

b. SPREAD

\[
\begin{array}{c}
\text{-ATR} \\
\mu & \mu & \mu \\
\text{-ATR} \\
\mu & \mu & \mu \\
\end{array}
\]

<table>
<thead>
<tr>
<th>ějè</th>
<th>‘blood’</th>
<th>elegé</th>
<th>‘delicate’</th>
</tr>
</thead>
<tbody>
<tr>
<td>ěrè</td>
<td>‘mud’</td>
<td>ělédè</td>
<td>‘pig’</td>
</tr>
</tbody>
</table>

We turn next to the Direction parameter: both rules apply from right to left. The critical forms showing the direction for Link are those with two mid vowels flanking a high vowel. As shown in (8a) only the rightmost mid vowel may be [-ATR], as expected under right to left linking. Were Link a left to right rule, the unattested $*e...i...e$ pattern would be predicted.
(8) DIRECTIONALITY

a. **LINK**

<table>
<thead>
<tr>
<th></th>
<th>-ATR</th>
<th>*-ATR</th>
<th>*-ATR</th>
<th>-ATR</th>
</tr>
</thead>
<tbody>
<tr>
<td>MID</td>
<td>HI</td>
<td>MID</td>
<td>HI</td>
<td>MID</td>
</tr>
<tr>
<td>èbútè ‘harbour’</td>
<td>èlúbó ‘yam flour’</td>
<td>*[e i e]</td>
<td>*-ATR</td>
<td></td>
</tr>
<tr>
<td>èkútè ‘house-rat’</td>
<td>crúpè ‘earth’</td>
<td>*[e i e]</td>
<td>*-ATR</td>
<td></td>
</tr>
<tr>
<td>eriko ‘midrib of igi’</td>
<td>ewúrè ‘goat’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ògòrò stripped of its leaves</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. **SPREAD**

<table>
<thead>
<tr>
<th></th>
<th>-ATR</th>
<th>*</th>
<th>-ATR</th>
<th>*</th>
<th>-ATR</th>
<th>-ATR</th>
</tr>
</thead>
<tbody>
<tr>
<td>MID</td>
<td>LO</td>
<td>MID</td>
<td>LO</td>
<td>MID</td>
<td>LO</td>
<td>MID</td>
</tr>
<tr>
<td>èwà ‘beauty’</td>
<td>*[e a]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>èrápó ‘type of plant’</td>
<td>but not by</td>
<td></td>
<td>aye ‘chance’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>epádi ‘area in the vicinity of the rampart’</td>
<td></td>
<td></td>
<td>ate ‘type of resin’</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With respect to Spread, the critical forms involve low and mid vowels. To the right of a low vowel, mid vowels may be either [-ATR] or [+ATR], depending on the presence or absence of an underlying [-ATR] value. Positing spread of [-ATR] from left to right would incorrectly rule out one of these attested classes, namely those with either of the patterns *e...e or a...o. Conversely, to the left of a low vowel, mid vowels may only be [-ATR], accounted for by the application of Spread from right to left.

In addition to sharing the parametric properties of applying *iteratively* from right to left, Link and Spread share identical substantive properties: both rules target uniquely the class of nonhigh vowels. As can be seen in (7a), when Link encounters a high vowel, the association process simply skips over the high vowel; association cannot target a high vowel (*etìrì “difficult”, *etìrì, etc.). (We use [i] to represent a retracted high vowel.) Similarly, as seen in (7a) and (8a), Spread cannot target a high vowel either (*ide “brass”, *ide, etc.). In Standard Yoruba, this restriction holds generally rather than of specific rules: there are no high [-ATR] vowels.

To conclude, the crucial properties of Link and Spread are identical: in terms of parameters, both rules insert a path from right to left, *iteratively*.

The effect of associating [-ATR] on a representation with a free [-ATR] is “linking”; the effect of association on a representation with a linked [-ATR] is “spreading”. The putative differences between the processes of linking and spreading in Yoruba, then, are artifacts of the divergent representations to which the “two” rules apply. That is, the crucial differences are due to properties of input representations, not to differences in the formal properties of rules. In purely formal terms, Link is equivalent to Spread. Yet the ordering arguments of section 2 establish that “Link” precedes Insert and “Spread” follows Insert, the Identity Paradox.
The Identity Paradox poses a serious challenge to the coherence and restrictiveness of the view that phonologies include a list of (partially) ordered rules. To account for the Yoruba pattern within such a theory, one possibility is to posit two completely identical Link/Spread rules, one preceding Insert and one following Insert (9a). Another possibility is that the same rule may appear in multiple positions within the list of rules (9b). Either of these conclusions about rule lists is possible only within an unrestricted theory. In addition, it is accidental within both accounts that [-ATR] extends its domain as far as possible regardless of its source (i.e. regardless of whether [-ATR] is present underlingly or is inserted by rule).

(9) Implications of the Identity Conclusion

a. LINK=SPREAD A
   INSERT
   LINK=SPREAD B
   -A, B are different rules, accidentally identical

b. LINK=SPREAD A
   [INSERT
   LINK=SPREAD A
   -LINK=SPREAD is one rule, listed twice

(c. LINK=SPREAD & INSERT
   --(LINK=SPREAD applies anywhere and everywhere)
   --LINK=SPREAD behaves like a convention but is language-particular

This observation is expressed in a third approach (9c): Insert remains a rule, but Link=Spread applies anywhere and everywhere, following Myers (1991). Unfortunately, while a persistent rule solution might at first appear to be a successful alternative, further data from Yoruba demonstrates that it is untenable. We digress briefly to demonstrate that the (9c) approach fails in Standard Yoruba: specifically, it fails to apply after a rule creating long vowels.

Consonants delete in certain environments in Standard Yoruba (Oyelaran 1971, Akinlabi 1993). When this deletion results in a mid-high sequence, the mid vowel spreads rightwards and the high vowel is lost. Strikingly, this spread may result in a sequence of a long [+ATR] mid vowel followed by a [-ATR] vowel. Crucially, the creation of such a potential environment for [-ATR] harmony does not feed the harmonic rule of Link=Spread.

(10) Anywhere and everywhere option is not tenable (cf. Akinlabi 1993)

a. yorùbá ↔ yoôbá  *yoôbá  ‘Yoruba’
b. ôdìde ↔ ôôde  *ôôde  ‘Grey Parrot’
c. èrùpè ↔ eepee  *eepee  ‘earth’

One might entertain the possibility that consonant deletion takes place at a stage in the grammar where [-ATR] harmony has ceased to be applicable. Such a possibility is unlikely, however. Akinlabi (1986) and Folarin (1987) present arguments that consonant deletion, progressive vowel spreading and the [ATR] harmony rules all apply on the same lexical stratum; this removes the possibility of explaining their noninteraction in purely morphosyntactic terms. We are forced to the conclusion that the anywhere-and-everywhere option fails to account for the distribution of [ATR] in Yoruba, and hence fails to resolve the Identity Paradox.

4 Optimization

The failure of ordered rules and of everywhere rules forces exploration of different approaches to the characterization of language particular relations. Here we propose a nonderivative approach in which the grammar includes a function that provides a direct mapping between underlying and surface forms. Our proposal follows most closely ideas found in a number of works by Alan Prince and Paul Smolensky (Prince and Smolensky [P&S] 1991a,b, 1992, 1993); see also Goldsmith (to appear) and the papers therein.
The basic idea is the following. Assume a set of wellformed underlying representations. A Yoruba example would be a morpheme with a floating [-ATR] value.

(11) A nonderivational alternative

```
-ATR
E b A
```
Underlying
Representation

Logically, such a representation could be mapped onto an infinite number of surface representations, for example, the forms given in (12). (In the following examples, [a] is used to represent an advanced low vowel.)

(12) A nonderivational alternative

```
a. -ATR
   \[\varepsilon \ b \ a\]

b. -ATR
   \[\varepsilon \ b \ \acute{a}\]

c. -ATR
   \[e \ b \ a\]

d. -ATR
   \[e \ b \ a\]

Possible
Surface Forms
```

e. +ATR
   \[\varepsilon \ b \ a\]

f. -ATR
   \[\varepsilon \ b \ a\]

g. +NAS
   \[\varepsilon \ b \ a\]

h. -ATR
   \[\varepsilon \ z \ a\]

etcetera...

Of the class of such logically possible corresponding surface forms, the phonological grammar must select (12a) as the best, or optimal, surface form for the underlying representation given in (11), choosing between the various candidates that compete for such optimal status. Consider first those in (12e-h). These cases are straightforwardly defined as nonoptimal because in each case, the relation between underlying and surface form cannot be defined in terms of a systematic function involving [-ATR]: (12e) involves [+ATR], (12f) involves lengthening of a vowel, (12g) involves the assignment of nasality, (12h) involves a consonantial change. As regards the cases in (12a-d), (12d) is formally related to the input in (11) by the Identity relation, (12c) is related by linking from right to left without spreading. (Alternatively, (12c) could be related to the input by insertion of [-ATR] to the low vowel with merger of the morpheme-level specification.) (12b) is related by linking (without spreading) from left to right, and (12a) is related by linking and spreading.

The optimization hypothesis claims that a static set of constraints defines one such form as the best for a given input. The challenge is how to accomplish this characterization without resorting to a completely unconstrained set of "constraints" as replacement for the unconstrained sets of rules of the standard approach. We propose a characterization in terms of two interacting scales, each scale derived from independently motivated properties of rules and representations (see A&P in press). The first scale ranks relations between representations in terms of parametric factors; the second performs a similar evaluation in terms of grounding factors.

Inspection of (13a) reveals that there is a single parametric difference between Link=Spread and Insert. Link=Spread adds a Path (association line) while Insert adds an F-element (feature). Values for other parameters, Function, Direction, and Iteration, remain constant. (The parameters are motivated in A&P in press.)
(13) Parametric Factors

a. Parameter of variation

<table>
<thead>
<tr>
<th>LINK-SPREAD RULE</th>
<th>INSERT RULE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INSERT</td>
<td>-ATR</td>
</tr>
<tr>
<td>PATH</td>
<td></td>
</tr>
<tr>
<td>RIGHT TO LEFT</td>
<td>μ</td>
</tr>
<tr>
<td>ITERATIVE</td>
<td></td>
</tr>
</tbody>
</table>

b. Ranking: **PATH » F-ELEMENT**

Following A&P (in press), we argue that relations defined by *Path* are less marked, therefore preferred, to relations defined by *F-element*. A Path rule exacts a minimal change in the representation, affecting only relations between existing information. An Insert Path rule enlarges the domain of influence of the Argument, making that feature more salient and so more recognizable/recoverable. Path insertion when applied to a free Argument links it to prosodic structure; without a path to prosodic structure, the free F-element would not surface, a Prosodic Licensing effect (Itô 1986). (The notion is also akin to the PARSE family of constraints found in P&S 1993; thanks to Robert Kirchner for bringing this to our attention.) By contrast, adding/removing an F-element alters the information content of the representation, making the relation between the two representations less recoverable since one contains information lacking in the other. Thus, manipulating a Path is optimal (13b), we claim, in comparison to manipulating an F-element.

Substantive conditions restricting where [-ATR] may associate are also relevant in Yoruba. Insert F-element imposes the substantive condition that the mora affected must be [+low]; the language as a whole imposes the substantive condition that all [-ATR] vowels are nonhigh. These conditions are neither ad hoc nor unusual: under Grounding Theory (A&P in press), feature coocurrence conditions governing rules and representations are required to be physically motivated. The relation between the tongue body position and tongue root position is such a grounded relation: tongue body lowering and tongue root retraction enhance each other both articulatorily and acoustically. Within the grounding framework, the interaction is formally expressed by the **RTR/LO CONDITION**: If [-ATR] then [+low]; if [-ATR] then not [-low] and the **RTR/HI CONDITION**: If [-ATR] then [+high]; if [-ATR] then not [+high].

Following Grounding Theory (A&P in press), configurations that respect RTR/LO are evaluated as substantively better than configurations that do not obey the condition. This is motivated by cross-linguistic evidence suggesting a skewing towards rules and representations that respect the condition, and by phonetic evidence for a strong correlation between tongue root retraction and tongue body lowering both articulatorily and acoustically. (See A&P in press for references to the phonetic literature on this topic.)

(14) Grounding factors (A&P in press):

a. General (governs all representations): RTR/HI: If [-ATR] then [+high]
   Rule-specific (governs F-element rule only): RTR/LO: If [-ATR] then [+low]

b. Relevant Ranking: RTRxLO » no conditions

Given the rankings in (13b) and (14b), what remains is to integrate the two classes of factors. We propose that integration is accomplished via “trade-off”: as the parametrically defined relations degrade, their quality in terms of grounding must be improved.
(15) Trade-off

The Path factor defines the strongest parametric configuration: as such, it can relate underlying and surface forms under optimal conditions with regards to grounding ([-ATR] associates to a low vowel), as well as under less optimal conditions ([-ATR] associates to any eligible (i.e. nonhigh) vowel). The F-element factor is weaker in terms of the parametric scale: as such, it can relate underlying and surface forms only under the best conditions as regards grounding ([-ATR] is inserted only onto a low vowel). Both combinations of factors are more highly evaluated than Identity, that is, relating underlying and surface representations that are identical with respect to [ATR].

(16) Integrated Yoruba [ATR] Scale

At this juncture, 3 issues remain. First we demonstrate that the [ATR] function in (16) actually does account for the Yoruba patterns. Second, we resolve the Identity Paradox. Finally, we return to the consonant deletion cases to show that the optimization approach to Yoruba succeeds where the anywhere-and-everywhere approach fails.

5 Resolving the Identity Paradox

Consider first examples of mid-voweled words with a floating [-ATR] in their underlying representation, cases such as esẹ ‘row’ (2a). Restricting our consideration to surface forms that can be related in terms simply of the feature [-ATR] (since any other alternatives will be valued less highly than Identity), four candidate surface representations need to be considered:

(17) Surface Candidates for [E,E] with a Floating [-ATR]

The representation in (17d) relates input and output representations by the Identity relation — a wellformed relation. The representations in (17b,c) each involve relations that are wellformed in a general sense; that is, in some language, rule parameters could be set to give left-to-right association without spreading (17b) or to give right-to-left association without spreading (17c). In Yoruba, however, such possibilities are illformed: the parameters in (13) define right-to-left iterative relations as superior to the Identity relation; other imaginable relations (such as defined by left-to-right or noniterative) are evaluated as worse than Identity. (Forms that are as good as or better than Identity are boxed; the optimal form is in
a shaded box.) As such the output in (17d) is ranked as better than those of (17b,c). The final candidate to be considered is (17a). This output is related to the input by the right-to-left iterative *Path* relation; grounding conditions (only the general condition RTR/HI is relevant) are satisfied. Unambiguously, the output in (17a) is the optimal one, correctly deriving forms like *ese* 'row': the relation that relates such a surface form to the underlying representation, *insert path R-L iterative*, is defined as optimal by the scale in (16).

In contrast to the case just seen, consider the optimal output for an underlying form involving two mid vowels *without* a morpheme-level [-ATR] specification, the underlying representation of a word like *ese* 'cat' (2b). In large measure, the logical possibilities are as in (17). The one significant difference is that, unlike (17d), the form defined by Identity would not include a floating [-ATR]; the wellformed output defined by Identity would be [e...e], two mid vowels unspecified for [ATR] and interpreted as advanced by the phonetics. Unlike with *ese*, the surface form [e...e] would be optimal for *ëse*: the only way to define a relation between an input without [-ATR] and an output with [-ATR] (cases not involving Identity) would be to invoke the *F*-element relation; the grammar of Yoruba, however, defines Identity as more highly ranked than the *F*-element relation except when restricted to low vowels.

At the beginning of this paper, an ordering paradox was demonstrated within a theory adopting ordered rules. The crux of the argument concerned the ordering of Link/Spread both prior to and after Insert. Two further demonstrations show how these putative ordering effects are derived within an optimization framework. Consider first a case like *âtjé* 'witch'; underlyingly, this type of case has a low-mid sequence with a floating [-ATR], used in (6) to demonstrate that Link precedes Insert.

As with (17d) above, the Identity relation defines (18d) as a wellformed output. Like (17c) above, (18c) is illformed for Yoruba: the relation is not one of *Identity*, nor is it appropriate for an *iteratively* defined *Path* relation, nor can it be defined by the *F*-element relation since the putative recipient of [-ATR] is not low. With regards to (18b), although the output cannot be related to the input by an iterative, right-to-left *Path* relation, (18b) does constitute a wellformed output as defined by the *F*-element relation: [-ATR] has been assigned to the maximal set of targets satisfying the substantive condition that they be low. (The single [-ATR] in the output would make this form compatible with the OCP). Finally, (18a), like (17a), is well-defined by the *Path* relation.

(18) Surface Candidates for [A...E] with a Floating [-ATR]

<table>
<thead>
<tr>
<th>INPUT</th>
<th>POTENTIAL OUTPUTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>-ATR</td>
<td>a. [-ATR]</td>
</tr>
<tr>
<td>A...E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. [-ATR]</td>
</tr>
<tr>
<td></td>
<td>c. [-ATR]</td>
</tr>
<tr>
<td></td>
<td>d. [-ATR]</td>
</tr>
<tr>
<td></td>
<td>a...E</td>
</tr>
<tr>
<td></td>
<td>a...E</td>
</tr>
<tr>
<td></td>
<td>a...e</td>
</tr>
<tr>
<td></td>
<td>a...e</td>
</tr>
</tbody>
</table>

Three output forms therefore compete for the optimal output corresponding to [A...E] with a floating [-ATR]. The winner for such a form is clearly (18a). Comparing (18b) with (18d), we see that the two are equivalent with respect to the second vowel — both vowels are related by *Identity* to the input vowel. As regards the first vowel, the two forms differ with respect to the *F*-element relation. Since *F*-element is more highly ranked than *Identity*, (18b) is the better form. Finally, comparing (18b) with (18a), the two are equivalent as far as the first vowels are concerned. The two outputs differ in that the final vowel of (18b) is
related to the input by \textit{Identity} while the final vowel of (18a) is related to the input by the \textit{Path} relation. Since \textit{Path} is the most highly valued relation in Yoruba, the grammar correctly selects (18a) as the optimal form.

Finally, the “Insert precedes Spread” effect is seen when a mid vowel precedes a low vowel and there is no floating [-ATR], for example, \textit{egba} ‘whip’. The optimal output here, (18a) evaluates the mid vowel by \textit{Path} and the low vowel by F-element. This is better than the other two candidates, for in each of those at least one vowel is evaluated by Identity.

(19) Surface Candidates for [E...A] \textit{NO Floating} [-ATR]

\begin{center}
\begin{tabular}{ccc}
INPUT & POTENTIAL OUTPUTS \\
\multirow{2}{*}{E...A} & a. \begin{array}{c}
\text{-ATR} \\
\text{E...A}
\end{array} & b. \begin{array}{c}
\text{-ATR} \\
\text{E...A}
\end{array} \\
& c. \begin{array}{c}
\text{-ATR} \\
\text{E...A}
\end{array} & d. \begin{array}{c}
\text{E...A}
\end{array}
\end{tabular}
\end{center}

Note that the representation in (18c) corresponds to the surface effect of Spread \textit{preceding} Insert, ordering of such rules constituting a crucial aspect of a conventional phonological analysis. In optimization terms, (18c) is evaluated as weaker than (18a) without any recourse to notions of derivation or extrinsic rule ordering. In conventional theory, the ordering of “Link then Insert then Spread” results in the wide applicability of “Spread”. Under optimization, this pervasive effect derives from the high ranking of the \textit{Path} relation.

We conclude that the optimization approach characterizes the Yoruba [ATR] patterns correctly without recourse to ordered rules. Since there are no ordered rules, the Identity Paradox does not arise.

6 Interaction with Consonant Deletion

We return briefly to the consonant deletion problem. To review, the optional rule of consonant deletion feeds vowel lengthening; vowel lengthening creates a long mid vowel. Crucially, a following [-ATR] does not spread onto this derived long mid vowel: \textit{yorùbáyọọbá, *yọọbá}. We provide a tentative and schematic explanation of this interaction here.

We propose that vowel lengthening spreads a Root node while consonant deletion delinks a Root node: the parametric values for these rules are given in (20) with the difference boxed. (For the purposes of this brief discussion, we ignore numerous issues. On consonant deletion in general, see Oyelaran 1971; for /\textit{t}/-Deletion, see Akinlabi 1993; on Root Spread, see Pulleyblank 1988, Akinlabi 1993.)

(20) [yorùbál] ↔ [yọọbá] cases

\begin{center}
\begin{tabular}{ccc}
\text{ROOT SPREAD RULE:} & \text{\textit{hl}-DELETION RULE:} \\
\begin{array}{c}
\text{INSERT} \\
\text{PATH} \\
\text{LEFT TO RIGHT} \\
\text{ITERATIVE} \\
\text{ROOT}
\end{array} & \begin{array}{c}
\text{DELETE} \\
\text{PATH} \\
\text{LEFT TO RIGHT} \\
\text{ITERATIVE} \\
\text{ROOT}
\end{array}
\end{tabular}
\end{center}

In terms of an optimization scale, Insert is preferred to Delete since deletion removes information from a representation, thereby decreasing recoverability. We suggest that the variability associated with consonant deletion is achieved by two different locations for Identity: if Identity is stronger than Delete, consonant
deletion may not take effect (and neither can vowel lengthening, for its environment is created by the loss of the consonant): yorūbá results. On the other hand, if Delete is better than Identity, the consonant deletes and the vowel lengthens: yoðbá results.

(21)

The question, then, is how to express the counterfeeding relation between the Root node function and the [ATR] function to correctly define relations between Yoruba representations. Our answer is that there is no interaction at all: both functions evaluate relations between representations independently, as depicted for yoðbá in (22). Relations between input and a variety of outputs are evaluated in terms of the [ATR] function and in terms of the consonant deletion function in (22). The optimal mapping between underlying and surface forms is the convergence of best mappings from each function.

With respect to the [ATR] function, the best mapping involves [-ATR] linked only to the third mora: the first and second moras are evaluated by Identity while the third mora is evaluated by F-element. Thus, [-ATR] is associated only to the final vowel, [a]. Of interest is the pairing of the optimal [ATR] output with the optimal output of the consonant deletion function, where consonant deletion and vowel spread create a lengthened mid vowel. In this case, the best mapping is one in which a consonant is lost and a vowel is lengthened. The results of evaluation in terms of these two functions converge in the representation for yoðbá, given as the optimal output in (22). (For the consonant function, if Identity were better than Delete, then the two representations would converge on yorūbá.)
7 Conclusion

We have argued here that an analysis of the distribution of [ATR] in Yoruba in terms of a list of rules requires an odd type of ordering, the Identity Paradox. Resolving the problems inherent in the "ordered list" approach, we argue for Optimization, a nonderivational theory of phonology. Three properties of Optimization are crucial for the account of Yoruba presented.

(23) Optimization

a. **Ranking of Factors:** Each class of variable factors which determine the distribution of some F-element are internally ranked. Here, the two classes are parametric and grounding factors.

b. **Trade-off:** These two rankings are integrated via *trade-off*: as the parametric scale deteriorates, its weakness is offset by improvement in other relevant scales, here the grounding scale, thereby creating a function defining the distribution of the argument in question.

c. **Independent Optimization Scales:** Internally-ranked sets of parametric factors involving different Arguments may function independently of each other. Built into a single scale, factors feed each other; in separate scales, factors are counterfeeding.

Yoruba illustrates three important results of this approach. First, ordering problems like the Identity Paradox cannot arise because there are no ordered lists of rules. Second, the effects attributed to different kinds of ordering result from whether or not various relations are integrated into a single function. For example, the [ATR] relations defined by Path, F-element, and Identity are all part of a single function, deriving the effect of each feeding the other, and pervasiveness corresponding to a more dominant ranking. By contrast, the Root node function is
completely independent of the [ATR] function, deriving the effect of counterfeeding.

Finally, the approach claims that phonological relations are characterized by the principles in (23). Systems which cannot be expressed in terms of these principles are impossible. For example, trade-off rules out a language in which strong factors are mapped to strong factors and weak factors are mapped to weak ones. Thus, Optimization restricts possible relations, or sets of rules, within a language, allowing us to explore the question of "what is a possible rule inventory?"

Acknowledgements

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References


There-Sentences and Inversion as Distinct Constructions: A Functional Account*

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1 Introduction

A number of previous studies (e.g. Hartvigson & Jakobsen 1974, Erdmann 1976, Breivik 1981, Penhallurick 1984) have claimed or assumed that existential there-sentences and locative PP inversions are functionally equivalent with respect to the information status of the post-verbal NP (henceforth PVNP). Indeed, some have gone so far as to assume that these two sentence types are variants of a single construction. Consider, for example, the there-sentence in (1a) and the PP inversion in (1b):

(1)  a. In the garden there was a parrot.
     b. In the garden was a parrot.

For some, the there-sentence in (1a) is merely a surface variant of the PP inversion in (1b).

In this paper we compare certain discourse-functional properties of there-sentences and inversions, and show that the two have very different distributions in naturally-occurring discourse. As demonstrated in Birner 1992, PP inversion, like inversion in general, serves to link relatively unfamiliar information to the prior context via the clause-initial placement of information that is relatively familiar in the discourse. As demonstrated in Ward & Birner 1993, however, felicitous use of there-sentences requires that the information represented by the PVNP constitute information that is new to the HEARER – not just to the discourse (Prince 1992). We begin with a brief review of earlier work on these constructions.

2 Previous studies

Previous accounts have attributed a wide range of discourse functions to various types of inversion. For example, Green (1980) posits a variety of distinct uses for inversion, including connective, emphatic, and introductory functions. Rochemont (1986), Rochemont & Culicover (1990), and Bresnan (1990) view locative PP inversions as identifying the postverbal

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constituent as a ‘presentative’ or ‘presentational’ focus, while Penhallurick (1984) argues that inversion in fact defocuses the PVNP, and Levine (1989) claims that inversion identifies the preverbal element as the focus. Moreover, Rochemont (1986) argues that the focussing of the post-verbal constituent is dependent on its not being ‘c-construable’ (roughly, ‘under discussion’) in context. Finally, Penhallurick (1984) argues that the postponing of the subject is licensed by virtue of its representing ‘new’ information.

Similarly, the notion of given and new information has played a key role in many previous functional studies of there-sentences. As many researchers have noted, the PVNP in a there-sentence must represent ‘new’ information in some sense. These studies, however, differ in their characterization of ‘new information’. Rando & Napoli (1978), for example, argue that this NP must be ‘non-anaphoric’, where anaphoricity is defined in terms of what is familiar to both speaker and hearer (Kuno 1972). However, as Abbott (1992, 1993) observes, an anaphoric NP may be fully felicitous if it represents a response to a request for entities “to fulfill a certain role”. Holmback (1984) argues that there-sentences serve a presentational function and therefore the PVNP in a there-sentence will generally represent unfamiliar information. Lumsden (1988), following Milsark (1974), argues for a distinction between ‘strong’ and ‘weak’ quantified expressions, where the interpretation of strong quantified expressions is “characterized by the expectation of the hearer that the set of objects over which quantification takes place is in some form already accessible to him”. In other words, when the hearer expects the set to be known or accessible, then the interpretation is strong and outside the province of there-sentences.

Thus we see very similar types of discourse functions being attributed to both constructions — i.e., that of presenting relatively new information in post-verbal position. In fact, there are those who claim that the two constructions are functionally equivalent with respect to the role of the PVNP. For example, Hartvigson & Jakobsen 1974 and Erdmann 1976 claim that the function of both inversions and there-sentences is to preserve the basic distribution of thematic information preceding rhematic information (Firbas 1964); that is, both constructions serve as devices for presenting rhematic, or new, information in sentence-final position. In a similar vein, Breivik (1981) argues that there can be ‘dispensed with’ (under certain well-defined conditions) if the locative adverbal is preposed; for example, according to Breivik’s ‘Visual Impact Constraint’, there appears if the sentence fails to convey visual impact (cf. Bolinger 1977). Likewise, Penhallurick (1984) considers there-sentences to be ‘non-paradigm’ cases of inversion, with there simply serving to fulfill the requirement that some expression must precede the verb; for cases where there is preceded by a PP, he appeals to Breivik’s Visual Impact Constraint. Nonetheless, for Penhallurick, both sentence types serve to present new information in post-verbal position, whereas we will show that in the two constructions this position is sensitive to very different types of familiarity.

3 Information status

As seen above, accounts of both inversion and existential there have commonly made reference to the notion of given and new information; these accounts differ, however, in their charac-
terization of these information types. Such terms as 'old/new', 'focused', 'non-anaphoric', 'thematic/rhetic', and 'c-construable' have all been employed, with varying definitions, in attempts to accurately characterize the precise nature of the long-recognized given/new distinction.

Prince (1981b), however, notes that a dichotomy of given and new information is inadequate, and presents instead a taxonomy of the various types of assumed familiarity that may be relevant for discourse. In Prince 1992 this taxonomy is further transformed into a matrix of crosscutting dichotomies: DISCOURSE-OLD vs. DISCOURSE-NEW information and HEARER-OLD vs. HEARER-NEW information. This matrix reflects the fact that what is new to the discourse may not be (assumed by the speaker to be) new to the hearer (cf. Firbas 1966, Chafe 1976:30), although presumably what is familiar in the discourse will be familiar to the hearer as well.

Thus, there are four theoretically possible information statuses, of which only three typically occur in natural discourse:

- Hearer-old, Discourse-old – Information previously evoked in the discourse, and therefore also assumed to be familiar to the hearer.
- Hearer-old, Discourse-new – Information not previously evoked in the discourse, but nonetheless assumed to be familiar to the hearer.
- Hearer-new, Discourse-new – Information not previously evoked in the discourse, and assumed to be unfamiliar to the hearer.
- Hearer-new, Discourse-old – Theoretically, information previously evoked in the discourse, but nonetheless assumed to be unfamiliar to the hearer. (For obvious reasons, this type presumably does not occur in natural discourse).

The advantage of this system is that it acknowledges the non-binary nature of familiarity. In particular, it provides a characterization of such information as that represented by the subject and direct object NPs in (2):

(2) a. Bill Clinton moved into the White House recently.
    b. The Bears are considering leaving Chicago.

Discourse-initially, for a typical Chicagoan, all four NPs in these examples constitute information that is discourse-new yet hearer-old; Bill Clinton, for example, can be assumed to represent information that is familiar to the hearer even in the absence of prior mention within the discourse. Any binary treatment of givenness must classify such information as categorically either given or new, predicting that it would pattern as consistently given or new in those constructions sensitive to information status. However, we will argue that such information in fact patterns quite differently in two such constructions, inversion and existential there.
4 Inversion

As seen above, many previous studies have recognized the importance of information status to the distribution of inversion, yet none of these studies has distinguished between information status relative to the hearer and information status relative to the discourse. Such a distinction is, however, drawn in Birner 1992, where it is argued that inversion serves an information-packaging function (Chafe 1976), allowing the presentation of relatively familiar information before a comparatively unfamiliar logical subject. Birner’s study of more than 1700 naturally-occurring tokens of inversion in context revealed that there was not a single token in the corpus wherein the element represented by the initial constituent was discourse-new while that represented by the post-verbal constituent was discourse-old. Thus, compare the naturally-occurring tokens in (3) with the infelicitous example in (4).

(3) a. We have complimentary soft drinks, coffee, Sanka, tea, and milk. Also complimentary is red and white wine.
   [Stewardess on Midway Airlines, 12/30/83]

   b. Expressions like ‘geezer,’ ‘codger,’ ‘fuddy-duddy,’ ‘old goat’ obviously disparage the old person. Not so obvious are the euphemisms ‘umpteen years young’ and ‘Golden Ager.’
   [Chicago Tribune, 3/15/90]

(4) A: Hey, Bill, where’s the coffee grinder? Our guests will probably want some cappuccino after dinner.
B: #On the kitchen counter is the coffee grinder.

In (3a), complimentary clearly represents discourse-old information, while red and white wine represents information new to the discourse. Likewise, in (3b), obvious represents discourse-old information, while the listed euphemisms are discourse-new. In (4), however, the kitchen counter represents discourse-new information, while the PVNP the coffee grinder represents discourse-old information, rendering the inversion infelicitous.

On the other hand, Birner did find tokens containing a hearer-new initial constituent with a hearer-old post-verbal constituent, as in (5):

(5) a. Napkin notes: Reopened after a summer siesta is the SMC Club, only it’s not the SMC Club anymore. With renovations and an expansion of the old Videotech concept came a new name—the Kennel Club.
   [Au Courant, 10/4/83]

   b. I had lunch at Marshall Field’s yesterday and you wouldn’t believe who was there. Behind a cluster of microphones was Mike Ditka, holding yet another press conference.

In (5a), the initial constituent reopened after a summer siesta represents hearer-new information, while the PVNP the SMC Club represents hearer-old information in context, and the
inversion is fully felicitous. The same point is illustrated in the (constructed) example in (5b). Thus, Birner concludes that it is not the (assumed) familiarity to the hearer that is relevant for felicitous inversion, but rather the familiarity WITHIN THE DISCOURSE of the information represented by the initial and post-verbal constituents – i.e., its DISCOURSE-FAMILIARITY.

Given these results, Birner 1992 posits a pragmatic constraint on inversion, to the effect that the initial element in an inversion must not be newer WITHIN THE DISCOURSE than the post-verbal element. Note that this is not equivalent to saying that the initial constituent in an inversion always represents discourse-old information while the post-verbal constituent always represents discourse-new information. Felicitous inversion is sometimes possible when the initial and post-verbal elements are either both discourse-old or both discourse-new; preliminary research suggests that in such cases other factors (including, for example, relative salience and topichood) affect the felicity of the inversion (see Birner 1992 for details).

Birner also found that ‘inferrable’ information (Prince 1981b) is treated as discourse-old with respect to inversion. That is, inferrables always precede, and never follow, discourse-new information in an inversion, and they may either precede or follow evoked (i.e., discourse-old) information. In total, 78% of the tokens for which sufficient context was available (1009/1290) contained a discourse-old (i.e., evoked or inferrable) initial element and a discourse-new post-verbal element. In sum, Birner concludes that inversion is sensitive to the discourse-familiarity of the elements represented by the initial and post-verbal constituents, and specifically that the initial element in an inversion must not be newer within the discourse than the post-verbal element.

5 There-sentences

The felicitous use of there-sentences is also sensitive to the information status of the PVNP (Erdmann 1976; Rando & Napoli 1978; Ziv 1982; Penhallurick 1984; Holmback 1984; Lumsden 1988; Prince 1992; McNally 1992; Abbott 1992, 1993; inter alia); however, unlike inversion, existential there is sensitive not to DISCOURSE-familiarity, but rather to HEARER-familiarity. That is, as noted in Prince 1992, the PVNP in a there-sentence is required to represent information that the speaker believes is not already known to the hearer. Given this constraint, the so-called ‘definiteness effect’ (Milsark 1974, Safr 1985, inter alia) long and, we argue, erroneously associated with there-sentences can be seen as epiphenomenal, the result of an imperfect correlation between the cognitive status to which definiteness in general is sensitive (i.e., unique identifiability) and the cognitive status to which the referent of the PVNP of a there-sentence is sensitive (i.e., hearer-newness). In Ward & Birner 1993, we examined a large corpus of naturally-occurring data and found that all cases of acceptable there-sentences with a definite PVNP could be accounted for by restricting definite NPs in post-verbal position to those that can be interpreted as hearer-new. In Ward & Birner 1993 we discussed five such contexts; these are listed in (6).
Classes of definite PVNP in *there*-sentences:

I  Hearer-old entities marked as hearer-new
II Hearer-new tokens of hearer-old types
III Hearer-old entities newly instantiating a variable
IV Hearer-new entities with unique IDs
V False definites

Type I consists of hearer-old entities marked as hearer-new. This category includes the 'reminder' *there*-sentences noted by Bolinger (1977), Hannay (1985), Lakoff (1987), and Abbott (1993), inter alia, as illustrated in (7):

(7) Mr. Rummel: Well, didn’t the designer of the orbiter, the manufacturer, develop maintenance requirements and documentation as part of the design obligation?
Mr. Collins: Yes, sir. And that is what we showed in the very first part, before the Pan Am study. *There were those other orbiter maintenance and requirement specifications*, which not only did processing of the vehicle, but in flow testing, pad testing, and what have you, but also accomplished or was in lieu of an inspection plan.
[Challenger Commission transcripts, 3/31/86]

Although the entity represented by the PVNP here has been previously evoked, there are sufficient grounds for the speaker to believe that the entity has been (temporarily) forgotten, thus licensing the speaker to treat it as hearer-new (see Lakoff 1987).

Examples of Type II, in which the PVNP in a *there*-sentence represents a new instance of a known type, are well attested in the literature (Jenkins 1975, Erdmann 1976, Ziv 1982, Hannay 1985, Lakoff 1987, Lumsden 1988, Prince 1992, Abbott 1993, inter alia); these include PVNPs with adjectives indicating resemblance to a known or inferrable type (e.g. *same, usual, obligatory, ideal, perfect, necessary*), as in (8):

(8) The Woody Allen-Mia Farrow breakup, and Woody’s declaration of love for one of Mia’s adopted daughters, seems to have everyone’s attention. *There are the usual sleazy reasons for that, of course* – the visceral thrill of seeing the extremely private couple’s dirt in the street, etc.
[“It’s All on the Screen,” *San Francisco Chronicle*, 8/24/92]

Here, the PVNP has dual reference, both to a type and a token. The definite is licensed by the unique identifiability of the (hearer-old) type (Hawkins 1978, 1991), while the *there*-construction is licensed by the hearer-new status of the current instantiation of that type.

The third class of definite PVNPs consists of hearer-old entities newly instantiating a variable, as in (9):

(9) And there’s two components in [Division H], which is the operations division: the people that do the flight activity planning procedures work, provide for the crew activity planning and the time line support and integrated procedures development and overall flight data file management; *and then there is the payload support folks, who*
provide for customer operations integration and support of their onboard interfaces.
[Challenger Commission transcripts, 4/8/86]

Here, the individuals listed are uniquely identifiable, thus warranting the definite; however, they constitute hearer-new instantiations of the variable in the salient open proposition ‘X is a component in Division H’ (see Prince 1981c, Ward 1985, Prince 1986, inter alia, for details).

Unlike the first three classes, the fourth type of definite PVNP does not depend on prior context for its felicity. Consider (10):

(10) In addition, as the review continues, there is always the chance that we’ll uncover something additional that is significant.
[Challenger Commission transcripts, 3/18/86]

Here, although the chance that we’ll uncover something additional that is significant may be new to the hearer, the description provided in the NP is sufficient to fully and uniquely identify the chance in question, hence the felicity of the definite (cf. Holmback 1984).

The last type of definite PVNP is what we call ‘false definites’. It has been noted (Prince 1981a) that the demonstrative this can felicitously introduce an NP whose referent is brand-new, as in (11):

(11) One day last year on a cold, clear, crisp afternoon, I saw this huge sheet of ice in the street.
[Hockey player; Terkel 1974:505; from Prince 1981a]

Here, this huge sheet of ice can be used to refer to an entity that is unknown to the hearer. While most uses of demonstratives require that the speaker assume the hearer is in a position to identify the referent, the use of this exemplified in (11) assumes the hearer is not in such a position, and instructs the hearer to add a new entity to his/her model of the discourse. And, as we would expect, NPs that represent such hearer-new entities are fully felicitous in the PVNP position of there-sentences. Consider (12):

(12) One day last year on a cold, clear, crisp afternoon, there was this huge sheet of ice in the street.

Whether one wishes to call this huge sheet of ice in (11) and (12) definite or indefinite depends on whether definiteness is being defined as a formal or cognitive category (cf. Prince 1992). Here, we use the term false definite to refer to formal definites used to represent entities not assumed to be uniquely identifiable to the hearer.

Although this is by far the most widely discussed of this class, there are other types of false definites that occur in there-sentences as well, as illustrated in (13):
In (13a), *all sorts of* does not mean literally ‘every sort of’, but rather is used colloquially to mean, in effect, ‘a lot of’. Likewise, in (13b), *every reason* doesn’t mean literally each one of a set of reasons, but rather something more like ‘good reasons’ or ‘many reasons’. Note that when the meaning is truly exhaustive, as with *each*, use of a TS is infelicitous:

(14)  

Finally, in (13c) *the most curious discussion* is not a literal superlative. The speaker will not be taken to believe that this discussion is actually the most curious of some set of discussions; rather, the superlative is used as a simple intensifier (see Hawkins 1978, 1991). None of these NPs, then, is being used to refer to a uniquely identifiable identity.

Thus, post-verbal position in *there*-sentences may felicitously be occupied by exactly those definite NPs that are construable as hearer-new, rendering the term ‘definiteness effect’ a misnomer. More importantly for our purposes, these results demonstrate that what is relevant for the felicitous use of *there*-sentences is not discourse-familiarity, but rather hearer-familiarity. That is, it is not sufficient for the PVNP to be merely discourse-new; it must in fact be hearer-new for the *there*-sentence to be used felicitously.

6 Discussion

As we have seen, felicitous inversion requires only that the information represented by the post-verbal constituent be newer in the discourse than that represented by the preverbal constituent, while felicitous use of a *there*-sentence requires that the post-verbal information be new to the hearer. Therefore, we can predict different distributions of these two constructions in discourse. Specifically, we would expect that in contexts where the information represented by the PVNP is familiar to the hearer but nonetheless new to the discourse, inversion may be felicitous while the corresponding *there*-sentence would not be. An examination of a large corpus of naturally-occurring data bears out this prediction. Consider the examples in (15)-(16):

(15)  

a. Georgia’s protective surplus stands at $9 million, the lowest level in 15 years. “That would run the state government for about six hours,” says Clark Stevens, director of the Governor’s office of planning and budget. In even worse shape is Mississippi, which is looking at a $120 million deficit in fiscal 1984, despite $250 million in pared spending.

[Time, p. 27, 11/28/83, article “Restoring a delicate balance”]

b. ...#In even worse shape there is Mississippi, which is looking at a $120 million deficit in fiscal 1984, despite $250 million in pared spending.
(16)  a. Now way out front with the ball is Brenner.  
    [Radio; cited in Green 1980]  
   
b. #Now way out front with the ball there is Brenner.

In each of these examples, the PVNP represents information that is at once hearer-old and discourse-new. The felicity of the inversions in (15a) and (16a) is due to the discourse-new status of the PVNP, while the infelicity of the corresponding there-sentences in (15b) and (16b) is due to its hearer-old status. This category of information status — hearer-old/discourse-new — corresponds to what Prince in earlier work called ‘unused information’ (1981b). Unused discourse entities are often represented by proper names, as in (15) and (16); however, definite descriptions may also have this information status, as in (17):

(17)  a. Hey, mom – what’s going on outside? A police car is parked in front of the Williams’ house. In the back seat is my biology teacher.  
   
b. Hey, mom – what’s going on outside? A police car is parked in front of the Williams’ house. #In the back seat there’s my biology teacher.

Here, my biology teacher represents information that is new to the discourse but presumably known to the hearer.

Pronouns, on the other hand, may not be used to represent unused information: they necessarily represent salient discourse-old (and hence hearer-old) information and thus are disallowed in post-verbal position in both there-sentences and inversion. Consider (18):

(18)  a. #In the corner was he/him.  
    
b. #In the corner there was he/him.

Here, the necessarily discourse-old status of the entity represented by the pronoun renders it infelicitous in post-verbal position in both sentence types.

We can conclude, then, that it is the category of hearer-old/discourse-new information that crucially differentiates the two constructions under investigation. If an NP represents information that is both hearer-new and discourse-new, then it will be felicitous as the PVNP in both inversion and the corresponding there-sentence, as in (19):

(19)  a. George, can you do me a favor? Up in my room, on the nightstand, is a pinkish-reddish envelope that has to go out immediately.  
    [=Birner 1992:3, ex. 1b]  
   
b. George, can you do me a favor? Up in my room, on the nightstand, there’s a pinkish-reddish envelope that has to go out immediately.

Likewise, if an NP represents information that is both hearer-old and discourse-old, then it will be infelicitous in a there-sentence, and also infelicitous in an inversion (unless the initial constituent represents more recently evoked, and hence older, information in the discourse (see Birner 1992)). We have already seen an infelicitous inversion of this type ((4), repeated below as (20a)); in (20b) we see that the corresponding there-sentence is equally infelicitous:
Only when the hearer-status of the PVNP differs from its discourse-status will the constructions systematically differ in felicity. Nonetheless, we see that the two constructions are sensitive to entirely different dimensions of familiarity. For inversion, what is relevant is the discourse-familiarity of the PVNP, while for there-sentences, it is hearer-familiarity that is relevant.

It is of course possible that these two sentence types are DERIVATIONALLY related, as argued by Coopmans (1989) and, more recently, by Freeze (1992); this, however, does not entail any type of functional relationship. Prince 1988, in fact, notes that “the coherence signals represented by the syntactic form of a sentence are not predictable from the actual syntactic operations that that sentence has undergone.” Instead, Prince observes that discourse functions in general correlate with particular ‘constructions’, with ‘construction’ being defined at a more abstract level, independently of their syntactic derivation.

Assuming that coherence signals do in fact correlate with particular constructions, distinct discourse functions would then mark distinct constructions in this sense. What we have shown in this paper is that, in the case of inversion and existential there, post-verbal position is sensitive to different types of information status. That is, these two sentence types have distinct discourse functions, reflected by their differing distributions in natural discourse. Thus, despite recent attempts to provide a unified syntactic derivation for there-sentences and inversion, a corresponding functional univocality does not follow, and we can conclude that the two constitute distinct constructions.
References


The mixed discourse genre as a social resource for participants

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Introduction: Intertextuality in a theory of genre

This paper examines an under-explored area of genre studies, the mixed discourse genre, as a social resource for participants in discourse. I take as the starting point for my discussion the recent work of Richard Bauman and Charles Briggs (Bauman & Briggs 1990; Briggs & Bauman 1992), which, although it is rooted in performance studies within folklore and anthropology, offers valuable insights for the understanding of the mixed genre in a more interactional-sociolinguistic approach.

Previous work on genre typology has tended to align itself either with a formal or a functional model of discourse types. Researchers such as Hymes (1974) and Virtanen (1992) privilege a genre’s formal characteristics, while others, like Swales (1990), argue for function as the central criterion in the classification of genres, and still others, for example Biber (1988), take an intermediate position by associating formal features with functional properties. Yet formal and functional taxonomies, whether taken separately or in combination, are unsatisfactory for several reasons. First, both typologies are constructed in an a prioristic manner. Even when categories are based on local description by informants rather than on analysis imposed from the outside by the researcher, they are generally presented ahistorically and removed from their conditions of production. Second, in traditional typologies the characteristics of particular genres are often reified either as necessary and sufficient properties or as prototypical features (Swales 1990; Virtanen 1992), thereby ignoring the possibilities of genre change or imposing theoretical limitations on innovation that may not be borne out by empirical study (cp. Hanks 1987). Finally, the typologizing urge may itself obstruct advances in the analysis of genre; in this arena as elsewhere, the discourse level appears to require a different heuristic than do other levels of language (Stubbs 1983).

The approach that Briggs and Bauman (1992) take, on the other hand, grants primacy to the situated context of discourse over abstract generalizations. They propose that genres are not merely configurations of formal or functional characteristics that are given a priori; instead generic types are emergent from their relationships with previous (and subsequent) discourses. This relationship, which Bakhtin thought of as “dialogic contact between texts” (1986:162), or intertextuality, must be considered an additional dimension of genre construction. Briggs and Bauman demonstrate that an analysis of the intertextual relations of a given genre offers the possibility of a rapprochement between researchers concerned with strictly linguistic data and those whose orientation is more socially
based, for it is in the relationship between texts that social values are constructed, values such as the social meaning of a particular genre and the subject positions of its participants. It is through intertextuality that norms such as formal and functional categories are produced and sustained or challenged. Hence formal and functional analyses of language are necessary but not sufficient for an understanding of genre; social issues of ideology, power, and identity also crucially pertain to its workings. Genre, then, is a culturally recognizable form of linguistic interaction that is achieved through prior texts on the one hand and current discursive acts on the other, and has associated with it a collection of knowledge about its norms, formal, functional, and social.

How genres leak

Central to an intertextual model of discourse is an understanding of the dynamic nature of texts. Intertextuality accounts for how genres are created, sustained, and changed over time, while formal and functional analyses tend to view generic categories as static and unshifting. This fluidity suggests that the realization of generic convention in a specific discursive setting is always contingent: although formal and functional norms established in the patterning of prior discourse inevitably influence subsequent talk, the former does not determine the shape of the latter. Indeed, it is the unsettled nature of genre that leads Briggs and Bauman (1992) to incorporate intertextuality into their analysis. The researchers' commitment to bringing what they call the "fuzzy fringes of genres" (1992:145) from the margin to the center of genre analysis is linked to their recognition that particular discourses are as likely to violate generic conventions as to conform to them. But transgression of generic norms is only one way in which genres may "leak," to use Bauman's (1992) term. For example, some genres are more open-ended than others. These are variously referred to in the literature as blended or mixed genres, boundary works, or secondary or dialogic genres, among other labels. The mixed genre, as I shall call it in this paper, following Schiffrin (forthcoming) and others, is the intersection between two or more discourse types, in which norms of each type of talk are drawn upon as resources for constructing interaction. This hybridization may be a transitional stage in the historical development of a new, socially recognizable discourse form, as Hanks (1987) has shown for Mayan colonial discourse, or it may stabilize as a conventionally ambiguous type of talk. A final way in which genres may leak is through the conflicting strategies of multiple participants, but this issue is not highlighted in the work of either Briggs and Bauman or Hanks, for they restrict the examination of genre primarily to so-called monologic discourse forms, with the consequence that genres are inevitably seen as unitary. Discourses that are dialogic (in a strict rather than Bakhtinian sense), however, are not authored by a single speaker and hence are potentially fragmented; rival and contradictory or complementary genres may emerge from the discursive efforts of multiple authors. Acknowledgment of genre
construction as an area of contention among participants enriches functional generic typologies such as that offered by Biber (1988): he defines genre categories on the basis of speaker purpose, but this is clearly inadequate when different speakers have divergent goals.

The panel discussion

The discourse type under consideration in this paper, the panel discussion, brings together these three sites of generic leakage: it is instantiated, in the specific data under consideration here, through repeated transgression of discourse norms; it belongs to the class of genres that are more open-ended and ambiguous; and its construction necessarily involves multiple authorship. As a mixed genre, the panel discussion has elements of both conversation and news interviews. These elements are often in conflict. Conversation is a normatively egalitarian type of talk, in which topic, turn-taking, and participant roles are fluid and unplanned (Goffman 1981). It is prototypically sensitive to physical and temporal setting and shared background knowledge, and its goal is assumed to be the maintenance of pre-existing relationships among participants (Biber 1988). Media interviews, in contrast, normatively have a fixed topic that is determined in advance, a turn-taking system that allows some participants but not others to select next speaker (a constraint that is not present in conversation; see Sacks, Schegloff, & Jefferson 1974), and asymmetrical participant roles that limit question-asking to the interviewer and question-answering to the interviewee (Heritage & Greatbatch 1991). Although they are generally highly interactive, interviews are not usually highly contextualized with regard to either setting or temporality (Biber 1988). A further convention associated with interviews is their mediated nature, whereby talk is performed not only for the benefit of copresent participants but also for an overhearing audience (Heritage & Greatbatch 1991; Bell 1991), and in this sense the purpose of interviews is to create an "imagined community" (Anderson [1983] 1991) that includes both the interview participants and the audience members. For instance, talk in radio interviews is generally constructed in recognition of the fact that the listening audience is unable to see the speakers, with the consequence that nonverbal information is replaced or supplemented by a verbal gloss. Interviewers, then, are generally seen as facilitators rather than as bona fide interactants; they serve as surrogate interlocutors on behalf of the wider audience.

The norms of the panel discussion are intermediate between those of the above-described discourse types: speaker roles and turn-taking rights may be relaxed in comparison to the interview, but the interview system is held to be normative; and participants usually orient to an overhearing audience. Speakers' footing in the panel discussion thus may take one of three forms from moment to moment: primarily conversation-like, primarily interview-like, or more or less equally balanced between the two. Creative adaptation of the norms allows participants with less institutionalized power in the discourse—the panelists—to
reduce the imbalance of power. Specifically, panelists are able to highlight the conversational component of the panel-discussion genre, thereby gaining an interactional advantage in the discourse, not only because conversation permits a more egalitarian turn-taking system, as discussed above, but also because the introduction of a contradictory genre into the ongoing interaction may be deployed as a strategy of dissent, whereby speakers may mark their resistance to the institutional discourse norms. Finally, by embedding conversational aspects of discourse into the norms of an already ambiguous generic type, participants are assured that their strategies will not attract sanctions from the moderator, as would generally be the case if their departures from convention were unequivocal violations (Heritage & Greatbatch 1991). Indeed, the fact that conversation is an element of the genre is of additional benefit to the panelists, since they are operating in a camaraderie-based culture (Lakoff 1973) that cannot fault them for increasing the level of involvement (Chafe 1982; Tannen 1984) among participants. Less-powerful interactants may additionally exploit the on-record character of public discourse. As noted by Morgan (1993), speakers whose language goes on-record through, e.g., electronic recording, are ambivalently located. On the one hand, their talk is subject to surveillance, in the Foucauldian sense, from those who hold institutional power (in her study, the academic researcher; in the present paper, the discussion moderator). On the other hand, those under scrutiny may take advantage of their position to bring the powerful and relatively invisible monitor of their language into the foreground, by introducing this individual into their discourse either as an overt or covert topic or as a participant.

To say that panelists have less power in the discourse relative to the moderator, however, is not to imply that they necessarily have less expertise. Indeed, in my own data just the opposite appears to be the case. The three participants with the greatest experience in the media, as verified by research on their public activities apart from the discussion, are those who draw most heavily upon the conversational component of the discourse. In fact, one panelist hosts his own talk-radio program. Conversely, the moderator is a print journalist who does not regularly participate in electronic-media events. These facts suggest that media savvy brings with it not acquiescence to the norms of the genre as set out by those who control it, but instead a heightened ability to exploit the discourse for one’s own ends.

The data

The data under analysis are taken from a two-hour radio panel discussion on U.S. race relations convened by a local newspaper (the Chronicle in the data) in response to the Los Angeles riots of 1992. The participants are the newspaper’s managing editor, a European American male (BG); the moderator, a white South African journalist (LF); three African American civil rights activists, one male (JM)
and two female (EH, EP); two African American male professors (TD, CC) who
not appear in the data below; and one European American male professor (GF).

Speaker orientation

Although participants in a panel discussion normatively orient primarily to
an overhearing audience rather than to one another, numerous occasions arise in the
data in which participants orient themselves instead to co-present others. This
change in footing is overwhelmingly associated with the introduction of a
"problem-solving" frame, in which a panelist offers advice to the editor and the
journalist from the newspaper sponsoring the event. Example (1) is taken from an
extended excerpt dominated by a single speaker, EP, who repeatedly orient to
these individuals during her turn at talk.

(1)a. We n- we- we’ll- (.) we black people will do what we have to do.
   → You’re the ones who really have the responsibili(ty) to really take care of some
      business and give me just a couple minutes here. (.h)

b. → You need to have some white leaders in this room and say,
   Look folks, (.h)
   we know we’re racist,
   what are we gonna do about it.

c. → And you Bill German look them in the eye and say (.) enough of this (.) it’s
   gotta stop,
   they will listen.

d. → If the Chronicle says George,
   this is a crossroads for America-
   are you gonna lead?
   or are you gonna (.) take the sh- take the low road,
   and go for re-elec(tion.)

This passage is striking in several ways. First, the speaker’s re-orientation is made
increasingly explicit as the turn develops. The referent of you’re in (1a) is ‘white
people’, contrasted with we black people in the line above. In (1b) EP restricts the
group she is concerned with to white leaders, and in (1c) she implicates one of the
participants, BG, as a member of that group. Finally, (1d) names the source of
BG’s power and highlights a single “white leader,” George (Bush), whom BG can
reach as a newspaper editor. The effect is to reframe the discourse as a personal
and unmediated dialogue between the speaker and her addressee. This effect is
reinforced by the deictic highlighting of the physical setting in line (1b) (in this
room), which Biber (1988) finds to be characteristic of conversation but not of
interviews. Paradoxically, the re-orientation heightens awareness of the
institutional context of the interaction as well, for it is justified by the speaker on the
grounds that she herself is powerless to instigate social change (this stretch of talk
is given as a response to the moderator’s question, Eva, what good can come of
this?). The effectiveness of this strategy is seen in the moderator’s reply, *I think you over(hear)estimate our uh (. ) our (h) influence in Washington*, which brings him into the discourse not as a neutral party, the idealized position of media interviewers (Heritage & Greatbatch 1991), but as a participant with specific institutional interests, for he aligns himself with the newspaper and assesses its power.

EP is not the only panelist to restructure the panel discussion through orientation to other participants and the physical setting, as shown in (2).

(2) EH: It’s up to (. ) people (. ) you know,
   → really (. ) open-hearted (. ) and well-intentioned people like you to—
   → and you (. ) and you to go do something actively (. ) beyond the microphone.

Once again, the speaker personalizes her general referent *people* to include *you* … and *you* (. ) and *you* (designating the three white people—LF, BG, and GF—who are involved in the discussion), and she also invokes the material context in a way that shows her sustained awareness of the institutional frame of the discourse (*go do something actively (. ) beyond the microphone*). That is, her introduction of the physical setting into the discourse cannot be explained as simple forgetfulness that leads her to interact in a more conversation-like manner, but instead must be seen as a strategy of dissent from the institutional goal of creating a seamless “imagined community” with the audience by omitting references to context that highlight the barriers between panel participants and audience members. This strategy echoes a motif introduced by EP earlier in the discussion when she remarks, *And sitting around tables like this (1.5) is a certain kind of beginning. But we need to take it out into the streets.*

The sensitivity of participants to each other’s contributions is part of the mechanism that enables the reshaping of the discourse genre. Conversation analysts make the claim that the realization of a discourse type is a joint production of interactants (e.g., Heritage 1984), and although this is an overstatement given the resistance of certain participants to others’ attempts to restructure the interaction, there is evidence in the data that at least some members collaborate to reinforce each other’s moves and build a coherent alternative discourse. Example (3) illustrates this relationship among three of the participants.

(3) EP: The multicultural issue must be brought home to you all.
   I’ve met with your editorial board a couple of times to my knowledge there are
   no people of color on that board.
   Is that correct? (. )
   On your editorial board.
   If you wanna talk multiculturalism.
   → JM:
   → EP: Case. In. Point. ((taps at each word)) bring
   → EH: it here. Go:.d.
What is remarkable about this exchange is the flawless timing of the participants who construct the sequence. Throughout the discussion the three speakers have manifested an alignment of solidarity with one another: they are all activists, as opposed to the three other panelists, who are academics, and they frequently use formal and stylistic markers of African American English, while the two other African American panelists (TD and CC) use them very little or not at all. Their repeatedly latched turns in (3) do not only contribute to the alternative genre but actually constitute it. Supportive and evaluative comments like those of JM and EH are common in conversation but are normatively withheld in radio interviews and discussions, not only by the interviewer (Heritage & Greatbatch 1991) but also by other participants, since it is difficult for the audience to identify the voice associated with such backchanneled remarks. The speakers must be well aware of this fact, since not only are they experienced in broadcast-media discourse, but in addition in the course of the larger interaction they have witnessed the moderator’s interjected identifications of each speaker. The ostensible absence here of orientation to the audience reinforces the conversational element of the genre and challenges the institution through which it is realized while simultaneously strengthening the authority of EP’s statement: by resisting the discursive norms the speakers create a chorus of moral indignation whose multivocality is likely to enhance its effect on listeners. Hence what superficially appears to be a failure to orient to the audience may in fact be a strategic realignment to accrue discursive power both among the immediate participants and with the listening audience; it may be, in effect, the construction of an alternate imagined community.

**Asking questions**

A second general strategy that participants utilize in reshaping the panel discussion is to refuse the normative turntaking system. This system limits the asking of information-seeking questions (Schiffrin forthcoming) to the role of the moderator. Other features of the panel discussion, as an interview-based form, are the moderator’s control of turn-taking allocation by selecting next speaker and permitting self-selection of next speaker (Schiffrin forthcoming). The lack of clearly defined participant roles, which is characteristic of the mixed genre, however, allows participants to “try to redefine those roles by adopting the mode of questioning conventionally associated with the other’s position” (Schiffrin forthcoming ch. 5). Again, unrestricted access to all types of turns is a marker of conversation, and the exploitation of question-asking shifts the frame of the discourse from more interview-like to more conversation-like. Example (4) represents an early attempt by a panelist to challenge the turntaking norms.

(4) EH: How did we get here? [Did we walk. (1.0)]
JM: [h.]
EH: I mean,
→ how did we get here George Frederickson.
(1.0) GF: Well, [see <I might > agree with you < >] [smashed like sar][dines.]
        EH: [In barges] [Yeah. [Yeah. [Yeah. Yeah.

        Yeah.

EH here transforms her earlier, seemingly rhetorical question—*How did we get here?* (‘How did African Americans get to the United States?’) *Did we walk.*—into one that is apparently information-seeking: *how did we get here, George Frederickson.* Here the speaker demonstrates her understanding of the moderator’s participant role by exploiting its central characteristics, the use of information-seeking questions and the right to select next speaker. EH returns to this strategy several pages later in the transcript, inquiring, *Now how can you answer—(.) anybody in this room how would you answer a seventeen-year-old African American man.* (1.3) *And give him the guidance that will lead him forward in his life.* (1.0) The second time, she receives no response; presumably the other participants have learned from GF’s experience. That EH’s behavior is indeed marked for participants is indicated in the pause following her question in example (4), which violates the no-gap, no-overlap constraint on turn-taking (Sacks, Schegloff, & Jefferson 1974). The question differs from a true information-seeking question, however, in that the act sequence in which it occurs does not match that required by such a question type. For when the selected next speaker begins his turn by providing the information that was presumably requested of him, EH interrupts him and provides a response to her own question. Remarkably, EH’s question seems instead to be of the information-checking type. Evidence for this hypothesis may be found in the brief chuckle that JM gives in response to EH’s first question, which does not provide information but instead signals recognition and understanding of EH’s point, the very goal of information-checking questions. Further, EH’s retaking of the floor is more in keeping with Schiffrin’s sequencing rules for information-checking questions than for the information-seeking kind: if EH were truly requesting information she would wait for GF to finish his turn. But if she is expecting instead an acknowledgment of her position then at the first sign that it is not forthcoming (after *Well*, since this particle cannot mark acknowledgment *per se*) she goes on with her turn, as would be predicted in an information-checking sequence. It must be recognized, of course, that EH does not innocently assume that GF will understand her speech act in the way that JM did; the selection of next speaker—which here is done in the formal manner compatible only with the information-seeking question type used by the moderator—confounds such a straightforward analysis. EH’s strategy gains her power in the discourse by systematically undercutting the authority of the moderator and of GF, a European American professor who acquiesces to the discourse conventions. Her challenge to the turntaking norms is therefore part of a larger challenge to the conventions of the discourse as a whole.
EH’s model is followed by the other participants who have aligned themselves with her, as shown in (5) and (6).

(5) EP: You all probably hear white friends saying nigger, chink, beamer, (.).
do you call em on it? (.h)
→ Are you in all-white clubs,
do you nail people on this stuff? (.h)

(6) JM: Y- yeah- I gotta-- maybe this is off the subject (.), so since I gotcha I gotta ask you (.), and you can tell me.
→ W(h)y(h)?
   W-m- my- Again I’m- like Erika said earl- earlier,
→ Why are white people so incredibly naïve.

Here again, white participants are targeted as recipients of apparent information-seeking questions (Are you in all-white clubs, (5); since I gotcha I gotta ask you … Why are white people so incredibly naïve, (6)). In these examples as elsewhere in the transcript in which this strategy is employed after the exchange between EH and GF, the participant nominated as next speaker (usually the moderator, as here) does not respond to the question. Although this lack of cooperation with the restructuring of the genre shows that the strategy is not fully successful, participants are not discouraged from drawing upon question-asking as a resource throughout the discussion. Indeed, they seem to anticipate this reaction and frequently continue their turn after asking a question, thereby diminishing the effect that the moderator’s refusal to answer would have on power relations within the discourse. In addition, panelists cope with the moderator’s resistance to their strategy by responding to his queries with questions of their own; this process is illustrated in (7).

(7) LF: I mean how many people actually know what happens in (.8) South Central (.7) LA,
or East Oakland,
or (1.1) or uh Bay View Hunters Point? (.)
How do we break down some of those (.), those divisions.
→ EH: Well why don’t they know.

Although question-asking by panelists never fully shifts the balance of power away from the moderator, it does have influence in a surprising quarter: toward the end of the discussion GF, who was himself a target of EH’s questioning, asks a question of his own for the first time in the discourse (example (8)).

(8) GF: What would it mean for (.), for white people to do something uh constructive here?
Well one thing everybody would have to do; there’s no question about this,
is pay higher taxes.
EH: (Thank you.)

GF is not fully committed to the questioning method employed by other participants; his question does not select a next speaker, and he not only continues talking after issuing his question but goes on to answer it himself. Nevertheless, his effort is rewarded with an appreciation token from EH, which suggests that she too recognizes the changes in the discourse that have taken place since her last exchange with GF.

**Conclusion**

The structuring of the panel discussion through the “recurrent and pervasive” (Heritage & Greatbatch 1991) use of features of conversation as shown in (1) through (8) systematically shifts the participant framework, although the dialogic form of the genre permits the moderator to resist its reconstruction in this direction. By electing to use the more “equitable” turntaking system offered by conversation, less-powerful participants effectively erode the powerful institutional role of the moderator. In addition, the orientation to the immediate interactants serves to highlight the institutional context of the discourse and to implicate all participants, including the moderator and the sponsor of the discussion, in the interaction. The result of such strategies is to net panelists greater control of the discourse and to level the power differences that inher in institutional roles.

It is the multivalence of the mixed genre that allows participants to transgress the limitations of formal and functional discourse norms with relative freedom. But speakers’ decisions to deviate from or conform to the conventions established by prior discourse highlight the emergent and intertextual nature of any genre. Hence, the mixed discourse genre is not merely a marginal case of category ambiguity; rather, it exemplifies with especial clarity what necessarily occurs when any genre is realized in interaction. As such, the mixed genre offers new insights into the relationships among formal, functional, and social norms in the analysis of discourse.
Appendix: Transcription conventions

The following transcription conventions have been observed:
Each intonational unit appears on a separate line.
. falling intonation
, fall-rise intonation
? rising intonation
— self-interruption; break in the intonational unit
- self-interruption; break in the word, sound abruptly cut off
: length
... text omitted
underline emphatic stress
() pause of 0.5 seconds or less
(n.n) pause of greater than 0.5 seconds, measured by a stopwatch
h laughter; each token marks one pulse
.h inhalation
() decreased amplitude as compared to surrounding speech
(( )) transcriber comment or nonvocal noise
< > uncertain transcription
[ ] overlap beginning and end
[[ ]]] second overlap in proximity to first
Z latching
→ data under discussion

References


Lakoff, Robin Tolmach (1973). The logic of politeness; or minding your p’s and q’s. Papers from the Seventh Regional Meeting of the Chicago Linguistic Society. University of Chicago, Department of Linguistics. 149-62.


A Reanalysis of Long Distance Agreement in Urdu

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1 Introduction

The problem tackled in this paper is the possibility of ‘long distance’ agreement in both Urdu and Hindi, two very closely related South Asian languages. The basic pattern of ‘long-distance’ agreement is illustrated in (1).1 Here the object embedded in the infinitival complement (gaarii ‘car’ and tāga ‘tonga2 in (1a) and (1b) respectively) determines the agreement morphology on the infinitive predicate (calaa-nii vs. calaa-naa ‘to drive’), and is ultimately responsible for the agreement morphology on the matrix verb. Because agreement in Urdu/Hindi is clause bound in all other constructions, the pattern in (1) is exceptional and in need of an explanation.

(1) a. naadyaa-ko [gaarii calaa-nii] aa-tii hai
    Nadya.(F)-Dat car.F-Nom drive-Inf.F.Sg come-Impf.F.Sg is
    ‘Nadya knows how to drive a car.’

b. naadyaa-ko [tāga calaa-naa] aa-taa hai
    Nadya.(F)-Dat tonga.M-Nom drive-Inf.M.Sg come-Impf.M.Sg is
    ‘Nadya knows how to drive a tonga.’

Mahajan (1989, 1990) and Davison (1985, 1988, 1990, 1991) represent two differing lines of research which have been concerned with ‘long distance’ agreement in Hindi. Both approaches attempt to bring long distance agreement in line with agreement in simple clauses. Neither approach, however, can explain the range of data presented in this paper.

I argue that if the infinitive constituents in (1) are analyzed as NPs (as demonstrated in Butt 1993a), rather than as CPs or VPs, as has been the case previously, and if agreement is taken to be with nominative argument NPs, ‘long distance’ agreement follows from the same principles as agreement in simple clauses. Furthermore, the percolation of agreement observed in (1) is optional. Previous approaches to agreement in Urdu/Hindi have not been able to satisfactorily explain this optionality, or why infinitives are able to take either verbal or nominal arguments. I present evidence that there are three different kinds of infinitive NPs. In one kind the embedded object forms a ‘compound’ with the infinitive and therefore does not trigger agreement. In examples like (1), on the other hand, the lower object does not participate in compounding and does trigger ‘long distance’ agreement. The third type of infinitive is unlike the other two in that it takes genitive (nominal rather
than verbal) arguments and does not give rise to 'long distance' agreement. I argue that this infinitive displays only nominal properties because it enters the syntax as a noun. In contrast, the other two infinitives are nominalized in the syntax, and as such display both verbal and nominal properties.

2 Agreement in Simple Cases

The generalization for agreement in simple clauses can be described as follows (see T. Mohanan 1992, Gair and Wali 1989, etc.).

- A verb can only agree with one of its nominative arguments.
- If both the subject and object are nominative, the verb agrees with the subject.
- If there is no nominative argument, the verb carries the 'default' masculine singular inflection -aa.

Nominative case in Urdu is the only case that is phonologically null. It is a 'direct' case in that it only appears on subjects and objects. Urdu is an ergative language, but it does not follow the ergative/absolutive pattern commonly postulated for ergative languages (Pandharipande and Kachru 1977, T. Mohanan 1993). Given this information, it is immediately apparent that the simple sentences in (2) follow the above generalizations about agreement.

(2) a. naadyaa xat likh-tii hai
   Nadya.(F)-Nom letter.(M)-Nom write-Impf.F.Sg is
   'Nadya writes a letter.'

b. naadyaa-ne xat likh-AA hai
   Nadya.(F)-Erg letter.(M)-Nom write-Perf.M.Sg is
   'Nadya has written a letter.'

c. naadyaa-ne citthi likh-ii hai
   Nadya.(F)-Erg note.F-Nom write-Perf.F.Sg is
   'Nadya has written a note.'

d. naadyaa-ne citthi-ko likh-AA hai
   Nadya.(F)-Erg note.F-Acc write-Perf.M.Sg is
   'Nadya has written a (particular) note.'

In (3a) the subject Nadya is nominative and feminine. The object xat 'letter' is nominative and masculine. As the subject takes precedence over the object, the verb likh-tii 'write' agrees with the feminine subject. In (2b) and (2c) the subject is ergative and therefore not available for agreement. The verb instead agrees with the nominative object. Neither the subject nor the object are nominative in (2d), so the verb likh-AA 'write' carries the 'default' masculine singular -aa morphology.
Agreement is not possible out of finite embedded clauses or other embedded nonfinite clauses in Urdu/Hindi. Although I do not demonstrate it here, subcategorized infinitives are the only type of embedded clause which allow long distance agreement. I argue that infinitives differ from other nonfinite and finite clauses precisely because infinitives are NPs and are able to fill argument positions of a predicate. If infinitive constituents are analyzed as NPs, and if agreement is taken to be possible only with nominative arguments, ‘long distance’ agreement follows from the same principles as agreement in simple clauses. The next section examines further cases of infinitive agreement and shows how the data is explained under this basic approach.

3 Infinitive Data

3.1 Previously Known Facts

The data presented in this section have been noted previously either by Mahajan (1989,1990) or Davison (1985, 1988, 1990, 1991), or both. As a language with object agreement, Urdu/Hindi poses problems for theories of syntax which assume that agreement is a characteristic of subjects. The challenge, then, is not only to bring long distance in line with cases of local agreement, but also to successfully formulate an analysis of local agreement.

Mahajan (1990) does this by making use of both a Spec of Agrs and a Spec of Agro within AgrP, and by formulating the basic pattern of agreement for simple clauses as follows. As perfect participles and psych verbs have ergative and dative (overtly case marked) subjects, and it is primarily in these constructions that agreement with a nominative object is possible, he takes perfect participles and psych verbs to be non Case assigning verbs. Objects of non Case assigning verbs must move to Spec of Agro in order to receive structural Case. Once they have moved to the Spec of Agro, they trigger verb agreement. Mahajan thus employs AgrP and movement for Case reasons to arrive at the essential generalization that verbs can only agree with NPs not overtly marked with a case clitic. Infinitives are taken to be somewhat like perfectives and psych predicates in that they are optionally non Case assigning. The optionality of Case assignment is primarily designed to account for the optionality of ‘long distance’ agreement, which will be illustrated shortly.

As will become clear, there are several disadvantages inherent to this approach. For one, the assumption that psych predicates and perfective participles are non Case assigning, and infinitives only optionally non Case assigning, is stipulative. On the other hand, Mahajan’s analysis has the advantage that agreement is taken to be a purely local phenomenon.

Davison (1991) analyzes infinitives as CP arguments of the matrix verb. Agreement is taken to be a case of $\phi$ feature percolation. Arguments carry $\phi$ feature specifications, which are percolated upward along with a theta-grid
(Speas 1990). Case clitics block \( \phi \) features. If more than one \( \phi \) feature is percolated upward, only the leftmost one results in agreement on the verb. Because infinitive constituents satisfy an argument position in the theta-grid of the matrix verb, the \( \phi \) features get percolated upwards in these CPs. Percolation of \( \phi \) features cannot take place out of non-argument CPs.

Although Davison’s approach accounts for a wider range of data than Mahajan’s theory of agreement, there are some issues which do not receive a satisfactory explanation. For example, there are finite CPs, such as “that” clauses, which parallel the function of some infinitives. If the infinitive CP can be analyzed as an argument of the matrix verb, finite CP complements could be analyzed as satisfying an argument position as well. However, ‘long distance’ agreement never takes place out of finite CPs. As with Mahajan’s analysis, the primary advantage of Davison’s approach is that the long distance percolation of features does not differ from local agreement. Furthermore, the possible argument status of infinitive constituents is recognized.

In the next few sections I present the facts previously noted about infinitives and briefly show how the data are accounted for under my basic approach to infinitives and agreement.

3.1.1 Blocking of Agreement by Case

Long distance agreement is blocked when there is a case clitic on the infinitive, as in (3). The embedded feminine object \( gaarii \) ‘car’ is nominative, but does not trigger agreement on either the infinitive or the matrix verb.

(3) anjum-ne saddaf-ko \( [gaarii \; calaa-ne]-ko \)
Anjum.(F)-Erg Saddaf.(F)-Dat car.(F)-Nom drive-Inf.Obl-Acc
kah-aa
say-Perf.M.Sg
‘Anjum told Saddaf to drive a car.’

Under my approach, the pattern of agreement in (3) is expected. The matrix verb has default masculine singular -\( aa \) morphology because there is no nominative NP in the matrix clause it can agree with: the subject and indirect object NPs as well as the infinitive constituent \( gaarii \; calaa-ne-ko \) ‘to drive a car’ are all non-nominative. Additionally, the infinitive predicate \( calaa-ne \) ‘to drive’ cannot show agreement with its nominative object because the presence of the case clitic -\( ko \) induces the oblique inflection -\( ne \).

3.1.2 Matrix plus Embedded Agreement

The matrix verb and the infinitive predicate can agree with different arguments. In (4) the infinitive predicate agrees with its nominative object \( rofii \)
‘bread’ and the matrix verb agrees with the subject Ram. The grammaticality of (4) is again expected under my approach. The infinitive predicate agrees with its only nominative argument, while the matrix verb agrees with its highest nominative argument, the subject.

(4) raam [roţii kʰaa-nii] caah-taa tʰaa
Ram.(M)-Nom bread.F-Nom eat-Inf.F.Sg want-Impf.M.Sg was
‘Ram wanted to eat the bread.’

For Mahajan (1990) the possibility of simultaneous matrix and embedded agreement is problematic. As the trace of the matrix nominative subject in these sentences already occupies a position in AgrP, the lower object cannot move to a matrix Spec of Agr position. Therefore, the sentence in (4) is predicted to be ungrammatical under Mahajan’s approach.

3.1.3 Genitive Arguments

Another kind of infinitive, a gerundive form shown in (5a), takes nominal arguments. The matrix verb lag-taa ‘seem’ here agrees with the infinitive, but the infinitive karaknaa ‘crackling’ does not show agreement with its feminine argument bijlii ‘lightning’. Rather, the genitive clitic -kaa, which behaves like an adjective in Urdu in that it always agrees with the head noun, agrees with the infinitive. Example (5b) contrasts minimally with (5a) (both these examples are adapted from Davison (1990)). Here the embedded argument is nominative and the effect of ‘long distance’ agreement is observed.

(5) a. adnaan-ko [bijlii-kaa karaknaa] accʰaa nahii
lag-taa
attached-Impf.M.Sg
‘Adnan does not like the crackling of lightning.’

b. adnaan-ko [bijlii karak-nii] accʰii nahii
Adnan.(M)-Dat lightning.F-Nom crackle-Inf.F good.F not
lag-tii
attached-Impf.F.Sg
‘Adnan does not like lightning crackling.’

Mahajan (1990, 1991) does not discuss the data in (5). Davison presents these examples, but does not ultimately formulate an account of the data. I argue that the crucial difference between (5a) and (5b) is that in (5a) the infinitive is a ‘true’ noun. It is formed in the lexicon as a masculine noun and takes a genitive argument. Some evidence for this view comes from the fact that the infinitive in (5a) can be modified by an adjective, while the verbal noun infinitive in (5b) can only be modified by an adverb.
3.1.4 Optionality of Agreement

A more puzzling phenomenon is illustrated in (6) and (7). The sentence in (6) is an instance of long distance agreement. However, as (7) shows, the agreement between the infinitive predicate and its nominative object gaarii ‘car’ is optional.

(6) naadyaa-ko [gaarii calaa-nii] aa-tii hai
Nadya.(F)-Dat car.F-Nom drive-Inf.F.Sg come-Impf.F.Sg is
‘Nadya knows how to drive a car.’

(7) naadyaa-ko [gaarii calaa-naa] aa-taa hai
Nadya.(F)-Dat car.F-Nom drive-Inf.M.Sg come-Impf.M.Sg is
‘Nadya knows how to drive a car.’

Mahajan (1990) accounts for the data in (6) and (7) by taking infinitives to be optionally non Case assigning. When no Case is assigned, the lower object must move to the matrix Spec of Agr_o to receive Case. Its trace in the lower clause triggers agreement with the infinitive, and its presence in the matrix clause triggers agreement there. When Case is assigned, the lower object does not move and no long distance agreement effects arise. However, such a stipulation of optional Case assignment, or a stipulation of optional agreement is not well motivated, nor is it ultimately desirable.

Both Mahajan (1989) and Davison (1988) (attributed to Hook (1979:29–30)) also observe that in (6) the object gaarii ‘car’ is more specific than the object gaarii ‘car’ in (7). I argue that this difference in specificity is directly attributable to the fact that (7) represents an ‘compounded’ structure while (6) does not. Example (7) denotes abstract ‘car-driving’, while (6) refers to ‘driving a car’. The data in the following section substantiate this argument.

3.2 A Case of ‘Compounding’

3.2.1. Scrambling Differences

The sentences in (8) and (9) illustrate a difference in scrambling possibilities between the agreeing and nonagreeing infinitives in (6) and (7). In the case of long distance agreement, it is possible to scramble either the entire infinitive constituent gaarii calaa-nii ‘driving a car’, or just the embedded object gaarii ‘car’ to the front of the sentence. This is illustrated in (8a) and (8b).

(8) a. [gaarii calaa-nii] [naadyaa-ko] [aa-tii hai]
car.F-Nom drive-Inf.F.Sg Nadya.(F)-Dat come-Impf.F.Sg is
‘Nadya knows how to drive a car.’
b. [gaarii] [naadyaa-ko] [calaa-nii aa-tii hai]
car.F-Nom Nadya.(F)-Dat drive-Inf.F.Sg come-Impf.F.Sg is
'Nadya knows how to drive a car.'

(9) a. [gaarii calaa-naa] [naadyaa-ko] [aa-taa hai]
car.F-Nom drive-Inf.M.Sg Nadya.(F)-Dat come-Impf.M.Sg is
'Nadya knows car-driving.'

b. *[gaarii] [naadyaa-ko] [calaa-naa aa-taa hai]
car.F-Nom Nadya.(F)-Dat drive-Inf.M.Sg come-Impf.M.Sg is
'Nadya knows car-driving.'

When the infinitive does not agree with its object, the scrambling possibilities differ. Although it is still possible to scramble the entire infinitive constituent to the front of the sentence in (9a), example (9b) shows that it is not possible to scramble the embedded object by itself. This suggests that in the nonagreeing example in (9), the embedded object and the infinitive form a type of compound.

3.2.2 Modification

While it is possible to modify the embedded object with a modifier expressing specificity when it agrees with the infinitive, this is not possible when the object and the infinitive show no agreement. In (10) the infinitive agrees with the object gaarii 'car'. In this case, modification with a genitive NP is possible.

(10) naadyaa-ko [adnaan-kii gaarii calaa-nii]
Nadya.(F)-Dat Adnan.(M)-Gen.F.Sg car.F-Nom drive-Inf.F.Sg
aa-tii hai
come-Impf.F.Sg is
'Nadya knows how to drive Adnan’s car.'

(11) *naadyaa-ko [adnaan-kii gaarii calaa-naa]
Nadya.(F)-Dat Adnan.(M)-Gen.F.Sg car.F-Nom drive-Inf.M.Sg
aa-taa hai
come-Impf.M.Sg is
'Nadya knows how to drive Adnan’s car.'

On the other hand, when the infinitive does not agree with its object gaarii 'car' in (11), it is not possible to modify that object. This again indicates that the gaarii 'car' in (11) and the infinitive predicate form a type of compound.
4 Analysis

The analysis of infinitive agreement presented here contains the advantages of previous approaches in that 'long distance' agreement is taken to be a case of successive local agreement. If infinitives are NPs, the possibility that they can function as arguments of a predicate follows immediately. Furthermore, if agreement is with nominative arguments, the 'long distance' agreement facts can be accounted for in exactly the same manner as local agreement.

In the theory of Lexical Functional Grammar (LFG), agreement is stated at the level of f(unctional)-structure. This level contains the representation of the grammatical relations of a given clause and also encodes such information as tense, aspect, gender, number and case. The agreement facts for Urdu can easily be accounted for within LFG. In Urdu, a given expression can only be wellformed if the predicate agrees with a nominative argument. This is 'checked' at f-structure. If there is more than one nominative argument in an expression, the predicate must agree with the higher one. The notion of 'higher' is ultimately derived from a thematic hierarchy (Bresnan and Kanerva 1989) from which theta roles are mapped on to grammatical relations at f-structure. Thus, a given PREDicate at f-structure must agree with a nominative argument (SUBJect, OBJect).

The apparent optionality of agreement, repeated here in (12) and (13), follows from the fact that there are two infinitive constituents which differ structurally. The embedded object in (13) forms a compound with the infinitive, while the embedded object in (12) does not.

(12) naadyaa-ko [gaarii calaa-nii] aa-tii hai
    Nadya.(F)-Dat car.F-Nom drive-Inf.F.Sg come-Impf.F.Sg is
    'Nadya knows how to drive a car.'

(13) naadyaa-ko [gaarii calaa-naa] aa-taa hai
    Nadya.(F)-Dat car.F-Nom drive-Inf.M.Sg come-Impf.M.Sg is
    'Nadya knows car-driving.'

The infinitive in (13) does not represent the kind of compounding familiar from English. It is possible in Urdu, unlike in English, to have material intervene between the gaarii 'car' and the infinitive calaa-naa 'drive' in (13). The compounding in (13) therefore cannot be lexical, but must be analyzed as occurring in the syntax. Example (13) also cannot be analyzed as a form of incorporation (see T. Mohanan (1992) on noun incorporation in Hindi).

Butt (1993b) proposes an elaborated a(rgument)-structure based on Jackendoff (1990) and formulates a-structure processes which account for complex predicate formation. Under this approach, an a-structure process similar to the ones needed for complex predicates allows the compounding of the lowest argument with its predicate (see Kim 1993). As I do not have the space
here for a detailed presentation, I simply assume a-structure compounding for the purposes of this paper.

The f-structure corresponding to the non-compounded infinitive in (12) is shown in (14). The infinitive constituent gaarii calaa-nii ‘to drive a car’ is represented as an XCOMP (complement) of the matrix predicate aa-tii ‘know’. The XCOMP PRED ‘drive’ must agree with the embedded XCOMP OBJ ‘car’ in (14) because the object is nominative and an argument of the XCOMP PRED. In turn, the matrix PRED ‘know’ agrees with its nominative XCOMP argument.

(14)

I do not have the space here to provide an elaborate phrase structure (c-structure) representation corresponding to the f-structure in (14). However, I take the internal structure of the infinitive NP to be roughly as in (15).

(15) [NP [NP gaarii] [N [v calaa-] [CL -nii]]]

The infinitive in (15) is represented as a verb calaa ‘drive’, which has been nominalized by the infinitive clitic -nii. The infinitive predicate calaa-nii ‘to drive’ is thus a verbal noun. Although it heads a constituent which has nominal properties, the arguments of the infinitive predicate can appear in direct (nominative, accusative) case, rather than being marked by the genitive, as is generally the case for arguments of nominals.

The compounded infinitive does not differ substantially from the non-compounded infinitive in terms of phrase structure. The only difference that must be expressed within LFG at c(ontituent)-structure is that both the embedded NP gaarii ‘car’ and the infinitive calaa-naa ‘to drive’ must be annotated as heads, which combine to form a compound.

The f-structure for the compounded infinitive is shown in (16). The crucial difference between this f-structure and the f-structure representing the non-compounded infinitive is that here the infinitive predicate calaa-naa ‘to drive’ does not have an object argument. Rather, the object car, forms a compounded XCOMP PRED with the infinitive ‘drive’. 
Since the XCOMP SUBJ is controlled by the matrix subject, and is therefore 'empty', there is no nominative argument that the XCOMP PRED car-drive can agree with. The agreement feature of the XCOMP must therefore be the default masculine. The matrix PRED 'know', however, does agree with the nominative masculine XCOMP. The impossibility of 'long distance' agreement in this construction is thus directly attributable to compounding.

At this point, only the infinitive in (17), which takes genitive arguments remains to be accounted for. As (18) illustrates, this infinitive is not nominalized in the syntax. It is a noun which is formed in the lexicon.

(17) adnaan-ko [bijlii-kaa karak-naa] accb'aa nahi\-\nAdnan.(M)-Dat lightning.F-Gen.M crackle-Inf.M good.M not lag-taa\nattached-Impf.M.Sg\n'Adnan does not like the crackling of lightning.'

(18) [NP [NP bijlii-kaa] [N karakaaknaa]]

The genitive clitic -kaa agrees with the masculine head noun karaknaa ‘crackling’. Since the infinitive constituent is an argument of the matrix verb lag-taa ‘seem’, the matrix verb must agree with the infinitive constituent. Finally, the representation of the infinitive in (18) as a ‘true’ noun, which is formed in the lexicon, accounts for the fact that it can be modified by an adjective (as in ‘the loud crackling of lightning’) while the verbal noun infinitive in (15) can only be modified by an adverb.

5 Conclusion

The account of ‘long distance’ agreement in Urdu presented here accounts for a wider range of facts in a simpler fashion than previously possible. At the same time, it retains the crucial insights of Mahajan (1990) and Davison (1991) that agreement in infinitives is essentially a case of successive local agreement
and that infinitive constituents have argument status (Davison 1991). ‘Long
distance’ agreement in Urdu can only take place with embedded infinitive con-
stituents. If infinitives are analyzed as NPs which fill argument positions, and
agreement is taken to be with nominative arguments, long distance agreement
can be reanalyzed as successive local agreement.

Three differing kinds of infinitive constituents were identified. One type
of infinitive is analyzed as a masculine noun which is formed in the lexicon. It
therefore takes genitive arguments and does not give rise to the effect of long
distance agreement. The other two types of infinitives are verbs which are
nominalized in the syntax. One of these infinitive constituents is a compound,
which is formed by an NP and the infinitive verbal noun. This type does
not trigger agreement because there is no nominative argument at f-structure
which the infinitive could agree with. The third type of infinitive contains an
embedded object NP that is not compounded. This object NP does trigger
agreement and gives rise to the appearance of long distance agreement in Urdu.

Notes

* Many thanks go to Peter Sells and Tracy King for helping me wrestle
with the material in this paper, and to Alice Davison for directing my attention
towards this problem in the first place.
1 Abbreviations used in this paper are as follows. F = feminine; M =
musculine; Erg = ergative; Nom = nominative; Gen = genitive; Dat = dative;
Acc = accusative; Inst = instrumental; Loc = locative; Inf = infinitive; Obl
= oblique; Perf = perfect; Impf = imperfect; Sg = singular; Pres = present.
2 A tonga is a two-wheeled horse-drawn carriage.
3 Spec of Agr$_s$ and Spec of Agr$_o$ cannot be filled at the same time because
it is impossible to have both subject and object agreement simultaneously in a
clause. Mahajan postulates that Spec of Agr$_o$ may simply be missing in these
cases as specifiers can be optional (Fukui and Speas 1986).
4 Mahajan proposes an explanation by which imperfective participles govern
the lower Spec of Agr$_o$. When the infinitive does not assign Case to the lower
object, the object can move to the lower Spec of Agr$_o$ to receive Case and
thus show agreement with the infinitive, but not with the matrix verb. This
explanation does not follow independently from any further data in Hindi.

References

Bresnan, Joan (Ed.). 1982. The Mental Representation of Grammatical
Relations. Cambridge, MA: MIT Press.
Butt, Miriam. 1993a. Hindi/Urdu Infinitives as NPs. South Asian


The Phonology and Phonetics of 'Voiceless' Vowels

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0. This paper argues that the so-called 'voiceless' vowels found in some languages have to be represented phonologically as aspirates, as has been proposed for voiceless sonorants in general by Halle and Stevens (1971), Mester and Itô (1989) and Cho (1991). For example, the Halle and Stevens system groups aspirated consonants and voiceless vowels by the same feature, [spread glottis] while voiceless, unaspirated consonants are characterized by an unrelated feature, [stiff vocal cords].

First, it will be demonstrated that none of the languages which have been claimed to have distinctively voiceless vowels have voiceless vowels, and that 'voiceless' vowels arise due to phonological and phonetic rules of the language in question. Second, a closer investigation of several languages known to exhibit 'voiceless' vowels supports a hitherto unrecognized distinction between aspirated vowels and devoiced vowels. It will be argued that aspirated vowels arise by aspiration assimilation in the phonological component of a grammar in such languages as Comanche and Acoma whereas phonetically devoiced vowels are produced by phonetic implementation rules which apply in a non-assimilatory and gradient fashion (as in Papago, Woleaian and Japanese).

1. Although voiceless vowels which arise from allophonic rules are not uncommon across languages, Comanche and its related Numic language Ute (and Southern Paiute) are the two well-known examples for which there has been a considerable debate as to whether the voiced/voiceless distinction should be part of the underlying representation for vowels.

Opinions differ as to the nature of the voiceless vowels in Comanche. Canonge (1957) assumes that all voiceless vowels are phonemic, whereas Jakobson, Fant and Halle (1952) question Canonge's (1957) claim that the language has underlingly voiceless vowels, with the following remark: "either the vocal murmur is not a distinctive feature and functions merely as a border mark, or it may be a concomitant of the tense-lax opposition" (1952:26).

More recently, Miller (1973) and Armagost (1984, 1986, 1987, 1988) claimed that voiceless vowels in Comanche are phonologically predictable. My analysis of Comanche vowel devoicing is based mainly on the data and the analyses given in Armagost, although I differ from him in claiming that vowel devoicing is the result of assimilating the aspiration feature, rather than [−voice].

First, there are two distinct types of vowel devoicing in the language: one, often called 'inorganic,' the other, 'organic'. Inorganic devoicing is optional and insensitive to other phonological and morphological factors. Also, it applies only in the final vowel of a word. On the other hand, organic devoicing is
obligatory and is triggered by the continuants /h/ and /s/. Moreover, it closely interacts with other phonological rules, which renders the workings of the rule opaque. As the data involving Organic Devoicing in (1) illustrate, Vowel Devoicing occurs before /h/ and /s/ in noninitial position.2


<table>
<thead>
<tr>
<th>Comanche</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>cáka</td>
<td>'to lead'</td>
</tr>
<tr>
<td>kóhno</td>
<td>'cradle'</td>
</tr>
<tr>
<td>tósa</td>
<td>'white'</td>
</tr>
<tr>
<td>pími</td>
<td>'themselves'</td>
</tr>
<tr>
<td>caki-hu-yika</td>
<td>'to round up'</td>
</tr>
<tr>
<td>haβi-ko-hno → haβikOno</td>
<td>'night cradle'</td>
</tr>
<tr>
<td>to-tOsa</td>
<td>'white' (redup.)</td>
</tr>
<tr>
<td>pǐmI-sia-pI</td>
<td>'crop'</td>
</tr>
</tbody>
</table>

The first syllable of a word never undergoes devoicing, and it is often attributed to the presence of stress in the word-initial syllable. Based on the fact that there is only one prominence in a word in Comanche, which has completely lost the old alternating stress pattern exhibited by Shoshoni, I will assume that Comanche is a tone system, rather than a stress system (Poser 1984). Moreover, these preaccented syllables never devoice, as the data in (2) illustrate.

(2) Words with idiosyncratic location of accent (Armagost 1986)

<table>
<thead>
<tr>
<th>Osage</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>?usúni</td>
<td>'always'</td>
</tr>
<tr>
<td>pihnáa?</td>
<td>'sugar'</td>
</tr>
<tr>
<td>wasáasi</td>
<td>Osage</td>
</tr>
<tr>
<td>pi-sikwanúu?i</td>
<td>'to slide sitting'</td>
</tr>
</tbody>
</table>

We can account for the phenomenon naturally by resorting to a rather common rule of tone spreading to the left. An alternate account manipulating some sort of stress shift is highly unmotivated. Crucially, all accented syllables are immune to vowel devoicing, whether they occur word-initially or medially.3 Vowel Aspiration is formulated in (3).

(3) Vowel Aspiration in Comanche

\[
\begin{array}{cc}
\text{V} & \text{C} \\
\hline
\text{Root} & \text{Laryngeal} \\
\text{[+s.g.]} & \text{[+s.g.]} \\
\end{array}
\]

(4) Accent-Aspiration Constraint

\[
\text{V} \quad \text{C} \\
\hline
\text{Root} & \text{Laryngeal} \\
\text{[+s.g.]} & \text{[+s.g.]} \\
\text{* H} & \text{Root} \\
\end{array}
\]

In view of the fact that accented syllables invariably fail to undergo the rule, we need to include an additional constraint on Vowel Aspiration in (4). I propose that there is a cooccurrence restriction between the tonal feature, High and the feature of aspiration. It is not clear at this point if all of the laryngeal features are incompatible with all of the tone features. In both Ute and Acoma, there is a close relationship between high tones and laryngeal features such as aspiration and glottalization, which makes one suspect that all of the laryngeal features might be involved.
The constraint in (4) assumes only an indirect relationship between tone features and aspiration in contrast to the Halle and Stevens system in which tones and laryngeal features on vowels and consonants are characterized by the same set of features. (See Anderson 1978 for a critique of this approach).

In addition, there are several other conditions on vowel devoicing as observed in detail by Armagost. First, there is no devoicing before tautomorphic [h]+Obstruent which corresponds to the old geminates of Shoshoni, as illustrated by a few correspondents in (5). Blocking of vowel devoicing in such clusters is exemplified in (6).

(5) Correspondences

<table>
<thead>
<tr>
<th>Shoshoni</th>
<th>Comanche</th>
</tr>
</thead>
<tbody>
<tr>
<td>appy</td>
<td>ahpy?</td>
</tr>
<tr>
<td>kittaa</td>
<td>kihta</td>
</tr>
<tr>
<td>iccimi</td>
<td>ihcumi</td>
</tr>
<tr>
<td>tukku</td>
<td>tuhku</td>
</tr>
</tbody>
</table>

(6) /h+C/ as non-trigger

| naki-kuhpa | ‘inside the ear’ | na-tyhka-? | ‘groceries’ |
| tena-hpy?   | ‘man’ (Absolutive) | wojBi-hta | ‘wood’ (Obj) |

It has been reported that /h/ which triggers devoicing has to be followed either by a sonorant or a morpheme boundary. This distributional fact lends support to the claim (made by Miller but argued against by Armagost) that tautomorphic h+stop clusters result from a rule of preaspiration which applies to geminate stops, which faithfully reflects the actual historical development. If these clusters are assumed to be underlying unaspirated geminates, there is no need to modify the rule of Vowel Aspiration; the only necessary stipulation is ordering Vowel Aspiration before Geminante Preaspiration.4

Second, there is a constraint on two adjacent aspirated syllables; on the surface, no two adjacent syllables contain voiceless vowels. When two potential targets occur next to each other, only the first vowel devoices, as illustrated by (7). Potential target vowels are underlined.

(7) Consecutive Syllable Constraint

/saip-h-kah/ → sap|ha | ‘at the belly’
|symf-sjhw| ‘tear completely’
|ekA-sahpana? | ‘soldier’ |

Third, there is an analogous dissimilatory effect holding among consonant triggers, as shown by (8). Vowel Aspiration fails when the two consonants flanking the potential target vowel are both aspires.5 Compare the examples in (8) with a form like hainlh-a ‘friend (obj./poss/)’.
(8) Dissimilation in /h/.../h/

puhihua 'tea'    naha-hu-tu?I 'will happen'
puhiihi 'brush arbor'

In order to account both for the vocalic and consonantal dissimilations shown in (7) and (8), we propose a single rule of delinking which is clearly motivated by the OCP, which prohibits two adjacent root nodes with the laryngeal specification.

(9) Dissimilation as Delinking

\[
\begin{array}{cccc}
X & X & \text{Root} \\
\| & \neq & \text{Laryngeal} \\
\| & \| & \\
\text{[+s.g.]} & \text{[+s.g.]} & \\
\end{array}
\]

Note that the OCP on aspiration holds on two immediately adjacent root nodes, so that delinking applies between two syllables as well as between an aspirated consonant and a vowel. The interaction between Vowel Aspiration and Dissimilation is represented in (10).

(10) Interaction between two aspirated segments

a. \[ V C V C \]  b. \[ C V C \]
   \[
   \begin{array}{cccc}
   \| & \| & \| & \| \\
   \| & \| & \| & \\
   \| & \| & \| & \\
   \text{[+s.g.]} & \text{[+s.g.]} & \\
   \end{array}
   \]

   \[
   \begin{array}{cccc}
   \| & \neq & \| \\
   \| & \| & \| \\
   \| & \| & \\
   \text{[+s.g.]} & \text{[+s.g.]} & \\
   \end{array}
   \]

In the unifying account of dissimilation as delinking the second laryngeal node, there is no difference whether or not the first syllable is devoiced due to the initial high tone since the source of aspiration is the aspirated consonant, rather than the vowel.

Fourth, vowel clusters of either identical or different vowels are never subject to devoicing. In other words, only short syllables devoice, and long vowels and sequences of glide+vowel fail to undergo the rule, as exemplified by (11).

(11) No Devoicing in Vowel Clusters

pisaa-hu-tu?I 'will apply warpaint'
paa-rau-hu-tu?I '(water) will rise up'
ni+i?maihutu?I 'will tire'

In the absence of detailed information on syllable structure, it is difficult to determine whether the right rule should be based on an intersyllabic or
intrasyllabic constraint, but relying on the description by Armagost that heterosyllabic vowel clusters are interrupted by the glottal stop, we assume that all syllables in Comanche should have an obligatory onset except for the word-initial syllable. I will assume a constraint on heavy syllables, which does not allow the aspiration specification within a branching syllable (i.e. in a bimoraic syllable).

In the next section, the language-particular aspect of this constraint will be clearly demonstrated; Vowel Aspiration in Acoma freely laryngealizes long vowels in contrast to Comanche.

Finally, there is an interesting interaction between a tone shift (which is termed 'stress shift' by Armagost) and Vowel Aspiration. As mentioned earlier, in an unmarked case, the high tone is realized on the initial syllable of a word, but for certain stylistic effects which are not well understood, the tone can optionally shift one syllable to the right, as illustrated by the first two examples in (12). However, when the second syllable is devoiced, the stress shift rule is sensitive to the previous application of Vowel Aspiration, thus skipping over the adjacent syllable if it contains a voiceless vowel, as illustrated by the last example in (12).

(12) Tone Shift over Aspirated Vowel

kasábipíukhíkina ‘making wing noises’
tíh íjaro?ínU ‘mounted up’
mupíhábiyíU ‘was lying bent’

a. Tone Shift

\[
\begin{array}{c}
\text{H} \\
\text{f} \\
\lfloor \text{w[V C V C V C]}
\end{array}
\]

b. Tone Shift over Aspiration

\[
\begin{array}{c}
\text{H} \\
\lfloor \text{w[V C V C V C]}
\end{array}
\]

The Accent-Aspiration Constraint in (3) can handle the phenomenon of vowel skipping without further stipulation. If the tone were to shift to the following aspirated vowel, it would result in specifying a high tone in the environment of the aspiration feature, an ill-formed feature combination. Therefore, the tone shift rule is blocked from applying to an aspirated vowel, and the high tone is realized on the third syllable.

This interaction between tone shift and Vowel Aspiration constitutes another piece of evidence for treating prominence in Comanche as tonal rather than stress-related. Whereas the close relationship between tones and laryngeal features is well documented in the literature (Mock 1987), it is highly unlikely that rules of stress assignment and stress shift are sensitive to laryn-
geal specification of target vowels (except perhaps for the case of Piraha as proposed by Everett 1988).

In this section, I hope to have demonstrated that Vowel Aspiration is a true phonological rule spreading the feature [+s.g.]. As has been demonstrated, it closely interacts with other well-established phonological rules of the language such as Geminate Preaspiration, Tone Shift, and Dissimilation.⁶

In addition, the fact that voicing is not one of the features that play a role in the consonant system in Comanche seems to support the position that voicing is not relevant in the vowel system either. Note that the obstruent inventory consists of a set of unaspirated voiceless stops and /s/, /h/ and /ʔ/. Furthermore, the fact that only /s/ and /h/, to the exclusion of the unaspirated voiceless stops, constitute a set of triggering segments strongly supports that the feature involved in the vowel devoicing rule is aspiration rather than [−voice]. There are two ways of capturing /s/ and /h/ as a natural class. One is by stipulating that the trigger is [+continuant], and the other is to assume that both /s/ and /h/ are characterized by the feature [+spread glottis]. In an autosegmental approach, it makes better sense to specify the triggers by the feature(s) they propagate rather than by an unrelated feature such as [cont].

It is interesting to note that historically, vowel aspiration was restricted to vowels before /h/ (the quintessential aspirated consonant), but has become generalized to include /s/. We can speculate that the /s/ in Comanche is not the ‘normal’ fricative but the aspirated [sʰ], which is known to occur in Burmese, Korean and Chumash.⁷

2. Assuming that /s/ in some languages is an aspirate is not without precedence. Kagaya (1974) and Kim (1971) suggested that the Korean /s/ be treated as aspirated on the basis of the fact that /s/, like the other aspirated consonants, involves a wide open glottis when the constriction of the vocal tract starts to release.⁸ Iverson (1983) reanalyzes Kagaya’s data, observing that /s/ shares the glottal width of the aspirated series but has the same vocal fold tension as the lax series. He concludes that even though the ambivalent laryngeal configuration of /s/ makes it possible to align it with the aspirated or the lax series, it should belong to the lax category on phonological grounds. The same kind of argument can be given for Comanche /s/. Even though it is not an underlyingly aspirated sound, it acquires [+s.g.] before the rule of vowel devoicing applies, which makes it possible to identify /s/ and /h/ as a natural class.

3. What is often termed ‘inorganic’ devoicing in Comanche is radically different from the Vowel Aspiration presented in the previous section. Its phonetic characteristics are clear from its behavior. First, devoicing is optional and gradient. Second, it applies only in prepausal position, which has nothing
to do with the aspiration environment as the trigger of the rule. Third, it is not sensitive to any one of the conditions Vowel Aspiration is subject to. For instance, inorganic devoicing is unaffected by a voiceless vowel in the preceding syllable, thus creating two consecutively devoiced vowels, as illustrated by (13).

(13) Devoicing in two consecutive syllables

/sapih-ka/ → sapIka ~ sapIkA ‘at the belly’
/omoisi/ → omomIsi ~ omomIsI ‘still by foot’

Finally, the two processes result in two different phonetic realizations of the low vowel /a/. /a/ devoiced by inorganic devoicing is realized as a devoiced low vowel [A], whereas organic devoicing produces the unexpected high back vowel [I] except when it is preceded by the glottal stop.9

4. Acoma, which belongs to the Keres language family, has a rule exactly parallel to Comanche Vowel Aspiration except for a few minor differences. According to Miller (1965), vowels in post-accentual position obligatorily devoice when the preceding consonant is a fricative (/h/ and /s/) or a plain stop, which is always aspirated in post-accentual position in the language.10

(14) Acoma Obligatory Devoicing (Miller 1965:17)

c?ápIpcI ‘it is spotted’ sgúhIma ‘I believed.’
zíyuucEE?e ‘they took him’ yuusI ‘God’
báqasU ‘straw’

Very much as in Comanche, Vowel Aspiration in Acoma interacts with other rules such as Tone assignment, so that it never applies to any accented vowels including preaccentual vowels which are always realized as [+high]. Not only pitch accent but also glottal accent is relevant in blocking Aspiration, again confirming the close relationship between laryngeal features and tone features whose distributional restriction can be accounted for by the same constraint as (3).

(15) No Devoicing in accented syllable

kuhâaru ‘curd’ kusée?e ‘his hair’

The similarities and differences between Comanche and Acoma are summarized in (16) and (17).
(16) Similarities
   a. triggering C’s: all and only the aspirated consonants
   b. Accent-Aspiration Constraint
   c. obligatory

(17) Differences
   a. directionality (right C in Comanche and left C in Acoma)
   b. triggering C’s (fricatives in Comanche and all Obsrs in Acoma)
   c. dissimilation (‘yes’ in Comanche and ‘no’ in Acoma)
   d. Heavy Syllable Constraint (‘yes’ in Comanche and ‘no’ in Acoma)

In addition to Vowel Aspiration, Acoma has a rule of optional devoicing: a
final vowel and sonorant devoices. Sonorant devoicing can also be caused by
the following devoiced vowel.

(18) Acoma Optional/Variable Devoicing

kawââyU ‘horse’ sínAnI ‘skin’
sénâa?AsI ‘my arch’ kuhâârU ‘curd’

In addition, the vowel may devoice in preaccentual position when the vowel
is surrounded by voiceless consonants. Note that all voiceless (even unaspi-
rated consonant) are triggers in contrast to the aspirated triggers of Vowel
Aspiration. In (19), devoiced vowels are underlined.

(19) Acoma Optional Devoicing in preaccented position

kâšâiti ‘summer’ khâtsâânà ‘your eye’
kâząâânà ‘your eye’ sâçokâni ‘when I smoked’

5. There are other languages with postlexical, phrasal vowel devoicing rules.
In Woleaian (Sohn 1975), five voiceless vowels occur in final position at the
ends of words, along with a series of voiced vowels. According to Sohn, a
voiceless vowel is a simple vowel and a voiced vowel is a long vowel in word-
final position. In word-final position, a simple vowel loses its voice and a double
vowel becomes short unless it is protected by a following modifier word or a
suffix, as illustrated by the examples in (20).

(20) Woleaian Vowel Devoicing (Sohn 1975)

/tto/ → ttO ‘deep’
/bboo/ → bbo ‘pounding stone’
/bboo we/ → bboo we (*bbo we) ‘that pounding stone’

Similarly, Papago (Saxton, et al. 1983) has a phrasal rule which devoices
sonorants including vowels. In particular, unstressed vowels devoice sentence
finally and after /h/ and glottal stop, as shown in (21).

(21) Papago Vowel Devoicing (Saxton, et al. 1983)

    maI   ‘to learn’   miA   ‘near’
    s-tohA ‘white’    mo?O ‘head’
    hikIhuU ‘already’  dagItoO ‘to drop something’

In addition to utterance final devoicing, there is devoicing before /h/ as well as between a stop and a voiceless consonant, as illustrated by the last two examples in (21). As in Woleaian, unstressed vowels in utterance-final position are shortened in Papago, “giving the impression of single and extra-short vowels, respectively” (Saxton et al. 1983:114), even though both long and short vowels undergo devoicing. The patterning of Vowel shortening with vowel devoicing can be thought of as resulting from a single phonetic process of reduction, rather than from two unrelated phonological rules.

Japanese High Vowel Devoicing seems to be a clearer case of a phonetic implementation rule. According to Han (1961), the two high vowels of Japanese /i/ and /u/ are devoiced between voiceless consonants in an unaccented syllable, and also after a voiceless consonant and before pause. Devoicing is determined by many factors such as the effect of tempo and the effect of pitch-accent. Also, there is a close relationship between the duration of vowels and devoicing: the vowel /u/ is more readily devoiced than /i/, which correlates with the fact that /u/ is inherently shorter than /i/. In addition, although voiceless stops, affricates, and fricatives trigger voiceless vowels, there is a hierarchy: fricatives and affricates show greater effect than stops. All these factors point to the conclusion that Japanese Vowel Devoicing is a phonetic rule that is governed by many factors which cannot be reduced to standard phonological operations.

More recently, Jun and Beckman (1993) conclude that the phenomenon of vowel devoicing in Japanese and Korean cannot be attributed to the phonological rule of assimilation. Rather, they argue for treating it as an instance of overlap and blending; in other words, “the glottal opening gesture for the consonant overlaps and blends into the glottal closing gesture for the following vowel, in effect obscuring the vowel’s voicing specification.”

6. In conclusion, it has been argued that there are two kinds of Vowel ‘Devoicing’ across languages. First, when a phonological rule is involved, a vowel is aspirated rather than devoiced due to the surrounding aspirated consonants by assimilation. Secondly, a phonetic rule of devoicing is often triggered by all voiceless consonants (regardless of the presence or the absence of aspiration) and often governed by non-phonological gradient factors.
Notes

[1] In addition, they assume a direct relationship between consonants and tones by assigning the same feature to voiceless consonants and a high tone on the one hand, and voiced consonants and a low tone on the other. That particular aspect of their theory does not have a direct bearing on the present study of voiceless vowels.

[2] Voiceless vowels are represented in capital letters.

[3] Armagogst deals with this restriction on preaccented syllables by further stipulating that the rule applies only when preceded by a voiced syllable. This formulation makes a prediction different from our account: when there are more than two potential targets in preaccentual position, he predicts that the second syllable should devoice since it is preceded by a voiced syllable. On the other hand, we predict no devoicing in any of the preaccented syllables, since all of them are realized as high-pitched. Although there seem to be no relevant examples in Comanche, in Acoma, all preaccented syllables which are realized as high pitched are immune to obligatory phonological devoicing.

[4] Since all true geminates always surface as h-stop clusters, there are a few cases in which reanalysis of underlying forms has taken place, which will not be discussed in this paper.

[5] Armagogst proposes a stridency condition, according to which devoicing occurs only when the two consonants flanking the potential target vowel do not agree in stridency, with the following result (no Devoicing in h..h, s..s, c..c and Devoicing in h..s, s..h, c..h). However, by limiting the domain of the rule within a lexical word, thus excluding clitics such as the discourse particles, /se/ and /ha/, there is no need to stipulate the rather unmotivated stridency condition. Instead, the dissimilation rule shown in (9) suffices. In addition, what Armagogst calls a true exception to the rule, whose effect is to preserve an important distinction in narratives, disappears since the exceptional item always involves the discourse markers.

[6] An analogous analysis can be extended to Ute and the closely related Southern Paiute (Goss 1970, Sapir 1930), where vowels are described to undergo aspiration in a metrically weak position when surrounded by aspirates. For both Comanche and Ute, analyses utilizing aspiration assimilation seem to make more sense in accounting for the close relation between vowel devoicing and the aspirated environment rather than positing distinctively voiceless vowels.

[7] In Burmese all obstruents occur in plain, aspirated, and voiced series including the sibilants (Cornyn 1944). The forms involving /s, /sʰ/, /z/ are shown in sùn ‘vigor’, sʰùn ‘rice for priest’ zùn ‘spoon’. Chumash has a phonetic, though not underlying, constrast between aspirated and unaspirated fricatives. Chumash has a rule that converts sequences of like consonants into an aspirate (CC → Cʰ, ss → sʰ) (Applegate 1972). Steriaide (1982) assumes that /s/ in
Attic Greek is redundantly aspirated.

[8] In particular, Kim (1970) argues for a new definition of aspiration as a function of the glottal opening at the time of release of the oral closure, rather than as a function of VOT (contrary to what Lisker and Abramson (1964) proposed.) This approach makes better sense, given the fact that there can be aspiration in final stops, where there is no VOT at all. Jun (1989) notes that /s/ and /h/ pattern together in assigning a High tone in the phonological phrase of the Chonnam dialect of Korean.

[9] We can assume a later phonetic rule delinking the low specification from the aspirated low vowel [A].

[10] Even though Miller does not specifically mention the behavior of /s/, in all the examples given, sibilants (/s, s’, s/) always trigger devoicing, as shown by the fourth and fifth examples of (14). In Cheyenne, all voiceless fricatives (/s, x, f, h/ trigger devoicing (Leman and Rhodes 1978).

References


Experiencers, Possessors, and Overlap Between Russian Dative and u + Genitive

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As in many languages, the dative case (DAT) in Russian can indicate several semantic and syntactic roles, such as that of an experiencer,

(1) Mne kholodno.
    1-SG-DAT cold
    ‘I’m cold.’

a prepositional object of motion or direction,

(2) Myezdili k babuške.
    2-PL-NOM went to grandma-DAT
    ‘We went to grandma’s.’

and even a possessor in certain contexts. This is especially true of inalienable possession, as in (3).

(3) V drake emu slomali rebro. (Levine 1984: 496)
    in fight-LOC 3-SG-Masc-DAT they-broke rib-ACC
    ‘His rib was broken in a fight.’ (‘They broke his rib in a fight.’)

But such usage is not exclusive to inalienable possession, as seen in (4).

(4) Sobaka porvala emu brjuki. (Levine 1990: 14)
    dog-NOM ripped 3-SG-Masc-DAT pants-ACC
    ‘The dog ripped his pants.’

In Russian, as in some other languages, possession by people is normally indicated with a construction that can, in other contexts, indicate a spatial location. This construction, the preposition u followed by the genitive case (GEN), can indicate: location near an inanimate object;

(5) Stol stoit u okna.
    table-NOM stands by/near window-GEN
    ‘The table is by the window.’

a location associated with some person (e.g., ‘at someone’s place’);

(6) Včera my byli u babuški.
    yesterday 1-PL-NOM were at grandma-GEN
    ‘Yesterday we were at grandma’s.’

as well as inalienable possession (without an explicit copula);

(7) U nego bol’šoj nos.
    at 1-SG-GEN big-NOM nose-NOM
    ‘He has a big nose.’

and alienable possession, usually with an explicit copula.1

(8) U Tani est’ novaja kniga.
    at Tanya-GEN be-INF new-NOM book-NOM
    ‘Tanya has a new book.’
In Russian, a phenomenon not found among other Slavic or Indo-European languages is the possible use of a possessive construction, namely *u + GEN*, to mark an animate being not just as a possessor, but also as an experiencer, as in (9).

(9) Vrač osmotrel u bol'nogo ruku.
    doctor-NOM examined at patient-GEN hand-ACC
    'The doctor examined the patient's hand.'

Overlap is, therefore, sometimes possible in the usage of DAT and *u + GEN*, namely in reference to the result of an action, often perceived by the speaker as negative, affecting something belonging to a person or even an animal, as in (10) and (11).

(10) Emu / U nego minoj otorvalo nogu.
    3-SG-Masc-DAT / at 3-SG-Masc-GEN mine-INSTRL tore-off leg-ACC
    'His leg was blown off by a mine.'

(11) Nado sostrič sobake / u sobaki šerst'.
    necessary cut-off-INF dog-DAT / at dog-GEN hair-ACC
    '(We) have to cut the dog's hair.'

Similar uses of the DAT case in other Indo-European languages were first discussed by Havers (1911). He introduced the term ‘dativus sympatheticus’, or sympathetic dative, for those instances when the dative case could be replaced by the genitive case. Garde (1985) followed through with the term, claiming that Russian actually has three ‘sympathetic cases’, that is three constructions which can be replaced by the genitive in certain circumstances, and which connote intimate participation of the individual affected by the verbal action, which was the criteria upon which Havers determined ‘sympathetic’ usage. The three constructions cited by Garde (for Russian) are DAT, *k + DAT*, and *u + GEN*. In this paper, I will focus on the question of overlap in the usage of DAT and *u + GEN*, and will analyze why these constructions are accepted by some native speakers as interchangeable in their ‘sympathetic’ usage, and yet are felt by other Russian speakers to express very different connotations.

Some previous analyses (Chvany 1975; Fowler 1987) based on syntactic principles have noted the difficulty of explaining when DAT or *u + GEN* is properly used in such sentences. In some sentences, either the DAT or *u + GEN* may used ‘sympathetically’, without being able to replace one another, as in (12) and (13):

(12) On byl mne otech. (Levine 1990: 11)
    3-SG-Masc-NOM was 1-SG-DAT father-INSTRL
    'He was like a father to me.'

(13) Smešnoj ty u menja. (Gustavsson 1976: 345)
    funny 2-SG-NOM at 1-SG-GEN
    'You're a real funny one! [...]and that affects me.']

Vácha’s (1974-5) and Garde’s (1985) analyses, however, shed light on some of the syntactic restrictions, and narrow down the syntactic environment in which there is truly overlap in the use of DAT and *u + GEN*. I will be limiting my discussion specifically to this context. This is namely in what I will call the ‘indirect object’ position in the sentence type shown in (14):
Garde (1985) identifies some of the characteristics of the verb, ‘indirect object,’ and direct object in these sentences. The verb must be transitive, and it must be a verb of action having an effect on the direct object. The direct object will be in the accusative case. The ‘indirect object’ is normally an animate being, most often a human being. The ‘indirect object’ possesses the direct object, with possession understood in its broadest sense. As shown in (15), Garde (1985) notes that in sentences where the DAT and u + GEN overlap, the direct object usually concerns either:

(15) a) a body part or a close possession

Odin čelovek možet isportiti’ žizn’ stol’kim ljudjam!
one-NOM person-NOM can spoil-INF life-ACC so-many-DAT people-DAT
‘One person can destroy so many people’s lives!’ (Panova, in Garde p. 187)

Traube khotel osmotret’ u Bestuževa pravuju ruku.
Traube wanted examine-INF at Bestuzhev-GEN right-ACC hand-ACC
‘Traube wanted to examine Bestuzhev’s right hand.’ (Paustovskij, in Garde p. 187)

or

b) some personal relation to the ‘indirect object,’ usually a family member, e.g.,

Ona isportit tebe vsekh dev’onok v brigade.
3-SG-Fem-NOM spoil 2-Sg-DAT all-ACC girls-ACC in brigade-LOC
‘She’ll spoil all the girls in your brigade (on you).’ (Belov, in Garde p. 191)

A vot ub’jut ego (syna) and DEMONSTR-PARTICLE they-will-kill 3-SG-Masc-ACC (son-ACC)

u tebja pri pervoj že vojne.
at 2-SG-GEN during first-LOC EMPHAT-PARTICLE war-LOC
‘And they’ll kill him (your son) on you in the first war.’ (Saltykov, in Garde p. 191)

Pete (1979) focusses on the fact that u + GEN rather than DAT tends to appear often with verbs indicating removal, loss, or some kind of distancing, and cites (p. 424) the following tendencies which characterize the use of one or the other construction:

(16) a) tendency towards the use of u + GEN with alienable possession versus DAT with inalienable possession:

U nego vyryvali sumku iz ruk.
at 3-SG-Masc-GEN tore bag-ACC out-of hands-GEN
‘They tore the bag out of his hands.’
Emu vyrvali zub.
3-SG-Masc-DAT they-pulled tooth-ACC
‘They pulled his tooth.’

b) contrast between a ‘patient’ being cured (or punished [!]) and a non-patient:

Vrač vyrval mne zub.
doctor pulled 1-SG-DAT tooth-ACC
‘The doctor pulled my tooth.’

Vrač vyrval u menja po ošibke zdorovyy zub.
doctor pulled at 1-SG-GEN by mistake-DAT health-ACC tooth-ACC
‘The doctor pulled a healthy tooth on me by mistake.’

c) contrast between a product and a living possessor:

Os’ka otrezal u treski golovu. (Kubanskij)
Os’ka cut-off at codfish-GEN head-ACC
‘Os’ka cut off the codfish’s head.’

Emu otrezali pravju ruku.
3-SG-Masc-DAT cut-off right-ACC hand-ACC
‘His right hand was cut off.’ (‘They cut off his right hand.’)

d) contrast between an individual versus generalized possessor:

Otrubit’ emu golovu!
cut-off-INF 3-SG-Masc-DAT head-ACC
‘Cut off his head!’

Esli otrubit’ u salamandry khvost, to čerez dve nedeli
if cut-off-INF at salamander-GEN tail-ACC then after two week-GEN
u nejo otrastiot novyj. (Čapek)
at 3-SG-Fem-GEN will-grow new-NOM
‘If you cut off a salamander’s tail, it will grow a new one in two weeks.’

However, even these tendencies are a little unsatisfying in that the descriptive listing does not capture any broader underlying principle. They also do not address the issue that, while some native speakers accept both constructions in a variety of different contexts, others have strong intuitions as to when either DAT or u + GEN are appropriate. Furthermore, the issue of stylistic differences between the two constructions remains unaddressed: whereas u + GEN in many of these sentences is neutral in tone or is sometimes perceived as more proper, the DAT can lend a more informal feeling or more emotional tone.

I would like to present some findings from research I conducted with native speakers of Russian in Moscow during the summer of 1992, based partly on interviews with them and partly on questionnaires filled out by them. My research looks to a solution in the semantics of the dative case and in the various factors determining one’s degree of ‘empathy’ with the narrated situation. My conclusion is that the tendency in Russian is towards use of the DAT in this sentence type with reference to humans as well as with animals with which the speaker feels empathy, and toward the use of u + GEN with inanimate entities and animals afforded less or
no empathy by the speaker. I also conclude that the probability that the speaker will extend the expression of empathy with the DAT is determined by a number of interacting factors, which I will discuss. First, however, I would like to discuss some aspects of the semantics of the dative case, and the genitive case with the preposition *u* in Russian.

While I will not be able to present anything approaching a complete picture of the semantic structures these grammatical forms can express, I can at least focus on some significant points which differentiate *u* + GEN and the DAT. For my purposes, cognitive grammar provides a good framework to explicate the relevant ideas. I will work on the assumption, for example, that every linguistic expression singles out some aspect or substructure of a domain for maximal salience, a process which I will refer to as HIGHLIGHTING. Prepositions and cases highlight relationships between entities. One of the entities in the relationship is identified as more prominent by being marked with a case form, by occurring with a preposition, or both. As I discuss in Cienki (in preparation), *u* + [animate entity]-GEN highlights a sphere of control or ownership about a possessor within which a possession is ‘located’, with location being understood in a concrete or abstract sense. For example, the sentence in (17),

(17) **U Tani** est’ novaja kniga.
    at Tanya-GEN be-INF new-NOM book-NOM
    ‘Tanya has a new book.’

Tanya = POSSR
kniga (‘book’)= POSSD

The figure in (17) gives a graphic representation of how to conceive of the relationship involved. (Langacker 1991b: 172 presents a similar model.) As Taylor (1989: 679-680) summarizes, the relation of possession is typically an asymmetric one, like that depicted here, whereby an animate participant has control over an inanimate one by virtue of its status as an energy source, with the potential for independent action. Possession, the relation highlighted by *u* + GEN when the object of the preposition is animate, is essentially a relationship in one direction, from possessor to possessed.

Now I would like to compare some aspects of the semantics of the dative case -- in general, and in Russian in particular. Unlike the genitive, the Russian dative, nominative, accusative, and instrumental can be grouped together as cases which primarily involve the roles of participants in processes normally expressed on the clausal level. A typical process or event, which results in a transfer of energy from one participant to another, forms what Langacker calls an action chain. This can be depicted as in (18).
(18) Possible action chains of an event (adapted from Langacker 1991b)

\[\text{AGENT} \rightarrow \text{PATIENT}\]

\[\text{AGENT} \rightarrow \text{MOVER}\]

The participants in the event are indicated by circles; the double arrow indicates the transmission of energy from the first participant to the second; and the single arrow indicates the resultant change of state of the second participant (in the case of the Patient), or its movement (for something that doesn’t itself change, but does change its location: a Mover). Langacker characterizes the semantics of cases such as the nominative, accusative, dative, and instrumental in terms of ROLE ARCHETYPES which they can represent. The archetypal AGENT is “a person who volitionally carries out physical activity resulting in contact with some external object and the transmission of energy to that object” (Langacker 1988: 59); the archetypal PATIENT is an inanimate object which absorbs this energy and thereby undergoes some change of state. The role archetypes are proposed as categories by which we organize our conception of participant interactions, conceptual categories, and not just linguistic constructs.

Recent research (such as that by Smith 1987 on German; Langacker 1991a on Newari, a language of Nepal; and Janda, forthcoming, on Czech) has pointed to the dual role of DAT-marked entities. As Smith (1987: 355-356) notes, they have the “potential for simultaneous active and passive participation in the action in the clause.” DAT entities typically mark the role archetype of EXPERIENCER. Like the Agent role, an Experiencer can exert physical and mental energy (that is, it can act as an energy source); but like a Patient, it is affected in some way by the flow of energy along the action chain (it can act as an energy sink). In a typical event of giving, where the DAT-marked entity is the indirect object, it also becomes the new possessor of what was given, and actually reflects a DUAL role of Experiencer-Possessor (EXPR-POSSR). I have depicted Langacker’s illustration of the transaction of giving in (19).

(19) Langacker’s (1991a: 227) illustration of the transaction of giving
The dashed-line circles stand for entities over which the Agent (AG) and EXPR-POSSR exercise some dominion (a region of control). The double bold arrow stands for the transmission of energy to what is marked as a Mover (MVR), the thing which is given. The single bold arrow depicts the motion or transfer that results. The dashed-line arrows from the EXPR-POSSR indicate the complex ways it interacts with its new acquisition, something which it now has some control over (as the new POSSR), but which also affects it (creating a new experience for it).

Bearing in mind what we have seen of the semantics of $u +$ GEN and of the DAT case, I would like to put a third issue on the table, that of the animacy hierarchy. The animacy hierarchy was originally developed by Silverstein (1976) to explain case marking in so-called split-ergative languages. It has since been found to have relevance in other areas of grammar, such as in explaining the use of English possessives with of versus those with the suffix -'s or a possessive pronoun (Deane, 1987). In (20) I present a simplified version of the animacy hierarchy. At the top of the hierarchy are highly context-dependent forms. Next come NPs with salient, human referents. At the bottom of the hierarchy are inanimate physical and abstract entities.

(20) A simplified version of the animacy hierarchy

Pronouns (1st person > 2nd > 3rd) > proper names > kin-terms >
other humans > other animals > physical objects > abstract entities

The connection between animacy and empathy is, I believe, intuitively clear, in that empathy is based upon seeing a similarity with oneself, including shared, common concerns. In this regard, I will sometimes refer to the Russian word sočuvstvie (literally ‘with-feeling’, like German Mitgefühl) which, I believe, expresses the concept more transparently to Russian speakers than ‘empathy’ or ‘sympathy’ do to English speakers.

The present data illustrate the importance of the animacy hierarchy in determining whether a speaker will more likely assume the ‘inner’ perspective of the affected animate being, and thereby have empathy with it (sočuvstvie), or retain the outside perspective, the more objective viewpoint of the observer of the situation. Considering the examples in (21), most of my informants preferred the DAT in examples such as those in the first half of the list more often than they did for the examples further down the list. I have therefore written the DAT form first in the sentences at the top, and $u +$ GEN first for the sentences further down.

(21) Ty razbudil mne / u menja rebnjanka.
2-SG-NOM woke-up 1-SG-DAT / at 1-SG-GEN baby
‘You woke up my baby on me.’

Emu / U nego minoj otorvalo nogu.
3-SG-Masc-DAT / at 3-SG-Masc-GEN mine-INSTRL tore-off leg-ACC
‘His leg was blown off by a mine.’

Sobake / U sobaki obrezali uši.
dog-DAT / at dog-GEN they-clipped ears-ACC
‘The dog’s ears were clipped.’ (‘They clipped the dog’s ears.’)
U lošadi / Lošadi udalili pulju.
at horse-GEN / horse-DAT they-removed bullet-ACC
‘They removed a bullet from the horse.’

U krokodila / Krokodilu výrvali bol’noj zub.
at crocodile-GEN / crocodile-DAT they-pulled sore/sick-ACC tooth-ACC
‘They pulled the crocodile’s sore tooth.’

On otrezal u treski / treske golovu.
3-SG-Masc-NOM cut-off at codfish-GEN / codfish-DAT head-ACC
‘He cut off the codfish’s head.’ (‘He cut the head off the codfish.’)

Admittedly, some of the examples are rather gruesome in nature, but it is precisely in these malefactive contexts that competition between the variants can appear.

When the affected animate being is lower on the animacy hierarchy, I propose that the speaker is more likely to focus only on the single relation of possession, expressed with u + GEN. This is depicted by the bold arrows in (22) extending from the highlighted Possessor. As in (18), the double arrow indicates the transmission of energy from the Agent to the Patient.

(22)  [AG-NOM] + [verb] + [u + POSSR-GEN] + [PAT-ACC]

The relation of possession may have some observable manifestations -- the animate being exerting its control over the entity possessed, especially in the case of inalienable possession, as with a body part.

When the speaker can have empathy with the person or animal affected, he or she is more liable to focus not only on the fact that the possessor is exerting its force outward over its possession, but may also focus on how the possessor is affected by an outside force acting on its possession. Assuming empathy with the Possessor, the speaker can relate to its dual role as an Experiencer/Possessor, which is reflected by using the dative case. This is depicted in (23) by the bold arrows extending both outwards and inwards: out from the Possessor, exerting its sphere of control; and inwards, as the effect on the Patient (the entity possessed) is experienced by the Possessor (i.e. the EXPR-POSSR). Janda (forthcoming), therefore, describes this construction as the ‘dative of affectedness via possession’. 
(23) \([\text{AG-NOM}] + [\text{verb}] + [\text{EXPR-POSSR-DAT}] + [\text{PAT-ACC}]\)

The above analysis is supported by some of the informants’ own comments as they tried to explain their intuitions: several cited the factor of \(\text{sočuvstvie}\) as what set apart the sentences using the DAT as opposed to \(u + \text{GEN}\). This becomes even clearer when the sentences are put into a more detailed context. One informant suggested the scenarios given in (24) and (25) (the informant’s comments are in parentheses; mine are in brackets):

(24) a) Nado sostrič sobake šerst’.
necessary cut-off-INF dog-DAT hair-ACC
‘(We) have to cut the dog’s hair.’

(It’s hot out. The dog needs it.) [You feel for the dog.]

b) Nado sostrič u sobaki šerst’.
necessary cut-off-INF at dog-GEN hair-ACC
‘(We) have to cut the dog’s hair.’

(The dog looks bad as it is.) [Judgment based on speaker’s perspective.]

(25) a) Krokodili vyrvali bol’noj zub.
crocodile-DAT they-pulled sore/sick-ACC tooth-ACC
‘They pulled the crocodile’s sore tooth.’

(We see that it’s suffering.) [sočuvstvie]

b) U krokodila vyrvali bol’noj zub.
at crocodile-GEN they-pulled sore/sick-ACC tooth-ACC
‘They pulled the crocodile’s sore tooth.’

(… and now they can feed it normally.) [objective observation]

Animacy, however, is not the only criterion that appears to factor into one’s expression of empathy. Another factor to be considered is the degree of the animal’s familiarity to the speaker. Any hierarchy based on degree of familiarity will vary from person to person, based on their experience (e.g., whether they work with animals or have pets, whether they live in a city or are surrounded by woods, etc.). For the last example in (21), most of my informants felt the DAT sounded funny unless in fact the fish was someone’s very dear pet. (This sentence more likely describes food preparation.)
Another factor is whether the possessor referred to is singular or plural. One is more likely to relate to, and empathize with, an individual rather than with a large group. This would concur with the tendency listed under (16d).

The level of formality of the speech situation also plays a role in which construction is used. Most native speakers consulted felt a stylistic difference in these sentences, with \( u + \) GEN being more formal, and the DAT as more colloquial. For example, most informants accepted both versions of a sentence given by Garde (1985: 187), reproduced here as (26), but several noted that the second variant (\( u \ bol'nogo \)) sounded more formal.

(26) Vrač osmotrel bol'nomu / u bol'nogo ruku.
doctor-NOM examined patient-DAT / at patient-GEN hand-ACC
‘The doctor examined the patient’s hand.’

Levine (1986: 445) also notes that in selecting the DAT in sentences such as (27),

(27) Emu urezali zarplatu.
3-SG-Masc-DAT they-cut salary-ACC
‘His salary was cut.’ (‘They cut his salary on him.’)

‘[...] the speaker is expressing a certain empathy with the possessor, who is felt to be ‘upset’ by what has happened to his property.” These findings concur with the semantic analysis discussed above: with \( u + \) GEN, the situation is being viewed more objectively from outside, whereas with the more ‘emotional’ DAT, the speaker expresses sočuvstvie and assumes the inner point of view of the Experiencer/Possessor.

I also observed a tendency away from the \( u + \) GEN variant with human referents since, as several informants commented, it could be ambiguous with the locative reading mentioned in (6) (‘at someone’s place’). One native speaker observed that in (28) the DAT (a) is preferable,

(28) (a) Kto-to ispačkal Ninu plat’e.
someone-NOM stained Nina-DAT dress-ACC
‘Someone stained Nina’s dress.’

(b) Kto-to ispačkal u Niny plat’e.
someone-NOM stained at Nina-GEN dress-ACC
‘Someone stained Nina’s dress.’

because with (28b) the listener could suppose that some woman stained her OWN dress while at Nina’s place, i.e., it would be short for (29).

(29) Kto-to ispačkal sebe u Niny plat’e.
Someone stained self-DAT at Nina-GEN dress-ACC
Someone stained her [own] dress at Nina’s.

However, this factor against the use of \( u + \) GEN is overridden if the verb concerns a state rather than a process; in (30) (a) and (b) (from Chvany 1975: 101), \( u + \) GEN and the DAT cannot replace each other.
(30)  (a) U Ivana svjazany ruki.
at Ivan-GEN tied-Past-Passive-Ppl hands-NOM‘Ivan’s hands are tied.’

(b) Ivanu svjazali ruki.
Ivan-DAT they-tied hands-ACC‘They tied Ivan’s hands.’

The use of \( u + \) GEN is also favored if there is a verb indicating co-location with the Possessor in conjunction with a prepositional phrase qualifying the location (versus motion toward the Possessor). Note the contrast in (31) (a) and (b) between location and motion, respectively (from Pete 1979: 423).

(31)  (a) On deržal rebjonka u sebją na kolenjakh.
3-SG-Masc-NOM held baby-ACC at self-GEN on knees-LOC‘He held the baby on his knees.’

(b) On posadil rebjonka sebe na koleni.
3-SG-Masc-NOM sat baby-ACC self-DAT on knees-ACC‘He sat the baby on his knees.’

Another factor, unrelated to the issue of empathy, is discussed by Vácha (1974-5) and Pete (1979), namely that \( u \) in some contexts reflects an ablative meaning,\(^6\) as shown in (16) and in (32):

(32)  brat’ den’gi u kogo-to
take-INF money-ACC from/at someone-GEN‘to take money from someone’

Unlike other Slavic languages such as Czech (Zajičková 1972; Janda forthcoming) and Polish (Wierzbićka 1988), Russian does not employ the DAT to express removal or loss. Therefore, in sentences such as (32) where the concept of removal predominates, \( u + \) GEN is the sole possibility.

In conclusion, the complexities of the usage of DAT versus \( u + \) GEN represent a more general linguistic principle: a number of semantic and syntactic factors interact to determine the speaker’s choice of a linguistic expression, and this process can be viewed as a competition among what Jackendoff (1983) has called differently weighted ‘preference conditions’. Different factors weight the balance towards which grammatical construction a speaker will use. For example, an informal speech situation, a speaker’s high degree of empathy with the possessor, and his/her construal of a strong effect on it would weight the use of the DAT. But a more formal setting and reference to, say, an unfamiliar reptile would weight the use of \( u + \) GEN. There is clearly an interrelation between some of the relevant factors. Several factors that favor the use of either DAT or \( u + \) GEN commonly occur together, and can reinforce each other.

While there may be other conditions relevant in determining the use of DAT versus \( u + \) GEN, the chart in (33) summarizes those discussed here.
(33) Factors influencing the use of DAT versus $u + \text{GEN}$ in this sentence type

**favors DAT**

Factors determining ‘empathy value’:
- high on animacy hierarchy
- familiar referent
- informal, emotional speech situation
- verb of action/motion toward referent
- singular (individual possessor)

Avoids ambiguity with locative interpretation

**favors $u + \text{GEN}$**

- low on animacy hierarchy
- unfamiliar referent
- formal speech situation
- stative verb
- plural (generalized)

Factor independent of empathy

Ablative interpretation (removal or loss)

Note that most of the factors determining the ‘empathy value’ are SUBJECTIVELY weighted by the speaker. Past studies have shown the futility of attempting to state specific syntactic criteria to explain and predict the usage discussed here.7 The factors in (33), however, do help make sense of the tendencies observed by Pete (1979), listed here in (16).

This semantic analysis also helps explain the variation in usage from one native speaker to another that I and researchers before me have observed. Previous studies have not focussed on any pattern of usage by INDIVIDUAL informants. The working assumption was, apparently, that usage would be consistent across native speakers. I conclude, though, that although each speaker may, in effect, draw the empathy dividing line in a different place according to the various factors mentioned, there is a fair amount of consistency in a given speaker’s usage. My observation is that some speakers, as expected, prefer the DAT with humans and animals with a high ‘empathy value’, and accept $u + \text{GEN}$ for animals with a lower ‘empathy value’; others, however, who prefer $u + \text{GEN}$ despite a high ‘empathy value’ rating for the possessors, tend to follow through with the tendency to use $u + \text{GEN}$ with possessors of ‘medium’ and ‘lower’ ‘empathy values’.

**Notes**

* An earlier version of this paper was presented at the annual meeting of the American Association of Teachers of Slavic and East European Languages, Dec. 28-30, 1992, New York, NY. I would like to thank my native speaker informants; Vladimir Sedov and Benjamin Hary for assistance in obtaining some of the data; and Paul Deane, Joe Grady, and Mary Ellen Ryder for their helpful comments. I am also grateful to Judge William Hill of the Fulton County Courthouse in Atlanta for allowing me to attend BLS 19 by releasing me from the jury I had been serving on for three long weeks.

1I will gloss Russian $u$ with English ‘at’, lacking a more convenient expression for the concept it represents.

2The relevance of a similar ‘empathy hierarchy’ in Russian syntax is discussed in Yokoyama (1982) and elsewhere.
Animacy, as a grammatical category in Russian, does not extend to plants. However, animals, and even insects, are identified in Russian by the question Kto êto? (‘Who is that?’) as opposed to Çto êto? (‘What is that?’).

See Janda (1990; forthcoming) for a similar depiction of the ‘free dative’ in Czech, in which “a nominative acts on an accusative in a dative’s sphere of control in a setting.”

I am grateful to Oscar Swan for this observation.

Note that historically, the original meaning of u was ablative, as in the related prefix u- with Russian verbs of motion today (e.g., ujti ‘to go away’) (Vasmer 1958: 168).

Even Fowler (1987) who states (p. 5), “I contend that there is no direct mapping of semantics onto case morphology -- rather, syntax serves as the interface, and has the last word in determining case,” also observes (p. 404), “Clearly the Dative case and the preposition u do not alternate at the level of syntax. [...] the choice between the competing constructions lies outside the realm of syntax [...]”

References


Prosodic Aspects of Broadcast News Register

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1. Introduction
One of the distinguishing features of broadcast news is how it sounds. In this paper, I will examine some of the communicative components that make up what can easily be identified as broadcast prosody. Prosody is key to defining the broadcast news register and in this talk I will examine data which are an initial attempt to isolate some of the distinctive prosodic variables involved. These data, which consist of analyses of recorded readings of news texts, will point up similarities and differences among performances by readers within and outside the profession, as well as speak to the psychological reality of the register. Among other factors, news broadcasts are marked prosodically by distinctive and quantifiable variations in pause, tempo, and pitch.

I will also note three significant and interconnected factors which influence the prosodic features of this discourse mode: (1) the structure of the news text, (2) the constraints of the medium, and (3) the "discourse relationship" between the broadcast announcer and an unseen interlocutor. Due to the communicative requirements imposed by these factors — which are understood functionally by broadcast professionals — the broadcast news register combines features of discourse modes which are traditionally viewed as distinct: written vs. spoken, conversational vs. more public forms; and formal vs. casual style. That the news register blurs those traditional delineations supports and is supported by more recent empirical analysis that demonstrates that these distinctions are not as binary as initially proposed.

Despite its potential as a source for linguistic information, there has not been a great deal of work done on broadcast news as a particular register, except for Bolinger (1982, 1989), who has observed how radio news announcers distort expected sentence stress and place accentual emphasis on words whether semantically justified or not. It is part of my aim to reconsider these assessments and show the motivations behind news-announcer prosody, and I will start by looking at the work of other researchers who have considered prosody in terms of discourse. This research is the basis on which I analyze my data.
2. Previous relevant work

Researchers such as Levin, Schaffer and Snow (1982) have examined what occurs prosodically when a story is read aloud from a text, as compared to when it is told. Their work is summarized in (1) below. The checkmarks on the chart indicate what features were found in the newscript readings in the data, and make it easy to see that the news stories which I will be discussing show all the prosodic characteristics of reading, as well as many features of spontaneous story-telling.

(1)

<table>
<thead>
<tr>
<th>Reading (planned)</th>
<th>Telling (spontaneous)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pauses</td>
<td>√ at grammatical junctures</td>
</tr>
<tr>
<td>Speech rate</td>
<td>√ faster</td>
</tr>
<tr>
<td>Intonation contours</td>
<td>√ follows punctuation (text); terminal falls</td>
</tr>
<tr>
<td>Silences</td>
<td>√ functional</td>
</tr>
<tr>
<td>Fillers (&quot;...um, uh...&quot;)</td>
<td>√ no</td>
</tr>
<tr>
<td>False starts, repetitions</td>
<td>yes</td>
</tr>
<tr>
<td>Lengthened vowels: &quot;drawls&quot;</td>
<td>√ yes</td>
</tr>
<tr>
<td>Speaker i.d.</td>
<td>√ before quote</td>
</tr>
</tbody>
</table>

From the chart (1) condensing Levin et al.'s results, we can see what happens when a story is read vs. when it is told. Pauses occur at grammatical junctures in a planned reading, rather than within grammatical units as in a spontaneous telling. Along with that, intonation contours follow punctuation and incorporate terminal falls in the reading, while in the told story, contours rely on non-terminal falls to unify utterances and offer story coherence for the listener. The speech rate is faster in a reading; silences are used functionally in both modes. Fillers, false starts, and repetitions occur in a spontaneous telling, but not in a planned reading. Told stories also incorporate stylistic vocal ornaments, like lengthened vowels on some words. Within the story frame, a speaker who is being quoted is always identified before the reported utterance in a told story.
The checkmarks on the chart show what happened in the news data. Despite the fact that the volunteers were reading a prepared text, pauses occurred within grammatical units as well as at the grammatical junctures more typical of planned reading. The faster speech rate of a reading was evidenced and intonation contours (terminal falls) followed the punctuation indications in a text. The readers also employed the non-terminal stylistic devices (that may be viewed as typical of news readings as well as spontaneous speech). Speaker-tags came before the quotation in the newscasts, just as they did in the told stories.

Crystal and Davy (1969) note prosodic phenomena in conversation similar to Levin's, with the additional observation that utterance stretches which are unstressed tend to sound rhythmically isochronous to the listener, that is, accents occur at what are perceived to be regular intervals. (This may be a way of accounting for "misplaced" accents in newscasts, as I will discuss later.)

The work of Johns-Lewis includes experimental evidence that pitch can differentiate discourse modes; together with loudness, it serves to focus and maintain attention in discourse settings where listener attention is problematic. She examined pitch values in acting, reading aloud and conversation, finding the largest fluctuation in mean pitch value in acting, because of a need to "drown out' competing stimuli" (Johns-Lewis 1986:217), and the smallest in conversation, with reading aloud falling in between. In our data below, we shall see a higher incidence of salient pitches in the text readings that were presented in a news style.

Her work points up a difference between conversation (elements of which show up in broadcast news) and the actual news reading. That a broadcaster is speaking to a generic, unseen audience, much as an actor does, would imply that some of the prosodic characteristics of acting would also be present. In this case, as Johns-Lewis says, "Pitch heightening, and increased loudness, can be shown to involve strategies that are effective in overcoming the two communication problems of 'scattered attention' and segmentation of utterances" (Johns-Lewis 1986:217) — problems that plague the actor on the stage and the radio announcer who has to compete with other demands on the listener's attention.
3. Relations among broadcast prosody motivators
As I noted earlier, I will look at three significant factors which
influence the prosodic features of the broadcast news discourse mode:
1) the structure of the news text; 2) the constraints of the medium; and
3) the "discourse relationship" between the broadcast announcer and
an unseen interlocutor. The following diagram shows how these
factors interrelate.

```
1. text structure
  ↓
2. medium constraints  3. unseen interlocutor
  ↓
  prosody
```

The text structure, besides responding to requirements of the medium
and the unseen interlocutor, derives from the main goals of the
broadcast: to convey newsworthiness and to locate and maintain
attention. The story is constructed to maximize impact. It is written to
enhance clarity, because clarity is necessary to maintain audience
attention. A listener has only one chance to hear the story, and
following certain rules will ensure greater listener interest and
retention. One journalism textbook states the obvious: "Radio
information is... fleeting—in one ear and out the other" (Newsom and

The authors note that semantically uncomplicated sentences
containing one or two points of information are part of the formula.
Journalism students are actually taught to keep the story
conversational ("broadcast news is written for the ear") but clear of the
false starts of conversation; to keep sentences short; to keep copy
informal and personal, including use of the second person; and to use
"natural" language — that is, vocabulary and phrasing that would be
found in spoken discourse, and not necessarily in literary texts (cf.
Newsom and Wollert).

The announcer's task of presenting the text is always guided by the
conscious awareness of the unseen interlocutor. The radio news
announcer in his or her discourse relationship with the listener must
meet three objectives which are fairly easy to achieve visually in print,
but which the broadcast medium challenges: That is, make explicit
where a story begins and ends; make obvious the meaning of the story; and make sure that attention is gained and sustained. These objectives are met in large part by vocal technique; the speaker makes use of every communicative means at his or her disposal. Additionally, these requirements may, according to Quirk, "engender medium-specific conventions of presentation with their own linguistic correlates" (Quirk 1982:87), which would aid in the comprehension of the news by the listener/unseen interlocutor. Related to this is "newsworthiness", also a key concept to the news practitioner; ideally each story should be worth getting excited about, and this excitement will be reflected prosodically. This factor is always defined in relation to the listener: what's pertinent to the listener? what would get the listener's attention?

With prosody as the usual currency of exchange, the fine line between professional credibility, which most practitioners equate with dispassionate objectivity, and personal connection within the discourse relationship, which is also an explicit goal within the profession, is always being negotiated in a news broadcast. The data below suggest that professionalism may be equated with formality in the minds of non-professionals, and certain features of formal discourse modes are indeed present in broadcast prosody.

The prosodic requirements of the job are acknowledged in the profession, but never made particularly explicit. Wynn 1974 says, "In delivery the newscaster should communicate quiet vitality, warmth, ease and authority", and when this fails to happen, there is danger of "failure to communicate the meaning of the news" (Wynn 1974:177). Budding newscasters learn primarily by example, and are encouraged to listen to the professionals to internalize a standard. This appears to be fairly effective; a practitioner's awareness of the components of the news does appear to alter prosody. For instance, we'll see in the following section that the trained volunteer's prosodic patterns in the sample more closely approximated the professional broadcaster than did the untrained volunteer's.

4. The data
For my sample, I took two stories (A and B) from Bolinger's KQED prosodic log of July 14, 1988. These are public radio broadcasts, from the news program "All Things Considered", which tend to have more moderate pitch fluctuations than commercial radio. The other stories (C and D) are from national broadcasts on commercial AM stations.
From these I transcribed newscasts, which were read by two volunteers who were instructed to read them first in a very neutral, unexcited manner, and second in their "best newscaster's voice". These were recorded at the University of California's language lab studio. Speaker 1 was a graduate student in broadcast journalism at Berkeley; she had had some experience announcing for the campus radio station. She was recommended by a journalism professor as someone who could competently read the news. Speaker 2 had no journalism nor announcing background. He is an amateur musician with a good ear, which is why I considered him to be a suitable volunteer.

I made prosodic markings of the version from the original radio broadcasts, and then of the "neutral" and "newsy" readings of the volunteers — five in all. It was of course not possible to get a neutral reading from the speakers in the aired newscasts, but I included the radio version because I think it furnishes a useful yardstick to measure the prosodic behaviors of the other speakers.

I marked the transcripts for salient accents and pause, and timed each broadcast story; the counter-numbers give a good sense of relative duration. I also indicated intonation contours, which I will not describe in detail in this paper. I believe there is enough data here to establish the relative differences among the speakers in my sample and to show meaningful distinctions. The chart (2) below shows the relative differences along the lines of four parameters: timing (counts); pauses overall; non-grammatical pauses; and pitches.

(I have included in Appendix A the transcript of Story A that was used by the volunteer speakers.)
<table>
<thead>
<tr>
<th></th>
<th>Radio</th>
<th>Spkr 1</th>
<th></th>
<th>Spkr 2</th>
<th></th>
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<tr>
<td></td>
<td></td>
<td>neut</td>
<td>newsy</td>
<td>neut</td>
<td>newsy</td>
</tr>
<tr>
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<td>8</td>
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<td>8</td>
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</tr>
<tr>
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<td>14</td>
<td>12</td>
<td>12</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Non-gram</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Pitches</td>
<td>25</td>
<td>10</td>
<td>24</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>6.5</td>
<td>6.5</td>
<td>7</td>
<td>7</td>
<td>7.5</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>9</td>
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<td>12</td>
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</tr>
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<td>4</td>
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<td>4</td>
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</tr>
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<td></td>
<td>19</td>
<td>9</td>
<td>21</td>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>Counts</td>
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<td>8</td>
<td>9</td>
<td>7</td>
<td>8.5</td>
</tr>
<tr>
<td></td>
<td>7</td>
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<td>Non-gram</td>
<td>1</td>
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<td>Pitches</td>
<td>20</td>
<td>11</td>
<td>17</td>
<td>13</td>
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<td>Counts</td>
<td>6.5</td>
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<td>9</td>
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<td>10</td>
</tr>
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<td></td>
<td>10</td>
<td>10</td>
<td>13</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Pitches</td>
<td>26</td>
<td>12</td>
<td>22</td>
<td>14</td>
<td>17</td>
</tr>
</tbody>
</table>

A comparison of the parameters shows interesting differences and similarities:

Counts (time or tempo): Roughly the same throughout, as you can see by looking at the first line for each story (A through D) on the chart. Radio was shortest, and the neutral counts were shorter compared to the newsy versions of the individual speakers, I think because both were being more careful when reading for a specific register than for neutrality. They also knew I was examining some element of news style, which would engender more carefulness.

Pauses: There were many more pauses at grammatical junctures than within a grammatical unit, as the numbers make clear — in keeping with a planned oral reading. An example from Story B: "In Boston//Michael Dukakis//has scheduled a news conference" (in which "/" indicates a pause). All three newsy versions are in fairly close agreement in terms of pause frequency. There was a closer correlation for the number of non-grammatical pauses between Radio and Speaker 1 than for Speaker 2, possibly because Speaker 1 has been
specifically trained for this sort of reading, and has experience with similar texts. There were somewhat more pauses overall in the newsy versions, compared to the neutral ones, which may suggest that these pauses were used for the functional effect of attention-getting (as other researchers have demonstrated).

Speaker 1, the experienced volunteer, has more non-grammatical pauses in the newsy reading; Speaker 2 has fewer. Paradoxically, I think this occurs for the same reason: When asked to speak in their "best newscaster's voice", Speaker 1 inserts the prosodic artifacts of her training (the injunction to be familiar or conversational), while Speaker 2 feels he has to put on a professional attitude while reading (and use prosodic markers that indicate "professionalism"), which increases a sense of formality.

Pitches: Pitch salience (by this I am referring to the subjective identifiability of an accent of emphasis on particular syllables, which is based on pitch obtrusion) is by far the most marked characteristic of the newsy and Radio versions. It is not so much that news stories contain more accents, they just contain more salient or identifiable accents. In my examination of the data, it was easier to determine "salient accent" in the Radio version, possibly because pitch movements seemed "wider" or more "pronounced".

Speaker 2 shows the least remarkable increase in salient accents, possibly because his grasp of "news style" is more from a listener's perspective than a practitioner's. That he is able to generate as many as he does, however, points to the significance of salient pitch as a characteristic of broadcast prosody.

Proficiency, or professional fluency, seems to be another key factor; if we take Speaker 2 to be out of his element, then his fatigue as he proceeded (noted by the trained studio technician) would be evidenced in less control of his medium, that is, more accents for a neutral instruction, fewer for newsy. That Speaker 1's newsy version was fairly close to the Radio's indicates that familiarity with the medium (whether it's text construction, awareness of "newsworthiness", or practice reading on air) helps her simulate what the professionals do.

Fluency may be a factor in more than just pitch control. The Radio version had a more pronounced falling contour at the end of a story, with the other near-terminal falls within the story offering some unification of text. The Radio version also had more evidence of
subjective rhythmic isochrony (from Story A:"ONly if NAto scraps ITS plans"), which can be perceived as more controlled. Carlos Gussenhoven (p.c.) has suggested that this can also be viewed as an alternate, more user-competent interpretation of what Bolinger has termed "misplaced accents", or accents on given or semantically less-important information. In this instance, a rhythmic analysis covers more ground than an accentual one.

I will also note in passing that voice quality was different in the neutral and newsy readings of the volunteer speakers. In the neutral cases, both speakers' relative pitch levels were lower.

5. Summary and conclusion
To summarize, keeping in mind our consideration of Levin's work as outlined in the chart (1) at the beginning of this paper, pauses have been found to occur more frequently within grammatical units in spontaneous speech and at the ends of grammatical units in planned speech. In our newscast sample, pauses followed the grammatical divisions typical of planned speech, but two of three newsy readings, particularly the Radio version, did contain pauses one would tend to find in told, and not read, speech. Furthermore, it appeared to be a factor of controlled production, and not reading miscues. Levin has also observed that pauses and silences are used functionally in both read and told stories. In the news context, they signal breaks between stories, and, in tandem with intonation contour, prosodically tie together elements of the story.

Levin has determined that speech rate is faster during reading. Since there were no told news stories, there is no real point of comparison. But we see (in the data chart 2) that the professionally read news version took the least time (as time competes with other factors of presentation in the production of radio, and speed would be a measure of skill).

Levin has observed that intonation contours follow punctuation in read discourse, with falls at commas and periods, but serve a different discourse function in told stories, with rises "tying together" the narrative elements in told stories. It seems in our sample the announcers used what they could to give an aural coherence to their message. Initially, I had not intended to note this parameter, and I already built certain prosodic cues (commas, etc.) in the transcript I furnished to the two volunteer readers. Despite that, there are instances of the more conversational non-terminal contours as well as
an adjustment to the written, punctuation-cued form. The Radio announcer did a better job of employing tying-together contours, but this seems a matter of his vocal control. He also employed a device of spontaneous, informal discourse, a lengthening effect which Levin refers to as a "drawl", as in these examples from the data: "a mixed blessing" from Story C; and "Soviet fighter planes" from Story A.

It appears that news prosody makes use of rate of delivery, pause, pitch movement, and other paralinguistic features in an identifiable way. Some of these features are the province of spontaneous discourse, and some derive from oral reading or the requirements of public discourse, such as acting. This allows an announcer to be simultaneously professionally distant and conversationally connected to the unseen listener, and to override the limitations of the medium. Along with pitch prominence, the control of these features seems most relevant, and it would be useful to determine a way to productively measure the intersection of control with prosody, to fully inform what comprises broadcast news. (Perhaps the best analogy is to a singing lesson. Singers are taught to use their voices in a certain manner, to achieve certain effects. Similarly, news announcers are taught to use their voices to achieve certain effects, predicated on what they know about the news and about the presentation of the news.) What Bolinger has termed "prosodic blunders" may be better viewed as "prosodic conventions" in newscasting, which are dictated by the structure of the news and the tasks of the news presenter.

Appendix A
Soviet leader Mikhail Gorbachev is offering to reduce the number of Soviet fighter planes in Eastern Europe. He made the offer yesterday in a speech to the Polish parliament. Gorbachev said his offer to reduce the number of Soviet fighter planes is good only if NATO scraps its plans to redeploy 70 American fighters from Spain to Italy. The Soviet leader has attempted to take the initiative on reducing conventional arms in Europe but most of the reactions to his offer yesterday were fairly negative. State Department officials say if the offer is serious it should be made in Vienna where a new forum for conventional arms control talks between East and West is being prepared.

Acknowledgements
I would like to thank Carlos Gussenhoven, Deborah Schiffrin, and especially the late Dwight Bolinger for invaluable suggestions and comments on earlier versions of this paper. All mistakes are my own.
Selected References


Javanese Adversatives, the 1-Advancement Exclusiveness Law
and Mapping Theory*
William D. Davies
University of Iowa

Constructions referred to as "adversatives" or "adversative passives" comprise a
group of constructions most characteristically found in languages of Asia, e.g.,
Chinese, Japanese, Korean, Indonesian, and others. Within Relational Grammar
(RG), Dubinsky (1985) has proposed a clause union analysis of Japanese
adversatives, which has been applied to Indonesian (Kana 1986) and Korean
(Gerdts 1991) as well. In this paper I demonstrate that so-called Javanese
adversatives (such as that in (1)) are best analyzed as regular passives with separate
morphology rather than a unions. Adversatives are signalled by the so-called ke-
-an circumfix.

(1) Montor-e Amir ke-tiba-n watu.
car-DEF A AD-fall rock
'Amir's car got fallen on by a rock.'

However, the analysis runs afoul of the 1-Advancement Exclusiveness Law and
provides support for Gerdts' (1992) Mapping Theory of RG.

There is an asymmetry which sharply contrasts the Japanese and Indonesian
adversatives. Japanese permits adversative structures of unergatives (2), but
disallows adversatives with an unaccusative base (3).

(2) Tanaka ga kodomo ni ie de asobareta
T NOM child DAT house LOC play.PASS.PERF
'Tanaka suffered the child playing in the house.'

(3)*John ga kion ni agarareta.
J NOM temperature DAT rise.PASS.PERF
(The temperature went up on John.)

Conversely, according to Kana (1986), Indonesian disallows adversatives of
unergatives (4), essentially restricting adversatives to unaccusative bases (5).

(4)*Sri kebicaraan pemuda.
S AFFECT.speak young.man
(Sri endured a young man's speaking.)

(5) Mobil itu kejatuhan batu.
car that AFFECT.fall rock
'The car got fallen on by a rock.'

Dubinsky (1985) motivates the union structure in (6) for (2).
In (6), which uses the monoclusal union representation of Davies and Rosen 1988, the "inner clause" consists of the predicate play and the nominals kodomo 'child' and ie 'house'. In the second P-sector, an affectee argument, here Tanaka, is introduced by the affective predicate, and subsequently advances to 1. Dubinsky accounts for the impossibility of adversatives of unaccusatives through appeal to the 1-Advancement Exclusiveness Law (Perlmutter and Postal 1984), which limits to one the number of advancees to 1 in a given clause. In (7), both John and kion 'temperature' advance to one, thus violating the 1AEX.

On the other hand, Kana resorts to a language-particular, construction-specific stipulation in accounting for the Indonesian. Thus, on the surface, it would seem that the language-particular constraint of the Indonesian analysis undermines the appeal to universal principles to explain the Japanese. From the standpoint of linguistic theory, this is an undesirable result.

Examining data from Javanese, a Western Austronesian language closely related to Indonesian, can clarify the situation. As the Javanese data in (8-9) show, the restriction on adversatives parallels that in Indonesian; unaccusatives appear to form adversatives (8), whereas unergatives do not (9).

(8) Montor-e Amir ke-tiba-n watu.
    car-DEF Amir ke-arrive on rock
    'Amir's car was fallen on by a rock.'

(9)*Kertas-e Amir ke-playo-nan bocahbocah.
    paper-DEF Amir ke-run-rock children
    (Amir's paper got run on by the children.)

However, a union analysis is inappropriate for this construction. Rather, the so-called adversatives are best analyzed as "non-volitional" or accidental passives, and the restriction to "largely" unaccusative bases follows from an independently
necessary language-particular constraint on advancement to 2. I will show that Javanese adveratives share properties with two other passive constructions (i) accidental passives and (ii) locative agentic passives.

Finally, and ironically, the structure that naturally accounts for the Javanese adveratives and some other passives violates the very principle with which Dubinsky explains the Japanese data, the 1-Advancement Exclusiveness Law (1AEX). I propose therefore that the Javanese data provide some support for Gerdts' (1992) Mapping Theory.

1. Javanese Passives

There are a number of Javanese clause types that can be categorized as passive constructions. For brevity, I ignore the possible controversial nature of this claim. Two passives will be of interest here. One is the volitional, agentic, or di-passive, in which a theme argument occurs preverbally and a third person agentic NP follows, optionally marked with the preposition karo. The verb is prefixed with di-.

(10) Bambang di-tempeling (karo) Amir.
   B       PASS-slap  by A
   'Bambang was slapped by Amir.'

This contrasts with the active transitive morphology (signalled by nasalization) of the propositionally equivalent (11).

(11) Amir nempeling Bambang.
   A       ACT.slap  B
   'Amir slapped Bambang.'

The other passive of interest is the "accidental" or nonvolitional passive illustrated in (12).

(12) Bambang ke-tempeling Amir.
   B       PASS-slap  A
   'Bambang was slapped by Amir.'

Here the prefix ke- marks the construction which generally indicates that the agent performed the action accidentally.

I intend to show that the so-called "adversative" ke- -an construction is actually an accidental passive in which the final subject is thematically a goal, locative, or some other oblique.
1.1 Similarities between Accidental Passives and Adversatives

Adversatives share a number of properties with accidental passives aside from the prefix ke-. Again for brevity, I discuss only two here: (i) the non-volitionality of the "agent" and (ii) co-occurrence restrictions on aspectual and modal auxiliaries.

First, in an adversative either the action of the "agent" is not volitional or the situation is unexpected (hence the notion in many cases of adversity). Adversatives and accidental passives cannot be formed on causative bases, those denote a conscious agentivity. Causatives are formed with the suffix -kne, -kna, or -kake, depending on the dialect. Thus the adversative in (13b) and the accidental passive in (14b) are ungrammatical, whereas the di-passive counterparts (13c, 14c) are fully grammatical.

    A ACT.story-CAUS story to A
    'Amir told the story to Ali.'

    b.*Ali ke-crita-an crita Amir.
    A AD-story story A
    (Ali got told the story by Amir.)

    A PASS-story-LOC story A
    'Ali was told the story by Amir.'

(14) a. Bambang nuro-kne bayi-ne.
    B ACT.sleep-CAUS baby-DEF
    'Bambang made his baby sleep.'

    b.*Bayi-ne ke-turo-kne Bambang.
    baby-DEF PASS-sleep-CAUS B
    (The baby was put to sleep by Bambang.)

    c. Bayi-ne di-turo-kne Bambang.
    baby-DEF PASS-sleep-CAUS B
    'The baby was put to sleep by Bambang.'

Second, di-passives can occur with any of the full inventory of aspectual and modal auxiliaries, as seen in (15).

    B will PROG can PERF PASS-slap A
    'Bambang will be slapped by Amir.'
    'Bambang has been slapped by Amir.'
    'Bambang is being slapped by Amir.'
    'Bambang can be slapped by Amir.'
    'Bambang has been slapped by Amir.'

Accidental passives (16) and adversatives (17) can only occur with isa 'can' and mari, a perfective auxiliary.
    B can PERF will PROG already PASS-slap A
    'Bambang can be/has been slapped by Amir.'

(17) Siti isa/ mari/ *arep/ *lagi/ *wis ke-kancing-an lawang-e.
    S can PERF will PROG already AD-lock door-DEF
    'Siti can get/has gotten the door locked on her.'

The data above show that adversatives share certain crucial properties with
accidental passives, which one naturally expects in an analysis that treats them as
accidental passives.

1.2 Adversatives and Locative di-passives

Adversatives also share some grammatical properties with locative di-passives,
di-passives in which the final subject bears the goal, location, or source thematic
role (but crucially not benefactive). These constructions are marked by the -i
"locative" suffix, as in (18, 19).

(18) Bambang di-kirim-i bungkus (karo) Siti.
    B PASS-send-LOC package by S
    'Bambang was sent a package by Siti.'

    A PASS-come-LOC by B
    'Amir was visited by Bambang.'

The -i suffix also occurs on active, in which a goal, locative, or source is
focused (at times in preference to a theme argument), as in the counterpart to (18) in
(20a). A standard RG treatment of this phenomenon would take -i as registering
the advancement of a 3 or oblique to 2; (20a) would thus have the RN in (20b).

(20) a. Siti ngirim-i Bambang bungkus.
    S ACT.send-LOC B package
    'Siti sent Bambang a package.'

b.  
   kirim  Siti    bungkus  Bambang
        1     cho    2

It has been noted in some grammars of Javanese that -an is the counterpart of -i
in the accidental passive (e.g., Horne 1961, Poedjosoedarmo 1986). Here I
substantiate this analysis by demonstrating similarities between adversatives and
locative di-passives.
First, the predicates serving as bases for the two constructions are for all intents and purposes the same. Included in the list are:

(21) *uncal* 'throw', *tutup* 'close', *kirim* 'send', *sepak* 'kick', *ciprat* 'splash',
    *gawa* 'carry', *banjir* 'flood', *ilang* 'disappear'

Second, the constructions show parallel postverbal word order. First, the agent and the theme of each construction may occur as a bare NP and may occur in either order. Thus, in the locative passive in (22), either ordering of the theme *banyu panas* or agent *Bambang* is acceptable.

(22) Siti di-ciprat-i (Bambang banyu panas/ banyu panas Bambang).
    S PASS-splash-LOC B water hot water hot B
    'Siti was splashed with hot water by Bambang.'

As (23) shows, the same is true of the "agent" and theme of the adversative.

(23) Siti ke-ciprat-an (Bambang banyu panas/ banyu panas Bambang).
    S AD-splash B water hot water hot B
    'Siti got splashed with hot water by Bambang.'

Additionally, the possible placement of the emphatic element *lho* (which has various effects on the meaning of a sentence) and maneh 'again' are similar in the two clause types. Here, I illustrate only with *lho*. With a locative *di*-passive the emphatic element *lho* may precede the agent NP only when the agent takes prepositional marking. Thus, (24), in which *lho* follows the unmarked agent *anak-e* 'her child', is fine, while (25), in which *lho* precedes the agent, is only grammatical when the agent takes prepositional marking.

(24) Siti di-ciprat-i banyu panas anak-e lho.
    S PASS-splash-LOC water hot child-DEF EMPH
    'Siti was splashed with hot water by her child!'

(25) Siti di-ciprat-i banyu panas lho *(karo) anak-e.
    S PASS-splash-LOC water hot EMPH by child-DEF
    'Siti got splashed with hot water by her child!'

The adversatives in (26,27) show the same constellation of facts. However, the variant in which the "agent" is preceded by *lho* cannot be saved since the "agent" cannot take prepositional marking, (27).

(26) Siti ke-ciprat-an banyu panas anak-e lho.
    S AD-splash water hot child-DEF EMPH
    'Siti got splashed with hot water by her child!'

(27)*Siti ke-ciprat-an banyu panas lho anak-e.
    S AD-splash water hot EMPH child-DEF
    (Siti got splashed with hot water by her child!)
These facts indicate the close relationship of adversatives and locative di-passives. The analysis is further strengthened by the fact that accidental passives cannot take the locative -i suffix. Thus, (28,29) are ungrammatical solely because of the form of the suffix.

(28)*Bambang ke-kirim-i bungkusan.
   B PASS-send-LOC package
   (Bambang was (accidentally) sent a package.)

(29)*Siti ke-ciprat-i banyu panas anak-e.
   S PASS-splash-LOC water hot child-DEF
   (Siti was (accidentally) splashed with hot water by her child.)

Further support for analysis of -an as a locative suffix comes from its use as a locative suffix in Philippine languages such as Tagalog and its reconstruction as a proto-Austronesian locative suffix.

2. The Analysis

Having established that Javanese adversatives are simply accidental passives open to a general passive structure, it remains to account for their distribution. As passives with non-theme final subjects, adversatives such as (30a) will have the representation in (30b).

(30) a. Siti ke-ciprat-an banyu panas anak-e.
   S PASS-splash-LOC water hot child-DEF
   'Siti got splashed with hot water by her child.'

b. Under the interpretation in which the locative suffix registers advancement to 2, Siti will first advance from 3 to 2 and then to 1.

The problem for the theory of RG emerges when we consider the case of unaccusative bases. For example, within a standard RG account, (31a) would have the structure in (31b).

   car-DEF A PASS-fall-LOC rock
   'Amir's car got fallen on by a rock.'
Tiba 'fall' is arguably an unaccusative predicate in Javanese, so that the initial stratum in (31b) will contain a 2-arc but no 1-arc. In order to set up a transitive stratum for the passive structure, the initial 2 must advance to 1 and the goal, montor-e Amir 'Amir's car' must advance to 2; montor-e Amir can then advance to 1 via passive. The problem, of course, is that the structure in (31b) violates the 1AEX, and thus (31a) should be ill-formed. However, this appears to be the most reasonable analysis of the data.

Gerdt's (1992) Mapping Theory of RG provides a solution. In an attempt to explain the constellation of RG structures found in particular languages, Gerdt adds a level of morphosyntactic argument structure to "classical" RG. In Gerdt's Mapping Theory, three types of information about nominals are encoded: (i) its thematic relation, (ii) its grammatical relation, and (iii) its MAP (morphosyntactically-licensed argument position) if it has one. The MAPs in a language correspond to the "direct arguments", or the syntactically active arguments. A language will generally have a maximum of 2 or 3 MAPs depending upon whether or not most morphosyntactic processes (e.g., structural vs. inherent case, verb agreement, word order) apply to only subjects and direct objects or to subjects, direct objects, and indirect objects. Gerdt identifies Indonesian as a 2-MAP language; Javanese is a 2-MAP language for many of the same reasons. This means that a Mapping Theory representation of an active transitive clause would be as in (32).

(32) thematic relations: agent theme

grammatical relations: 1 2 (initial GRs in RG)

     | |  
MAPs     A B (final GRs in RG)

MAPs are ordered positions (represented as A, B, etc.) linked to morphological statements (e.g., active morphology licenses A, immediate postverbal position licenses B). In any given clause, the number of MAPs is based on three things: (i) the valence of the verb, (ii) MAP-reducing or -building morphology, (iii) the MAP threshold set for the language (here 2). Gerdt also includes a number of principles for linking GRs and MAPs, which we will not go into here; these are well-formedness conditions on linking akin to laws of RG and conditions on linking in other linking theories. A final bit of information is that unmarked associations of GRs to MAPs proceed in a vertical left-to-right fashion, as illustrated in (32). Marked associations involve non-vertical linkings or linking
a nominal not present in the valence of the verb. These are generally accompanied by morphological conditions and marking and parallel some of the relation-changing structures of RG, e.g., passive, 3-2 advancement, and so on.

To take two examples from Javanese, the passive clause in (10) would have the MAP representation in (33) and the 3-2 Advancement clause in (20) would have the MAP representation in (34).

(33) Passive (10)

\[ \ThetaRs: \quad \text{agent} \quad \text{theme} \]

\[ \text{GRs:} \quad 1 \quad 2 \]

\[ \text{MAPs:} \quad A \quad B \]

(34) 3-2 Advancement (20)

\[ \ThetaRs: \quad \text{agent} \quad \text{theme} \quad \text{goal} \]

\[ \text{GRs:} \quad 1 \quad 2 \quad 3 \]

\[ \text{MAPs:} \quad A \quad B \]

In the Passive in (33), the theme 2 links directly to the A MAP and the agent 1 is unlinked, and the B MAP is erased (denoted here by the line through it). In the 3-2 representation in (34), the agent 1 links to the A MAP and the goal 3 links to the B MAP; the theme is unlinked. The fact that the agent in (33) and the theme in (34) are unlinked accounts for their being morphosyntactically inert. Passive morphology is triggered when the highest GR goes unlinked, and LOC morphology is triggered when the 3/Obl is linked to a MAP.

Let us return to the adversatives. The MAP representation of (30) would be:

(35) \[ \ThetaRs: \quad \text{agent} \quad \text{theme} \quad \text{goal} \]

\[ \text{GRs:} \quad 1 \quad 2 \quad 3 \]

\[ \text{MAPs:} \quad A \quad B \]

Linking the goal argument with either MAP results in LOC marking, here -an since it is an accidental passive, and linking a lower-ranking GR to the A MAP triggers
passive morphology, here *ke-*). Note that a locative *di-*passive will have the same representation and morphosyntactic rules for the -*i* morpheme will parallel that for the -*an* morpheme and that for the *di-* morpheme will parallel that for the *ke-* morpheme. Accepting a representation such as (35) for (30) allows a solution to the problematic case in (31) that does not violate the 1AEX or any of Gerdts' Mapping Theory principles. The passive with the unaccusative base will have the representation in (36).

(36)  \( \Theta \text{Rs: } \text{theme goal} \)

\[ \begin{array}{cc}
\text{GRs:} & 2 & 3 \\
\text{MAPs:} & A
\end{array} \]

The representation in (36) results in the appropriate morphology. A goal argument is linked to a MAP, hence the verb takes the locative suffix -*an*. Additionally, the highest GR (here the 2) is not linked to the A MAP, thus yielding passive morphology. Importantly, the representation in (36) also serves for a locative *di-*passive with an unaccusative base, such as (37).

(37) Bambang di-teka-ni Amir.
    B PASS-come-LOC A
    'Bambang was visited by Amir.'

3. Conclusion

We have seen how treating Javanese adveratives as passives more correctly reflects a range of facts about Javanese than would a Union analysis. We have also seen that granting the passive analysis of could well provide support for Gerdts' Mapping Theory, granting the correctness of the 1-Advancement Exclusiveness or some close analogue. However, we have not yet explained the restriction of "adveratives" to unaccusative bases. As stated above, this restriction does not arise from a language-particular constraint on "adveratives" or *ke-* -*an* passives, rather this apparent restriction stems from a language-particular constraint on the construction responsible for locative morphology, 3-2 Advancement. This can only be recognized under the passive analysis of adveratives.

Quite simply, for reasons that remain obscure, 3-2 or Obl-2 advancement is possible only when there is an initial 2 (or in Mapping Theory terms a 2 GR). This restriction shows up in all passive constructions as well as actives. Thus, an unergative clause with a Goal, Locative, or Source argument will not allow the oblique to surface as a 2 or 1. In (38), we have such an unergative.

(38) Bocahbocah kuwi mlayu menyang toko kuwi.
    children that run to store that
    'The children ran to the store.'
However, for most speakers, advancing the locative to 2, resulting in loss of preposition and the addition of locative morphology, results in ungrammaticality in both actives (39) and $di$-passives (40).

(39)*Bocah kuwi mlayo-ni toko kuwi. children that run-LOC store that (The children ran to the store.)

(40)*Toko kuwi di-payo-ni bocahbocah. store that PASS-run-LOC children (The store was run to by the children.)

Although the reason for the constraint against Obl-2 advancement in the absence of a 2 is mysterious (a similar constraint has been noted by Aissen (1983) for Tzotzil and Chung (1976) for Indonesian), the illicitness of this construction in actives and $di$-passives reveals that the restriction of adveratives to unaccusatives among intransitive bases does not reflect a construction-specific constraint of the type suggested by Kana for Indonesian but follows from restrictions necessary elsewhere in the grammar.

Notes

*The Javanese reported on here is the familiar or Ngoko style spoken by young adults in Surabaya. I would like to thank Susanto Teng, Surtjahjo, and Djoko Luknanto for providing the data reported on here. This work was supported in part by the Graduate School of the University of Iowa and the University of Iowa Center for Asian and Pacific Studies.

References

At, by, to and past: An essay in multimodal image theory

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1. The Data. It is well known that prepositions are highly polysemous words, displaying a wide range of motivated but apparently unpredictable meanings. The prepositions at, by, to and past provide a good example.

In some contexts, the prepositions at and to are roughly synonymous:

(1)a. They looked at the house.
   b. They looked to the house.

There is a similar rough synonymy between by and past:

(2)a. They looked by the house.
   b. They looked past the house.

In these contexts, the prepositions at, to, by and past denote directions. At and to denote directions oriented toward contact with the landmark; by and past denote directions oriented toward--but to one side--of the landmark.

Despite these rough similarities, there are major differences in usage:

(i) to and past collocate readily with verbs of movement. In this context, to denotes reaching a location, whereas past denotes continuing further:

(3)a. They ran to the house.
   b. They ran past the house.

In the same context, by remains synonymous with past but at takes on rather different connotations:

(4)a. They ran at the house.
   b. They ran by the house.
That is, (3a) entails that they reached the house; (4a), merely that they approached it.

(ii) At and by collocate readily with verbs of static position. In this context, at denotes spatial coincidence and implies the presence of functional interaction; by denotes spatial proximity and implies a lack of functional interaction:

(5)a. They are at the house.
   b. They are by the house.

(6)a. They are at the gate.
   b. They are by the gate.

Notice that at can denote either coincidence with a region apprehended as a point or proximity (Cuyckens 1984). In the same context, to is ungrammatical, whereas past takes on an endpoint-focus interpretation in which it denotes location at the end of a path which goes by the landmark:

(7)a. *They are to the gate.
   b. They are past the gate.

Note the contrast between by and past: (6b) denotes location to the side of the gate; (7b), location beyond the gate.

(iii) At and by have senses in which they collocate with measure nouns and denote clearance from the landmark. In this context, at denotes how far TR is in front of LM, and by denotes how far TR is to the side of LM:

(8)a. I missed at a hundred yards.
   b. I missed by a hundred yards.

The prepositions past and to have no such senses:

(9)a. *I missed to a hundred yards.
   b. *I missed past a hundred yards.

(iv) The applicability of at and by seems to depend upon the presence of an orienting surface, typically but not necessarily the surface of the Earth. To and past are compatible with any orientation. To illustrate the point, consider the following situations:

(10) The speaker holds a penny in midair and places a finger in front of the penny.

(11) The speaker tapes a penny to a wall and then places a finger in front of the penny.

In situation (10), one cannot felicitously assert My finger is at the penny. In situation (11) one can. Similarly, consider situations (12) and (13):
(12) The speaker holds a loose doorknob in midair and places a hand underneath the doorknob.

(13) A doorknob is in its normal position on a door. The speaker places a hand underneath the doorknob.

In situation (12), one cannot felicitously assert My hand is by the doorknob. In situation (13), one can.

These examples illustrate the fact the presence of a salient surface in the background can significantly alter the contexts in which at and by are appropriate. To and past are not context-sensitive in the same way. Thus sentences like (14) could be used of either (10) or (11), while (15) could be used of either (12) or (13):

(14) a. I moved my finger to the penny.
    b. I am moving my finger past the penny.

(15) a. I put my hand to the doorknob.
    b. I am waving my hand past the doorknob.

2. Accidental polysemy or semantic regularity? There are at least two analytical approaches that can be taken to the kind of data we have just examined. One hypothesis would postulate that the irregularities in the data reflected accidental polysemies. One could conclude, for example, that there are two prepositions at: a locative at which describes spatial coincidence and a adative at which describes approach. One might conclude, equally, that at and by just happen to have 'distance' senses in sentences like (8), a sense which the prepositions by and past just happen to lack. On this view, the prepositions by and past in their directional uses come very close to true synonymy: it just happens that by but not past has developed a static locative sense, while past but not by has developed an endpoint focus sense. This view is quite common. It is the view adopted in Jackendoff (1991: 72), Sweetser (1986: 532), and Choi and Bowerman (1991: 112). Once it is assumed that a distributional pattern reflects accidental polysemies, the only issue that remains is whether there is a motivated relation among the meanings (polysemy) or if the relation is unmotivated (homonymy). Once this point has been decided the description stops.

On the other hand, if we assume that distributional irregularities reflect underlying semantic regularities, we have a much more difficult analytical task, but the explanatory potential is much greater. Consider, for example, the preposition at. In locative uses, at often carries an implication of functional interaction (Herskovits 1986: 135). If locative at is considered in isolation, the analysis essentially stops at that point. We may note that other proximity prepositions, such as by, do not carry the same implication, and thus conclude that the implication is lexically associated with the word, but we cannot explain why the word the lexical association exists. On the other hand, if we consider adative uses of at, such as I charged at the enemy, we immediately note that at carries very similar
implications: orientation toward the landmark with intent to engage. We may then hypothesize that one basic element of at’s meaning is the idea ‘oriented so as to interact with the landmark’. If our semantic theory allows us to predict when this element will be present and when it can be suppressed, we will end up with a much more useful account. Even if it is difficult to account for apparent irregularities, the hypothesis of semantic regularity deserves to be pushed as far as possible, for regularities not looked for are certain not to be found.

The author has been developing an approach to the semantics of spatial prepositions which instantiates the hypothesis of semantic regularity (cf. Deane 1993a, b). This approach, which may be termed **multimodal image theory**, is inspired in part by recent findings in the neuropsychology of spatial cognition (cf. Paillard, ed., 1991). This framework may be briefly described as follows: To begin with, a distinction is made between three types of spatial image, each of which constitutes a separate modality of spatial thought:

(i) **Visual space** images, which represent spatial relationships in terms of such variables as occlusion, visual separation, angle of gaze, etc. The obvious function of visual space images is to interpret visual information in spatial terms. Visual space images presuppose a visual frame of reference in which position is calculated relative to the line of gaze.

(ii) **Maneuver space** images, which encode the kind of information needed for fine motor control, such as the clearance between objects or the effects of moving or rotating one object when it is close to another. Maneuver space images presuppose an object-centered frame of reference in which position is calculated relative to the surface of a reference object.

(iii) **Kinetic space** images, which encode the kind of information necessary to calculate force-dynamic interaction (cf. Talmi 1985), such as conceptual paths which define direction (and potential) for movement, degree of impetus, and resistance to impact. Kinetic space images presuppose a dynamic frame of reference in which the up-down dimension is defined by gravity and the forward-back dimension by the orientation and (potential) movement of a reference entity, often the speaker or a viewpoint character.

The second characteristic of the framework is that it defines spatial relations as clusters of images in which each image defines some view or aspect of the whole. For example, Deane (1993a, b) defines over in part by the following cluster of visual space images:
(17) characterizes prototypical over by defining what it looks like under varying perceptual conditions. (13a) provides a side view: at this angle, we observe that TR is higher than LM and separated from it by a gap. (13b) provides a top view: at this angle we observe that TR partially blocks off our view of LM. (13c) provides a blurred side view, such as we might obtain at a distance. Under these conditions, TR appears to touch LM: indicating that they are relatively close, as a larger gap would remain visible even in a blurred image. Finally, (13d) provides a blurred top view, in which TR appears to cover LM.

The third characteristic of the framework is that it provides principles by which to predict polysemy and lexical irregularity, at least with regard to a preposition's spatial meaninngs. There are two major principles:

(i) Semantic variants of a preposition are derived from its prototype by combining images from its prototype. In other words, the images which define a preposition are assumed not only to define its meaning but to provide a kind of prototype by functioning as preference rules in the sense of Jackendoff (1983, 1991).

(ii) Irregularities and gaps are assumed to reflect either an underlying difference in meaning or the blocking effects of paradigmatic opposition. That is, a preposition's semantic variants must be distinct from the prototype for any competing competition. For example, (18) is not a permissible variant of (17) because it will form (part of) the prototype for on:
In what follows, prototypes will be proposed for the prepositions past, by, to, and at. In each case, the word's polysemy and basic distribution can be deduced from the prototype.

3. Past vs. By. Within the theory under consideration, the preposition past has a very simple semantic representation. Consider (19):

(19) TYPE OF IMAGE: Kinetic Space
PREPOSITION DEFINED: past
ARGUMENT STRUCTURE: TR=external argument;
LM=object of past

The images in (19) contain four elements: a moving object, TR; a reference object, LM; the path along which TR is being tracked, and an interaction zone around LM which defines the region within which TR is capable of interacting dynamically with LM. (19a) is the key image: it describes a relation in which TR is passing along a path which traverses LM's interaction zone and emerges on the other side. (19b) represents the anticipated final state of (19a) in which TR has reached the end of the path. In the present theory, the concept PATH is only defined in kinetic space images; endpoint focus, or tracking a path to its endpoint, is an automatic process. There are thus two possible combinations: (19a) plus (19b), in which past indicates the direction of movement or orientation, and (19b), in which it defines location at the end of a path. Notice that these images predict the word's syntactic distribution more or less automatically. The sequence (19a) plus (19b) can only be interpreted as an indication of movement or direction; it is thus compatible only with verbs like point or move which indicate the appropriate dynamic patterns. On the other hand, a static verb like stay or stand is compatible with (19b) but not with the dynamic sequence (19a) plus (19b). The theory thus predicts that past will take on an endpoint focus sense with static verbs like stay or stand.

Contrast the preposition by. It is a rather more complex preposition that past, a fact which is reflected in the complexity of the proposed definition:
(20) **Word Defined:** **by**  
**Argument Structure:** TR = External argument  
LM or clearance = object of by

1 MANEUVER SPACE IMAGE

1a  
TR <clearance> LM  
GROUND  
No rotation  
No displacement

1b  
greater TR <clearance> LM  
GROUND  
No rotation  
horizontal displacement (before or after current position)

2 KINETIC SPACE IMAGE

\[ \uparrow \uparrow \quad ^{\text{TR}} \quad ^{\text{LM}} \]

(20) defines by in two different systems of images. On the one hand, the word carries strong implications of a lack of functional interaction, as in They just stood by the fight and watched. The implication can be explained as follows. Kinetic space images represent spatial relationships in terms of their functional implications. Thus, if A is by B, we infer (i) that A is close enough to B to interact with it; (ii) That A isn’t actually interacting with B; (iii) That if A moves, it will move past B not not towards it. These implications, however, are simply one aspect of the meaning of by. The word must be defined in very different terms if we are to capture its meaning more fully.

The remainder of (20) provides a definition for by using maneuver space images. Maneuver space focuses on the kinds of spatial information which is critical for fine motor control, such as manipulation of objects with the hands, or maneuvering through a crowd. In (20), for example, the maneuver space images indicate the following facts: (i) that TR and LM are about the same distance from the surface of the ground (the surface of an object which provides the local frame of reference.) (ii) that there is clearance between TR and LM; (ii) that if TR is displaced parallel to the surface of the ground, it continues to clear the LM.
Notice how (20) accounts for the polysemy and distribution of by as a preposition of spatial proximity:

(i) The preposition is not associated with a path image in kinetic space; it is thus incapable of developing an endpoint focus sense.

(ii) If we select one of the maneuver space images, we define a static relationship in which TR is close enough to LM to require us to calculate the clearance between them. This yields the basic proximity sense of by which collocates with verbs of static location.

(iii) The combination of images (1a) and (1b) jointly define a direction of displacement in which TR's current position is its closest approach to LM. This yields the directional sense of by which collocates with verbs of motion and orientation.

(iv) Images (1a) and (1b) prominently feature the clearance between TR and LM. If we background the actual landmark and profile the clearance instead, we can account for the use of by to indicate degree of clearance as in (8b).

(v) Maneuver space images are always oriented to a local frame of reference defined by the surface of the ground object. This accounts for the fact that walls and other flat surfaces can alter the applicability of by: they provide an alternate frame of reference.

4. To vs. At. Examination reveals that to contrasts with at much as by contrasts with past. We may set up the following set of contrasts:

<table>
<thead>
<tr>
<th>Defined in Kinetic Space</th>
<th>Defined in Maneuver Space and Kinetic Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poised to Approach LM</td>
<td>TO</td>
</tr>
<tr>
<td></td>
<td>AT</td>
</tr>
<tr>
<td>Poised to Bypass LM</td>
<td>PAST</td>
</tr>
<tr>
<td></td>
<td>BY</td>
</tr>
</tbody>
</table>

However, a crucial asymmetry breaks the parallelism between at and by. The preposition by always denotes static position; it can never be used to describe location after bypassing LM:

(21)a. I am standing by the gate.
       b. I am now by the gate. (This does not mean 'I have now bypassed the gate')

The preposition at, by contrast, can be used to describe either (a) static location or (b) location after approaching. That is, one can say either (22a), which is essentially static, or (22b), which implies previous movement:


(22)a. I am standing at the gate.
    b. I am now at the gate.
    (This does mean 'I have now approached the gate')

These results imply that at must be associated not with one kinetic space image, as was proposed for by, but with two. One image indicates static location, the other location after movement.

The following prototypes may therefore be proposed:

(23) Type of image: Kinetic Space
    Word defined: to
    Argument Structure: TR=external argument; LM=object of to
    a. ........................................  b. ........................................
    \[ \text{TR} \rightarrow \text{LM} \]

Note that the preposition to does not have an endpoint focus sense. This is a direct consequence of the fact that at and to share the endpoint focus image. Since the image is shared, the principles of the theory predict that it cannot be isolated as a semantic variant. Since the preposition to is only associated with two images, the net effect is to bar to from developing an endpoint focus sense. It can only be used to indicate motion or orientation along a path.

On the other hand, the preposition at is associated with a rather wide variety of images. It therefore displays a wide range of meanings. Since image 2a is shared with the preposition to, this image cannot be isolated as a separate sense. The result: at is not directly interpretable in an endpoint-focus sense. Image 2a can only appear if combined with some other image. For example, if combined with image 2b or the maneuver-space images in (1), it yields sentences like (24):

(24) The enemy are now at the door.

(24) describes the enemies' position as resulting from movement toward the door, but it adds other nuances: the nuance of image 2b, most likely, implying that the enemy are ready to use the door, but possibly implying that there is some clearance between enemy and door (image 1a).

Pure maneuver-space interpretations are also possible. For example, when at combines with a verb of static location, we obtain sentences like (25):

(25)a. Jane is camping at the castle.
    b. John is camping at the bottom of the cliff.
(25a) is a typical use of at with concrete nouns. The maneuver-space ground is the surface of the earth; the castle is construed as a location on the ground. Jane is located not in contact with the castle but where movement is likely to bring her into contact with it. In other words, Jane must be either in or by the castle. (25b) is a slightly different use, what Herskovits (1986: 136-137)

(26) **Word Defined:** at

**Argument Structure:**

\[ TR_1 \text{ or } 2 = \text{external argument} \]

\[ LM_1 \text{ or } 2 = \text{object of at} \]

<table>
<thead>
<tr>
<th>1 MANEUVER SPACE; Center of Field: TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1a TR clearance</td>
</tr>
<tr>
<td>___ LM movement ___________</td>
</tr>
<tr>
<td>ground ___________________________</td>
</tr>
<tr>
<td>No rotation</td>
</tr>
<tr>
<td>No displacement</td>
</tr>
<tr>
<td>1b TR ground</td>
</tr>
<tr>
<td>___ LM ground ___________</td>
</tr>
<tr>
<td>No rotation</td>
</tr>
<tr>
<td>Horizontal displacement</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 KINETIC SPACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a TR = TR &gt; LM</td>
</tr>
<tr>
<td>___ ___ ___ ___ ___ ___ ________ ___</td>
</tr>
<tr>
<td>2b TR &gt; LM</td>
</tr>
</tbody>
</table>

The maneuver space images also yield appropriate results when combined with a verb of motion. The two images (1a) and (1b) imply a direction of movement: toward contact with the landmark. But they also imply that contact is not actually achieved at the trajector's current location. And this is exactly the sense at has in sentences like (28):
(28)a. They ran at me.  
   b. They hit at me.

(28) implies that the trajector never actually reached its goal: at the end of the action, there was still clearance between the trajector and the landmark. This is exactly what (24) predicts. Notice that at, like by, can take a NP denoting the clearance as its object. This accounts for sentences like:

(29) He misses at 100 yards.

Finally, (24) accounts readily for uses of at to describe functional interaction. As Herskovits (1986: 135-136) notes, this is a frequent use of the word:

(30)a. Jane is at her desk.  
   b. John is at the wheel.

This interpretation can be derived by isolating image 2b from (24). The prototypes for at and by also account well for certain additional differences between them. It is difficult to use at with respect to a person, whereas by is normal:

(31)a. John is by his brother.  
   b. ??John is at his brother.

This difference follows from the fact that at requires its LM to be a location on the ground; people are not normally construed as locations. By, by contrast, defines LM as a separate object at the same level as TR: a condition readily fulfilled when one person is placed next to another. Note that in (30a), by implies that John is not facing his brother. This follows because John must be positioned so that he is poised to bypass his brother.

The prototypes we have postulated also account for certain well-known contrasts between at and by:

(32)a. Jane is at her desk.  
   b. Jane is by her desk.

At is appropriate only if Jane is expected to move toward contact with her desk, i.e., if she is likely to make use of it. By, on the other hand, implies that Jane is likely to move away from her desk, i.e., has an impetus directed away from the desk--an expectation incompatible with the expectation of imminent use.

15. Conclusion. The chief purpose of this paper has been to explore the idea that it is possible to explain and possibly even predict the polysemy and distribution of spatial prepositions. While the analysis presented here is of necessity exploratory, the results are encouraging. To sum up:

(i) There are two ways that a preposition may combine with a verb of motion or orientation. On the one hand, it may directly
denote a path in kinetic space. On the other, it may describe a
direction-of-displacement in maneuver space. This is why there are
such similarities between by and past, on the one hand, and at and
to on the other. They define similar directions even if they do so in
very different ways.

(ii) Past has an endpoint-focus sense because it describes
location along a path in kinetic space. By has no endpoint-focus
sense because it is defined primarily in maneuver space; its only
kinetic-space image defines a static location. To would have an
endpoint-focus sense, but it shares the relevant image with at. The
shared image prevents to from having an endpoint-focus sense at all.
At can provide a functional substitute, but only if additional nuances
are added which keep at distinct from to, such as being poised to
functionally interact with the landmark.

(iii) At and by can be used to describe clearance from the
landmark because they define relations in maneuver space, where
clearance is a salient spatial property. To and past lack clearance
senses because they lack maneuver space images upon which such a
sense would be based.

(iv) The applicability of at and by can be altered by the
presence or absence of walls, ceilings, and other surfaces because
they are oriented in maneuver space. Maneuver space images always
require a local surface to define their horizontal and vertical
dimensions. To and past are not context-sensitive in their orientation
because they are defined in kinetic space without reference to
extrinsic dimensions.

To the extent that such results can be replicated and extended
for other prepositions, they suggest that prepositional polysemy is a
predictable phenomenon. If this is correct, it is an important result.
Polysemy has traditionally been the 'problem child' of lexical
semantics, a phenomenon generally swept under the rug because it
resisted available techniques. Recent approaches to polysemy, such as
& Lakoff (1988), have often achieved descriptive adequacy by
distinguishing a large set of meanings and listing them exhaustively. If
polysemy can be predicted, linguistic semantics may face entirely new
prospects for explanatory adequacy.

References

Brugman, Claudia. 1981. The Story of Over: Polysemy, Semantics, and
the Structure of the Lexicon. University of California, Berkeley
M.A. Thesis.

Brugman, Claudia and George Lakoff. 1988. Cognitive topology and
lexical networks. In Steven I. Small, Garrison W. Cottrell, and
Michael K. Tanenhaus, eds., Lexical Ambiguity Resolution:
Perspectives from Psycholinguistics, Neuropsychology, and


On Genericity: A Case Study in Czech
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1. Properties of VA-Sentences and Previous Treatments
Czech has a large class of so-called habitual or iterative verbs that are derived with the suffix -va- from simple and derived imperfective verbs:

(1-a) \[
\text{simple imperfective verb} \\
p\text{sd}t \text{‘to write’} \\
\rightarrow \\
\text{derived imperfective VA-verb} \\
p\text{sd}v\text{at}
\]

(1-b) \[
\text{derived imperfective verb} \\
z\text{apisovat} \text{‘to note, to record’} \\
\rightarrow \\
\text{derived imperfective VA-verb} \\
z\text{apisovd}v\text{at}
\]

Unlike in some other Slavic languages (Russian, for example, cf. Isačenko 1962:405-7; Comrie 1976:27; Kučera 1981:177), in Czech this derivation process is very productive and such derived VA-verbs can be found in all the styles of speech (cf. Kučera 1981:177). The suffix -va- may be repeated for emphasis, which gives rise to a set of expanded verbs: \(p\text{sd}^1\text{t} \text{‘to write’} \rightarrow p\text{sdv}^1\text{at} \rightarrow p\text{sdvdv}^1\text{at}\).

The suffix -va- is typically found on the main verb in such generic sentences as those in (2a) to (2e) (examples are taken from Kučera 1981:182):

(2-a) \(\text{Petr mi p\text{sával}.}\)  
‘Peter used to write to me.’

(2-b) \(v\text{ sobotu P\text{avel s}d\text{áv}v\text{á v} h\text{ospod}ě.}\)  
‘On Saturday, Paul (usually) sits in the pub.’

(2-c) \(n\text{ěmci m\text{l}uv\v{r}ají šp\text{atn}ě ě\text{cs}ky.}\)  
‘Germans tend to speak Czech badly.’

(2-d) \(r\text{u\v{f}t}‘\text{g}ener\text{d}l\v{r}ově u\text{m}í\v{r}\v{a}j\v{r} v m\v{l}ad\v{e}m v\v{e}k\u{u}.\)  
‘Russian generals tend to die young.’

(2-e) \(\text{Čapek v tě\v{c}ch letech p\text{sával} r\text{om\v{a}ny.}\)  
‘Čapek wrote (mostly) novels in those years.’

The basic property of sentences with VA-verbs is traditionally seen as expressing an iteration, a habit, or a regularity. The suffix -va- is optional, its use is a sufficient, but not a necessary, condition for this interpretation. In an appropriate context, generic sentences in (2) can be replaced by the corresponding sentences without the suffix -va- on the main verb. For example, (2a) can be replaced by

(2-a’) \(\text{Petr mi psal.}\)  
‘Peter wrote to me / Peter was writing to me’

as (2a’) has two contextually-determined uses: it reports a habit or a particular episode.

Kučera (1981), who, to my knowledge, provides the only recent and systematic analysis of sentences with VA-verbs, claims that such sentences as (2a) - (2e) express quantified states and “this quantification may manifest itself in various ways. It may, of course, apply to the predicate verb itself [2a], in which case the sentence designates a proper habit, that is, a state that arises from repeated or recurrent activity, accomplishment,
or achievement. But the quantification may also extend over the scope of a temporal adver-
bial in the sentence [2b], or the subject of the sentence [2c, 2d], or - more rarely - even the
object of the verb [2e]" (Kučera 1981:182). Hence, according to him, it does not seem to
be possible to provide a uniform analysis for such generic sentences as (2a) - (2e).

What is puzzling about the use of the suffix -va- is the fact that it is used in sentences
that normally do not denote a regularity or a habit. For example, in its most natural
interpretation, (3a)

\[
(3-a)\quad \text{Na tom kopci stával hrad.} \\
\quad \text{on that hill stood-HAB-3SG castle-SG-NOM}
\]

‘There used to stand a castle on that hill.’

asserts that the castle stood on a hill throughout a certain single uninterrupted interval.
Under this interpretation, (3a) does not entail that there were several situations on each of
which the castle stood on a hill, with intervening subintervals when it did not.

There is one important feature that both the generic VA-sentences ((2a) - (2e)) and
simple state VA-sentences ((3a)) share in common: they have a ‘remote past reference’ (cf.
Kučera 1981). Kučera (1981) speculates that "there is a distinct connection between
quantification and such a digitalization of the past continuum" (Kučera 1981:184). How-
ever, neither he nor anybody else has succeeded in providing an explanation for this puta-
tive connection. In this respect he sharply departs from the traditional-structuralist ana-
lyses (markedness theory) in which such a connection is implicitly denied, because it is
assumed that the basic property of sentences with the suffix -va- is to express an iteration
or a habit, and the ‘remote past tense’ is simply listed as a separate meaning. This point of
view is evident in the common practice in Slavic linguistics to label the suffix -va- as a
‘habitual suffix’ and the whole class of the verbs to which it is attached as iterative verbs.1

Another puzzle is posed by the fact that the present tense counterparts of such sen-
tences as (3a) are almost always unacceptable. Consider (3b):

\[
(3-b)\quad \text{??Na tom kopci stával hrad.} \\
\quad \text{??on that hill stands-HAB-3SG castle-SG-NOM}
\]

‘There usually stands a castle on that hill.’

And finally, we need to account for the fact that the suffix -va- is unacceptable in sen-
tences expressing exceptionless, unchangeable states of affairs:

\[
(4)\quad \text{??Země se točívá I kolem slunce.} \\
\quad \text{??earth-SG-NOM REFL revolves-HAB-3SG around-PREP sun-SG-GEN}
\]

‘The earth tends to revolve around the sun.’

In view of the properties of VA-sentences described here, I will address the following
questions:

(i) Is there a common denominator for all the distributional facts?
(ii) Given that the suffix -va- appears to extend its scope over different constituents in such
sentences as (2a) - (2e), for example, and given that it is used in sentences with and
without generic interpretation, is it possible to provide a uniform analysis for it?
(iii) Is there any connection between the kind of genericity associated with VA-sentences and the 'remote past' interpretation?

The analysis of Czech characterizing sentences in this paper presupposes the account of generic sentences given in Krifka, M., Pelletier, J., Carlson, G., ter Meulen, A., Link, G., Chierchia, G. in their Introduction to The Generic Book (edited by L. Schubert and J. F. Pelletier, 1992, ms.). In the next section, I will give a brief outline of their framework.

2. General Framework

Krifka et al. point out that two distinct phenomena have been subsumed under the notion of GENERICITY. These are what they label as REFERENCE TO KINDS and CHARACTERIZING SENTENCES. Reference to kinds can be illustrated by such sentences as The potato was first cultivated in South America, Potatoes had been introduced into Ireland by the end of the 17th century, The Irish economy became dependent upon the potato, and Gold is a precious metal in which the NPs in bold type are called kind-referring or generic NPs. A characterizing sentence such as Pluto chases trucks is said to express a habit or a regularity that arises out of a number of specific episodes that are denoted by the corresponding PARTICULAR SENTENCE Pluto is chasing the UPS truck.

In this paper I focus on characterizing sentences, as this type is instantiated by the Czech generic sentences with the suffix -va-. According to Krifka et al. the type of genericity expressed in characterizing sentences is associated with the following two properties, among others:

(i) Characterizing sentences "express 'principled' generalizations over the entities of a class, and cannot capture 'accidental' facts about them" (Krifka et al., 1992, II, p. 31). However, they do allow for 'exceptions' or 'counterexamples'. This feature clearly distinguishes them from universal statements.

(ii) "[T]he type of genericity found in characterizing sentences is tied to sentences rather than to NPs" (Krifka et al., 1992, II, p. 1). The characterizing reading may be enforced, for example, by various sentence adverbs (usually, always, often, rarely, typically), by auxiliaries (as in the English used to construction), and also by verbal affixes on main verbs (e.g., the suffix -va- in Czech).

In Krifka et al., characterizing sentences are analyzed in terms of a tripartite semantic representation that has the following general form: QUANTIFIER (RESTRICTOR) (MATRIX). The general principles of quantifier interpretation in terms of a tripartite structure were suggested by Lewis (1975), Kamp (1981) and Heim (1982). For example, a sentence like (5a)

\[(5\text{-a})\quad \textit{Oranges are usually sweet}\]

has the semantic representation as in (5b)

\[(5\text{-b})\quad \begin{array}{c}
    \text{S} \\
    \text{QUANTIFIER} \\
    \text{usually} \\
    \text{RESTRICTOR} \\
    \text{x is an orange} \\
    \text{MATRIX} \\
    \text{x is sweet}
\end{array}\]
In (5b), the variable $x$ introduced in the restrictor by the bare subject NP *oranges* is bound by the operator *usually*. Characterizing sentences which lack an overt quantificational adverb are represented with an abstract generic operator GEN, as in (6b)

(6-a) *Oranges are sweet*

(6-b) GEN [x:] (x is an orange ; x is sweet)

The representation of characterizing sentences in terms of a tripartite structure captures in a straightforward way the observation that the type of genericity associated with characterizing sentences takes sentential scope, and that it should be described as being similar to such adverbs as *usually*, *typically*, *occasionally*, that are not only close in meaning to the generic operator but also function as sentential adverbs.


3. Suggested Analysis

3.1. The Suffix "-VA-" as a Quantifier: Tripartite Semantic Representation

If we assume that the suffix *-va-* functions as a dyadic quantifier that relates two predicate meanings, all the disparate ways in which the quantification induced by the suffix *-va-* appears to manifest itself can be described in a uniform way. Take a characterizing sentence such as (2c), repeated here as (7a):

(7-a) Nemči mluvívačí špatné česky.

German-PL-NOM speak-HAB-3PL badly Czech

‘Germans tend to speak Czech badly.’

(7a) can be represented as in (7b):

(7-b) GEN [x,s:] (x is German & s is a situation ; x speaks Czech badly in s)

In (b), the generic (characterizing) operator VA quantifies over pairs of individuals and situations, indicated by the individual variable $x$ and situation variable $s$. In general, the quantifier in a tripartite structure can bind more than one variable and it binds all those variables that occur free in the restrictor clause. Other variables are bound existentially within the matrix. Following Lewis (1975), a quantification over more than one entity can be labelled ‘quantification over *cases*’.

The idea of quantification over situations goes back to Lawler (1973). The situation variable was introduced by Kratzer (1989) who draws on Carlson’s distinction (1977a,b) between individual-level and stage-level predicates, and on Davidson’s event variable. Kratzer (1989) argues that the difference between these two types of predicates should be represented in terms of the difference in their argument structure. Stage-level or episodic predicates, such as *to be dancing on the lawn*, have a situation ("spatiotemporal") external argument that can function as a variable in quantificational contexts and it can be bound by various quantificational operators (adverbs, verbal affixes). Individual-level or static
predicates, such as *to be a dancer* on the other hand, have no situation argument.

Characterizing sentences (2a), (2b), (2c) and (2e) express generalizations over situations. Such characterizing sentences are called *habitual* sentences and they have the following general form (cf. also Krifka et al., II, p. 16):

\[(8) \quad \text{GEN [...s...]} \text{ (restrictor [...s...]; matrix [...s...])}\]

The situation variable may be overtly specified by a temporal adverb (on *Saturday*, as in (2b), *in those years*, as in (2e)) or by a subordinate clause. If the linguistic context does not specify the situation variable *s* (as in (2a) and (2c)), the restrictor is left underspecified and the VA operator is interpreted in such a way that it generalizes only over those situations which are in some sense relevant. The restriction to the relevant set of situations is then supplied by the context, on the basis of world knowledge, of the general pragmatic principles that govern the use of habitual sentences in the discourse (cf. Spears (1974), Newton (1979), Conrad (1982), Kleiber (1985), Krifka (1987), Schubert and Pelletier (1989); Krifka et al. (1992).

Example (2d), repeated here as (9a)

\[(9a) \quad \text{Rušťi' generalové} \quad \text{uměřávaji'} \quad \text{v} \quad \text{mladém} \quad \text{vešku.}\]

Russian generals die-HAB-3PL in-PREP young age

‘Russian generals tend to die young.’

illustrates an interesting case, as the operator VA does not, under the most typical interpretation of (9a), quantify over a situation variable, even though it has an episodic predicate in its scope. Such episodic predicates as *uměřat*¹ 'to die' are telic and denote an irreversible transition from one state to another to which a particular individual can be subjected at most once. Since each particular individual can die only once, the situation variable is tied to only one occasion for any given individual. Hence, characterizing sentences with such predicates do not generalize over situations, but rather over individuals, as is shown in (9b)

\[(9b) \quad \text{VA [x:] (x is a Russian general; x die young).}\]

Given that the denoted event is "non-resettable" with one and the same particular individual, the individual variable must not be tied to a particular individual. This motivates the fact that the following characterizing sentence is pragmatically deviant:

\[(10) \quad ??\text{Petr Veliký'} \quad \text{uměřává} \quad \text{v} \quad \text{mladém} \quad \text{vešku.}\]

??Peter Great dies-HAB-3SG in-PREP young age

‘Peter the Great tends to die young.’

We can think of less usual situations or worlds in which the above sentences may be ascribed a plausible reading (for example, in the following context: ‘In Russian movies, Peter the Great tends to die young’).

What is crucial then for characterizing sentences is that they "must have at least one variable to generalize over. That is, there must be at least one variable which is not explicitly tied to some particular object. If this were not the case, they would merely state that a certain particular object (as described by the restrictor) has a certain property (as described by the matrix), and they can no longer express a ‘generic’ fact" (Krifka et al., II, p. 17). This finding is formulated as in (11):
(11) 
"An expression \( Q [...;... ] \) (restricctor [...x...]; matrix [...{x}...])

is a generalization over \( x \) iff it allows for models in which there is more than one value for \( x \) for which \( \exists [\text{restricctor} [...x...]] \) is true (where \( \exists \) binds all free variables except \( x \))" (Krifka et al. II,17).

This general statement subsumes as a special case Kopečnýs (1962) "non-actuality" property which is taken to be the salient feature of characterizing sentences and it captures the fact that they are incompatible with temporal adverbials indicating specific time points. This is shown, for example, by the following characterizing sentence:

(12):

*Pavel hrával \( ^{I} \) šachy včera v sedm hodin večer.

*Paul played-HAB-3SG chess yesterday at seven o'clock evening

*‘Paul used to play chess yesterday at seven o'clock.’

(12) is ungrammatical, because the situation and individual variable are tied to a particular single reference point and to a particular individual, respectively.

The quantificational analysis in terms of a tripartite structure has the advantage that it provides a unified account of the operator \( VA \) in characterizing sentences. And this is an important theoretic improvement on the previous accounts, in particular on Kučera (1981). Assuming that the operator \( VA \) functions as a quantifier over "cases" set up in the restricctor, and that such "cases" involve specifications of time, location, participants, and so on, the different ways the operator \( VA \) affects the interpretation of characterizing sentences can be accounted for in terms of the differences in mapping of lexical material into the restricctor and matrix. The partition of the semantic material into these two semantic constituents depends not only on the syntactic position (cf. Diesing’s (1992) Mapping Hypothesis\(^6\)), but it is also related to stress placement, and the topic-focus structure of a sentence, among other things.

This analysis also provides an explicit motivation for the restrictions on the occurrence of determiner quantifiers, adverbs of quantification and numerals in characterizing sentences. In the next two sections, I will discuss some of these constraints.

3.2. Conditions on the Restrictor

3.2.1. Constraints on the Subject NP (Strong/Weak Determiners, Milsark 1974)

Krifka et al. observe that characterizing sentences can contain proper names, definite singular NPs (John/My brother drinks whiskey), indefinite singular NPs (A professor drinks whiskey), quantified NPs (Every professor drinks whiskey), bare plural NPs (Professors drink whiskey) and bare mass NPs (Milk is healthy). On the basis of such examples, they conclude that characterizing sentences impose no limitations on the kind of NPs which occur in them, "[t]he subject (or other NP) of a characterizing sentence may be ANY TYPE OF NP" (Krifka et al. 1992, II, p. 2). And hence the type of genericity found in characterizing sentences does not stem from any particular NP.

I propose that this conclusion must be modified, in view of the following sentences, among others:
These examples show that characterizing sentences that are formally marked with the suffix -va- on the main verb are incompatible with universally quantified subject NPs, while sentences without this suffix CAN be universally quantified.

In (13a), the plural subject NP introduces an individual variable into the restrictor clause. Following Link (1983), I assume that plural NPs represent sum individuals, that is, they represent individuals that consist of other individuals. In (13a’) the variable x ranges over such a sum individual, and it is bound by the universal quantifier ‘all’. Given that the stative predicate be good musicians has a distributive interpretation, (13a’) is true if it is true for every individual denoted by the subject NP that this individual is a good musician.

The semantic representation (13b’), which underlies (13b) is ill-formed, because the variable x is bound by the universal quantifier ∀ in the restrictor, and it cannot be at the same time bound by the quantifier VA. The formula (13b’) does not contain any other free variable for the quantifier VA to bind. If we assume that there is a general prohibition against vacuous quantification in natural language (cf. Milsark (1974), Chomsky (1982), Kratzer (1989), for example), the ungrammaticality of (13b) is accounted for:

(14) **Prohibition against vacuous quantification**
    For every quantifier Q, there must be a variable x such that Q binds an occurrence of x in both its restrictive clause and its nuclear scope (Kratzer 1989:9).

However, we cannot simply conclude that the subject NP must never be universally quantified in characterizing sentences with the operator VA. Such sentences license universally quantified subject-NPs if they contain non-distributive predicates. The quantifier VA then binds the situation variable s, as is shown in the following examples:

(15-a)  
\[ \text{Všechny tužky bývají v této zásuvce.} \]
\*‘All the pencils are usually in this drawer.’

(15-a’)  
\[ \forall x (x \text{ are pencils } \rightarrow \text{ VA } [s]) (s \text{ is a situation; } x \text{ is in the drawer in } s) \]

(15-a’’)  
\[ \text{VA } [s] (s \text{ is a situation; } \forall x (x \text{ are pencils } \rightarrow x \text{ is in the drawer in } s)) \]

(15-b)  
\[ V \text{ pátek přichází všechny děti.} \]
\*‘All the children usually come on Friday.’
This is the right result given the intuition that (15a) does not state a regularity about pencils, but rather it generalizes over the situations in which the pencils are in the drawer. And similarly in (15b), the episodic predicate přicházívat ‘to come’, ‘to arrive’ introduces the situation variable s that is bound by VA, and hence the fact that the individual variable is bound by the universal quantifier does not effect the well-formedness of the sentence:

(15-b)  
V páté přicházívají všechny děti.  
on Friday come-HAB-3PL all-PL-NOM children-PL-NOM  
‘All the children usually come on Friday.’

Although such stative distributive predicates as ‘to be good musicians’ are typically not interpreted as having an open situation variable, they can be construed episodically in certain contexts. And consequently, they will be represented with the situation variable s. Such a construal often occurs with restrictive when-clauses, as is illustrated by (16):

(16)  
Všichni Češi bývají dobří mužští, když jsou v zahraničí.  
‘All the Czechs tend to be good musicians, when they are abroad.’

Given such data, we can draw the following conclusion: A tripartite structure with the quantifier VA and a universally quantified subject-NP in the restrictor is well-formed, if the quantifier VA binds the situation variable s. The fact that universally quantified subject-NPs are not licensed in all the characterizing sentences certainly weakens the claim, made by Krifka et al., that characterizing sentences impose no limitations on the kind of NPs that occur in them.

The prohibition against vacuous quantification is violated by in characterizing VA-sentences with strong determiner quantifiers (cf. Milsark 1974, and also Diesing 1992:59, for example), namely universal quantifiers like každý ‘every’, ‘each’, ani jeden ‘not a single’, skoro všichni ‘almost all’. On the other hand, weak determiner quantifiers like some, many, a few and numerals do not give rise to the vacuous quantification, but rather to pragmatically deviant characterizing sentences. And this holds, regardless whether they are formally marked with the suffix -va-:

(17-a)  
(?)Několik Čechů je dobrymi mužikanty.  
(?)several Czechs-PL GEN is-3SG good-PL-INSTR musicians-PL-GEN  
(?)‘Several Czechs are good musicians.’

(17-b)  
Několik Čechů bývá dobrymi mužikanty.  
?several Czechs-PL GEN is-HAB-3SG good-PL-INSTR musicians-PL-GEN  
?‘Several Czechs are usually good musicians.’

The question mark in parenthesis in (17a) indicates that such sentences are perfectly acceptable if they are not characterizing, that is, if they make an assertion about particular individuals. Similarly as in Krifka et al. (1992, II, p. 20), it may be argued that Czech characterizing sentences, such as (17a) and (17b), are pragmatically deviant, rather than semantically unacceptable. The reason is that they involve quantification over individuals and the numerically specified subject NP indicates that their interpretation depends on the number of individuals indicated by it. However, it is difficult to find a context in which the number of individuals would play a crucial role. Why should it matter for the
appropriateness of (17) whether the number of Czech musicians is two, twenty, several or any other number? In those cases in which we come up with some rather outlandish context that makes characterizing sentences such as (17a) and (17b) appropriate utterances, the quantifier \( VA \) will bind the situation variable \( s \). However, sentences with weak determiner quantifiers are often pragmatically odd, even if they involve a quantification over the situation variable. For example, a characterizing sentence in which the subject-NP contains a numeral, such as \( \text{two} \), is odd in the context of a restrictive \( \text{when} \) clause that introduces a situation variable into the restrictor:

\[
\text{(18) \quad ?Dva \ Češi jsou / bývají dobrí muzikanti, když jsou v zahraničí.} \\
\quad \text{?'Two Czechs are / tend to be good musicians, when they are abroad.'}
\]

Krikfa et al. also point out that the subject NP of a characterizing sentence can be numerically specified with weak determiner quantifiers, if the predicate has a non-distributive interpretation. This is shown in (19):

\[
\text{(19-a) \quad Two canaries can be kept in the same cage, if it is large enough.} \\
\text{(19-b) \quad Two magnets either attract or repel each other. Krikfa et al. (1992, II, p. 20-21)}
\]

The following Czech example illustrates the same point:

\[
\text{(20) \quad Dvě molekuly vodíku se vydají na jednu molekulu kyslíku.} \\
\quad \text{‘Two molecules of hydrogen bind one molecule of oxygen.’}
\]

\[
\text{(20') \quad GEN [x, y] (x is two molecules of H & y is one molecule of O ; x binds y)}
\]

Here, the number specification is essential. Hence, the following conclusion can be made:

\[
\text{(21) \quad Characterizing sentences are often pragmatically deviant if their subject NPs are modified with weak determiner quantifiers and if they are headed by distributive predicates.}
\]

3. 2. 2. Constraints on Temporal Adverbials

The prohibition against vacuous quantification motivates not only the constraint on the occurrence of universally quantified subject NPs, but also the constraint on the occurrence of universal adverbs of quantification, such as \( \text{always} \) or \( \text{never} \). This is shown in (22):

\[
\text{(22-a) \quad *Nikdy tam nebyvám. včas.} \\
\quad \text{*never there NEG-am-HAB-1SG on-time} \\
\quad \text{'I am usually never there on time.'}
\]

\[
\text{(22-b) \quad *Vždycky tam bývám. včas.} \\
\quad \text{*always there am-HAB-1SG on-time} \\
\quad \text{'I am usually always there on time.'}
\]

Such sentences lack a bindable variable in the restrictor. The \( \text{only} \) available variable, namely the situation variable \( s \), is bound by the universal quantifier \( \forall \) in the restrictor. Since (22) does not contain any other free variable for the quantifier \( VA \) to bind, the logical representation yields a vacuous quantification.
Count cardinal temporal adverbials, such as *three times*, and frequency adverbials, such as *several times* and *many times*, can be accommodated within the scope of the operator VA provided that they constitute sum situations over which the operator VA quantifies. In other words, it must be obvious from the context that the number of episodes indicated by such adverbials is repeated an unspecified number of times. This point is illustrated by the following examples:

(23-a)  
\[\text{*Pavel } \text{hr\textdia{v}a\text{I}\_trikr\acute{a}t\_\text{\v{s}achy.}\text{*Paul } \text{plays-HAB-3SG\_three-times\_chess}\]  

(23-b)  
\[\text{Pavel } \text{hr\textdia{v}a\text{I}\_trikr\acute{a}t\_t\ddot{y}dn\acute{e}\_\text{\v{s}achy.}\text{Paul } \text{played-HAB-3SG\_three-times\_weekly\_chess}\}`\text{Paul usually plays chess three times a week.}^{'}\]

VA [s:] (Paul plays chess in s ; s is three times a week)

By comparison, characterizing sentences with such frequency adverbials as *usually, often, seldom* are perfectly acceptable:

(24)  
\[\text{Oby\v{c}ejn\textdia{e}\_\v{c}asto\_\text{zr\ddot{a}ka\_tam\_b\acute{y}v\acute{a}m\text{I\_v\r{c}as.}\text{usually\_often\_rarely\_there\_am-HAB-1SG\_on-time}\]  

We could attribute this difference to the difference among various subclasses of what Lewis (1975) calls ‘adverbs of quantification’. While universal adverbs of quantification *always* and *never* correspond to standard quantifiers, such adverbs as *usually, generally, often, seldom* do not (cf. Farkas & Sugioka 1983). We could assume that adverbs that do not correspond to standard quantifiers can occur in the scope of the operator VA, while those that do, like universal adverbs of quantification, for example, cannot, as they bind the situation variable.

The ultimate motivation for the above facts, for the interaction between the quantifier VA and the quantifiers and numerals within the subject-NP should be sought in the semantics of the quantifier VA, namely in its inherent vagueness and in the exception-allowing feature that ensues from it.

3. 2. 3. The ‘Essential/Contingent’ Distinction, the Suffix -VA- and Genericity

It has been observed that characterizing sentences allow exceptions or counterexamples. This feature clearly distinguishes them from universal statements. For example, the proposition expressed by such a characterizing sentence as *Pluto chases trucks* is true, even if there is one occasion on which Pluto sees a truck and does not chase it. However, in this situation the corresponding universally quantified sentence *Pluto always chases trucks* will be false.

This exception-allowing feature can be traced back to the inherent vagueness that is associated with the kind of quantification found in characterizing sentences. If in reply to the question about where my socks are, the speaker answers with (25)
and should it turn out that the socks are always, without exception, in the closet, and the speaker later asserts

(26)  
\[ \text{Přesně řečeno, tvoje ponožky jsou}^1 \text{ vždycky ve skříni.} \]

'Strictly speaking, your socks are-3PL always in-PREP closet'

he is not contradicting himself.

In general, every time the operator -va- is used, vagueness is a crucial part of the message. The vagueness motivates the possibility of exceptions or counterexamples and it can be denied or suspended by an explicit comment from the speaker. Therefore, it is to be seen as an implicature of characterizing sentences, rather than an entailment. It may be suggested that the speaker chooses the operator VA as a "hedging" device, because he lacks an adequate evidence for making a stronger claim or because the stronger statement is known to be false.

It is well known that formulae involving universal quantification cannot capture the meaning of generic sentences (Lyons 1977, Carlson 1977, Schubert&Pelletier 1987, Krifka et al. 1992, among many others). Carlson (1977b) convincingly argues that characterizing sentences cannot be adequately represented as involving a near-universal quantifier most or almost all. Just like the generic operator GEN, so does VA require that there be a 'sufficiently large and vague' number of admissible assignments of values for the free variable(s) that it binds. It is notoriously difficult to determine what the "suitable" number of instances is over which a characterizing sentence can be said to express a generalization. What counts as "a suitable number" or "a sufficiently large number" varies from sentence to sentence, and it may depend on various contextual parameters, both linguistic and non-linguistic, including our general knowledge of the real world. The inherent vagueness is the central problem of generic sentences that needs to be solved. It poses a problem in particular to a truth conditional semantic description of characterizing sentences (cf. Krifka et al., among others).

The exception-allowing feature is motivated by the vagueness inherent in the kind of quantification found in characterizing sentences. The vagueness, in turn, presupposes that the predications in the scope of VA express a contingent state of affairs. This is shown by the following sentences:

(27-a)  
\[ \text{??Valčík bývá}^1 \text{ ve tríčtvrtéčním taktu.} \]

??'The waltz tends to be in three-four time.'

(27-b)  
\[ \text{Valčík bývá}^1 \text{ populární.} \]

waltz is-HAB-3SG popular

'The waltz tends to be popular.'
It is a necessary attribute of waltzes that they are in three-four time, whereas being popular is not.

The crucial point, illustrated by the above examples, is that Czech provides two systematic means for expressing generic sentences depending on whether they express generalizations based on necessary, permanent, unchangeable properties or on temporary, accidental, contingent properties. Formally, this semantic distinction is optionally marked by the suffix -va- that is sanctioned only in the latter type of generic sentences. This behavior may be captured by the following generalization: The predicate $P$ in a formula $VA(P)$ expresses a contingent state of affairs.\textsuperscript{10}

The recognition of different kinds of predication that is based on the distinction between what is essential and what is contingent raises a number of epistemological and metaphysical problems (cf. Lyons 1977:195-7). Nevertheless, despite the problematic status of essentialism, such a distinction seems to play an important role in the semantic analysis of Czech and also in other languages, for example in the analysis of the English progressive (cf. Dowty 1979:179 and 198).\textsuperscript{11}

Why should a predication expressing an exceptionless state of affairs in the scope of the operator $VA$ be odd? The most compelling motivation seems to be a pragmatic one. In the case of exceptionless states of affairs, the use of the generic predication $P$ is more expected than the use of the characterizing predication $VA(P)$, because the state of affairs expressed by such a predication $P$ does not allow any exceptions or counterexamples (at least in the real world as we know it). Informationally, the predication $P$ that conveys an exceptionless state of affairs is stronger than the corresponding characterizing predication $VA(P)$. By Grice’s maxim of quantity\textsuperscript{12}, it seems that the weaker, contingent predication with a characterizing verb should be used by the speaker only if the stronger statement is known to be false or if the speaker does not have enough evidence for its truth.

How should we describe the difference between the generic sentences with the suffix -va- and those without it? Both types of generic sentences represent generalizations from past experiences to statements of regularity. Since they involve induction from limited experiences or observations about the actual world to a regularity about possible worlds, both types of the quantifiers used in them, namely $VA$ and -$VA$ (for those generic sentences that do not allow the suffix -$va$-), can be viewed as modal operators. The main difference between these two quantifiers would be in their respective modal bases with respect to which the generic sentences are interpreted. (cf. more on this in Krifka et al., the possible worlds semantics based on Stalnaker (1968), Lewis (1973) and Kratzer (1981)).

4. Stative Predicates with the Suffix -$VA$-: Episodic Construal and/or "Remote Past"
A further supporting argument for the claim that the application of the operator $VA$ to a given predication $P$ requires that the predication express a contingent property of some entity mentioned in it, can be provided by the stative predicates with the suffix -$va$-. Consider the following characterizing sentences with stative predicates to know, to be intelligent, to like:
(28-a)

??Znávám\(^I\) Ivana dobre.
??know-HAB-1SG Ivan-SG-ACC well
??'I usually know Ivan well.'

(28-b)

??Pluto byvá\(^I\) inteligentní:
??Pluto is-HAB-3SG intelligent
??'Pluto tends to be intelligent.'

(28-c)

??Milu\(^A\) Ivana ráda.
??has-HAB-3SG Ivan-SG-ACC fond-FEM
??'She tends to like Ivan.'

Stative predicates do not introduce an open situation variable. Therefore, if they occur in characterizing sentences, the operator VA quantifies over an individual variable. Since in the above sentences the individual variable is tied to a particular individual, they constitute meaningful utterances only if the denoted disposition can be seen as a temporary or transient characteristics of the individual denoted by the subject NP. This presupposes that the stative predicate can be coerced into an "episodic" construal, which, in turn, sanctions the introduction of an open situation variable. Hence, the acceptability of such characterizing sentences will depend on the subject NP as well as on the (linguistic and extra-linguistic) context. For example, the episodic construal of the stative predicate to be intelligent may mean something like ‘to act in an intelligent way’, that is, (28b) would mean that Pluto changes back and forth between acting in an intelligent way and not. There certainly is nothing unusual about making such an assertion, given that many dispositions vary across the different stages of a single individual. Just as one can assert something about a kind by saying something that is generally true of the objects that realize it, one can assert something of an object by saying something that is generally true of its stages. The oddity of such characterizing sentences as (28a) - (28c) is attributable to the fact that the episodic construal may not easily fit our conventional ways of viewing dispositions or potentials of particular individuals. Even though dispositions may change in time, they do not change at the same rate as episodic states of affairs do.

The corresponding past tense sentences (29a) - (29c)

(29-a)

Znával\(^I\) Ivana dobre.
know-HAB-1SG Ivan-SG-ACC well
'I used to know Ivan well.'

(29-b)

Pluto byval\(^I\) inteligentní:
Pluto was-HAB-3SG intelligent
'Pluto used to be intelligent.'

(29-c)

Mívala\(^I\) Ivana ráda.
had-HAB-3SG-FEM Ivan-SG-ACC fond-FEM
'She used to like Ivan.'

have two possible interpretations: (i) quantificational and (ii) non-quantificational. Contrary to Kučera (1981), who claims that such past tense sentences have only the non-quantificational interpretation, I believe that the non-quantificational interpretation is in
most situations the one that is clearly preferred. The main reason is that it is often difficult to coerce stative predicates into an episodic construal. Since the non-quantificational meaning is readily available in the past tense, there are no restrictions on the occurrence of universally quantified subject-NPs and universal adverbs of quantification:

(30-a)  
\[
\text{Všichni Češi byvalí dobří muzikanti.} \\
\text{all Czechs-PL-NOM were-HAB-3PL good musicians} \\
\text{‘All the Czechs used to be good musicians.’}
\]

(30-b)  
\[
\text{Býval jsem tam vždycky včas.} \\
\text{NEG-am-HAB-1SG am-AUX-1sg there never on-time} \\
\text{‘I always used to be there on time.’}
\]

In such sentences, the presence of universal quantifiers does not violate the constraint against vacuous quantification, because the operator \( VA \) does not here function as a quantifier.

All the past tense sentences with operator \( VA \), assert that the denoted state holds in the distant past. And they have the implicature that there exists a nonempty interval between this distant past and \( t_o \) for which the disposition is not asserted to be true (cf. also Kučera 1981:179-180). This can be shown by the following examples in which characterizing sentences with the operator \( VA \) are incompatible with adverbials indicating recent past, such as \( až \) do \( včerejška \) ‘until yesterday’:

(31-a)  
\[
\text{Kdysi tajně poslouchával radio.} \\
\text{once-upon-a-time secretly listened-to-HAB-3SG radio} \\
\text{‘Then he used to listen secretly to the radio.’}
\]

(31-b)  
\[
\text{?*Až do včerejška tajně poslouchával radio.} \\
\text{?*until yesterday secretly listened-to-HAB-3SG radio}
\]

On the other hand, the corresponding sentences without the suffix -\( va \)- would be perfectly acceptable with temporal adverbials indicating both the remote and recent past.

For English, it may be argued that \textit{used to} functions as a past tense operator that is applied to stative predicates. In Czech, on the other hand, the situation is puzzling, given that the suffix -\( va \)- on its own does not carry any tense indication. If we assume that the suffix -\( va \)- is a sentential modal operator, its use in quantificational and non-quantificational sentences could be traced back to its inherent vagueness. Both the quantificational and non-quantificational uses of \( VA \)-sentences have in common that they are stative and express a property that is a contingent property of some entity mentioned in a sentence. In both the quantificational and non-quantificational uses, a property is asserted to hold for only some objects or individuals that realize a certain kind or for only certain stages of a given particular object. Hence, the well-formedness conditions on both the quantificationally and non-quantificationally used \( VA \)-sentences crucially rely on the notions of exceptions or counterexamples and on the contingency of the expressed state of affairs. It is much harder to justify the connection between the inherent vagueness of the operator \( VA \) and the ‘remote past’ meaning. It is possible to speculate that the remote past reference is derivable from the combination of two meaning components present in the
past tense VA-sentences: the past tense and the vagueness inherent in the modal operator VA. The solution to the puzzle formulated by Kučera (1981) is to be sought in the intersection of modal and temporal semantics.

Footnotes

1. In Czech linguistics such verbs are known as slovesa iterativní or slovesa nádobé, in Russian the terms mnogokratnýj (cf. Comrie 1976:27, Fn. 1); or "indefinite-iterative" (cf. Rassudova 1984:16ff.) are used.

2. Heim (1982) was the first to propose a theory of characterizing sentences with indefinite generic NPs using a dyadic operator.

3. Carlson (1989) provides a relational analysis of characterizing sentences that assumes that characterizing sentences relate two semantic constituents, whereby their different readings can be represented by varying the specific relation in which the constituents are related to each other.

4. Partee, Bach, Kratzer (1987) and Partee (1990; 1991a; 1991b) employ the tripartite structure representation to capture the parallels between the different morpho-syntactic means by which quantification is expressed within one language and across languages. The quantifier can be realized not only by determiner quantifiers (every, most) within NPs, that is, by D-quantifiers, but it may also be expressed at the level of the sentence or VP with sentence adverbs (usually, always), auxiliaries, and verbal affixes, that is, by A-quantifiers.

5. Carlson’s distinction can be roughly described as a distinction between predicates that hold more or less permanently or that can be predicated atemporally of their arguments and predicates that are episodic, namely those predicates that Carlson analyzes as applying to a spatiotemporal slice of an individual. The distinction between individuals and their temporally restricted stages can be illustrated with adjectival predicates: tall, intelligent, sane apply to individuals and drunk, present, sick to their temporary manifestations.

6. According to Diesing’s (1992) Mapping Hypothesis, the material from the VP is mapped into the Nuclear Scope, while the material outside the VP is mapped into the Restrictive Clause.

7. Declerck (1988) claims that generic sentences and restrictive when-clauses are associated with a general property of ‘unboundedness’. In support of this argument, he gives examples, such as (a) Cats are beautiful when they have white fur, and (b) ?Twelve cats are beautiful when they have white fur. Declerck (1988) believes that such examples as (b) show that the restrictive indefinite NP must not be numerically specified. Against Declerck (1988), Krifka et al. argue that there are pragmatic, rather than semantic, reasons for the unacceptability of such sentences as (b). They assign the following quantificational analysis to (a) and (b):

(a’) GEN [x:] (x is a cat & x has white fur; x is beautiful)
(b’) GEN [x:] (x is twelve cats & x have white fur; x are beautiful) (cf. Krifka et al. (1992, II, p. 20)).

8. The reason is that universal quantification is too strong, because formulae involving universal quantification are falsifiable by just one counterexample. At the same time,
universally quantified formulae are too weak, because they may be true as a matter of accidental fact.

9. Carlson (1977b), in his discussion of generics, observes that sentences such as Dutchmen are good sailors can be true even if the corresponding sentences with most or almost all are false. Obviously, most Dutchmen are not sailors at all, nevertheless Dutchmen are good sailors is true. And a similar argument can be made for Czech characterizing sentences. Contrary to Dahl's (1985) claim, for example, the use of the suffix -va- does not always indicate that "what is expressed in the sentence took place in the majority of those occasions" (Dahl 1985:97).

10. The following contrastive pairs also illustrate this point: ??Země se tocí1 kolem slunce ??"The earth tends to revolve around the sun" vs. Všechno se tocí1 kolem ní "Everything tends to revolve around her"; ??Voda mírá1 chemické složení H2O ??"Water usually has the chemical composition H₂O" vs. Voda z vodovodu mírá2 správnou teplotu. 'Tap water is usually the right temperature.' Notice that such examples show that the 'essential/contingent' distinction cannot be made in the lexicon of a language once and for all. A particular lexical predicate may belong to either class in different sentences. Whether a given sentence expresses an essential or a contingent property of some entity mentioned in it, cannot be often viewed simply as a projection of the lexical semantic properties of the main verbal predicate, but rather it depends on a number of contextual factors: the subject-NP, various adjuncts, interpreter's knowledge about the larger scenes (in Fillmore's sense) that a given sentence evokes.

11. Dowty (1979:179 and 198) illustrates this point, among others, with the following examples: Your beer glass is sitting near the edge of the table - The long box is standing on end - The socks were lying under the bed; John's house sits at the top of a hill - ??John's house is sitting at the top of a hill; New Orleans lies at the mouth of the Mississippi River - ??New Orleans is lying at the mouth of the Mississippi River; The river flows through the center of town - (?) The river is flowing through the center of town.

12. (1) Make your contribution as informative as is required (for the current purposes of the exchange.). And, (2) Do not make your contribution more informative than is required. Cf. Grice (1975)

References


Carlson, G. N. 1982. "Generic Terms and Generic Sentences." In: Journal of Philosophi-

Academic Publishers.

cago University Press.

Press.

Cambridge: Cambridge University Press.


Dowty, D. R. 1979. Word Meaning and Montague Grammar. The Semantics of Verbs and 
Times in Generative Semantics and in Montague’s PTQ. Dordrecht: Reidel.

Farkas, D. F. & Y. Sugioka. 1983. "Restrictive If/When Clauses". In: Linguistics and Phi-
losophy, 6, 225-258.


tion, University of Massachusetts at Amherst.

al. (Ed.). Formal Methods in the Study of Language. Mathematisch Centrum, 
Amsterdam.

Kay, P. 1982. Linguistic Competence and Folk Theories of Language: Two English 

Kratzer, A. 1989. "Stage-Level and Individual-Level Predicates". In: Bach, Kratzer, and 
Partee (Eds.), Papers on Quantification, NSF Report, Mass.


Introduction to The Generic Book by Schubert, L. and J. F. Pelletier (Eds.).

177-189.


What Studies of the Brain Can Tell Us About Language (if anything) and Vice Versa

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I. Introduction

Despite great advances made in the understanding of brain structure, brain mechanisms, and neural nets, particularly in the recent years due to technological developments such as MRI's (Magnetic Resonance Imaging), Positron Emission Tomography (PET), Event Related Potentials (ERPs), computer simulation programs and connection machines, studies of the brain still cannot tell us whether X-Bar Theory or the Verb-Internal Subject Hypothesis is correct, whether G-B or HPSG, or LFG is a viable theory of language, or whether stages in the acquisition of language reveal a continuity or maturation of UG. We have unfortunately no more to add to John Marshall's observations in 1980:

'Biologists...have accumulated a vast body of knowledge concerning the gross anatomy of those parts of the central and peripheral nervous system which seem to be implicated in the acquisition and exercise of linguistic abilities. Some knowledge is even available about the slightly less gross physiology of the relevant brain areas.... (P)sycho/linguists...have amassed alarming amounts of data of the progression from the birth cry to the multiply embedded relative clause. The problem is...found in the simple fact that no one...has the slightest idea how to relate these two domains of inquiry to each other.... We have so far failed...to construct...models...that could mediate between noun phrases and neurons.'

Yet, despite the seemingly discouraging picture, many of us keep looking for a way to relate noun phrases to neurons in our attempts to answer a question posed by Chomsky (1988):

'What are the physical mechanisms that serve as the material basis for (the) system of (linguistic knowledge) and for the use of this knowledge? (p 3) In the study of language we proceed abstractly, at the level of mind, and we also hope to be able to gain understanding of how the entities constructed at this abstract level and their properties and the principles that govern them can be accounted for in terms of properties of the brain.' (p 8)

Although we have not yet been able to delineate the neural structures underlying linguistic structures, there is evidence from studies of the brain and language that bear on a number of issues of interest to linguistics. One such issue which this paper will consider is currently being debated among linguists and other cognitive scientists; it concerns the question of whether the human mind and the brain which serves as its neural base is 'modular'.

Simply stated, the question is whether human language ability is a genetically determined, autonomous system, independent of other cognitive systems with which it interacts, or whether it is derivative of more general cognitive ability. It is of course possible that language is acquired on the basis of non-linguistic general cognitive abilities and in the course of its development becomes independent. Thus one can accept the notion of modularity and reject that of innateness, but they are related issues. With some small changes in Fodor's (1983) definition, we can ask whether the language system is domain-specific, informationally encapsulated, suberved by specific neural architecture and subject to idiosyncratic pathological
breakdown. As we can see from Figure 12, according to at least one historical view, language does indeed constitute such a module.

Since I doubt that anyone today will accept the phrenological head as 'proof' of a modular brain, I will attempt in the remainder of this paper to provide some more viable empirical evidence for this claim.

A second related but independent question is whether the components of the mental grammar are themselves modular units. Given the size limitations of the paper, I will be able to do no more than mention some aphasia data on differential breakdown of linguistic abilities which suggests that such modules do exist.

Finally, again because of size limitations, I will deal only briefly with a third related issue which concerns the relationship between language and non-linguistic conceptual knowledge in the mature brain.

II. Historical Overview

The interest in the neural basis of language and cognition goes back at least 2000 years. In fact, evidence for the independence or modularity of language has been accumulating over thousands of years and did not spring full grown Medusa like out of the minds of either Chomsky or Fodor.

Since it is becoming fashionable to quote the scriptures given the rise of fundamentalism throughout the world, it may be of interest to note that in the 135th Psalm, one finds an implicit recognition of the left brain / language interface (although contralateral brain function was of course not understood). The verse states: 'If I will forget thee, Jerusalem, let my right hand die -- let my tongue stick to the roof of my mouth.' That is, they observed a relationship between disfunctions of the right side of the body which we now know is controlled by the left cerebral hemisphere and the ability to speak which we now know is also controlled by the left brain.

In the New Testament, St. Luke reports that Zacharias could not speak but could write, predating the modern observations of the independence of linguistic components by two millennia.

Observations of language loss with intact general intelligence are found in the medical records written on papyrus in 1700 B.C.E. by Egyptian surgeons, long before the philosophers of ancient Greece speculated about the brain/mind relationships. (Breasted 1930) Although neither Plato nor Aristotle recognized the brain's crucial function in cognition or memory as shown by Aristotle's suggestion that the brain is a cold sponge whose function is to cool the blood, in the same period, the Graeco-Roman physicians' Hippocratic Treatises (written from 400 BCE to 135 CE) reveal their understanding of the role of the brain in cognition noting that language and speech disorders result from cerebral trauma or brain disease and that loss of speech often occurred simultaneously with paralysis of the right side of the body. They also showed an understanding of the separation of linguistic competence and performance in their observation that language loss may occur without the loss of speech and vice versa.

Other writers and scholars of the ancient classical world and the mediaeval period provide us with a wealth of information on aphasia -- the loss of distinct linguistic abilities -- with a preservation of nonlinguistic cognitive functions, as well as differential impairment and preservation of different linguistic abilities. Over 2000 years ago Valerius Maximus and Pliny described the Athenian scholar who in the words of Pliny '...with the stroke of a stone, fell presently to forget his letters
only, and could read no more; otherwise his memory served him well enough.'

Numerous clinical descriptions of patients with language deficits and preserved non-linguistic cognitive systems were published from the 15th to the 18th century. And as we can see from this drawing of Albertus Magnus in 1506 shown in Figure 2, the view that the brain was modular is not a new one.

Other reports describe patients suffering from acquired dyslexia (loss of ability to read) who nevertheless preserved their ability to write, and patients who could "write to dictation but could not read back what they had written" (Arbib et al. 1982).

Carl Linnaeus in 1745 published a case study of a man suffering from jargon aphasia, who spoke "as it were a foreign language, having his own names for all words" revealing either a disruption of the phonological representation of words or a breakdown in the phonemic to articulatory mapping. (Benton and Joynt 1960) An important observation regarding word substitution errors was made by Ryklof Michel von Goens in 1789 in his reference to a patient which he described as follows: "After an illness, she was suddenly afflicted with a forgetting, or, rather, an incapacity or confusion of speech...If she desired a chair, she would ask for a table... Sometimes she herself perceived that she misnamed objects; at other times, she was annoyed when a fan, which she had asked for, was brought to her, instead of the bonnet, which she thought she had requested." (Crichton 1798; Winslow 1868)

The description of this and other similarly afflicted patients reveals that they substituted words that were semantically or phonologically similar to the intended ones, producing errors similar to normal word substitution errors (cf. Fromkin 1980) or to those produced by the agnosia patient of the Drs. Damasio in Iowa who called Ronald Reagan 'John Wayne'. (Damasio, personal communication).

In 1770 Johann Gesner described a case of jargon aphasia in which the patient not only produced neologisms but in writing words used orthography which reflected the phonology of the jargon, showing his use of phoneme-to-orthographic rules. He also discussed bilingual asymmetry in which, for example, an abbot, following brain damage, retained his ability to read Latin but not German.

Another case was of a patient who, in reading aloud, substituted semantically similar words, like a patient mentioned who made such errors in spontaneous speech. Such errors are again similar to what we find today like the patient who reads 'cake' for bun, 'poison' for arsenic and 'pixie' for gnome.

Gesner did not attribute these language difficulties to either general intellectual deficits or loss of memory "in general" but instead to a specific impairment to language memory, stating: "just as some verbal powers can become weakened without injury to others, memory also can be specifically impaired to a greater or lesser degree with respect to only certain classes of ideas." (Benton 1981)

Because of such asymmetries in the breakdown of distinct cognitive abilities, Franz Joseph Gall (1791) argued against the majority view of his time that the brain was an unstructured organ and in favor of discrete anatomical areas (or cortical organs) which were directly responsible for specific cognitive functions (or faculties), including language.

It was not until 1861 that language was specifically related to the left side of the brain. In the seminal paper which has now become part of linguistic as well as
Figure 2. The three ventricles of the brain as drawn by Albertus Magnus in *De Anima* 1506

Figure 3. Lateral (external) view of the left hemisphere of the human brain showing the position of Broca and Wernicke regions.
neurological common knowledge, Paul Broca (1861) presented autopsy evidence showing that a localized (anterior) left hemisphere lesion resulted in a loss of ability to speak, whereas focal lesions in similar parts of the right brain did not. He managed to convince his Parisian audience (and most of neurology) that "On parle avec l'hémisphère gauche".

In 1874, Carl Wernicke (1874), however, pointed out that damage in the posterior portion of the left temporal lobe results in a different form of language breakdown than that occurring after damage to the frontal cortex (now called Broca's area). These different kinds of acquired language loss -- aphasias -- continue to be corroborated.

These localized areas for different kinds of language breakdown are shown in Figure 3.

The years which followed Broca's and Wernicke's discoveries stimulated neurologists throughout the world such as Broadbent (1879) and Bastian (1887) in Britain, Pick (1913) and Salomon (1914) in Germany, and Moutier (1908) in France to apply linguistic analyses to aphasis data.

Jakobson (1940, 1955, 1964) was the first linguist to apply linguistic theory to aphasis research, following up on the insights of de Courtenay in 1885 and Saussure in 1879 who had expressed the belief that a study of language pathology could contribute to linguistics.

Except for Jakobson, few linguists followed up the early interest in linguistics by neurologists who drew on linguistic concepts in their investigations of aphasis. There was the pioneering study of Blumstein (1977), a student of Jakobson, but it is only in the last two or three decades, possibly because of the dominant ideology of behaviorism in the period prior to Chomsky, that serious linguistic work on the brain/language interface has been conducted.

Many of us who now work in the area of neurolinguistic research were spurred on by Chomsky's notion of the language faculty and by the seminal work on the biological basis of language by Lenenberg (1967).

As to his views on modularity, Chomsky (1988) states that '...there seems to be little reason to insist that the brain is unique in the biological world in that it is unstructured and undifferentiated' referring to David Hubel's work on the physical basis for mammalian vision.

III. Aphasia Evidence for Modularity

The current linguistic interest in aphasis is partially due to the fact that focal injuries to different parts of the brain not only lead to selective cognitive disorders, but may also lead to damage of distinct components of language or of specific linguistic processing mechanisms.

Following damage to different parts of the left hemisphere, syntax may be impaired with phonology retained, for example, or vice versa as is the case of jargon aphasics who while producing many neologisms, properly reflect them as shown in the following examples from Buckingham (1981).

1. The leg vilted from here down.
2. This is the krebekacks where the frejes get out after the chew.

The aphasic disorder referred to as agrammatism -- a term first used by Pick in 1918 -- has been of particular interest in the attempts to understand the nature of abnormal as well as normal language. Pick noted that the sentences pro-
duced by some Broca's aphasics were ungrammatical although the patients seemed to be aware of their 'intended preverbal meaning'.

Pick also showed linguistic sophistication when he distinguished between lexical and grammatical formatives. This distinction has been revealed in certain patients after brain damage as shown in the different reading responses to lexical and grammatical words of a patient of Newcome and Marshall (1985), shown in 3. The patient suffered from acquired dyslexia -- the loss of the ability to read by a former literate individual.

3.  STIMULUS  |  RESPONSE  |  STIMULUS  |  RESPONSE
--- | --- | --- | ---
witch | 'witch' | bean | 'soup'
which | 'No!' | been | 'No!'
hour | 'time' | eye | 'eyes'
our | 'No!' | I | 'No!'
hymn | 'Bible' | wood | 'wood'
him | 'A Boy? No!' | would | 'I hate those little words'

four | four | moor | 'mist--fog?'
for | 'No!' | more | 'No!'

Note that GR while making semantically similar substitution errors in reading the content word in lexical/grammatical homophone pairs, is unable to read the grammatical formatives at all.

Agrammatism was originally considered to be a disorder of speech production in which some Broca's aphasic patients delete such grammatical formatives like auxiliaries, pronouns, determiners and some prepositions, and inflectional affixes.

Up until the 1970's, it was believed that the comprehension of these patients was intact, thus suggesting that the disorder was due to a problem in processing grammatical formatives during speech production. However, controlled experimental studies showed that where comprehension depends on the syntactic structure of sentences, syntactic comprehension deficits (also referred to as asyntactic comprehension) also arise in these patients (Caramazza and Zurif 1976; Heilman and Scholes 1976; Kean 1985)

The observation that asyntactic comprehension occurs with agrammatic production led to the view that agrammatism is a central deficit of the syntactic component of the grammar (Linebarger et al. 1983; Linebarger 1989; Luketela et al. 1986; Shankweiler et al. 1989). More recently, less global theories of the deficit have been proposed, which focus on some particular aspect of syntactic processing as the locus of failure (Cornell et al. 1993; Mauner et al. 1993; Grodzinsky 1984, 1986, 1990; Hickock 1992)

While linguists may not be interested in which specific lesion sites produce different aphasic symptoms, the fact that there are such sites and that they are correlated with different linguistic difficulties is of interest. The neural architecture is revealed by Magnetic Resonant Imaging techniques and the templates processed by Hanna Damasio showing the different lesions sites of a Broca's aphasic and a Wernicke's aphasic, as in Figures 4 and 5.

IV. Genetic evidence

There is mounting evidence to support a genetic basis for language acquisi-
Figure 4. Templates taken from weighted MR images of a 67-year old woman with Broca's aphasia, i.e., nonfluent, effortful speech, severe word-finding difficulty, and paraphasic (both semantic and phonemic) word substitutions. Comprehension of grammatically complex sentences was severely defective. The black areas show the site of the lesion. Each diagram represents a brain 'slice'. (Damasio and Damasio 1989, p 53)

Figure 5. Templates taken from MRJ's of a 63-year old woman with Wernicke's aphasia. Her speech was marred by neologisms, but was grammatical and well articulated. Comprehension of words and sentences was severely defective. (Damasio and Damasio 1989, p 107)
tion and a structured and differentiated brain. The new evidence extends the historical findings that localized brain damage effects different cognitive functions selectively, for example, language versus non-language.

In a recent article, Gopnik and Crago (1991) reported on a study of a family in which, of 30 members across three generations, 16 suffered from the inability to acquire syntactic rules. Otherwise, the 16 were normal as were the unaffected family members. She suggests that this reflects a genetic based syntactic ability, which some linguists would refer to as Universal Grammar.

Whether one looks at the selective impairment or preservation of language abilities in child development or in the mature brain one can find little to support the view of language as derivative of some general intellectual capacity.

A. Evidence from Childhood hemiplegics and hemidecorticates

Children who have suffered prenatal, perinatal, or childhood left hemisphere lesions provide evidence that the brain is differentiated in regard to language and non-language abilities. Children with acquired unilateral lesions of the brain, and who retain both hemispheres (one normal and one diseased) -- called hemiplegic -- were studied by Dennis and Whitaker (1976). The children with left damaged hemispheres showed deficiency in language acquisition and performance, with the greatest impairments in their syntactic ability.

In studies of hemidecorticate children, those with left hemispheres removed either within the first year of life or later in childhood, Dennis and her colleagues (1980a,b) found that the IQ. and cognitive skills were equivalent in both left and right hemidecorticates, but in visual-spatial function, the left-hemidecorticates outperform the right, and in language, the right-hemidecorticates outstrip the left. In addition, both hemispheres appear to be equivalent in the ability to acquire the use of the sense and referential structure of common words, but the right hemisphere again shows syntactic deficits.

B. Asymmetry of abilities

The psychological literature documents numerous cases of intellectually handicapped individuals, traditionally, known as 'idiot savants' (but more recently simply called 'savants') who, despite their disabilities in certain spheres show remarkable talents in others. The classic cases include individuals who, without the required ability to take care of themselves, are superb musicians, or artists, or draftsmen. Some of the most famous savants are human calculators who can perform complex arithmetic processes at phenomenal speed.

Until recently, most of the savants have been reported to be linguistically handicapped. While such cases strongly argue for domain specific abilities and suggest that certain talents do not require general intelligence, they do not decisively respond to the suggestion that language is one ability that is derivative of general cognitive abilities, if such individuals show little linguistic knowledge.

A more telling case can be made if there are individuals who have acquired the highly complex system which we call grammar, without parallel abilities of equal complexity. There are now a number of such studies of children who have few cognitive skills and virtually no ability to utilize language in sustained meaningful communication and yet have extensive mastery of linguistic structure. Yamada (1990) reports on one severely retarded young woman, named Laura with a non-verbal IQ of 41–44, lacking almost all number concepts including basic counting principles, drawing at a preschool level, and processing an auditory memory span
limited to three units, who at the age of 16 produced syntactically complex sentences like 'She does paintings, this really good friend of the kids who I went to school with last year and really loved.'

Although Laura produces sentences with multiple embeddings, can conjoin verb phrases, produce passives, inflect verbs for number and person to agree with the grammatical subject, and forms past tenses when the time adverbial structurally refers to a previous time, she can not add 2 + 2, read nor write nor tell time. She does not know who the president of the US is or what country she lives in and does not know her own age. Her drawing of humans resemble potatoes with stick arms and legs. Yet, in a sentence imitation task she both detected and corrected surface syntactic and morphological errors, but is unable to tie her shoes.

Laura is but one of many examples of children who display well-developed phonological, morphological and syntactic linguistic abilities, seemingly less developed lexical, semantic, or referential aspects of language, and deficits in non-linguistic cognitive development. A number of such cases, studied at UCLA by Curtiss (1982) and others, have been reported in the literature.

Any notion that linguistic ability results simply from communicative abilities or develops to serve communication functions is also negated by studies of Blank, Gessner, and Esposito (1979) which concern a child with fully developed structural linguistic knowledge but with almost a total absence of communicative skills and by Cromer who showed a dissociation between pragmatic and syntactic abilities. Similar cases of schizophrenic and autistic children are also reported. It thus seems clear that the ability to communicate in a social setting depends on different cognitive skills than the acquisition of language.

Interesting studies of genetic disorders such as Turners syndrome and Williams syndrome also reveal domain specificity. Five out of six children with Turner's syndrome (a chromosomal anomaly) studied by Curtiss and Yamada (1981) and Curtiss and Kempler (1982) revealed normal or advanced language simultaneous with serious non-linguistic cognitive deficits. Similarly, the studies by Bellugi and her colleagues (1988) of the language development in Williams syndrome children reveal a unique, behavioral profile in which there appears to be a selective preservation of linguistic functions in the face of severe general cognitive deficits.

A similar and perhaps even more dramatic case is being studied by Smith and Tsimpli (1991) of a 29 year old man, named Christopher, investigated first by O'Connor and Hermelin. Christopher has a non-verbal IQ between 60 and 70 and is institutionalized because he is unable to take care of himself. As Smith and Tsimpli report, he finds the tasks of buttoning a shirt, cutting his finger-nails or vacuuming the carpet too difficult. Yet when given written texts in some 15 or 16 languages he translates them immediately into English. The languages include Germanic languages like Danish, Dutch, and German, Romance languages like French, Italian, Portuguese, Spanish, as well as Polish, Finnish, Greek, Hindi, Turkish, and Welsh.

Christopher's conversation is quite laconic, repetitive and 'full of snatches that appear to have been memorized from textbooks'. Smith and Tsimpli therefore conducted controlled experiments to test his command of English syntax and pragmatics and syntax of other languages.

Smith and Tsimpli point out that while it is still too early to draw complete conclusions about Christopher's remarkable ability, 'it is clear that his talent for learning languages is remarkable, ... and that, despite his handicap, his command of English is essentially normal'. His knowledge of other languages varies from very
good to 'so-so'.

Smith and Tsimpli also conclude that 'Christopher's linguistic ability (is) independent of his general cognition and could operate in the absence of "central" control', supporting the notion of encapsulation of the language module.

Such cases argue against the view that linguistic ability derives from more general cognitive 'intelligence', since in these cases language develops against a background of deficits in general, non-linguistic intellectual abilities.

C. **Sign language studies.**

Perhaps the most telling findings on the brain/language relationship which supports the conception of the brain and mind as consisting of neurological and cognitive interactive but autonomous modules is revealed by the exciting research on sign language conducted by Bellugi and her colleagues (Bellugi et al. 1988). The linguistic study of sign language over the last 25 years has already revealed that these languages of the deaf have all the crucial properties common to all spoken languages, including highly abstract underlying grammatical and formal principles.

Since the same abstract linguistic principles underlie all human languages -- spoken or signed -- regardless of the motor and perceptual mechanisms which are used in their expression, it is not surprising that deaf patients show aphasia for sign language similar to the language breakdown in hearing aphasics following damage to the left hemisphere. Furthermore, while these patients show marked sign language deficits, they can correctly process non-language visual-spatial relationships. The left cerebral hemisphere is thus not dominant for speech, as had been suggested, but for language, the cognitive system underlying both speech and sign. Hearing and speech are not necessary for the development of left hemispheric specialization for language.

This has been a crucial point in determining that the left hemisphere specialization in language acquisition is not due to its capacity for fine auditory analysis, but for language analysis per se. As long as linguists concerned themselves only with spoken languages, there was no way to separate what is essential to the linguistic cognitive system from the constraints imposed, productively and perceptually, by the auditory-vocal modality, that is, to discover what the genetically, biologically determined linguistic ability of the human brain is.

D. **Agnosia and Prosopagnosia**

Further evidence for the separation of cognitive modules is provided by the neurological and behavioral findings that auditory agnosia (inability to recognize sounds), color agnosia, prosopagnosia (loss of the ability to recognize familiar faces) can all be distinguished from visual object agnosia. (Damasio et al 1988; Warrington and Shallice 1984) Even within a specific agnosia we find evidence of distinct category loss. One agnosia patient at the Radcliffe Infirmary in Oxford, shows particular difficulty in recognizing animals and less difficulty with non-animate objects.

At the University of Iowa, the Drs. Damasio and their colleagues have found that 'together with data from patients with surgical ablations, or selective neuronal loss due to Alzheimer's or Pick's diseases, the retrieval of items from a previously learned lexicon depends on the integrity of neural systems located in left temporal cortices, namely in the inferotemporal region and in the polar temporal region. One component of this system, i.e. area 38, appears to be especially dedicated to the retrieval of proper nouns, as opposed to common nouns. These systems do not appear
necessary for phonemic and syntactic levels of language operation'. They state
(Damasio & Damasio 1989) that 'Patients possess the generic information about a
given animal or object. They are aware of its visual and functional properties. But
they cannot access the unique name label.' Were they linguists, they would say they
can not access the lexical entry.

Further support for the dissociation of linguistic and conceptual knowledge is
provided by a patient of the Damasio's, named Boswell. When given the name of a
well known city, e.g. Denver, and asked to say what state it is in he replies 'Denver
Colorado'. If he is asked to name a city in Colorado, however, he is unable to do so.
Nor is he able to give any information about Denver, or Los Angeles (which he will
say is 'Los Angeles, California') without being able to give the name of a city in
California. He responds similarly when asked what football team plays in Los
Angeles -- saying 'Los Angeles Rams' -- but if asked in what city the Rams play he
cannot tell you.

[Denver, Colorado] appears to be a single lexical item, with a semantic
representation something like {city, state}. Boswell can access the item or the entry
[Colorado], which is also in his lexicon, but the pathway between the lexical
representations of these items and conceptual knowledge about their references
seems to be blocked if not destroyed.

Boswell also suffers from prosopagnosia, the inability to recognize familiar
faces. There are cases where patients who do not seem to have trouble with naming
other visual stimuli suffer from this problem. Yet, again through meticulously
controlled experimentation the Damasio group have shown that prosopagnosia pa-
tients have the same differential physiological skin responses to familiar and
unfamiliar faces as do normals. In other words, these patients suffer from an
accessing rather than a representation loss. Some prosopagnosia patients can't quite
get to the name but make interesting substitutions. One patient recognized a picture
of Judy Garland as Liza Minelli, referred to a picture of Ronald Reagan as 'John
Wayne' and when shown a picture of Kruschev said on the first day of testing 'I
don't know but I think it's a Russian' and on the second day of testing responded
'Lenin', Vladimir that is, not John.

V. Conclusions

There is more evidence. One additional example of the separation of
language from non-linguistic abilities will have to suffice for this paper. Campbell
conducted lip reading studies in which she found that the ability to process faces for
verbal information can be maintained despite inability to process faces for emotional
or gestural interpretation. The same perceptual processes are used for the two tasks
and therefore the difficulty cannot be due to non-linguistic factors. It is language
processing that is independent of other cognitive processing.

The more we look, whether at studies of neonates or development or lesions,
the more we find that knowledge and processing of language is separate from the
ability to acquire and process other kinds of knowledge, that the asymmetry between
general knowledge and linguistic knowledge shows language to be independent of
general intellectual ability, and that language itself, as well as other cognitive
systems, is distinct both anatomically and functionally.

1Sections of this paper were previously discussed in Fromkin 1990 and 1991
2The picture of the phrenology head and the idea of it being used as 'proof' for a language module
was provided by Lila Gleitman.
REFERENCES


Bastian, C. 1887. On different kinds of aphasia with special reference to their classification and ultimate pathology. British Medical Journal 2, 931-6


Broadbent, W.H. 1879. A case of peculiar affection of speech, with commentary. Brain 1, 484-503


Dennis, Maureen. and Harry Whitaker 1976. Language acquisition following hemidecortication: Linguistic superiority of the left over the right hemisphere. Brain and Language. 3. 404-433


Grodzinsky, Yosip. 1986. Language deficits and the theory of syntax. Brain and Language 27. 135-159


Moutier, F. 1908. *L'aphasie de Broca* Paris: Steinheil


0. **Introduction**

The nasal harmony system of Terena, an Arawakan language of southern Mato Grosso, Brazil, raises significant questions for the treatment of opacity and transparency in phonological theory. As described by Bendor-Samuel (1960), Terena marks the category of 1st-person by progressive nasalization. For forms such as ayo 'his brother', each segment is nasalized to produce āyō 'my brother'. Of particular interest, however, is the phonologically janus behavior of obstruents, which pattern systematically both as targets for and blockers of harmony. Thus, owoku 'his house' becomes ōwōgü 'my house'. Here, nasal spread is blocked by k, yet k itself surfaces as the prenasalized üg. The behavior of nasal stops is also of interest. Unlike obstruents, nasal stops are transparent to harmony: they do not alternate, and they do not arrest [+nasal] spread, as in emo?u 'his word' → ēmō?ū 'my word'. An analysis of the Terena data must thus address these two issues: 1) the dual behavior of obstruents, and 2) the transparency of nasal consonants.

I argue that the data are best accounted for within the context of a theory of feature cooccurrence constraints (cf. Archangeli and Pulleyblank 1989, in press). In §1, I present the relevant facts, and in §2 I provide my analysis, showing that nasalization is subject to a single constraint: \textit{IF [+NASAL], THEN NOT [-SONORANT]} (NAS/SON). I compare the Terena data with nasalization in Orejón (Pulleyblank 1989), and, crucially, I show that NAS/SON must hold only of triggers for harmony in Terena. This approach then allows for a simple treatment of the transparency of nasal stops in terms of the MORPHEME PLANE HYPOTHESIS (McCarthy 1981, Cole 1987). In §3 I argue against the viability of attributing the behavior of obstruents to the NO CROSSING CONSTRAINT (Goldsmith 1976, Clements 1981, Clements and Sezer 1982, Sagey 1986, Hammond 1988, Rice and Avery 1990, etc.). And in §4 I present my conclusions.

1. **The Data**

Bendor-Samuel (1960) provides the following phonemic inventory for Terena. As can be seen, voicing is not distinctive for obstruents, and the language lacks underlying prenasalized consonants and nasalized vowels.

<table>
<thead>
<tr>
<th>Stops</th>
<th>p</th>
<th>t</th>
<th>k</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fricatives</td>
<td>s</td>
<td>$</td>
<td>h</td>
<td>hy</td>
</tr>
<tr>
<td>Laterals</td>
<td>l,r</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>m</td>
<td>n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glides</td>
<td>y</td>
<td>w</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vowels</td>
<td>i, e, a, o, u</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The process of 1st-person nasalization is exemplified in (2):

(2)  a. ayo    'his brother'    äyô    'my brother'
b. arine    'sickness'    ârînê    'my sickness'
c. unae    'boss'    ünâã    'my boss'
d. emo?u    'his word'    êmô?û    'my word'
e. owoku    'his house'    òwògù    'my house'
f. iwú?išo    'he rides'    ìwú?ìžo    'I ride'
g. ituke    'poss. pro.'    ì'duke    '1st p. poss. pro'
h. nokone    'need'    ñògonë    'I need'
i. taki    'arm'    ñ'daki    'my arm'
j. tuti    'head'    ñ'duti    'my head'
k. paho    'mouth'    ñ'baho    'my mouth'
l. piho    'he went'    ñ'bhô    'I went'
m. ahya?ašo    'he desires'    ân'ãašò    'I desire'
n. ha?a    'father'    ñ'ãa    'my father'
o. hyišoe    'dress'    ñ'zišô    'my dress'

The forms in (a-d) are three ways relevant. First, vowels, liquids, and glides are all seen to be targets for nasalization and also permit the further propagation of the process. Secondly, (b-d) show the transparency of nasal stops, i.e., that these sounds do not block nasalization. And thirdly, (d) shows the transparency of the glottal stop as well. In (e-h) we see that nasalization proceeds from left to right until it reaches an obstructed. As seen in òwògù, the obstructed surfaces as prenasalized and the process is arrested. Interestingly, the forms in (i-l) all begin with an obstructed, showing that harmony cannot not skip segments; that is, if the first segment of a word is an obstructed, it is prenasalized and further spread of [+nasal] is halted. Finally, (m-o) show that the laryngeal continuants, ŋ and ñ, pattern with obstructs in that they become prenasalized and arrest nasalization. In the case of ŋ, prenasalization involves the concomitant acquisition of a coronal point of articulation.

2. Nasalization and Feature Cooccurrence

In recent years, researchers have looked to feature cooccurrence constraints as a means of deriving opacity (cf. Archangeli and Pulleyblank 1989, in press; Cohn 1989, 1990; Pulleyblank 1989). Usually, such constraints function as filters, i.e., as generalizations which govern the well-formedness of phonological representations. Cohn (1989, 1990), for example, invokes the constraint in (3) for Sundanese:
This constraint prohibits the combination of [+nasal], [+continuant] and [+consonantal] within a segment. For Cohn, this explains the opacity of liquids, whose [+continuant] specification disqualifies them as targets for [+nasal] spread. The claim here is that the puzzling behavior of obstruents in Terena is also best viewed in terms of feature cooccurrence constraints. Specifically, I will assume that harmony results from the application of a rule linking and spreading a floating [+nasal] 1st-person marker. And I will argue that a single NAS/SON constraint holds of this rule: \textit{IF [+NASAL], THEN NOT [-SONORANT]} (after Archangeli and Pulleyblank in press).

Interestingly, however, conceiving of constraints as filters which hold \textit{globally} for a given language gives rise to an apparent paradox for Terena. Consider, for example, the incorrect derivation of \textit{*ôwôku} 'my house:

\begin{itemize}
  \item \textbf{owoku} \rightarrow \textbf{*ôwôku} 'my house'
\end{itemize}

If NAS/SON holds globally, [+nasal] should be prevented from docking to obstruents such as \textit{k}. Of course, this cannot be the case, since the correct output is \textit{ôwôgu}, a form in which [+nasal] docks to \textit{k}, deriving the prenasalized \textit{g}.

Nevertheless, global constraints do appear to be crucial for the characterization of languages such as the Tucanoan language Orejón (cf. Arnaiz 1988, Pulleyblank 1989). Here, I review Pulleyblank’s analysis, in which [+nasal] is claimed to be lexically specified for particular morphemes, as in (5):

\begin{itemize}
  \item a) [+N] bî-te? \rightarrow mî-te? 'mosquito'
  \item b) [+N] ?bori- \rightarrow ?mõnî- 'come'
  \item c) [+N] ?dâki- \rightarrow ?nâki- 'chew'
  \item d) [+N] rîka- \rightarrow nîka- 'stop'
  \item e) [+N] yakoa? \rightarrow ñâko? 'eye'
  \item f) [+N] gara? \rightarrow ñânâ 'fly'
  \item g) [+N] take? \rightarrow ñâke? 'monkey'
  \item h) [+N] kosa? \rightarrow ñâsa? 'ant'
  \item i) [+N] sebe? \rightarrow ñéme? 'wild pig'
\end{itemize}

For Pulleyblank, the distribution of nasality is determined by a rule that links and spreads floating [+nasal] from left to right. This rule is subject to a
NAS/VOI constraint of the form: IF [+NASAL], THEN [+VOICE]; IF [+NASAL], THEN NOT [-VOICE]. Focussing on the form in (a), we see that NAS/VOI prohibits the association of [+nasal] to the voiceless consonant t, resulting in the surface form mîte? 'mosquito'. The opacity of t results from two factors. First, NAS/VOI rules it out as a target for nasalization. Secondly, Pulleyblank assumes that spreading is strictly local, i.e. from segment to segment. Initial, voiceless consonants would appear to constitute counter-examples to the ban against non-local spread, as seen in (g-h). Here, Pulleyblank argues, the prohibition is not violated, since [+nasal] is unassociated at UR. That is, for non-local spread to occur, [+nasal] must already be associated. Iterative association, and not non-local spread, is thus responsible for the skipping of initial voiceless segments. Derivations are provided in (6):

(6)  

a) [+N] r + k a \[\rightarrow\] n + k a 'stop'  

\[\begin{array}{c}
\text{+nas} \\
\text{-voi} \\
\text{r + k a} \\
\text{+nas} \\
\text{*r + k a}
\end{array}\]

b) [+N] t a k e \[\rightarrow\] t â k e 'monkey'  

\[\begin{array}{c}
\text{-voi} \\
\text{t a k e} \\
\text{+nas}
\end{array}\]

Crucially, a global use of constraints does characterize the distribution of floating [+nasal] in Orejón. How, then, are we to reconcile the Orejón facts with those of Terena, in which such a use of NAS/SON makes incorrect predictions? Following the work of Archangeli and Pulleyblank (1989, in press), I argue that the solution lies in relativizing the role of constraints in the grammar.

Consider for a moment the following differences between the two languages: 1) Orejón permits the skipping of initial consonants, while Terena prohibits such skipping; and 2) Orejón does not allow [+nasal] to dock to opaque segments, while Terena does, resulting in prenasalization. My claim is that these differences follow directly from role played by feature cooccurrence constraints in each language. In Orejón, NAS/VOI governs all representations, so the combination of [+nasal] and [-voice] is universally proscribed. In Terena, NAS/SON obtains only as a constraint on the application of the rule spreading [+nasal]. This is expressed via the statement of NAS/SON as a trigger condition
in the rule in (7):\(^6\)

(7) \[a) \text{+NASAL LINK/SPREAD:}\]

\[
\begin{array}{c|c}
\text{Type:} & \text{LINK/SPREAD} \\
\text{Direction:} & \text{LEFT TO RIGHT} \\
\text{Iteration:} & \text{YES} \\
\text{Trigger Condition:} & \text{NAS/SON} \\
\end{array}
\]

IF [+NAS] then NOT [-SON]

This rule accounts both for the initial association and the subsequent spreading of [+nasal] by iteratively inserting association lines between [+nasal] and target segments from left to right.\(^7\) Of relevance here is that NAS/SON defines the set of possible triggers for the rule, but that it does not obtain of representations in general. This now provides an explanation for why Terena prohibits the skipping of initial segments. Specifically, since NAS/SON holds only of triggers, the rule linking and spreading [+nasal] applies to all segments. But if an initial segment is [-sonorant], [+nasal] association results in a violation of the NAS/SON constraint. As a trigger constraint, NAS/SON thus blocks any subsequent spread of [+nasal]. In essence, NAS/SON in Terena creates a fly-paper effect: [+nasal] can spread onto any segment, but it cannot continue to spread once it has combined with [-sonorant].

The effect of NAS/SON is seen in the derivation of \textit{owuko} $\rightarrow \ddot{o}\text{w}u\ddot{u}go$ 'my house' in (8). Note that under this approach, opacity and prenasalization are derived in one step: [+nasal] docks iteratively across the string up to \(k\), while NAS/SON serves to prevent further spread.\(^8\)

(8) \[
\begin{array}{c}
\text{owuku} \quad \rightarrow \quad \text{owuku} \\
\text{+nas} \\
\end{array}
\]

The transparency of nasal consonants can be shown to follow straightforwardly from the Morpheme Plane Hypothesis (McCarthy 1981, Cole 1987). By hypothesis, morphemic [+nasal] resides on and spreads from its own plane. This circumvents the potential problem of opacity effects resulting from the crossing the [+nasal] association lines of underlying nasal consonants. An example is provided in (9), where I assume that plane conflation automatically triggers the fusion of [+nasal] association lines:
As for the glottal stop, I follow Bendor-Samuel (1960) in assuming that, like all segments, it undergoes nasalization. That is, nothing prevents the lowering of the velum during the articulation of glottal stop, but the lack of airflow results in a case of phonological nasalization with no phonetic effect. I claim that the absence of a [-sonorant] specification accounts for its transparency:

2.1 Residual questions

Invoking NAS/SON as a trigger condition in Terena provides a maximally simple account for why obstruents are both targets for and blockers of the process. However, two interesting questions emerge. First, this analysis does not treat prenasalized segments as [+nasal]-[-nasal] contours (cf. Sagey 1986). That is, there is no explicit explanation for why the cooccurrence of [-sonorant] and [+nasal] might not equally result in post-nasalization. Similarly, there is no direct relation between the directionality of spreading and the creation of prenasalized segments.

Interestingly, recent work by Steriade (forthcoming in a,b,c) on the representation of closure and release provides important insights into these questions in a framework compatible with the approach to feature cooccurrence taken here. Steriade argues that prenasalization is best represented by a theory of feature geometry that explicitly encodes both the closure phase and the release phase of plosives via the use of aperture nodes. Thus, a stop is represented as a sequence consisting of a closure phase ($A_0$), followed by a release phase ($A_{\text{max}}$). Vowels and approximants, in contrast, are simply characterized as $A_{\text{max}}$ segments. Importantly, Steriade’s geometry can be incorporated directly into my analysis by assuming that the prenasalization of [-sonorant] sounds involves the spreading of [+nasal] onto their closure ($A_0$) phase, while the failure of continued spread derives from the NAS/SON trigger constraint discussed above. In short, this produces representations with nasal closure and oral release, i.e., prenasalized segments.

What is important to note is that Steriade’s geometry does not obviate the need for a NAS/SON constraint in Terena. It is still necessary to account for why
nasalization is blocked by obstruents. That is, given that we know that the process is iterative, we must still account for why the harmony does not continue to spread [+nasal] onto the release phase of obstruents, deriving full nasals. In fact, such would have to be the explanation for the full nasalization of underlying voiced stops in the Orellón data above. Thus, while Steriade’s model neatly encodes the relationship between the representation of prenasalization and captures its derivation via rightward spreading, NAS/SON is still needed to account for why iteration fails after [+nasal] docks to obstruents.

A second, related issue pertains to the assumption that both the prenasalization of obstruents and the iterative nasalization of vowels and approximants are the result of a single, iterative harmony rule. Alternatively, as Donca Steriade (p.c.) has suggested, one might argue that there are two rules: 1) an iterative harmony rule that is blocked by obstruents, and 2) a later, non-iterative rule that accounts for prenasalization. Under this approach, there would be no need to invoke NAS/SON as a constraint on triggers, since prenasalization would be the result of a separate process.

Clearly, the tacit assumption of such an approach is that two rules are, in some sense, less costly than relativizing the use of feature cooccurrence constraints. Note, however, that Archangeli and Pulleyblank (1989, in press) provide numerous examples in which feature cooccurrence constraints must hold of specific rules within a language and not of representations in general. One such example is their discussion of Lango (Archangeli and Pulleyblank in press). Lango contains a number of rules of [ATR] harmony, one of which involves the left to right spread of [-ATR]. Interestingly, this rule must be restricted to spreading [-ATR] from [+back] vowels only, even though the distribution of [-ATR] itself is not restricted to [+back] vowels. This is precisely how NAS/SON functions in Terena insofar as it delimits the set of possible triggers for spread. Given the independent motivation for trigger constraints, then, it is not clear that their use in Terena is any more costly than a multiple rule analysis.

In fact, a two rule analysis itself is not altogether straightforward. Such an analysis would actually require three rules. First, since word-initial obstruents block harmony, the rule associating [+nasal] would have to be non-iterative; i.e. it could not skip initial segments as in Orellón. Secondly, unbounded harmony would require an iterative rule that is blocked by obstruents. And finally, prenasalization would require a non-iterative rule spreading [+nasal] from a nasalized vowel to a following obstruent. The situation is, in fact, even more complicated, since we must also countenance the prenasalization of word-initial obstruents. That is, this approach would also require that floating [+nasal] persist in the derivation after failing to associate word-initial obstruents. Under my analysis, both the general pattern of harmony and the opacity of obstruents receive a maximally simple account in terms of a single rule, subject to a single constraint.
3. Line Crossing

The standard treatment of opacity within autosegmental theory involves the No Crossing Constraint or NCC (Goldsmith 1976, Clements and Sezer 1982, Sagey 1986, Hammond 1988, Rice and Avery 1990, etc.). For Terena, this would require that opaque segments be specified for [-nasal], as in (11).

\[ (11) \quad \text{ow} \quad \text{oku} \quad \Rightarrow \quad \text{ow} \quad \text{oku} \]

\[ +\text{nas} \quad -\text{nas} \quad +\text{nas} \quad -\text{nas} \]

This analysis has two ostensible benefits. First, the prohibition against crossed association lines blocks [+nasal] from spreading across obstruents. Secondly, prenasalized segments are represented as [+nasal][-nasal] contours (Sagey 1986). I argue, however, that this use of [-nasal] turns out to be highly problematic for both contrastive and radical approaches to underspecification, and leads to unnecessary complexity in the treatment nasal consonants.

First, consider the cost of a crossing constraint solution in the context of contrastive underspecification (Steriade 1987). Arguably, the feature [+/-nasal] is not contrastive for obstruents in Terena, given that there are no underlying [+nasal][-nasal] contrasts in this class. And even if we stipulate that [+/-nasal] is contrastive for non-continuants, it is clearly not contrastive for fricatives, which pattern with stops with respect to harmony, as in \( \text{iwu?} \, \text{so} \rightarrow \text{iw} \, \text{w} \, \text{u?} \, \text{so} \) 'I ride'. Yet an NCC based analysis requires the specification of non-contrastive [-nasal] for segments such as \( \ddot{s} \) solely to provide a barrier for [+nasal] spread.

Moreover, the NCC leads to serious problems for the treatment of nasal stops, which are transparent to harmony. The paradox is that invoking the Morpheme Plane Hypothesis would mean the loss of the NCC account for the opacity of [-nasal] segments. This is shown in the derivation of the incorrect \( \text{iwu?} \, \text{so} \rightarrow *\text{iw} \, \text{w} \, \text{u?} \, \text{z} \, \text{so} \) 'I ride' in (12):

\[ (12) \quad \text{iw} \quad \text{u} \quad \ddot{s} \quad \text{o} \quad \Rightarrow \quad *\text{iw} \quad \text{u} \quad \ddot{s} \quad \text{o} \]

\[ +\text{nas} \quad -\text{nas} \quad -\text{nas} \quad +\text{nas} \]

The opacity of obstruents requires that harmony follow plane conflation. But now the problem is that nasal consonants are incorrectly predicted to be opaque:
If plane conflation precedes harmony, the derivation of the correct \( emo?u \rightarrow ëmõ?ù \) 'my word' leads to ad hoc stipulation. In particular, the rule spreading [+nasal] must be feature changing, just in case it targets a [+nasal] (but not a [-nasal]) segment, as in (14):

One might respond by adopting a radical approach to underspecification (Kiparsky 1982, Archangeli 1984, 1988), simply underspecifying nasal consonants for [+nasal]. As Bendor-Samuel notes, nasal consonants themselves do not trigger the nasalization of adjacent vowels. One might thus argue that their transparency arises from their lack of a [+nasal] association line, and that they would only be specified for [+nasal] by a redundancy rule after harmony has applied (i.e. at the output of the phonology). A possible derivation for ëmõ?ù 'my word' is given in (15):

Note, however, that this is a conceptually peculiar result. First, it is inconsistent with a basic premise of Radical Underspecification in that it requires the violation of the REDUNDANCY RULE ORDERING CONSTRAINT (Archangeli 1984). That is, harmony must refer to [+nasal] prior to default [+nasal] insertion. Moreover, obstruents must be specified for [-nasal], despite the fact that [+/-nasal] is non-contrastive for these sounds. And nasal consonants, the most obvious candidates for an underlying [+nasal] specification, are left unspecified for [+nasal] in order to account for their transparency to harmony.

The fundamental problem derives, I argue, from the assumption that opacity must result from the crossing of association lines. For Terena, this position forces ad hoc revisions in both contrastive and radical approaches to underspecification, running into particular difficulties in the treatment of nasal consonants.
4. Conclusions

The behavior of obstruents in nasal harmony in Terena is particularly interesting in that these segments exhibit two apparently contradictory properties. On the one hand, they are opaque; that is, they block harmony. On the other, they are targets for harmony. Attempting to analyze the data in terms of the No Crossing Constraint leads to a series of problems for the specification of underlying features, and, especially, for the treatment of the transparency of nasal stops. A far simpler analysis involves the interaction of nasalization with a single, feature cooccurrence constraint: IF [+NASAL] THEN NOT [-SONORANT]. Building on the work of Archangeli and Pulleyblank (in press), I have argued in particular that the phonologically janus nature of obstruents is a consequence of the fact that this constraint holds of triggers, but not of targets, for the [+nasal] link/spread rule in (7) above.

Importantly, this approach views opacity as a consequence of the interaction of representations and rules within phonological theory. That is, opacity is not a trivial by-product of representations themselves, but rather, a manifestation of the interplay between representations and relations. A surprising benefit of this analysis is that besides accounting for the Terena data itself, it calls attention to the similarities between what appear to be quite distinct processes of nasalization in Terena and Orejón, respectively. In particular, the different surface patterns of nasalization can be traced to the role played by feature cooccurrence constraints in the grammar of each language. In Terena, NAS/SON holds exclusively of triggers; in Orejón, NAS/VOI holds of all representations.

Notes

1. I would like to thank Diana Archangeli and Sung-Hoon Hong for much discussion in the development of the ideas presented here. Thanks also to the members of the U. of Arizona Phonology Reading Group, to whom an earlier version of this material was presented, and to Donca Steriade for helpful input regarding the structural representation of prenasalization. All errors are my own. This research was funded in part by an NSF-FAW grant #BNS9023323 to Diana Archangeli.

2. I have included /ʔ/ in the inventory. Though Bendor-Samuel does not include this sound in his chart, he treats it as a segment in his discussion of the data, and it is not clear whether or not its distribution is predictable.

3. Poser (1980) points out that there are a small number of exceptions found either in Portuguese borrowings such as sêdu 'one hundred' or in a few native words such as êê 'yes' and mêu 'world'.

4. Poser (1980) points out that the phonetic realization of these two sounds is unclear, given the existence of conflicting descriptions. Here, I will treat these
sounds as [-sonorant] and will not address the issue of how h acquires a coronal point of articulation, as this question is orthogonal to the focus of this paper.

5. This constraint might equally be stated in terms of the feature [-voice], instead of [-sonorant]. I have chosen [-sonorant] because voicing is not distinctive for obstruents, but this particular choice is not crucial to the analysis.

6. The formalization of this rule is based on the parametric rule model of Archangeli and Pulleyblank (in press).

7. This rule must also only apply in the case of 1st-person marking. Nasal consonants themselves do not induce nasализation.


9. Of course, in the case of the prenasalization of fricatives, which Steriade characterizes as containing a single phase of fricated release (A₀), prenasalization must also involve the concomitant projection of A₀, resulting in an A₀A₁ structure. For Steriade, all prenasalization requires that a segment be internally complex; i.e., that it have both a closure and release phase.

10. What is particularly interesting about Terena, however, is that iterativity and NAS/SON combine to produce the fly-paper effect described above. In contrast, Archangeli and Pulleyblank’s (in press) use of -ATR/BACK in Lango constrains triggers for non-iterative processes.

11. See Piggott (1989) for a particularly complex attempt to accommodate the Terena facts within an NCC based approach.

12. See also Steriade (forthcoming) for arguments for the privativity of the feature [nasal]. Clearly, if Steriade is correct, a crossing constraint solution becomes impossible.

13. See Archangeli and Pulleyblank (in press) for discussion of this issue.

References


Bendor-Samuel, John T. 1960. Some Problems of Segmentation in the
Lexical Phonology and the Problem of Variation

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The theory of lexical phonology (LP), as it has been developed over the last decade in works such as Kiparsky 1982, Mohanan 1986, and numerous others, postulates a fundamental distinction between lexical and post-lexical applications of rules. Several criteria distinguish between these two: one is the status of exceptions: lexical rules may have lexical exceptions and are often lexically specific, while post-lexical processes apply across the entire lexicon, without exception. Another criterion is the kind of conditioning the rules are sensitive to: lexical rule applications occur within the lexicon, in the course of a derivation, and therefore have no external context and cannot be subject to cross-word-boundary conditions of any sort; however, they do have access to morphological information about the internal structure of the word. Post-lexical operations, on the other hand, have the converse of these properties: operating on the surface phonology, they may apply across word boundaries and be subject to word-external constraints. However, they are predicted by the theory to be insensitive to the internal morphological structure of the word. This prediction follows from the principle of BRACKET ERASURE, by which morphological bracketing is erased at the end of each derivational level. Hence when a form exits the lexicon, there is no word-internal bracketing left in the representation for the surface phonology to make reference to. Post-lexical rules therefore can't have morphological conditioning.

A potential problem for this analysis arises in the study of variable phonological processes. There are a number of such processes that are well-known to be sensitive simultaneously to word-internal morphological conditioning and cross-word-boundary factors. An example is English coronal stop deletion, by which /t/ and /d/ are optionally deleted from word-final consonant clusters, especially in phrasal contexts like wes' side and ol' man (cf. Guy 1980, Labov 1989). This process operates in all dialects of English, subject to certain apparently universal conditions. These are illustrated in Table 1.

Across word boundaries, there is more deletion before a following obstruent than before a following vowel (wes' side is more likely than wes' end); this suggests that the rule operates POSTLEXICALLY.\(^1\) But the process is also morphologically conditioned: there is significantly less deletion in past tense forms like missed, packed than in underived, monomorphic forms like mist, pact. The irregular or semi-weak past tense forms, with both a vowel change and a final stop suffix, like lose-lost, tell-told, keep-kept, leave-left etc., fall at an intermediate position: less deletion than the monomorphemes and more than regular past tense forms. This systematic differentiation of morphological classes should imply that the rule applies IN THE LEXICON.

Two other characteristics of the rule are compatible with either lexical or post-lexical application. In 1.2 we see that the rule is conditioned by the preceding segment, with maximum deletion after obstruents and least after sonorants. And finally, there are no known lexical conditions on the rule.

Now are there three things about these results that are important to note: First, it is ONLY these three morphological classes that are significantly distinguished by this process; past participles, for example, undergo the rule at the same rate as their structurally equivalent past tense forms. Second, these results are very robust; the
specific numbers in Table 1 are from a recent corpus of my own, but they have been replicated in over 20 different corpora by many different researchers. And third, these results present a serious question of explanation: why do we get these numbers, in this order, and not some other deletion rates or some other order of the three classes?

In any case, this is a rule that clearly shows both kinds of conditioning at the same time: cross-word-boundary and internal morphological. But lexical phonology predicts that this can't happen. And this is not an isolated instance. A number of such cases have been described in the variationist literature. For example, final -s deletion in Spanish is shown to be sensitive to the following (i.e. cross-word-boundary) phonological context, and to the morphological status of the segment as a plural marker, verbal inflection, or mere segment of a larger morpheme in studies of Panamanian Spanish (Cedergren 1973), Puerto Rican Spanish (Poplack 1980, Hochberg 1986) and several other varieties (e.g. Terrell 1979, 1981). In Brazilian Portuguese, a parallel process of final sibilant deletion with both kinds of conditioning is documented in Braga 1977, Guy 1981a,b, and Scherre 1988, and a doubly-conditioned process of final /r/ deletion is described in De Oliveira 1982. And Caribbean Spanish also shows deletion of final /n/ with both morphological and word-external phonological conditioning (Poplack 1978). Note that all of these cases involve deletion or weakening processes, targeting single final consonants that can occur as either part of a root morpheme or as an inflectional affix in the language in question. By way of contrast, Brazilian Portuguese has a rule of final vowel denasalization which appears to be only postlexical (Guy 1981a). It affects monomorphemes like orfão, ontem at the same rate as plural verbs like falam, comem, where the nasality of the final vowel (orthographically indicated by the letter m) represents plurality. But this rule targets a mere feature, not a separate segment. So there appears to be a valid generalization to account for: processes may be doubly conditioned if and only if they target final, potentially inflectional segments.

If these data are to be reconciled with LP, there are only two courses open to us. One would be to abandon the bracket erasure convention. This would be a fairly drastic step, because bracket erasure is important to the theory for several reasons: it restricts the power of the model, it allows for the elimination of the messy inventory of boundary types that were found in SPE-style representations, and it accounts for a variety of facts, like the strict sequencing of affix attachment, that suggest that derivational processes treat the units they operate on as unanalyzed chunks. (e.g. past tense of operationalize is not *operateditionalize; the process can't look inside and see a verb operate and work on it.) So bracket erasure has important status in the theory, and the consequences of eliminating it would be far-reaching. There may be arguments in favor of some modification of it as regards post-lexical rules, but I will not pursue this issue here.

Therefore, if we wish to preserve bracket erasure, there remains only one alternative: that is to postulate that coronal stop deletion has BOTH LEXICAL AND POST-LEXICAL APPLICATIONS. This is possible within the LP framework because of the convention that the pool of rules is unitary and a given rule can apply at more than one level in the derivation. So the morphological conditioning on -t,d deletion is taken as evidence that the rule applies within the lexicon, and the cross-word-boundary phonological conditioning is taken as evidence that the rule also applies postlexically. The surface observations reported in Table 1 then represent the accumulated effects of conditioning on several distinct levels of application of this
rule. In principle, we are saying that the rule is available to operate at all levels of derivation.

This analysis neatly resolves the conditioning paradox in a way that is consistent with the LP framework. But it has one very important consequence. It implies that the rule could potentially apply more than once to a given form. The theory assumes multiple levels of derivation within the lexicon; minimally, there are two: the familiar level 1, where most derivational affixes and irregular inflection occurs, and level 2, where regular inflection and some derivation occurs. It is postulated that all lexical items pass through all the derivational levels en route to production, so if the rule operates at multiple levels, a given word would have several potential exposures to it, at least two within the lexicon and one postlexically.

Now if we put this observation together with one other, we get a very interesting result. Note that in Table 1.3 the rate of deletion in each morphological class is correlated with the derivational depth of the target cluster. The monomorphemic forms that are subject to the rule have their final consonant clusters present underlyingly, from the beginning of a derivation. The irregular past tense forms, however, get their final stop attached at level 1, while the regular past tense forms acquire their final stop suffix at level 2, at the end of a derivation.

This suggests a very attractive explanation for the ordering of the deletion rates in the three classes. The classes with higher rates of deletion can be accounted for as a consequence of their having more exposures to the deletion rule. Since words like mist have their final cluster throughout the derivation, they are exposed to the rule on every pass through the rule system -- that is, once on each derivational level. If the final segment is not deleted on some pass, it is still potentially subject to deletion at a later level. Derived forms like missed, on the other hand, have their final clusters created by affix attachment late in the lexical derivation and hence have fewer exposures to the deletion rule. Therefore, in a population of words, a greater cumulative rate of deletion should be observed in the underived forms than in the inflected forms. Irregular inflected forms like slept, told will have an intermediate rate of deletion, because their final coronal stops are derived earlier than the regular past forms, but not present underlyingly.

This model implies several very strong and precise quantitative predictions. It is commonly postulated in variation studies (cf. Cedergren & Sankoff 1974) that variable rules have a fixed base rate of application, or p₀. In the model I am proposing, that means that the observed surface frequencies of deletion and retention of final stops in the various morphological classes should be exponential functions of p₀. Specifically, the fraction of stops retained (i.e. not deleted) for any given morphological class should be (1-p₀)ⁿ where n equals the number of passes through the rule system which the class sustains (i.e. the number of levels or strata in the derivation). Thus a rule that deleted half of all forms on each pass would leave half retained after one pass; then on the second pass it would delete half of those, leaving 1/4 retained (which is the square of 1/2); after three passes it would leave 1/8 (the cube of 1/2), and so on.

For coronal stop deletion, if we postulate just two lexical levels plus one postlexical level, we should find exactly three possible morphological classes, with the exponential relationship illustrated in 1. In the affixed (past tense) forms, I will assume that the cluster becomes eligible to undergo the rule when bracket erasure removes the boundary between root and affix. Therefore, monomorphemes will be exposed to the rule at levels 1, 2 and postlexically; irregular past tense forms exposed at level 2 and postlexically, and regular past tense forms only
postlexically. Consequently, the frequency of retention in regular past tense forms (R) will be equal to \((1-p_0)\), the frequency in irregular forms (I) will be the square of this value, and the frequency in monomorphemes (M) the cube of this value. This can be summarized by defining the probability of retention, \(p_r\) (equal to \(1-p_0\)): this should be equal to \(R\), to the square root of \(I\), and to the cube root of \(M\):

1. The exponential model.

\[
M = R^3 \quad \text{Undervived forms retained at approximately the cube of level 2-derived (regular past tense) forms;}
\]

\[
I = R^2 \quad \text{Level 1-derived (irregular past tense) forms are about the square of level-2 derived forms.}
\]

\[
p_r = R = \sqrt{I} = \sqrt[3]{M}
\]

This prediction of an exponential relation among deletion rates in the morphological classes is strong, unexpected, and easily testable. It also turns out to be true, or at least well supported by a number of data sets. Results for three of the largest corpora it has been tested on are given in Table 2: my own data set, Santa Ana's dissertation data (1991), and the preliminary results from Bayley's current research in San Antonio (1993). I've also tested it on published data collected in the 1960's by Walt Wolfram (cf. Guy 1992), and various other data sets. So far, all of these tests confirm the exponential model. Statistical findings for fitting the model to the data are given for two of these corpora in Table 2, and confirm a high-probability fit. In a previous paper (Guy 1991) I have compared this fit with the standard logistic analysis used in many variation studies, and shown that my model actually fit these data better, using fewer parameters. So it now appears that we can make a strong empirical statement that the rates of coronal stop retention in English morphological classes are exponentially ordered, within the usual limits of random sampling error. For a given speech community or speaker, we find figures like .8, .64 and .512, or .7, .49, and .343. But we do NOT find rates like .8, .7, .6, or .90, .50, .10. This empirical fact is a profound challenge to any model of phonology that does NOT involve integral iterations of a single rule with a fixed base rate of application.

Besides this overall relation among the morphological classes, the exponential model makes quantitative predictions about the other conditioning factors. These are summarized in 2.

2. Contextual constraints: predictions of the exponential model.

2.1a. Internal constraints will show an apparent increase in magnitude for derivational classes exposed to multiple passes of the rule.

2.1b. External constraints will have the same magnitude (i.e. the same range of factor weights) for all derivational classes.

2.2a. Words with the same internal constraint will preserve the exponential relation. (e.g. \(R = \sqrt[3]{M}\))

2.2b. Words with the same external constraint will deviate from the exponential relation. When the external constraint promotes retention, \(\sqrt[3]{M} < R\). When the constraint retards retention (i.e. promotes rule application) \(\sqrt[3]{M} > R\).

Word-internal constraints on the rule will always be present whenever the rule applies, and therefore should iterate in the lexicon. This means two things: first, their effect should appear to be amplified on forms with more exposures to the
rule, and second, each separate internal context should define a set of forms which preserve the exponential relationship across the several morphological classes. These predictions are confirmed in Tables 3 and 5. In 3 we see that the magnitude of the preceding factor effect is apparently greater for monomorphemic words than for past tense words (because it has been iterated in the lexicon for the former), and in 5 we see that the basic exponential model fits the subsets defined by the various preceding segments (remember: a high p-value equals a good fit; the model is not rejected for any of the preceding contexts.)

Word-external constraints, on the other hand, should affect the rule only in its final, postlexical operation. Therefore, their effects are NOT iterated in the lexicon. Hence they should be equal for all the morphological classes. Table 4 confirms that this is the case. Furthermore, each individual following context should define a set of words that do not neatly follow the exponential relationship. The direction of deviation from the exponential order will depend on whether the external context favors or disfavors retention. A favoring context for example exercises its favoring effect only once for all classes, so it is not squared and cubed for two and three applications. Therefore, in a context that promotes retention, the observed retention rate in the irregular verbs will be less than the square of the retention rate in past tense forms, and the retention rate in monomorphemic words will be less than the cube. The converse will be true of disfavoring contexts. Table 6 illustrates this effect in the data published in Wolfram 1969. In the retention favoring environment of a following non-consonantal, every one of his five social classes showed the retention rate in monomorphemes to be less than the cube of the retention rate in regular past tense forms, while in the disfavoring context of a following consonantal, the reverse is true. If these values were varying randomly, we would be extremely unlikely to find all ten of these inequalities going in the predicted direction.

Now, there are still two problems for this model, one empirical and one lexical. The empirical problem, illustrated in 8, is that words like test and land never surface with derived forms like *tessing and *lanned in place of testing and landed. But my model allows deletion to apply to them early in the derivation, before these affixes are attached, so forms like tessing should occur at least some of the time. The same is true of the other four processes I cited: Spanish pan and paz have plural forms of panes and paces, and never just *pas, which would be generated if n and s deletion applied in a derivation before plural formation. Similarly Portuguese words like rapaz and cor always have plurals of rapazes and cores, and never *rapas or *cos.2

The theoretical problem arises from the principle of strict cyclicity: lexical rule applications are supposed to be limited to contexts that were derived on the current level, and not apply to undervided material. This principle limits the power of the model, prevents excessively abstract analyses, prevents rules from undoing the work of other rules, and generally does a lot of desirable things. For my model, it would seem to limit the application of coronal stop deletion to one opportunity per lexical item: the first time the appropriate context is created. However, there are certain classes of rules that cannot be subject to this principle, mainly operations that define structure that is not present in underlying representations. For example, in an underspecified model, the default rules to fill in underspecified features will have to operate on undervided material at some point. And more importantly, syllabification rules will need to build and rebuild syllables throughout derivations.
Now coronal stop deletion, and the four other cases that I mentioned from Spanish and Portuguese, all involve coda weakening processes affecting word final consonants, and all are disfavored by a following word that begins with a vowel. This is a context where the final consonant may be resyllabified rightward as the onset of the following syllable, and thus moved to a non-coda position out of the scope of the weakening rule. So, I suggest that the correct analysis of these rules is not that they delete segments directly, but rather they operate on the syllabification of these segments. The coronal stop deletion rule can be treated as delinking the final -t,d from the syllable to its left, or blocking its attachment to that syllable, thus rendering it extrasyllabic. If such a segment is subsequently licensed by rightward attachment as an onset, it will surface, but otherwise it will be removed by a general process of stray erasure. Treating the process in this way as a syllable structure operation removes the conflict with strict cyclicity. It also makes a prediction: that exponential iteration of rule effects will only be found for processes operating on syllabification. Happily, this explains why the Portuguese vowel denasalization rule does NOT have morphological conditioning. Since it's not a syllabification rule, it is subject to cyclicity, and can't iterate on the same form.

This treatment also explains the non-occurrence of inflected forms like *teeing and *lanned, and Spanish and Portuguese cases like *pas and *cos. Any final consonants which are rendered extrasyllabic by a coda weakening process early in a derivation, but subsequently have a vowel-initial suffix attached, will automatically be relicensed as onsets, and hence retained.

Finally, this analysis predicts that the following segment effect is basically a constraint on possible syllable onsets. For instance, rightward resyllabification should be possible before a following word beginning with /tr/, because /tr-/ and /dr-/ are possible onsets in English. But it should be impossible to relink the coronal stop to a word beginning with /l/ because English disallows initial /tl, dl/. This prediction is also confirmed in my studies, as illustrated in Table 7. The probability of deletion in the 6 contexts distinguished there correlates with the possibility of the coronal stop becoming part of the onset. Following /l/ favor deletion at a high rate, like other obstruents, while following /tr/ disfavors deletion modestly. Glides are intermediate, presumably because some stop plus glide onsets are possible in English and others rare or impossible.

CONCLUSIONS.

So, what can we conclude from all this? Let me start by reviewing the empirical facts. They are:

- First, it is clear there are variable phonological processes that show the characteristics of both lexical AND postlexical applications.
- Second, the processes that do so all involve deletion of final consonants.
- Third, such deletion processes are inhibited by rightward resyllabification of the consonant.
- Fourth, the one such process examined in detail, English coronal stop deletion, distinguishes exactly three morphological classes, R, I, and M.
- Fifth, the order of retention in those three classes is R> I>M
- Sixth, the frequency of retention in those classes is exponentially related:
  \[ R^2 = I, \quad R^3 = M \]
- Seventh, internal and external constraints on the rule differ as predicted in 2.
How can these facts be accounted for? I have proposed that we can do so with a variationist version of lexical phonology. To get all these facts right would seem to require, at a minimum:

- iterated applications of variable processes,
- the number of such iterations to depend on derivation
- distinctive derivational histories for exactly the three classes mentioned, and no more.
- a contrast between lexical and postlexical processes.

The model I have proposed has all these things; it is hard to see how one could do without any of them and not stumble over the empirical facts. The exponential ordering of the classes is probably the toughest. For example, one might appeal to functional load to explain why there is more deletion of monomorphemes than of past tense forms: this correctly predicts the ordering of the three classes, but would be perfectly compatible with non-exponential retention frequencies, like 80%, 70%, 60%, which are in fact NOT found. Similarly, the standard variationist model of logistic constraints would predict the uniform magnitude of external constraint effects found in Table 4, but cannot account for the nonuniform results for internal constraints shown in Table 3.

Finally, the approach proposed here requires a suspension of the strict cyclity convention, but in a motivated way, for syllabification rules. This accounts for why it is only these resyllifiable final consonants that show this kind of double conditioning. Other variable processes that don’t affect syllabification, like certain feature assimilations for example, I would predict not to show this lexical/postlexical duality.

Therefore, at the present state of our knowledge, the model I have sketched correctly predicts all the facts, while the alternatives do not. Thus we might fairly say that lexical phonology no longer has a problem with variation, but rather offers a solution for it.

NOTES
1. The effect of a following pause (i.e. utterance final position) varies by dialect; cf. Guy 1980.
2. In both languages, final sibilant deletion can apply to the plural forms cited, leaving forms like pane, pace, vece, rapaze, core, but such forms all retain the final consonant of the root, and therefore apparently did not undergo deletion BEFORE affix attachment. They can be treated in this model as having lost the final sibilant in the postlexical phonology.

REFERENCES


Table 1. Constraints on English coronal stop deletion.

1.1. External phonological conditioning: following segment effect

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>% Deleted</th>
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<tbody>
<tr>
<td>___</td>
<td>###C</td>
<td>422</td>
</tr>
<tr>
<td>___</td>
<td>###V</td>
<td>293</td>
</tr>
<tr>
<td>___</td>
<td>###</td>
<td>180</td>
</tr>
</tbody>
</table>

1.2. Internal phonological conditioning: preceding segment effect

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>___</td>
<td>obstruent__</td>
<td>449</td>
</tr>
<tr>
<td>___</td>
<td>nasal__</td>
<td>248</td>
</tr>
<tr>
<td>___</td>
<td>liquid__</td>
<td>198</td>
</tr>
</tbody>
</table>

1.3. Morphological conditioning: morphological class

| Monomorphemes          | 658 | 38.1%     |
| (e.g. mist, old)      |     |           |
| Irregular Past         | 56  | 33.9      |
| (e.g. lost, told)      |     |           |
| Regular Past           | 181 | 16.0      |
| (e.g. missed, tolled)  |     |           |

Table 2. The exponential relationship: -t,d retention in three data sets
-t,d retention in three data sets

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Observed % retained</th>
<th>Predicted exponential progression</th>
<th>Model-fitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corpus 1 (Guy 1991, 7 speakers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monomorphemes</td>
<td>658</td>
<td>61.9</td>
<td>.614 (n=3)</td>
<td>Best-fit $p_0 = .15$</td>
</tr>
<tr>
<td>Irregular Past</td>
<td>56</td>
<td>66.1</td>
<td>.723 (n=2)</td>
<td>Chi-square = 1.28</td>
</tr>
<tr>
<td>Regular Past</td>
<td>181</td>
<td>84.0</td>
<td>.85 (n=1)</td>
<td>$p=.55$</td>
</tr>
<tr>
<td>Corpus 2 (Santa Ana 1991, 45 speakers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monomorphemes</td>
<td>3724</td>
<td>42.1</td>
<td>.422</td>
<td>Best-fit $p_0 = .25$</td>
</tr>
<tr>
<td>Irregular Past</td>
<td>297</td>
<td>59.3</td>
<td>.563</td>
<td>Chi-square = 1.17</td>
</tr>
<tr>
<td>Regular Past</td>
<td>836</td>
<td>74.3</td>
<td>.75</td>
<td>$p=.57$</td>
</tr>
<tr>
<td>Corpus 3 (Bayley 1993, 18 speakers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monomorphemes</td>
<td>2216</td>
<td>43.9</td>
<td>.439</td>
<td>Best-fit $p_0 = .24$</td>
</tr>
<tr>
<td>Regular Past</td>
<td>568</td>
<td>75.5</td>
<td>.760</td>
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### Table 3. Internal constraint - Preceding segment effect on -t,d deletion:
Varbrul factor weights for separate analyses of morphological classes.  
(Guy 1991 corpus)

<table>
<thead>
<tr>
<th>Preceding Segment</th>
<th>Morphological Class</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sibilants</td>
<td>M</td>
<td>.66</td>
<td>.67</td>
</tr>
<tr>
<td>Obstruents (stops, nonsib. fricatives)</td>
<td>.49</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>Nasals</td>
<td>.59</td>
<td>.41</td>
<td></td>
</tr>
<tr>
<td>Liquids</td>
<td>.27</td>
<td>.44</td>
<td></td>
</tr>
</tbody>
</table>

Range: .39 > .26

### Table 4. External constraint - Following segment effect on -t,d deletion:
Varbrul factor weights for separate analyses of morphological classes.  
(Guy 1991 corpus)

<table>
<thead>
<tr>
<th>Following Segment</th>
<th>Morphological Class</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Consonants (incl. liquids and glides)</td>
<td>.73</td>
<td>.65</td>
<td></td>
</tr>
<tr>
<td>Vowels</td>
<td>.31</td>
<td>.24</td>
<td></td>
</tr>
<tr>
<td>Pause</td>
<td>.45</td>
<td>.63</td>
<td></td>
</tr>
</tbody>
</table>

Range: .42 = .41

### Table 5. Internal constraint - Preceding segment effect:
Retention rates and estimates of $p_r$ according to the exponential model.  
(Guy 1991 corpus)

<table>
<thead>
<tr>
<th>Preceding Segment</th>
<th>Ret/Tot</th>
<th>M</th>
<th>Est. $p_r$</th>
<th>Ret/Tot</th>
<th>R</th>
<th>Est. $p_r$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sibilants</td>
<td>134/269</td>
<td>49.8</td>
<td>.7927</td>
<td>31/40</td>
<td>77.5</td>
<td>.7750</td>
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<tr>
<td>Obstruents</td>
<td>24/34</td>
<td>70.6</td>
<td>.8904</td>
<td>79/93</td>
<td>84.9</td>
<td>.8495</td>
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<tr>
<td>Nasals</td>
<td>133/214</td>
<td>62.2</td>
<td>.8534</td>
<td>16/19</td>
<td>84.2</td>
<td>.8421</td>
</tr>
<tr>
<td>Liquids</td>
<td>116/141</td>
<td>82.3</td>
<td>.9370</td>
<td>26/29</td>
<td>89.7</td>
<td>.8966</td>
</tr>
</tbody>
</table>

Best $p_r$  
(M)  
(R)  
Expected Ret.  
Tot. Chi-sq.  
(p=)

Sibilants .790  
Obstruents .865  
Nasals .853  
Liquids .932  

.132.6  
22.0  
132.8  
114.2  
31.6  
80.4  
16.2  
27.0  
.0835  
.7050  
.0185  
.7318  
.87  
.75  
.94  
.78
Table 6. External constraint - Following segment effect:
Estimates of $p_r$ (Wolfram 1969 corpus)

<table>
<thead>
<tr>
<th>Estimates based on: $\sqrt[3]{M}$</th>
<th>Following consonantal $R$</th>
<th>Following non-consonantal $R$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Group:</td>
<td>$\sqrt[3]{M}$</td>
<td>$R$</td>
</tr>
<tr>
<td>UMW</td>
<td>.695 &gt; .628</td>
<td>.960 &lt; .972</td>
</tr>
<tr>
<td>UMN</td>
<td>.595 &gt; .508</td>
<td>.918 &lt; .932</td>
</tr>
<tr>
<td>LMN</td>
<td>.510 &gt; .383</td>
<td>.828 &lt; .867</td>
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<tr>
<td>UWN</td>
<td>.402 &gt; .275</td>
<td>.702 &lt; .757</td>
</tr>
<tr>
<td>LWN</td>
<td>.300 &gt; .240</td>
<td>.653 &lt; .661</td>
</tr>
</tbody>
</table>

Table 7. Following segment effect on -t,d deletion - detail.
(Guy 1991 corpus)

<table>
<thead>
<tr>
<th>Following segment</th>
<th>Prob. of deletion</th>
<th>Syllable onset conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>obstruent</td>
<td>.66</td>
<td>*ts- *tk- *tn- etc.</td>
</tr>
<tr>
<td>/l/</td>
<td>.80</td>
<td>*tl-</td>
</tr>
<tr>
<td>glide</td>
<td>.57</td>
<td>tw- + front vowel, tyu- (some dialects)</td>
</tr>
<tr>
<td>/r/</td>
<td>.42</td>
<td>tr-</td>
</tr>
<tr>
<td>vowel</td>
<td>.19</td>
<td>ta-, etc.</td>
</tr>
<tr>
<td>pause</td>
<td>.37</td>
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</table>
Mapping Phonological Structure to Phonetic Timing:
Moras and Duration in Two Bantu Languages*
Kathleen A. Hubbard
U.C. Berkeley

The mora has a number of phonological roles: it is sometimes used as a unit of weight, sometimes as a unit of quantity (length), and sometimes as a unit of timing. In this paper I ask whether the phonological unit ‘mora’ has any phonetic reality, and I conclude that at least for the languages under examination, the answer is yes. First I review the role of the mora as a unit of phonological representation, and then I look to see how such representations are reflected in phonetic output. For this purpose I present data from two Bantu languages (a family that figures prominently in the development of moraic theory, because of its rich prosodic structure involving tone, length distinctions, and quantity-sensitive phonological and morphological rules). Finally, I outline a theory of mapping between the underlying timing system of a mora-timed language and the surface output observed in speech.

Timing-tier theory arose because linear segmental representation of phonological structure was insufficient to account for prosodic phenomena such as light vs. heavy syllable distinctions, short vs. long segments, compensatory lengthening, stress and tone assignment, etc. (Ingria 1980, Hyman 1984 and 1985, etc.). In the timing model in (1), proposed by Clements and Keyser (1983), syllables do not directly dominate segments but instead are built on timing units (shown here as C’s and V’s).

(1)

\[ \sigma \]
\[ C \quad V \quad C \]
\[ p \quad i \quad t \]

A major insight of this model is that long segments involve a single segmental feature matrix linked to multiple timing units, and that phonological processes can affect either just the segmental or just the CV tier. Thus compensatory lengthening (as formulated in Clements 1986) involves reassociation of a segment from its own V unit to the following C, and spreading of the preceding vowel to fill the vacated timing slot:

(2)

\[ C \quad V \quad V \quad C \quad V \]
\[ t \quad a \quad n \quad d \quad a \] underlying representation

\[ C \quad V \quad V \quad C \quad V \]
\[ t \quad a \quad n \quad d \quad a \] Prenasalization

\[ C \quad V \quad V \quad C \quad V \]
\[ t \quad a \quad n \quad d \quad a \] Linking Convention
The notion of compensatory lengthening as maintenance of syllable timing is phonological, not phonetic. It is of course related to phonetic duration, and makes predictions about relative duration: all other things being equal, a segment linked to two timing units will have greater duration than a segment linked to just one. But it is emphasized that the mapping between the discrete phonological timing units used here and the nondiscrete relations of phonetic duration is as yet poorly understood, and thus the CV model should not be seen as one that directly encodes durations in milliseconds. This disclaimer about the phonetic predictions made by duration-based phonological representations persists into later versions of timing-tier theory as well.

Moraic theory evolved because CV theory did not sufficiently address the issue of phonological weight (Hyman 1985). In this theory, the mora is the unit that is relevant for syllable weight, vowel length, tone assignment, etc. Instead of mediating syllabic structure and segmental content through a tier that assigns one timing unit to each segment, moraic theory assumes that timing has more to do with the bearers of weight, stress, and tone. As shown in (3), moras are what dominate segments and are dominated by syllables (Hyman 1984 and 1985, McCarthy and Prince 1986, Hayes 1989). There is some disagreement about the details of this representation, but they are not crucial to this paper. What everyone agrees on is that a light syllable has one mora, a heavy syllable two. (In some languages both CVV and CVC are bimoraic (e.g. Latin, Hausa), while in others only CVV is bimoraic (i.e. CVC counts as light, as in Lardil and Huasteco).)

(3)

\[
\begin{align*}
a. & \quad \sigma \\
& \quad \mu \\
& \quad \text{[t\,a], light} \\
b. & \quad \sigma \\
& \quad \mu \quad \mu \\
& \quad \text{[t\,a\,\,\,], heavy} \\
c. & \quad \sigma \\
& \quad \mu \quad \mu \\
& \quad \text{[t\,a\,\,\,t], heavy} \\
& \quad \text{(e.g. Latin)} \\
d. & \quad \sigma \\
& \quad \mu \\
& \quad \text{[t\,a\,\,\,t], light} \\
& \quad \text{(e.g. Lardil)}
\end{align*}
\]

This model represents more straightforwardly certain phenomena that had to be stipulated in CV theory: e.g., onsets never contribute weight while codas may, and segment deletion only triggers compensatory lengthening if it occurs in the syllable rhyme. The moraic model is also supported by a wide range of historical compensatory lengthening processes (Hock 1986).

But what is the relationship of such a representation to phonetic realization? The durational issue that the moraic model hints at but does not explicitly address is isochrony: the usual notion of isochrony (as discussed in Lehiste 1970) is that certain events occur at regular intervals in the speech stream (this is what we hear as the rhythmic aspect of speech). It has been claimed that this regular event is main word stress in English, the syllable boundary in French, and the mora in Japanese — in other words, there is supposed to be in English a regular durational interval between main stresses (regardless of how many syllables intervene), while in French each syllable takes up roughly the same durational span, and in Japanese the regular durational unit is the mora (constituted by CV, moraic N, or the first half of a geminate C). Thus these
languages are described as stress-timed, syllable-timed, and mora-timed, respectively.

But phoneticians have long since demonstrated that this notion is incorrect — at least insofar as the acoustic reflexes of stress and syllable/mora boundaries indicate. It is simply not the case that every main stress in English comes along with metronome-like regularity, and that the duration of intervening syllables is adjusted to compensate. There is some evidence that isochrony does exist perceptually, and some articulatory data that suggest why: the action of certain muscles is isochronous, but the execution of the articulation takes varying lengths of time to achieve depending on the nature of the segment (Fischer-Jørgensen 1964 [cited in Lehiste 1970], Lehiste 1984). So perhaps as listeners we correct for the differing mobility of the various articulators; that is, we extract from a non-isochronous acoustic signal a percept of isochronous articulatory triggers (though it is not clear how). In this paper I do not address the perceptual or articulatory basis for moraic timing, but I mention isochrony because it seems to be at the root of the notion “mora”: since we know that for phonological purposes CV = V = CVC in some languages, and in others CVV = VV = CVC, it is natural to ask whether this relationship holds in phonetic realization or whether it is strictly an abstract fact.

The present phonetic study examines the phonetic correlation between moraic structure and surface duration in Runyambo (a Bantu language of Tanzania) and Luganda (a closely related language of Uganda). Earlier studies of this relationship are mostly on Japanese, where the mora has a long history in traditional linguistics: it is said to be an isochronous timing unit, such that a CV syllable, a moraic nasal, and the first half of a geminate consonant are supposed to take up the same amount of time. The mora is a unit that all literate speakers are conscious of, since the kana writing system and the long poetic tradition both make use of it (and thus it is taught in school). Phonetic studies such as Beckman (1982), however, claim that the mora cannot be the kind of unit it is traditionally thought to be: for one thing, the inherent durations of different segments cause sequences that count as a mora phonologically to have very different durations. Further evidence in Beckman’s study against the mora as a constant unit of phonetic timing comes from the behavior of geminates and of devoiced (or deleted) high vowels.

But a later phonetic study of Japanese, Port, Dalby and O’Dell (1987), shows that looking just at long consonants or devoiced-vowel syllables or plain CV’s in isolation restricts one’s view to a stretch of speech that is too narrow for investigating moraic timing. Port et al. conclude that the mora is in fact a phonetically real timing unit in Japanese, but that segmental adjustment (compensation) to maintain mora count is done at the level of the word. That is, if you extend a sequence of segments by units that are phonologically one mora at a time, the duration of the word increases by roughly constant increments. Likewise, all phonologically-three-mora words fall into the same range of duration, regardless of syllable structure or segmental content, as do all four-mora words, five-mora words, etc.

This is precisely the conclusion I came to in an earlier study of Runyambo syllable timing (Hubbard 1992), rather by accident. In looking at the timing of prenasalized consonants and compensatorily lengthened vowels, I discovered that my corpus of words sorted neatly into groups by total word duration, and that those groups corresponded to phonological mora count. Since those tokens were
not balanced for the counting of moras and syllables, I performed a new experiment that was more carefully controlled to look for exactly this effect.

Bantu languages provide a natural way to extend a sound sequence by one mora or syllable at a time, namely verb affixes. I elicited a number of Runyambo verb infinitives with different numbers of prefixes and suffixes, as well as roots of varying shapes. These included long vowels, vowel-nasal-consonant sequences, and plain CV sequences, such that mora count and syllable count matched in some cases and not in others. The corpus is given in (4):

\[
\begin{align*}
\text{roots + affixes} & \\
\text{kunógoora} & \text{‘to mold’} & \text{kuguruka} & \text{‘to jump’} \\
\text{kunógoorera} & \text{‘to mold for/at’} & \text{kugurucira} & \text{‘to jump for/at’} \\
\text{kujinógoora} & \text{‘to mold it (clay)’} & \text{kucigurucira} & \text{‘to jump over it for/at’} \\
\text{kujinógoorera} & \text{‘to mold it for/at’} & \text{kucitugurucira} & \text{‘to jump over it for us’} \\
\text{kujitenógoorera} & \text{‘to mold it for us’} \\
\text{kujeenda} & \text{‘to go’} & \text{kukóma} & \text{‘to tie’} \\
\text{kujeendera} & \text{‘to go to’} & \text{kukómera} & \text{‘to tie for/at’} \\
\text{roots of minimally different shape} & \\
\text{kugoba} & \text{‘reach, arrive’} & \text{kukuba} & \text{‘fold’} \\
\text{kugooba} & \text{‘bend’} & \text{kukuuba} & \text{‘polish’} \\
\text{kugomba} & \text{‘desire’} & \text{kukumba} & \text{‘tilt, fall over’} \\
\text{kusiba} & \text{‘to imprison’} & \text{kutana} & \text{‘fester’} \\
\text{kusiiba} & \text{‘pass time at’} & \text{kutáana} & \text{‘go separate ways’} \\
\text{kusinba} & \text{‘erect sth/’} & \text{kutánga} & \text{‘forbid’} \\
\text{kusáaga} & \text{‘be left over’} & \text{kusona} & \text{‘sew’} \\
\text{kusanga} & \text{‘come upon’} & \text{kusonda} & \text{‘peck’} \\
\text{kubona} & \text{‘to see’}
\end{align*}
\]

The hypothesis was that total word duration would correlate closely with mora count, and that as phonological sequences were extended mora by mora, their duration would increase by nearly the same amount each time.

All target words were elicited in the frame “Gamba ______ rumo” (“say ______ once”), and each word appeared three times on a randomized list. A native speaker of Runyambo read the list onto tape; the tokens were then digitized at 10kHz and durations were measured from waveforms and wide-band spectrograms. The total length of each utterance was noted (from the release of /g/ in gamba to the onset of /o/ in rumo) so as to control for speech tempo; anomalously long or short tokens were discarded. The duration of each target word was logged and the results were analyzed statistically.

The mean values for each item are given in (5); mean values by number of moras are shown in (6). Analysis of variance to determine the correlation of word duration with mora count is compared with syllable count in (7); though I do not give here the results of all the post-hoc statistical tests, I have determined that they show (like the F-values here) that although syllable count does correlate with word duration, the correlation is much weaker than that with mora count.
(5) Mean Durations of Runyambo Tokens

<table>
<thead>
<tr>
<th>word</th>
<th>moras</th>
<th>sylls</th>
<th>dur</th>
</tr>
</thead>
<tbody>
<tr>
<td>kuguruca</td>
<td>4</td>
<td>4</td>
<td>572</td>
</tr>
<tr>
<td>kugurucira</td>
<td>5</td>
<td>5</td>
<td>677</td>
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<td>6</td>
<td>807</td>
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<td>7</td>
<td>874</td>
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<td>7</td>
<td>957</td>
</tr>
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<td>kusaaga</td>
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<td>3</td>
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<td>kusanga</td>
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<td>3</td>
<td>476</td>
</tr>
<tr>
<td>kusonda</td>
<td>4</td>
<td>3</td>
<td>549</td>
</tr>
<tr>
<td>kukuba</td>
<td>3</td>
<td>3</td>
<td>488</td>
</tr>
<tr>
<td>kukuuba</td>
<td>4</td>
<td>3</td>
<td>562</td>
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<tr>
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</table>

<table>
<thead>
<tr>
<th>word</th>
<th>moras</th>
<th>sylls</th>
<th>dur</th>
</tr>
</thead>
<tbody>
<tr>
<td>kukumba</td>
<td>4</td>
<td>3</td>
<td>575</td>
</tr>
<tr>
<td>kutana</td>
<td>3</td>
<td>3</td>
<td>468</td>
</tr>
<tr>
<td>kutaana</td>
<td>4</td>
<td>3</td>
<td>528</td>
</tr>
<tr>
<td>kutanga</td>
<td>4</td>
<td>3</td>
<td>561</td>
</tr>
<tr>
<td>kusiba</td>
<td>3</td>
<td>3</td>
<td>448</td>
</tr>
<tr>
<td>kusiiba</td>
<td>4</td>
<td>3</td>
<td>528</td>
</tr>
<tr>
<td>kusimba</td>
<td>4</td>
<td>3</td>
<td>546</td>
</tr>
<tr>
<td>kukoma</td>
<td>3</td>
<td>3</td>
<td>484</td>
</tr>
<tr>
<td>kukomera</td>
<td>4</td>
<td>4</td>
<td>581</td>
</tr>
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<td>3</td>
<td>3</td>
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</tr>
<tr>
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<td>3</td>
<td>3</td>
<td>464</td>
</tr>
<tr>
<td>kugoba</td>
<td>3</td>
<td>3</td>
<td>464</td>
</tr>
<tr>
<td>kugoba</td>
<td>4</td>
<td>3</td>
<td>529</td>
</tr>
<tr>
<td>kugomba</td>
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<td>3</td>
<td>549</td>
</tr>
<tr>
<td>kujeenda</td>
<td>4</td>
<td>3</td>
<td>513</td>
</tr>
<tr>
<td>kujeendera</td>
<td>5</td>
<td>4</td>
<td>621</td>
</tr>
</tbody>
</table>

(6) Duration by Mora Count

<table>
<thead>
<tr>
<th>moras</th>
<th>duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>476</td>
</tr>
<tr>
<td>4</td>
<td>550</td>
</tr>
<tr>
<td>5</td>
<td>658</td>
</tr>
<tr>
<td>6</td>
<td>786</td>
</tr>
<tr>
<td>7</td>
<td>859</td>
</tr>
<tr>
<td>8</td>
<td>957</td>
</tr>
</tbody>
</table>

Note that the mean difference between categories in (6) is 96 ms; that is the apparent "standard" duration for a mora in Runyambo.

(7) ANOVA's: Correlation with mora count vs. syllable count

<table>
<thead>
<tr>
<th></th>
<th>F-value</th>
<th>degrees of freedom</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mora</td>
<td>452.814</td>
<td>5, 79</td>
<td>.0001</td>
</tr>
<tr>
<td>syllable</td>
<td>185.253</td>
<td>4,80</td>
<td>.0001</td>
</tr>
</tbody>
</table>

The main result is that the total duration of a word in Runyambo is very closely correlated with mora count, much moreso than with syllable count. Though the syllable criterion also gives a statistically significant result, it is much smaller than that of the mora criterion. In addition, we can see that a four-syllable word containing a long vowel, such as kunogoora (675 ms), is much closer in duration to a five-syllable word with all short vowels such as kugurucira (677 ms) than to a four-syllable all-short word such as kuguruca (572 ms). Likewise kukumba (575 ms) is much closer in duration to words like kukomera (581 ms) than to words like kusona (476 ms). This relationship holds throughout the data set.
The same patterns were visible in the data from my pilot study in 1990, even though that experiment was not controlled specifically for this effect. As with Beckman’s (1982) results for Japanese, it is not the case that every phonologically moraic sequence has the same duration:

(8)  

\[
\begin{array}{ll}
\text{one mora:} & \text{two moras:} \\
/ku/ = 194 \text{ ms} & /\text{tana}/ = 351 \text{ ms} \\
/go/ = 136 \text{ ms} & /\text{gom(b)}/ = 300 \text{ ms}
\end{array}
\]

But it is the case that words with the same mora count have very comparable durations. From these patterns it is possible to conclude that although Runyambo does not have a rigidly isochronous mora-timing scheme, some kind of segmental compensation is taking place that is sufficient to override large inherent durational differences between segment types and roughly maintain a weight constant.

To extend this finding, I extracted some Luganda utterances from a tape that was made for another study to see if the same sort of mora effect appears in that language. The data set was originally elicited for a study of intonation, but contains a number of tokens much like those I used for the Runyambo study. It includes a number of single-word utterances that differ by the addition of one syllable or mora at a time, as well as a set of two- and three-word utterances. The tokens, produced by a native speaker of Luganda and recorded by Larry Hyman and Ian Maddieson, were elicited in four contexts: first in declarative intonation, then in two tonally different interrogative intonations, and finally in surprise intonation. Of these I used only declaratives. There was no carrier sentence, since the parameter to be measured was the intonation contour over utterances of a specific length. Each subset of four to eight items was read twice in the same order (which probably resulted in some rhythmic and order effects on duration). The tokens I selected are shown in (9):

(9)  

\[
\begin{array}{ll}
bálíma^2 & \text{‘they are cultivating’} \\
bámùlímá & \text{‘they are cultivating it’} \\
bálímíra & \text{‘they are cultivating for/at’} \\
bámbùlímíra & \text{‘they are cultivating it for him’} \\
bálímáálímá & \text{‘they are cultivating here and there’} \\
bálímíralímíra & \text{‘they are cultivating it here and there’} \\
bámbùlímíralímíra & \text{‘they are cultivating for him here and there’} \\
báguálíra & \text{‘they are bribing’} \\
bámùgúálíra & \text{‘they are bribing him’} \\
bááguálíra & \text{‘they bribed’} \\
báámbùgúálíra & \text{‘they bribed him’} \\
tébágúálíra & \text{‘they are not bribing’} \\
ómúlimi & \text{‘farmer’} \\
omúpákási & \text{‘porter’} \\
omúsélíkálè & \text{‘soldier’} \\
omugóbá & \text{‘driver’} \\
múlumuzi^3 & \text{‘judge’} \\
múngélézá & \text{‘Englishman’} \\
\end{array}
\]

\[
\begin{array}{ll}
abálimi & \text{‘farmers’} \\
abápákási & \text{‘porters’} \\
abasélíkálè & \text{‘soldiers’} \\
abagóbá & \text{‘drivers’} \\
músíglile^4 & \text{‘deputy’} \\
múvúbúká & \text{‘adolescent’}
\end{array}
\]
These tokens were digitized and measured in the same way as before. There were some problems with measurement, including the difficulty of identifying the beginning of a vowel after pause and the end of a vowel before pause; this speaker often has periods of voiceless formant energy at pause boundaries, or trails off at the end of an utterance in voiced but very attenuated vowel offsets. Nonetheless, a number of fairly reliable measurements were obtained, and these durations were statistically analyzed as before.

Mean durations for some words (a representative sample) and for pooled data are shown in (10) and (11). ANOVA’s for correlation of word duration with mora count and syllable count follow in (12); in this case, all post-hoc tests were significant to 99% for mora count, but only some were significant for syllable count (and even those numbers were again much weaker).

(10) Mean Durations of Selected Luganda Verbs in Isolation

<table>
<thead>
<tr>
<th>word</th>
<th>moras</th>
<th>syllables</th>
<th>duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>balimba</td>
<td>3</td>
<td>3</td>
<td>426</td>
</tr>
<tr>
<td>bamulimba</td>
<td>4</td>
<td>4</td>
<td>553</td>
</tr>
<tr>
<td>balimira</td>
<td>4</td>
<td>4</td>
<td>538</td>
</tr>
<tr>
<td>bamulimira</td>
<td>5</td>
<td>5</td>
<td>599</td>
</tr>
<tr>
<td>balimaalima</td>
<td>6</td>
<td>5</td>
<td>769</td>
</tr>
<tr>
<td>bamulimaalima</td>
<td>7</td>
<td>6</td>
<td>869</td>
</tr>
<tr>
<td>balimiraimira</td>
<td>7</td>
<td>7</td>
<td>817</td>
</tr>
<tr>
<td>bamulimiraimira</td>
<td>8</td>
<td>8</td>
<td>901</td>
</tr>
<tr>
<td>bagulirira</td>
<td>5</td>
<td>5</td>
<td>610</td>
</tr>
<tr>
<td>baagulirira</td>
<td>6</td>
<td>5</td>
<td>852</td>
</tr>
<tr>
<td>baamugulirira</td>
<td>7</td>
<td>6</td>
<td>914</td>
</tr>
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</table>

(11) Duration by Mora Count

<table>
<thead>
<tr>
<th>moras</th>
<th>duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>426</td>
</tr>
<tr>
<td>4</td>
<td>545</td>
</tr>
<tr>
<td>5</td>
<td>604</td>
</tr>
<tr>
<td>6</td>
<td>810</td>
</tr>
<tr>
<td>7</td>
<td>867</td>
</tr>
<tr>
<td>8</td>
<td>901</td>
</tr>
</tbody>
</table>

Here, the mean difference between categories, or apparent moraic constant, is 95 ms -- but this is not as consistent as in Runyambo.

(12) ANOVA’s: Correlation with mora count vs. syllable count

<table>
<thead>
<tr>
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<th>p-value</th>
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<td>mora</td>
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<td>5, 97</td>
<td>.0001</td>
</tr>
<tr>
<td>syllable</td>
<td>12.368</td>
<td>5, 105</td>
<td>.0001</td>
</tr>
</tbody>
</table>
As in Runyambo, it appears that in Luganda mora count is a more relevant timing factor than syllable count. The results are not as consistent — standard deviations are greater, and categories are not as distinct — but this is at least partly because the tokens were not elicited in the same way. For example, there is a large durational effect of position within an utterance: a given word is longer in isolation or utterance-finally than utterance-initially, and so on. In Runyambo, all target words occurred in the same position within the utterance, so this effect did not interfere with other timing factors. Luganda timing needs to be explored in greater depth with measurements of more comparable tokens; although it is presumably timed similarly to Runyambo (given similarities of vowel quantity distribution, compensatory lengthening processes, etc.), Hubbard (1992) shows that there are significant differences between the two languages in both phonological representation and surface duration (as seen in compensatory lengthening and tone assignment). So careful examination of both categorial and gradient differences between the timing systems of these languages is called for. Nonetheless, it appears that at least for the two speakers in this experiment, there is a significant effect of mora maintenance and segmental compensation on surface timing. Although syllable boundaries do not line up neatly across different words (as was implicitly claimed in Herbert 1975 for Luganda), there is some higher-order timing pattern such that (for instance) four-mora words containing long consonants like /k/ and /s/ are not radically longer than four-mora words containing short consonants like /t/ and /l/.

(13) Segment durations

<table>
<thead>
<tr>
<th>word</th>
<th>total</th>
<th>C2</th>
<th>V2</th>
<th>C3</th>
</tr>
</thead>
<tbody>
<tr>
<td>kusona</td>
<td>476</td>
<td>107</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>kubona</td>
<td>469</td>
<td>51</td>
<td>98</td>
<td>72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>word</th>
<th>total</th>
<th>C2</th>
<th>V2</th>
<th>C3</th>
<th>C4</th>
</tr>
</thead>
<tbody>
<tr>
<td>kusanga</td>
<td>562</td>
<td>125</td>
<td>133</td>
<td>78</td>
<td>13</td>
</tr>
<tr>
<td>kutanga</td>
<td>561</td>
<td>88</td>
<td>167</td>
<td>76</td>
<td>15</td>
</tr>
</tbody>
</table>

Though I have not yet determined exactly how this compensation is achieved, it appears that vowels adjust around the inherent durations of consonants to maintain approximately constant duration for words of \( n \) moras. The natural next step in this research is to find out exactly where this compensation occurs (i.e. at what point within the syllable and word), and whether it indeed occurs only in vowels. Meanwhile, we can take this phonetic result as evidence that moraic representation does have a systematic relation to physical output, and thus we can use phonetic data as evidence for and against specific versions of phonological representations.

One obstacle in testing such representations, though, is the lack of a comprehensive model for how phonological timing gets mapped to surface realization. Models for other aspects of the mapping between phonological structure and phonetic output have been developed recently; see among others Beckman and Pierrehumbert (1986), Browman and Goldstein (1986), Keating (1988). These have dealt primarily with intonation, coarticulation, and the nature of phonetic targets and the trajectories between them. I assume that the same principles apply to timing -- specifically, that the path from abstract phonological structure to speech production looks something like (14) (the schematic is taken from Cohn (1990)): 
Given this model, we can assume that there is a point at the output of the phonological derivation where duration is assigned to segments and syllables. In a language like English, a chief priority at this point will be assigning greater duration to stressed syllables. In a language like Runyambo, the highest priority will be to assign duration to segments dominated by a mora: these are the ones that determine distinctive quantity, and thus are subject to the constraint of maintaining a distinctive durational contrast, while other segments may receive their duration specification solely from other sources (such as their place and manner features).

There is some evidence for a timing model like this, from research in speech synthesis. Campbell and Isard (1991), in an effort to find a workable algorithm for calculating duration in synthesized speech, examined natural speech corpora of British English and concluded that the syllable was the most relevant unit of programming for duration (not the segment or anything else). Thus they consider the following factors in their model: (1) number of segments in the syllable, (2) nature of the syllable nucleus (tense/lax vowel, sonorant consonant, etc.), (3) position of the syllable in the foot, (4) position of the syllable in the phrase and clause, (5) stress, and (6) the function vs. content role of the word. The first thing to be calculated is not segment duration but syllable duration, taking into account stress, phrasal position, etc. and leaving out phonetic detail. Then the appropriate durations for individual segments are computed within that syllable span, considering factors such as inherent durations, the nature of pre-boundary lengthening (whether it applies to all segments in a syllable or just the last ones), etc.

Based on my measurements of Runyambo and Luganda, I conclude that a similar process takes place in natural language in the mapping of phonological timing to phonetic duration. This means for a general theory of timing we would want to take into account at least the following:
Does the language make phonological reference to moras?
Yes: assign minimum durations to maintain quantity distinction
No: next step

Calculate appropriate duration for the syllable:
   how many syllables in phonological word?
   how many words in phrase?
   position in phrase?
   location of stress?

Calculate appropriate duration for each segment:
   feature specification?
   specifications of neighboring segments?

At this stage in the computation of timing, language-specific allophonic rules would apply, and their output would be subject to universal physiological constraints on relative timing. This means that a number of factors may influence the final realization of duration after the end of the phonological derivation. But this does not necessarily obscure underlying relationships; indeed in languages with distinctive quantity we know that it does not.

Clearly, more phonetic data must be gathered before we can fill in the details of such a timing model. Articulatory studies can tell us more about universal constraints as well as language-specific patterns; perceptual studies can help us determine the degree of \"slack\" there is in how accurately timing relations must be executed to maintain necessary contrasts. And, more fundamentally, further acoustic studies on more languages will provide the basic data on duration that will allow us to compare surface timing with phonological structure. Then it will be possible to determine the true role of the mora.

Notes

* The work on Luganda in this paper was supported in part by National Science Foundation Grant BNS91-09234.

1 The /b/ is not included in the measurement; it is shown to indicate that the VN sequence occurred before a stop, the environment in which compensatory lengthening takes place (cf. (3)). I have argued elsewhere (Hubbard 1992) that in Runyambo, this compensatory lengthening does not result in the nasal giving up all of its mora, as it does in Luganda. Rather, as Maddieson (1992) found for Sukuma, the nasal ends up sharing its mora with the preceding vowel. Thus it is not possible in Runyambo to get a \"two-mora\" measurement just from a compensatorily lengthened vowel; the nasal must also be included.

2 Acute accent marks High tone, grave accent Low tone, unmarked = toneless.

3 Phonetically [m(u)lamudzi]. These four tokens have no augment (initial vowel) because they were elicited after a negative verb, an environment in which nouns lose their augment.

4 Phonetically [musi\gi\ire].

5 In Runyambo, for example, this step will assign greater duration to the penultimate syllable of the phonological word (see Hubbard 1992).
References


McCarthy, John J. and Alan S. Prince. 1986. Prosodic Morphology. MS, University of Massachusetts, Amherst and Brandeis University.


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Expletive Verb Marking in Abkhaz

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University of Chicago

1.0 Introduction.

It is well known that many languages contain "expletive" or "dummy" noun phrases which have no semantic content, but which fill a syntactic slot required by the language. The best known examples of these are English "it" and "there" and French "il", as illustrated in (1):

1) a. It is raining.
   b. It is obvious that John is guilty.
   c. There is a unicorn in the garden.
   d. Il fait beau.
   e. Il est impossible que Jean soit parti.

Proponents of the Government and Binding model of syntax (e.g. Chomsky 1981: 35) have often claimed that expletive NPs can only occur in subject position (as in the examples in (1)), because this position is not subcategorized for by the verb in GB. In that theory, syntactic subcategorization is the same as theta-marking; a verb subcategorizes for a syntactic position if and only if it assigns a theta role to it, where the theta roles assigned by a verb represent its semantic arguments. Since expletives, being semantically empty, receive no theta role, it follows that they cannot occur in subcategorized positions. However, Postal and Pullum (1988) show that, at least in English, expletive NPs can indeed occur in subcategorized positions, as in the following examples:

2) a. I regret it very much that we could not hire Mosconi.
   b. The Lord stopped it from raining.
   c. The mayor prevented there from being a riot.
   d. See to it that this package arrives on time.
   e. Beat it!

Postal and Pullum show that the underlined NPs in (2) are indeed semantically vacuous expletives, and that they are in fact arguments of their respective main verbs by all available tests. P & P argue that such examples show that syntactic subcategorization cannot be reduced to semantic argument structure, as is generally done in GB; a verb may subcategorize syntactically for a position it assigns no theta role to. Authier (1991) concedes Postal and Pullum’s main point and proposes a modified definition of subcategorization in GB which does not rely exclusively on theta-marking.

In this paper I argue that the conclusions reached by Postal and Pullum for syntax apply equally well to morphology: it is possible for a verb to subcategorize morphologically for an "agreement" affix which corresponds to no semantic or syntactic argument of the verb. Specifically, I will show that the Northwest Caucasian language Abkhaz contains at least three different semantically and syntactically empty person-number markers, one corresponding to each agreement slot on the verb, which are morpho-phonologically identical to third person singular agreement markers. Thus the lexical entry for each Abkhaz verb must contain a morphological "subcategorization frame" (stating which person-number affixes it
requires) in addition to information about syntactic subcategorization and semantic argument structure.

2.0 Abkhaz verb morphology

Abkhaz, like most of the indigenous languages of the Caucasus, is very complex morphologically, particularly with respect to the verb. Abkhaz verb morphology is templatic, as in many Native American languages; the verbal template contains a large number of “slots”, and only one affix from each slot may be present at once. The exact number of slots in the Abkhaz verb is not a completely settled matter (Spruit 1987 shows 20, Hewitt 1989 shows 25), but the following simplified diagram includes the most important affixes for our purposes:

3) absolutive-dative-preverb-ergative-root-tense/aspect

These affixes must occur in the above order, though of course all will not necessarily cooccur in the same verb. Three of the above affixes (absolutive, dative, and ergative) are generally referred to as agreement prefixes, since they vary according to the person, number, and animacy of the verb’s arguments. Table (4) shows the different forms these prefixes can take, and (5) illustrates a verb which contains all three prefixes:23

<table>
<thead>
<tr>
<th>4)</th>
<th>Absolutive</th>
<th>Dative</th>
<th>Ergative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg.</td>
<td>s-</td>
<td>s-</td>
<td>s-/z-</td>
</tr>
<tr>
<td>2sg. masc.</td>
<td>w-</td>
<td>w-</td>
<td>w-</td>
</tr>
<tr>
<td>2sg. fem.</td>
<td>b-</td>
<td>b-</td>
<td>b-</td>
</tr>
<tr>
<td>3sg. masc.</td>
<td>d-</td>
<td>y-</td>
<td>y-</td>
</tr>
<tr>
<td>3sg. fem.</td>
<td>d-</td>
<td>l-</td>
<td>l-</td>
</tr>
<tr>
<td>3sg. nonhum.</td>
<td>y-/Ø</td>
<td>a-/Ø</td>
<td>a-/na-</td>
</tr>
<tr>
<td>1pl.</td>
<td>h-</td>
<td>h-</td>
<td>h-/aa-</td>
</tr>
<tr>
<td>2pl.</td>
<td>§*-</td>
<td>§*-</td>
<td>§<em>-/</em>-</td>
</tr>
<tr>
<td>3pl.</td>
<td>y-/Ø</td>
<td>r-</td>
<td>r-</td>
</tr>
</tbody>
</table>

5) a-xáč'a a-š"q"s a- ph"s y- ló- y- te- yt'
   “The man gave the woman the book”

The slashes in the table indicate various alternations, some phonologically-based and some morphologically-based, which will be discussed below. Also, some of the morphemes which appear to be identical in the table actually differ in stress-status, which will also be discussed below.

Many Abkhaz verbs contain preverbs, which occur between the dative and ergative markers in (3); these are roughly similar in function to English prepositions, though there are more of them (well over 100) and they can be more specialized in meaning:45

6) a-mašˈjna ˈa-c’la-k*ˈa ɒ- rə- bžˈsə- sə- yt'
   “The car passed between the trees” (-bžˈsə- = ‘between’)


7) a-č'áš' č'asá-k' Ø- á- mə- s- xe- yt'
DEF-loaf piece-one 3.SG.ABS-3.SG.DAT-from-1.SG.ERG-take-AOR.ACT
“I took a piece (of bread) from the loaf” (-mə=‘at; from’)

8) a-xálpə Ø- k'ną- s- ha- yt'
DEF-cap 3.SG.ABS-hook-1.SG.ERG-put-AOR.ACT
“I hung up the cap” (-k'ną=‘on a hook’)

Some preverbs require the verb to have an indirect object with a corresponding
dative marker (6-7 above), while others do not (8).

3.0 Expletive verb marking
For the most part, it is possible to reconstruct the argument structure of a
clause in Abkhaz by looking at the number of agreement markers on the verb; each
marker corresponds to a semantic argument. However, some Abkhaz verbs do not
conform to this ideal: they require a dummy third person singular (nonhuman)
“agreement” marker which seems not to correspond to any verbal argument. Such
dummies can occupy any of the three agreement slots in the Abkhaz verbal
template, as the following examples illustrate (dummy markers are in boldface):

9) Absolutive dummy
a) (sará) y- sə- z- ha- węyt'
I 3.SG.ABS-1.SG.DAT-for-grow-PRES.ACT
“l grow”, literally “It grows for me” (-z=‘for’)

b) (sará) a-ca-rá y- á- k”ə- s- k”ə- yt'
I go-INF 3.SG.ABS-3.SG.DAT-on-1.SG.ERG-hold-AOR.ACT
“I intended to go”, lit. “I held it on going” (-k”ə=‘on’)

c) y- pxnə- wp'
3.SG.ABS-be.summer-PRES.STATIVE
“It is summer”

10) Dative dummy:
a) a-pšá Ø- á- s- weyt'
DEF-wind 3.SG.ABS-3.SG.DAT-hit-PRES.ACT
“The wind is blowing”, lit. “The wind is hitting it”

b) (sará) a-č-k”á Ø- a- nə- s- c’e- yt'
I DEF-horse-PL 3.PL.ABS-3.SG.DAT-on-1.SG.ERG-put-AOR.ACT
“I bred horses”, lit. “I put horses on it” (-nə=‘on (a flat or concave
surface’))

c) (dará) d- á- c’a- xe- yt’
he 3.SG.ABS-3.SG.DAT-under-remain-AOR.ACT
“He was defeated”, lit. “He remained under it” (-c’a=‘under’)

d) (dará) d- á- lə- r- xe- yt’
him 3.SG.ABS-3.SG.DAT-out.of-3.PL.ERG-take-AOR.ACT
“They elected him”, lit. “They took him out of it” (-lə=‘in, out of (a
solid or a group’))
11) Ergative dummy:

a) a-k’á ø-a- w- wéyt’
   DEF-rain 3.SG.ABS-3.SG.ERG-make-PRES.ACT
   “It is raining”, lit. “It is making rain”

b) á- rc’ew- k’a ró- fa-ra ø-a- w- wéyt’
   “It is possible to eat grasshoppers”, lit. “It makes eating grasshoppers”

c) (sará) a-psáž ø-sø- č’- na- xe- yt’
   I DEF-fish 3.SG.ABS-1.SG.DAT-face-3.SG.ERG-take-AOR.ACT
   “I vomited up the fish”, lit. “It took the fish out of my mouth” (-č’- = ‘at / from the face’)

d) (dará) d- ro- la- na- gala- yt’
   he 3.SG.ABS-3.PL.DAT-among-3.SG.ERG-bring-AOR.ACT
   “He found himself among them”, lit. “It brought him among them” (-lo- = as in 8d above)

As the glosses in (9)-(11) indicate, these dummy verb markers do not correspond to anything in the semantics. Nevertheless, there is considerable evidence that they are morphologically identical to their non-dummy counterparts. This evidence includes the following: (a) Dummy and non-dummy third person markers are homophonous and occupy the same slots in the verb’s morphological template, as a comparison of the morpheme glosses in (5)-(8) vs. (9)-(11) illustrates. (b) They have the same effect on word stress. Each mora of an Abkhaz word can be divided into one of two classes, accented and unaccented; stress in a word goes on the first accented mora which is not immediately followed by another accented mora (cf. Spruit 1985, Kathman 1992). Abkhaz third person singular verb markers have the same stress status whether they are dummy or not: the absolutive (y-/ø-) is unaccented, the dative (a-/ø-) is accented, and the ergative (a-/na-) is unaccented. (c) They participate in the same morphosyntactically conditioned alternations. For example, the 3sg. nonhuman dative marker is realized as a- with certain verb roots (cf. 10 above) and as ø- with others (cf. 13-15 below). Dummy and “real” agreement markers behave exactly alike in this respect. Similarly, the 3sg. nonhuman ergative marker is realized as a- when there is no preverb present (cf. 11.a-b) and as na- when there is a preverb present (cf. 11.c-d). Here, too, dummy and non-dummy verb markers behave exactly alike.

Whether expletive verb markers correspond to anything in the syntax is a more difficult question, partly empirical and partly depending on one’s theoretical assumptions. Like most languages with comparably rich verb inflection, Abkhaz does not require overt NPs to occur with its verbs; thus a single finite verb, such as the one in (5) above, can stand alone as a sentence:

12) y- lo- y- te- yt’
   3.SG.ABS-3.SG.F.DAT-3.SG.M.ERG-give-AOR
   “He gave it to her”

In a Government-and-Binding analysis (e.g. Baker 1991), the above sentence would contain null pronouns (“little pro”) coindexed with the agreement markers and serving as the syntactic arguments of the verb; thus we might say that the
sentences in (9)-(11) contain a similar null pronoun which is coindexed with the dummy verb markers. However, such an analysis is not without its problems. Note that each of the markers in the above verb can correspond to an overt NP, as a comparison of (12) with (5) illustrates. In contrast, expletive verb markers are incapable of appearing with an overt NP; this can be illustrated by comparing verbs which have inflectional dummies in an idiomatic meaning with their literal counterparts where the same marker is not a dummy, as in the following minimal pairs:

13a. (*yara) y- a- nó- s- c’e- yt’ a-č-ká
   it  3.PL.ABS-3.SG.DAT-ON-1.SG.ERG-put- AOR.ACT  DEF-horse-PL
   “I bred horses”, lit. “I put horses on it” (= 10.b above)

14a. a-baá a-soldat-c’á (*yará) y- Ø- k-ə- r- xə- yt’
   DEF-castle DEF-soldier-PL it 3.SG.ABS-3.SG.DAT-off-3.PL.ERG-take-AOR
   “The soldiers destroyed the castle”, lit. “The soldiers took the castle off it”

15a. (*yará) d- Ø- tá- xa- yt’ a-soldáť
   it  3.SG.ABS-3.SG.DAT-in-remain-AOR.ACT  DEF-soldier

b. s-zóba y- Ø- tá- xa- yt’ a-c”á
   1.SG-pocket  3.SG.ABS-3.SG.DAT-in-remain-AOR.ACT  DEF-apple
   “The apple remained in my pocket”  (ta- = ‘in (a hollow space)’)

The verbs in each pair are morphologically identical, but the (a) sentences permit one fewer overt NP than the (b) sentences; thus if we adopted a little pro analysis, we would have to specify somehow that the expletive markers obligatorily, rather than optionally, are governed by a null pronoun. Stump (1984) in fact argues for something like this analysis to account for some superficially similar facts in Breton. As Stump shows, in Breton “the appearance of personal inflections encoding a particular argument position excludes the appearance of an overt noun phrase in that position” (1984: 289); in other words, sentences with subject agreement on the verb cannot contain a subject NP. He accounts for this fact by proposing that Breton has a principle stating that the governor of AGR must be null; in practice this means that the subject of any verb containing agreement must be little pro. Even if we accept Stump’s arguments, though, there are some crucial differences which make the little pro analysis less than ideal for Abkhaz. For one thing, Stump’s principle covers all agreement in Breton, but for Abkhaz we would have to lexically specify that only certain agreement markers in certain verbs require their governor to be null. Even if we could come up with some way to do this, there is a more serious problem: under standard GB assumptions, little pro must receive a theta role. Since the Abkhaz dummy markers are semantically empty, they
do not correspond to any theta role unless we make the notion of theta role semantically vacuous; thus, they could not be governed by little pro.

Another possible analysis would be to say that Abkhaz person-number markers are themselves the syntactic arguments of the verb; then we would be able to treat expletive verb markers as syntactically equivalent to the expletive NPs in such sentences as It is raining and I regret it very much that we could not hire Mosconi, and whatever explanation we propose for syntactic expletives could be extended to morphological expletives. Among the more prominent analyses which treat “agreement” morphology as a syntactic argument are Jelinek (1984, 1989) and Sadock (1991: 198-205). Jelinek argues that, at least in Warlpiri and certain other languages, what are generally considered “agreement markers” are actually the syntactic arguments of the verb, and that any overt NPs which appear in a sentence are syntactically adjuncts. Sadock (1991; 198-205) treats at least some verb agreement morphology in such languages as Breton and Spanish as a syntactic argument (generally subject) of the verb; however, he differs from Jelinek in that he allows overt third person NPs to also be arguments if they are present, in which case the agreement morphology loses its syntactic independence.

Here, too, we run into problems when we try to apply these analyses to Abkhaz. For one thing, there are numerous ways in which Abkhaz NPs do not behave like adjuncts, as they would under a Jelinek-style “pronominal argument” analysis: (1) As Hewitt (1989; 155) notes, NPs in Abkhaz, including independent pronouns, do not have any inherent contrastive force and commonly occur in unmarked, noncontrastive environments; there is a separate set of emphatic contrastive pronouns. This is in contrast to Jelinek’s pronominal argument languages (e.g. Warlpiri, Choctaw), where all pronouns are emphatic to some degree. (2) Not all argument NPs are optional in Abkhaz; they are strongly preferred in questions, and some postpositions require an overt NP object (Hewitt (1989: 73)). Abkhaz differs in this way from the languages discussed by Jelinek, where the optionality of NPs is one of her primary reasons for considering them adjuncts. (3) Hewitt (1989) makes numerous syntactic generalizations, involving such things as word order, reflexives, and reciprocals, under the assumption that Abkhaz NPs are arguments of the verb bearing grammatical relations such as subject, direct object, etc. These generalizations are lost if all NPs are considered adjuncts.

Not only is there reason to believe that Abkhaz NPs are arguments (contra Jelinek’s analysis), but I am aware of no evidence that Abkhaz verbal markers should be considered syntactically independent verbal arguments. There are languages in which good arguments can be made for the syntactic independence of bound agreement morphemes – for example, numerous languages, including Irish (McCloskey 1986), Crow (Gracyzek 1991), and Greenlandic (Sadock p.c.) allow agreement morphology to be conjoined with a full NP. However, such conjunction does not work in Abkhaz:

16) a. áxre-y saré-y h- aa- yt'  
AXRA-AND I-AND 1.PL.ABS-COME-AOR.ACT  
"Axra and I came"

b. * áxre-y h- aa- yt'  
AXRA-AND 1.PL.ABS-COME-AOR.ACT
c. *áxre-y s- aa- yt’
AXRA-AND 1.SG.ABS-COME-AOR.ACT

Such a fact does not, of course, mean that it is impossible to analyze Abkhaz verb markers as having syntactic independence, but in general I am aware of no positive evidence for such an analysis. In the absence of any evidence to the contrary, I will assume that Abkhaz verb inflection in general (and expletive verb agreement in particular) does not have any independent syntactic reality, and that it does not correspond to any null element in the syntax.

4.0 Consequences

The facts outlined above are difficult to reconcile with the common model of agreement whereby features are copied from NPs onto the verb, since with dummy marking there is nothing for the features to be copied from. I suggest that we can best account for the facts of Abkhaz by positing the existence of a morphological subcategorization frame separate from both semantic argument structure and syntactic subcategorization. Verbs can subcategorize for more morphological slots than syntactic/semantic arguments, in which case one of the morphological slots must be a dummy, unconnected to the syntactic frame. The following lexical entries for the Abkhaz verb roots -ha- ‘grow’ and -s- ‘blow’ illustrate this, using some of the notation of Autolexical Syntax (Sadock 1991):

17) a. -ha- “grow” (9.a)
   semantics: [F-1]
   syntax: [s NP __]
   morphology: [Agr1, Agr3]

   b. -s- “blow” (10.a)
   semantics: [F-1]
   syntax: [s NP __]
   morphology: [Agr1, Agr3]

These entries indicate that semantically, both verbs are one-place predicates, and syntactically, both are intransitive verbs, which combine with an NP to make a sentence. Although they each require only one semantic and syntactic argument, both verbs subcategorize for two person-number markers: an absolutive (indicated by “Agr1”) and a dative (indicated by “Agr3”). Furthermore, we must specify lexically which of the markers in each verb corresponds to the single syntactico-semantic argument and which is a dummy: in (17a), the absolutive marker is a dummy (indicated by underlining it), and so the dative marker corresponds to the single syntactic argument; in (17b), the dative marker is a dummy, and so the absolutive marker corresponds to the syntactic argument. For transitive verbs containing morphological dummies (such as those shown earlier in (13)-(14), which take two syntactic arguments but three verb markers), things are slightly more complicated; not only do we have to specify which of the three verb markers is a dummy, but we have to make sure that the two non-dummy morphological slots correspond to the right syntactic arguments. In Kathman (in progress) this is accomplished by linking rules involving parallel hierarchies of grammatical relations and of agreement markers; I will not go into these linking rules here because of space limitations, but the system outlined in Gerdts (1993) is very similar in spirit.

Enriching the lexical entries of verbs in this way might be a questionable move if it were done solely to handle the facts of Abkhaz; as it turns out, though, similar dummy “agreement” marking is found in many other languages, though usually not as clearly or extensively as in Abkhaz. The following is by no means
an exhaustive catalog of languages with dummy verb marking, but it should be
even to show that the phenomena we have seen in Abkhaz are far from unique,
and that they need to be accomodated in any linguistic theory with any claim to be
universal. All of these cases can be handled by separating morphological and
syntactic subcategorization, as in (17); details can be found in Kathman (in progress).
a) Georgian has some verbs which require an indirect object marker, even
though syntactically they are intransitive and cannot take an indirect object (Aronson
1990: 407): 9

18) a. kari u-berav-s
   wind 3.SG.IO-blow-3.SG.SUBJ.PRES
   “The wind blows”

   b. ga-e mgzavr-a
   PVB-3.SG.IO-travel-3.SG.SUBJ.AOR
   “He traveled”

   c. da-e-cem-a
   PVB-3.SG.DAT-fall.down-3.SG.SUBJ.FUT
   “He will fall down”

   b) Algonquian languages also provide numerous examples (many pointed
out by Anderson 1992a) of verbs whose morphology indicates more arguments
than are present syntactically. Algonquian verbs are traditionally divided into four
classes according to their transitivity and the animacy of the absolutive argument,
and these classes are clearly distinguished morphologically. In most of these
languages, there are some verbs which are syntactically and semantically
intransitive, yet which require Transitive Inanimate inflection, normally used for
verbs which take an inanimate direct object (in the terminology of Bloomfield 1962,
these verbs take a “formal object”): 10

19) a. Menomini (Bloomfield 1962: 46)
   noqnon-am
   swim-3.SG.SUBJ/INAN.OBJ
   “He swims”

   b. Fox (Amy Dahlstrom, personal communication)
   a:hkwamat-amwa
   be.sick-3.SG.SUBJ/INAN.OBJ
   “He is sick”

   c. Cree (Amy Dahlstrom, p.c.)
   kaske:yiht-am
   be.lonesome-3.SG.SUBJ/INAN.OBJ
   “He is lonesome, homesick”

c) Tlingit, as described by Leer (1992), also exhibits expletive verb marking
in some constructions. Tlingit has four main verb classes: Impersonal (taking
neither subject nor object), Intransitive (taking a subject but not object), Objective
(taking an object but no subject), and Transitive (taking both subject and object). In
addition, there are two groups of verbs which require a dummy indefinite human subject marker *du*. The first of these, which Leer calls *du*-impersonal, is syntactically and semantically an Impersonal verb (it takes no arguments), but morphologically it is Intransitive, inflected as though it had a subject (cf. 20a). The class which Leer calls *du*-objective has a single syntactic argument crossreferenced by an object marker on the verb, as well as a dummy indefinite human subject marker (cf. 20b):

20) a. wu- du- wa- nígw
   PREF-3.HUM.INDEF.SUBJ-PREF-WIND.BLOW
   “The wind is blowing”

b. Xad# kaw- du- wa- sáy
   1.SG.OBJ-PREF-3.HUM.INDEF.SUBJ-PREF-BE.HOT
   “I am hot, sweaty”

d) Finally, in Warlpiri (Hale 1973: 336), certain transitive verbs can optionally take a dummy dative marker, which adds a sense of attempt or incompleteness to the action. Cf. 21a below, without a dative dummy, vs. 21b, with a dummy:

21) a. nyuntulu-rlu Ø- npa- ju pantu-rnu ngaju-Ø
    YOU-ERG PAST-2.SG.NOM-1.SG.ACC spear-PAST me-ABS
    “You speared me”

b. nyuntulu-rlu Ø- npa- ju- rla pantu-rnu ngaju-Ø
    YOU-ERG PAST-2.SG.NOM-1.SG.ACC-3.DAT spear-PAST me-ABS
    “You speared at me; you tried to spear me”

The dative marker in (21b) is not a dummy marker in the strict sense, since it does contribute to the semantics of the sentence, but it arguably does not correspond to anything in the syntax since it cannot appear with an NP.

On a different note, an analysis which separates the morphology and the syntax of verb agreement predicts that in addition to dummy “agreement” morphology, there should be verbs in morphologically complex languages which exceptionally fail to agree with certain arguments -- i.e., which subcategorize for fewer morphological than syntactic arguments. This is in fact possible: while in general an Abkhaz verb must agree with any NP in its clause which is not the object of a postposition, a significant number of Abkhaz root-preverb combinations only optionally exhibit agreement with the object of the preverb:

22) a. a-3Ø a-k’ólc“ara-k”a yə- r- k’ól- sə- yt’
    DEF-water DEF-hole-PL 3.SG.ABS-3.PL.DAT-through-pass-AOR.ACT
    “The water leaked through the holes”

b. a-3Ø a-k’ólc“ara-k”a yə- k’ól- sə- yt’
    DEF-water DEF-hole-PL 3.SG.ABS-through-pass-AOR.ACT
    “The water leaked through the holes”
Both the fact that the object a-k’šl’c’’ara-k’a does trigger agreement in (22a) and the fact that it appears without a postposition indicate that this NP is in fact a direct argument of the verb. We can account for the variation in (22) by positing two lexical entries for this verb: one, corresponding to (22a), which contains both Agr1 and Agr3 in its morphological frame, and the other, corresponding to (22b), which only contains Agr1:

23) a. -k’šl-sə- “pass through” (22a)  
   semantics: [F-2]  
   syntax: [VP NP ___]  
   morphology: [Agr1, Agr3]

   b. -k’šl-sə- “pass through” (22b)  
   semantics: [F-2]  
   syntax: [VP NP ___]  
   morphology: [Agr1]

Here, too, such phenomena are not limited to Abkhaz; most Algonquian languages have verbs which are syntactically transitive but morphologically intransitive (the opposite of the examples given above in (19)):

24) a. Fox (Amy Dahlstrom, p.c.)  
   ahpe:nemo-wa  
   depend.on–3.ANIM.SUBJ  
   “He depends on him/it”

   b. Menomini (Bloomfield 1962: 47)  
   napa:kehnakesawan tepa:ha:ke:w  
   FLAT.TIMBERS SELL–3.INAN.SUBJ  
   “He sells flat timbers”

Such examples can be handled straightforwardly as verbs which are transitive morphologically but intransitive syntactically, parallel to the Abkhaz example in (23b).

5.0 Conclusion

I hope to have shown in the preceding pages that the relationship between “agreement” morphology and syntax is not always straightforward, and that separating morphological from syntactic subcategorization is a worthwhile and necessary step to take. Though the conclusions reached here are intended to be relevant for any grammatica framework, the existence of expletive verb marking in Abkhaz and other languages provides support for analyses, such as that of Sadock (1991), which treat morphology and syntax (and semantics) as independent but connected systems.

Notes

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1 See Simpson and Withgott (1986) for a discussion of templatic morphology and a comparison with the “layered” morphology found in European languages like English.

2 Spruit (1987) identifies a separate set of “causee” prefixes, used for the embedded subject in causatives of transitive verbs. These are similar but (contra
Hewitt 1989: 171) not identical to the dative prefixes; I will ignore them in this paper, since they are not relevant for our purpose.

I will use the following abbreviations in the morpheme glosses: DEF = definite; SG = singular; PL = plural; M = masculine; F = feminine; H = human; ABS = absolutive; DAT = dative; ERG = ergative; AOR = aorist; PRES = present; ACT = active; STAT = stative; SUBJ = subject; OBJ = object; INAN = inanimate. A third person singular marker not glossed with M, F, or H should be assumed to be nonhuman; Ø denotes apparently zero allomorphs which retain a metrical grid (Kathman 1993a).

Abkhaz does have postpositions, in some cases with meanings very similar to those of certain preverbs. Spruit (1987) contains extensive discussion of the differences in meaning between combinations of verb root + preverb and verb + postposition.

The third person absolutive marker y- (nonhuman or plural) is realized as zero (Ø) when it is immediately preceded by its referent, as in (6)-(8).

Such sentences can contain an NP coreferential with the agreement, but Stump argues that such NPs are outside the sentence (i.e., are topics) and do not occupy an argument position. Also note that Stump’s account is intended to cover inflected postpositions as well as verbs, but we need not go into postpositions here since they are not directly relevant to the point at hand.

Chomsky (1981: 37, 325) does propose the existence of a dummy theta role to be assigned to idiom chunks (“advantage” in “take advantage of”) and some instances of pleonastic “it” (as in “It is raining”); however, in Chomsky (1982: 10) he seems to change his mind, saying that pleonastic “it” never receives a theta role. Positing semantically empty theta roles effectively strips the notion of theta role of any semantic content, and such an idea has been rejected by most GB syntacticians (such as Authier 1991).

I am here treating subjects as subcategorized arguments, as in Lexical Functional Grammar (Bresnan 1982).

Anderson (1992b) argues that some verbs in Georgian (those which Aronson (1990) calls Third Conjugation) have a dummy direct object marker. However, since the third person direct object marker is zero in Georgian, Anderson’s evidence is necessarily indirect and his argument rather involved, so we will not go into it here.

Bloomfield (1962: 46-48) describes some further peculiarities of the verbal system of Menomini, including a verb which reflects for a dummy third person plural object, as well as verbs which have the morphological characteristics of ditransitive verbs despite being monotransitive syntactically. I will not go into these verbs here, but Kathman (in progress, Chapter 3) contains a discussion of them within a framework very similar to the one used in this paper.

References


Verbal Compounding in Korean

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Introduction

In this paper, I will discuss verbal compounds (=synthetic compounds) from a morphosyntactic point of view. The paper consists of two parts. First, morphosyntactic evidence will be provided for the structure of the verbal compound in which compounding precedes the suffixation. Secondly, based on Grimshaw’s (1990) theory of argument structure, I propose the “no external argument” condition to describe Korean verbal compounds rather than the “no subject condition” proposed by Selkirk (1982).

1. Morphological Structure

The verbal compounds involve both compounding and derivation. If we follow the level-ordering hypothesis (Allen 1978) in which derivation is followed by compounding, and then by inflection, the structure given in (1) would be the morphological structure for the verbal compounds.

\[
(1) \quad \begin{array}{c}
N^0 \\
\downarrow \\
N^{-1} \\
\downarrow \\
\text{truck} \\
\downarrow \\
V^{-1} \\
\downarrow \\
\text{drive} \\
\downarrow \\
\text{Suffix} \\
\downarrow \\
\text{er}
\end{array}
\]

With the structure in (1), we treat verbal compounding exactly like other compounding, that is, two nominal stems combine to make a compound word.

Sohn (1987) assumes the structure in (1) to explain phonological facts such as neutralization and palatalization in Korean, which suggest that the verbal stem and the derivational suffix are a unit.

\[
(2) \quad \begin{array}{c}
\text{Neutralization} \\
\text{Palatalization}
\end{array}
\]

a. \([k'oc\text{h}][k'oc-i]\rightarrow *[k'otk'odi] [k'otk'oji]\\n\text{‘flower-put-nml (flower arrangement)’}

b. \([h\ae][tot-i]\rightarrow [h\ae\text{doji}] *[h\ae\text{doti}]\\n\text{‘sun-rise-nml (sun rise)’}

However, in the framework of prosodic phonology, Han (1991) has observed that morphological structure and phonological bracketing are mismatched in many cases. Therefore, phonological evidence cannot be a valid argument for the morphological structure.

Selkirk (1982) assumes this structure given the fact that compounds with the composition of [N V] do not exist in English: Most [N V] compounds such as baby-sit, and brow-beat are formed by back-formation. Such an argument is based on the assumption that every subtree of the word tree is a word. There is no verb truck-drive in English. However, typical examples of verbal compounds such as church-goer and bird-watcher are problematic to this assumption, since the right-hand stem of each compound, goer, watcher, is not an existing lexical item in English. We might introduce a constraint that filters out an [N V] compound as a word in English (W. Croft (p.c.)). The constraint would rule out the compounded verbs as the output of the lexicon. The verbal compounds are nouns or adjectives when they come out of the word-formation component, hence the constraint does not apply. It is ad hoc to preclude the [N V] compounding rule itself in the Grammar. Compared with English, Korean has a more general constraint: in order for a verbal stem to be a word, it always needs a derivational or inflectional morpheme. In other words, every verbal stem is a bound morpheme, whether it is simple or complex. Therefore, the lack of a word which consists of simply [N V] cannot be evidence for the structure in (1).

In the following section, I will argue for the structure in (3) as the proper morphological structure of the verbal compound (cf. Lieber 1983).

(3)

```
N^0
   / \          Suffix
V^-1  \
   /   \       \
N^-1  V^-1     er
  truck  drive
```

2. Eventive vs. Non-eventive Verbal Compounds

There are two types of verbal compounds: while one type of compound denotes an event, the other type denotes a referential object. The distinction hinges on the suffix. This fact can be easily captured under the assumption of the morphological structure given in (3), which has a suffix as the head. I will discuss the two main differences between the two types of verbal compounds:
argument linking and cooccurrence with duration adverbials, and show that these differences cannot be accounted for with the structure in (1).

2.1. Argument Linking beyond a Compound

The previous studies on verbal compounds (Roepke and Siegel 1978, Selkirk 1982, Lieber 1983, Sugioka 1984, etc.) have been concerned only with the argument of the verbal stem satisfied within the compound. What happens to the other arguments if the verbal stem has more than one argument?

Recall that the head of a morphological structure is the right-hand sister according to Williams (1981b). If the two structures in (1) and (3) are considered with this assumption, the right-hand nominal stem is the head in (1), whereas the suffix is the head in (3). In either structure, the verbal stem itself is not the head of the whole compound. Given that morphological operations take place in the lexicon, and that syntactic operations will be blind to the internal structure and the features of the non-head of a lexical item (Mohanand 1986), it follows that the argument of the non-head (verbal stem) must not be linked outside the verbal compound.

However, consider the examples in (4).

(4) a. Sandy-uy ṭal-tha-ki
    Sandy-GEN horse-ride-nml
    ‘Sandy’s (Agent) horse-riding’

b. Sandy-uy ṭung-tta-kay
    Sandy-GEN bottle-open-nml
    ‘Sandy’s (Possessor, *Agent) bottle-opener’

Genitive marked noun phrases outside of verbal compounds are interpreted differently: Sandy is Agent of the verbal compound in (4)a, while it is Possessor in (4)b. In other words, the left-over argument of the verbal stem is linked to the NP outside of the compound in (4)a, but cannot be linked in (4)b. I will call these two types of verbal compounds the eventive and non-eventive verbal compounds, respectively.

2.2. Cooccurrence with Duration Adverbials

In addition to the distinction in argument linking, we find another contrast between the two types of verbal compounds.

(5) a. han sikan tongan-uy ṭal-tha-ki
    one hour during-GEN horse-ride-ing
    ‘horse-riding for an hour’

b. *han sikan tongan-uy ṭung-tta-kay
    one hour during-GEN bottle-open-er
    ‘bottle-opener for an hour’
(5) shows that an aspectual modifier such as a duration adverbial can cooccur with an eventive verbal compound and not with the other. Grimshaw (1990) explicates the difference between what I will call eventive nominals and non-eventive nominals. Cooccurrence with aspectual modifiers is one of the main differences. What should be noted is that when a duration adverbial modifies an eventive verbal compound, it modifies the event which the verbal stem denotes. (5)b is acceptable in a special situation, eg., where someone says “this was my bottle-opener (used) for an hour” referring to an object which is not a conventional bottle-opener. But, in such a case, what is modified by the duration adverbial is not the event of opening but the event of using. The important distinction is whether a durational adverbial can modify the event denoted by the verbal stem in a verbal compound or not.

A few more examples of eventive and non-eventive verbal compounds are given in (6) and (7).

(6) Eventive Verbal Compounds
   a. cang-po-ki  
      ‘grocery-shopping’
   b. phato-tha-ki  
      ‘wave-riding (surfing)’
   c. yen-nalliki  
      ‘kite-flying’
   d. kong-kwuli-ki  
      ‘ball-rolling’
   e. hay-tot-i  
      ‘sun-rise’
   f. seyspang-sal-i  
      ‘living in a rented room’

(7) Non-eventive Verbal Compounds
   a. yenphil-kak-k-i  
      ‘pencil-sharpener’
   b. cec-mek-i  
      ‘breast milk-eat-nml (baby)’
   c. os-kel-i  
      ‘clothes-hanger’
   d. cay-thel-i  
      ‘ash-shaker (ash tray)’
   e. kil-cap-i  
      ‘road-catcher (guide)’
   f. halwu-sal-i  
      ‘one day-live-nml (day-fly)’

2.3. An Analysis: Eventive vs. Non-eventive Nominalizer

Let us see how we can capture the differences of the two types of verbal compounds in the proposed structure. I propose that the distinction comes from the different lexical information in each suffix. The suffixes in non-eventive verbal compounds such as in (8)a have the “R(eferential)” role (Williams 1981a) in their argument structures and make derived nouns referential objects. (8)b shows the argument linking involved in the phrase in (8)a, and (8)c is lexical information of the suffix kay.
(8) a. Sandy-uy pyeng-tta-kay
    Sandy-GEN bottle-open-nml
    'Sandy’s bottle-opener'

b.  
   NP
      NP
         Sandy-uy
         N <R>
          V⁻¹ <Ag<Inst>>
          nml
          N⁻¹ V⁻¹ kay <R>
          pyeng :Thm tta<Ag<Inst<Thm>>>

c. kay: subcategorization [V a.s.<...Instrument...> —— ] N
    argument structure R <= Instrument >
    (The suffix -kay subcategorizes for a verb to make a noun, and the derived
    noun denotes a referential object, which is identified with the Instrument
    role of the verb stem.)

As the compound inherits the argument structure from its head, the suffix
kay, the Event structure which is contained in the verb stem’s argument
structure has no effect, and neither can the left-over argument be linked to
the genitive NP outside the whole compound noun.

It is shown that in the case of eventive verbal compounds, a genitive NP
can be interpreted as an argument of the verb stem and a duration adverbial
can modify the event denoted by the verbal stem. To explain these facts,
we should make sure that even though the suffix, as the head, determines
the category of the whole compound, it must not block the argument struc-
ture of the verbal stem from percolating up to the whole compound. This is
achieved by a special property of particular suffixes, which inherit the argu-
ment structure of their sister constituent to compose with their own argument
structures. A similar mechanism is proposed for the complex predicates in
Sells (1991). (9)b illustrates the argument linking involved in the phrase with
an eventive verbal compound in (9)a, and (9)c shows the argument structure
sharing between the eventive suffix -ki and the verbal stem.
(9) a. Sandy-uy mal-tha-ki
    Sandy-GEN horse-ride-nml
    ‘Sandy’s horse-riding’

b. 

```
NP
   NP
    Sandy-uy :Ag
    v^-1 <Ag>
    N^-1 v^-1 nml
    ki <Ev<X>>
    mal :Thm
    tha <Ag<Thm>>
```

c. ki: subcategorization [V_a.s.<x> - - - ] N
    argument structure < Ev < X >>
    (The eventive suffix ki subcategorizes for a verbal stem and inherits its
    argument structure including the event structure, which fills in the external
    argument position in the argument structure of the suffix.)

The proposed analysis makes a correct prediction regarding compounds
which have verbal nouns as their right-hand stems, as in (10)a.³

(10) a. pumo-uy casik-salang
    parent-GEN child-love
    ‘parent’s love for children’

b. 

```
NP
   NP
    pumo-uy:Exp
    v^-1 <Exp>
    N^-1 v^-1 casik :Thm
    salang <Ev<Exp<Thm>>>
```

Compounds with a verbal noun such as casik-salang are all eventive nominals. Since there is no suffix involved, and no verbal noun denotes a referential object, there is no way the whole compound gets the R role. Accordingly,
the event structure and the argument structure of the verbal noun which is the head percolate up to the compound except for the argument which is linked to the left nominal stem, as shown in (10)b. Therefore, the genitive NP is interpreted as the remaining argument (Experiencer) of the verbal noun in (10)a.

To sum up, verbal compounds are distinguished as either eventive or non-eventive compounds depending on the suffix. As the suffix of the verbal compound is posited as the head in the proposed structure, the different properties of the two types of verbal compounds can be easily captured.

2.4. Problem of the Other Structure

This section is concerned with the non-eventive verbal compounds under the assumption of the other structure, where suffixation precedes compounding. The phrase in (9) would be analyzed as follows (cf. Di Sciullo and Williams 1987).

(11)

With the structure in (11), we get a dilemma. The head of the right-hand nominal stem *tta-kay* 'opener' is the suffix *-kay*. In order to account for the fact that the nominal stem *pyeng* 'bottle' satisfies one argument of the verbal stem *tta* 'open', we would have to regard the suffix *kay* as inheriting the argument structure of the verbal stem; but then the argument structure should percolate up to the whole compound, and thus we could not prevent the genitive NP *Sandy-uy* from linking to an argument of the verb stem. If we tried to prevent this by assuming the right-hand nominal stem 'opener' gets only the *R* role from its head, and the argument structure of the verbal stem is not visible there, we could not account for the fact that the nominal stem 'bottle' is interpreted as an argument of the verbal stem 'open'.

There is another fundamental problem to this structure. In such a structure, the verbal compound is regarded as a combination of two nominal stems. When we describe verbal compounds by a condition that no subject
(or external argument) appears inside a verbal compound, what is relevant is
the verbal stem’s subject (or external argument), not the deverbal nominal
stem’s. The relevant argument is not the external argument of the derived
nominal such as opener. The derived nominal has $R$ as its external argu-
ment. And it is doubtful that the noun has subject function. Whether the
proper condition is a “no subject” or a “no external argument” condition, it
cannot apply in this structure without complexities. Therefore, I conclude
that this structure is not proper for the verbal compound.

3. “No External Argument” Condition

In this section, I will consider the argument linking inside the verbal com-
 Pound in Korean. It has been observed that verbal compounds have a
predicate-argument relation between the stems, and the nominal stem has
been claimed to be “the first sister” (Roeppe and Siegel 1978) or a “non-
subject” argument (Selkirk 1982) of the verbal stem. (12) illustrates this
point.

(12) a. ai-ka mal-ul tha-n-ta.
    child-NOM horse-ACC ride-PRES-DECL
    ‘A child rides horses.’
b. mal-tha-ki
    ‘horse-riding’
c. *ai-tha-ki
    ‘riding by children’

3.1. Subject Inside of Verbal Compounds

What is different in Korean from English is that Korean “unaccusative”
verbs may form compounds with their subject arguments, as in (13). Thus,
a generalization cannot be made in terms of grammatical functions.

(13) a. hay tot-i
    ‘sun rise-ing (sun-rise)’
b. tong thu-ki
    ‘east break-ing (sun-rise)’
c. mul kwup-i
    ‘water bend-ing (bend in a river)’
d. san kwup-i
    ‘mountain bend-ing’
e. nalssi pyenhwaa
    ‘weather change’
f. mulka sangsung
    ‘price go-up (inflation)’

We find similar facts in Japanese as well, as in (14).
(14) a. ame-huri ‘rain-fall’  
   b. hi-gure ‘sun-set (time)’  
   c. zi-nari ‘ground-ring (sound)’  
   d. muna-sawagi ‘chest-make noise (worrying thoughts)’  
   e. ne-sagari ‘price-come down (price cut)’  
   f. mizu-tamari ‘water-accumulate (puddle)’  
   g. hito-de ‘people-going-out (turnout)’  
   h. yama-kuzure ‘mountain-collapse (avalanche)’

These examples in (13) and (14) are treated as exceptions in the view which tries to generalize the verbal compounds in terms of grammatical functions. Sugioka (1984) notes that “the cases of [Subj V] seem to be limited to some types of natural phenomena.” But, behind such an intuitional observation, there is an important fact that natural things lack volitional controllability of events, which is a crucial characteristic of the external argument.

Even though some subject argument can be inside the verbal compound, it is not true that Korean has no restriction on verbal compounding. There is no attested case of a verbal compound whose elements have an Agent-Pred relationship, as in (12)c.

3.2. Argument Structure and Verbal Compounds

I propose that Korean verbal compounds should be generalized in terms of argument structure. I adopt Grimshaw’s (1990) theory of argument structure, which I will summarize briefly. The first assumption is that thematic structure is organized in accordance with the Thematic Hierarchy (Kiparsky 1987): < Ag < Source < Goal < Instr < Theme < Loc >>>>>>. The outer role is more prominent than the inner one. Second, each verb has associated with it an event structure. The event structure representing aspectual analysis breaks down events into aspecual subparts, action and state (or change of state). The argument which participates in the first sub-event is more prominent than an argument that participates in the second sub-event. Third, for an argument to be an external argument, it must be prominent both thematically and aspecually. It follows that the thematically highest role of an accusative verb cannot be the external argument (Kim 1992). This notion of external argument is quite different from Williams’ (1981a) which is defined as the argument realized outside of the maximal projection of the predicate.

With Grimshaw’s notion of external argument, we can distinguish between unacceptable verbal compounds and acceptable ones: while the unacceptable verbal compound in (12)c is composed of the verbal stem and its external argument, the verbal compounds in (13) and (14) each have the verbal stem’s internal argument as the nominal stem. In other words, if we assume that a Korean verbal stem may combine with only its internal ar-
gument to make a verbal compound, we can correctly exclude the subject argument of unergative or transitive verbs, and allow the subject argument of unaccusative verbs inside the verbal compound. Now, we can make a generalization in terms of argument structure rather than grammatical functions.  

(15) No External Argument Condition: An external argument cannot be inside of a verbal compound.

The generalization in terms of argument structure is desirable not only empirically but also theoretically. It is widely accepted that a verb has an argument structure and the grammatical functions are derived by a linking principle (e.g. Lexical Mapping theory in LFG). This means that grammatical functions are not included in the lexical information of verbs and are only relevant in the syntax. Hence, verbal compounding which is a word-formation process need not (or may not) refer to a syntactic notion such as "subject".

Grimshaw’s structured argument structure hypothesis makes a general prediction for verbal compounding, as in (16), which expresses the essence of the First Sister Principle of Roeper and Siegel (1978).

(16) If the verbal stem of a verbal compound has more than one argument, the least prominent argument appears inside the compound, and the more prominent outside.

As the thematic hierarchy defines the order in which arguments are semantically combined with their predicates, it is natural for the innermost (=least prominent) argument to combine with the verb to make a new unit and be lexicalized. This generalization predicts most cases of argument linking in Korean verbal compounds.

(17) a. kwi-kel-i ear,Loc-hang<Ag<Th<Loc>>-nml ‘earring’
  b. sayngsen-kwu-i fish-Thm-broil<Ag<Inst<Th>>>-nml ‘broiled fish’

In (17)a and b, the verbal stem’s least prominent argument is linked to the nominal stem, Location and Theme, respectively.

Consider the verbal compound in (18) which has the same verbal stem as that in (17)b. The nominal stem is not the least prominent argument of the verbal stem.

(18) swuchpul-kwu-i charcoal.Inst-broil<Ag<Inst<Th>>>-nml ‘charcoal-broil’

However, this example cannot falsify the prominence theory. We could assume that the verbal stem kwu ‘broil’ has its Theme incorporated, and its Instrument is the least prominent argument which is to link to the nominal stem in this case. If Theme and Instrument are to be expressed at the same time, the Theme argument must appear inside the verbal compound. The reverse order of linking is unacceptable, as in (19).
(19) *kalpi-uy swuchpul-kwu-i
   b.b.q.beef-GEN charcoal-broil-ing
   'charcoal-broiling of b.b.q. beef'

There is no case where the nominal stem is linked to the more prominent argument than an NP outside of a verbal compound. Therefore, examples such as (18) are not true counter-examples to the generalization in (16).

4. Conclusion

To sum up, I have shown that argument structure rather than grammatical function is relevant to the formation of possible verbal compounds in Korean. The nominal stem in a verbal compound is interpreted as an internal argument of the verb stem. Hence, in contrast with English, a Korean unaccusative verb constitutes a verbal compound with its argument, which would be realized as the subject in a sentence.

Based on the morphological structure where the nominal and verbal stem combine before suffixation, we can capture the distinctions between eventive verbal compounds and non-eventive ones. Regarding left-over arguments of the verb stem, we found that they can be linked to genitive NP’s in eventive verbal compounds but cannot be linked in the others. An eventive suffix inherits the argument structure of the verb stem to let it percolate up to the whole compound, thereby an NP outside of a verbal compound can be interpreted as an argument of the verb stem. By inheriting the argument structure of the verb stem, a compound gets the event structure that allows it to cooccur with a duration adverbial. On the other hand, a non-eventive suffix has its own argument structure, < R >, which blocks the argument structure of the verb stem from percolating up to the whole compound.

Notes

I would like to thank Paul Kiparsky, Peter Sells, Ivan A. Sag, John Rickford, Lynn Cherny, and the participants at the 19th BLS conference for their valuable discussions and comments.

1Thematic labels such as Agent and Theme are used simply for convenience.

2It is true that most derived nouns which contain the suffix kay denote instruments by which agents do something to others. But when this suffix combines with a particular set of verbs (involuntary body action verbs), the derived nouns denote persons who habitually do such actions denoted by the verbal stems, as in (i). The verbal stem (kho)-hulli ‘to snivel’ does not have Instrument role. Thus, the R role of the suffix cannot be identified with Instrument. The nominal stem in (i) is linked to the least prominent argument of the verbal stem and the R of the suffix is identified with the external argument of the verbal stem.

(i) kho-hulli-kay
   snivel-run-nml
   'a snotty-nosed kid'
3See Cho (1992) for the phonological argument for regarding such compounds as verbal compounds. The Bindings /s/ (obstruent-tensing) does not apply in verbal compounds.

4The condition in (15) is necessary for Korean verbal compounds, while English does not need this. Grimshaw correctly points out that the outermost role of the verbal stem cannot be linked to the nominal stem in the verbal compound in English, whether it is the external argument or not: *boy-reading and *rain-falling are equally unacceptable. A more general constraint about the relation between a modifier and modified rules out such compounds (Williams 1984, Grimshaw 1990).

References


Linking constructions vs. linking rules: evidence from French

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In trying to understand the nature of the mapping of semantic structure onto surface syntax, linking theories are driven by their answers to the following two questions: (i) how much and what kind of information is relevant for the statement of linking rules; (ii) how general are these rules within and across languages. Baker, 1988, Zubizarreta, 1987, and, to a certain extent, Grimshaw, 1990, provide one set of answers to these questions. According to these theories, the information available for the mapping is minimal (a theta-grid with or without theta-role labels), and cannot make reference to the fined-grained semantic structure associated with each lexical entry. Moreover, the mapping is maximally regular within and across languages. The strongest form of this latter hypothesis is of course Baker’s UTAH principle, which claims:

‘Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure’ (Baker, op.cit., p.46)

In this paper, I wish to present some empirical evidence in support of a very different view of linking. According to the theory underlying this paper, linking patterns are word-level templates directly associating semantic structure and (underspecified) subcategorization requirements. They describe classes of words within an inheritance-based hierarchical lexicon (see Flickinger, 1988, Pollard and Sag, 1993). Such a view of linking makes two predictions which directly contradicts the assumptions mentioned in the last paragraph. (i) Linking processes can have access to the entire semantic and syntactic information carried by lexical entries, since linking rules are abstractions over actual lexical items. (ii) Although they can be very general and specify a minimum amount of information, they can also include constraints which are both language-specific and construction-specific, since linking patterns form an inheritance hierarchy of more or less general types. The linking construction I concentrate on in this paper and which I call the Dative Predication construction (DP) supports both of these predictions. It was first discussed at length in Ruwert, 1982, and is exemplified in (1a)-(2a).

(1) a. Je veux bien admettre des circonstances atténuantes à certains criminels...
   I want.PR well admit.INF some circumstances mitigating to some criminals...
   b. Je veux bien admettre que certains criminels ont des circonstances atténuantes...
   I want.PR well admit.PR that certain criminals have.PR INDEF circumstances mitigating
   ‘I am willing to admit that certain criminals have mitigating circumstances...’

(2) a. Le fisc lui estime une fortune de 3 Millions de francs.
The I.R.S. to.3SG esteem.PR a fortune of 3 Millions of francs
b. Le fisc estime qu’il a une fortune de 3 Millions de francs.
The I.R.S. to.3SG esteem.PR that he have.PR a fortune of 3 Millions of francs
‘The I.R.S thinks he has a fortune of 3 Million francs’
1. Description of the DP

Let me first describe the facts particular to the DATIVE PREDICATION construction which are relevant for my general, theoretical point concerning the nature of linking.

First, the DATIVE PREDICATION pattern constrains the semantics of verbs it applies to, like *admettre* in (1a). As many other valence alternations (see Green, 1974, Pinker, 1989, Groepen, Pinker, Hollander, and Goldberg, 1991, Goldberg, 1991), the pattern is restricted to a few narrowly defined verb classes, and cannot apply to verb classes apparently similar semantically. At my last count, there are at least sixty verbs which participate in the pattern. I list below the classes of verbs which can head a DATIVE PREDICATION sentence, as well as two classes which cannot.

Verb classes which can participate in the alternation

VERBS OF ASSERTION


*Verbs of saying*: dire ‘say’, murmurer ‘whisper’...

*Commissives as assertives*: promettre ‘promise’, parier ‘bet’, jurer ‘swear’...

*Declaratives as assertives*: reconnaître ‘recognize’, décréter ‘decree’, déclarer ‘declare’...

*Verbs of admission*: confesser ‘confess’, admettre ‘admit’, accorder ‘grant’

VERBS OF MENTAL REPRESENTATION

*Verbs of coming to notice*: noter ‘note’, trouver ‘find out’, découvrir ‘discover’...

*Verbs of coming to perceive*: voir ‘see’, sentir ‘feel’, (?)flairer ‘smell’...

*Verbs of guessing*: imaginer ‘imagine’, deviner ‘guess’, soupçonner ‘suspect’...

*Verbs of state of knowledge*: savoir ‘know’, croire ‘believe’, douter ‘doubt’...

VERBS OF EMOTIONAL ATTITUDES

aimer ‘like’, craindre ‘fear’, regretter ‘regret’, espérer ‘hope’...

Verb classes which cannot participate in the alternation

VERBS OF LEARNING AND UNDERSTANDING

apprendre ‘learn’; comprendre ‘understand’...

VERBS OF EXPLANATION OR SIGNALING

montrer ‘show’, expliquer ‘explain’, signaler ‘signal’, indiquer ‘indicate’...

More important for us, the classes of verbs which alternate between DP and sentential complementation structures are the same classes which alternate between raising-to-object and sentential complementation structures (see (3) for an example of a raising-to-object structure in French):

(3)    Je croyais Marc heureux.
       I believe.IMPF Marc happy
       ‘I thought Marc happy’

The second fact of relevance is that the direct object and à-PP complement of examples (1a)-(2a), do not form a constituent of the surface string. Notably, they do not form a small clause à la Stowell, 1983, contra Guéron, 1985, as shown by the fact that the sequence of the direct object and à-PP complement cannot be the dislocated element of a cleft or ps-cleft structure:
(4) a. (7) Je croyais une maîtresse dans chaque port à ce vieux marin (Ruwet).
   I think.pst a mistress in every harbour to this old sailor
   ‘I thought that this old sailor had a mistress in every harbour’
   b. *C’est une maîtresse dans chaque port à ce vieux marin que je croyais.
   It be.PR a mistress in every harbour to this old sailor that I think.pst
   c. *Ce que je croyais, c’est une maîtresse dans chaque port à ce vieux marin.
   That which I think.pst it be.PR a mistress in every harbour to this old sailor.

(5) a. Je trouve beaucoup de charme à cette musique.
   I find.PR a.lot of charm to this music
   ‘I find that this music has a lot of charm’
   b. *C’est beaucoup de charme à cette musique que je trouve.
   It be.PR a.lot of charm to this music that I find.PR
   c. *Ce que je trouve, c’est beaucoup de charme à cette musique.
   That wich I find.PR it be.PR a.lot of charm to this music.

There is also abundant evidence against Guéron’s specific proposal that sentences like (6a) have the structure in (6b), i.e. that des ennuis is the predicate of a small clause:

(6) a. Je leur promets des ennuis. ‘I promise that they will have difficulties’
   b. Je leur, promets [sc {e} des ennuis]

First, by opposition to ordinary predicates of small clauses (see (7b)), the structural position or grammatical function of NP’s like des ennuis is not fixed in object position. They can be the subject of a passive sentence (8); the subject of a Tough-verb (9), or an extraposed constituent (10):

(7) a. Jean a été cru son meilleur ami pendant longtemps
   Jean have.PR be.PPT believe.PASS his best friend during long.time
   ‘Jean was believed his best friend for a long time’
   b. *Son meilleur ami a été cru Jean pendant longtemps
   His best friend have.PR be.PPT believe.PASS during long.time

(8) De nombreux défauts lui ont été découverts
   INDEF numerous faults to.3SG have.PR be.PPT discover.PASS

(9) ?Une interprétation ésotérique serait difficile à découvrir aux œuvres de
A interpretation esoteric be.COND difficult to discover.INF to.the works of
George Lakoff
George Lakoff (Ruwet’s example (47)).
‘It would be difficult to discover esoteric interpretations to G. Lakoff’s works’

(10) Il lui a été trouvé du charme
   It to.3SG have.PR be.PPT find.PASS INDEF charm
   ‘People found that he had some charm’

Second, NP’s like des ennuis, when realized as direct objects can cliticize as any ordinary direct object. They do not cliticize as the pro-predicate clitic le, as the contrast between (11b) and (12b) shows:

(11) a. Ils sont mes meilleurs amis
   ‘They are my best friends’
   b. Ils le sont
   They 3ACC.SG are [i.e. my best friends]
(12) a. Je lui ai vu ces volumes entre les mains
   I to.3SG have.PR see.PPT these books between the hands
   ‘I have seen him with these books in his hands’
   b. Je les (*le) lui ai vus entre les mains
       I 3ACC.PL (*3ACC.SG) 3SG.DAT have.PR see.PPT between his hands

(13) il l’a été longtemps cru [e.g. fou]
    He 3ACC.SG have.PR be.PPT long.time believe.PASS [fool]
   ‘He was believed to be so for a long time [e.g. fool]’

This impossibility of criticising the object NP as the pro-predicate clitic le cannot
be accounted for by appealing to a general prohibition against such criticisation of
the pro-predicate in raising-to-object structures, as the grammaticality of (13) shows. The
ungrammaticality of (12b) with le, and its grammaticality with les is thus left unexplained,
if des ennus in (6) is just the predicate of an ordinary small clause, as Guéron assumes.

I now turn to the third fact of relevance, the semantic constraint the DP pattern
imposes on the relation between the denotata of à certains criminels and des circonstances
atténuantes in (1a). As the gloss suggests, the relationship between the two denotata is
paraphrasable by have in English or avoir in French, and seems to involve some notion
of possession. In fact, a DP sentence always denotes the same situation-type as a sentence
where the same verb, like admettre in (1a)-(1b), has a sentential complement whose main
verb is avoir ‘have’, as in (1b). Sentences (14)-(18) are examples of the five major classes
of relations that can hold between the denotata of the two NP’s.

OWNERSHIP
(14) Tiens, il a une Toyota. Je lui croyais une Renault 18.
    Hold, he have.PR a Toyota. I to.3SG believe.IMPF a Renault 18.
   ‘Hmm! He has a Toyota. I thought he had a Renault 18’

ABSTRACT PROPERTY
(15) Je lui aimerais davantage d’enthousiasme
    I to.3SG like.COND more of enthusiasm
   ‘I would like him to have more enthusiasm’

INALIENABLE POSSESSION
(16) Je lui crois le bras gauche plus fort que le bras droit.
    I to.3SG believe.PR the arm left more strong than the arm right
   ‘I believe that he has a stronger left arm (than the right one)’

SOCIAL RELATIONSHIPS (INCLUDING KINSHIP)
(17) Nous lui savons plusieurs contacts au pentagone.
    We to.3SG know.PR several contacts at.the pentagone
   ‘We know that he has several contacts in the pentagone’

EXPERIENCES (EVENTS THAT HAPPEN TO AN INDIVIDUAL)
(18) Je lui prédiss de nombreux accidents avec ce tas de feraille.
    I to.3SG predict.PR some numerous accidents with this heap of scrap
   ‘I predict that he will have a lot of accidents with this pile of junk’

What is common to all these relationships? An answer, I think, can be found if
we compare the range of semantic relations found here and that which can hold between
the denotata of a noun and its genitive complement. Nikiforidou, 1991 argues
convincingly that the set of relations which can hold between a genitive and the head
noun it complements is not infinite in range, but is restricted to literal or metaphorical
possibility or origin. The details of her analysis are not important for us here. What is remarkable is the fact that the set of possible semantic relations between the denotata of the two relevant NP’s in the case of the DP construction or avoir ‘have’ is a well-defined subset of the relations which a genitive or PP headed by de can denote: either literal possession or any metaphorical extension of the possession relation. In examples (19)-(22) I give corresponding examples with avoir and de, as well as the name of the metaphors involved (see Lakoff, Espenson, and Schwartz, 1991 for a more thorough description of these metaphors). There thus seems to be a “natural” semantic class with respect to which all three constructions are defined. Although my argument does not depend on this analysis of the nature of the semantic class, I assume in what follows it consists of the relation of literal possession and any metaphorical relation of possession, where metaphorical possession relations are defined as the output of metaphorical mappings taking literal possession as their source domain (see Lakoff, 1992 on the notion of metaphorical mapping). I name this class of relations EXTENDED-POSSESSION.

**Corresponding uses of avoir or de**

**PARTS ARE POSSESSIONS**

(19)  
a. Il a de très beaux yeux. ‘He has very nice eyes’

b. Les yeux de Jacques sont très beaux. ‘Jack’s eyes are very nice’

**PROPERTIES ARE POSSESSIONS**

(20)  
a. Il a de l’admiration pour elle. ‘He has some admiration for her’

b. L’admiration de Jacques pour sa musique est extraordinaire. ‘Jack’s admiration for his music is extraordinary’

**THINGS THAT HAPPEN TO US ARE POSSESSIONS**

(21)  
a. J’ai eu un accident la semaine dernière. ‘I had an accident last week’

b. L’accident de Jacques nous a rappelé à la réalité. ‘Jack’s accident brought us back to reality’

**A PERSON WHICH PLAYS A SOCIAL ROLE IN YOUR LIFE IS A POSSESSION**

(22)  
a. J’ai un nouvel ami. ‘I have a new friend’

b. L’ami de Jacques est gentil. ‘Jack’s friend is nice’

I have now described the three crucial facts for my argument concerning the nature of linking: (i) the DP applies to the same semantically defined classes of verbs which can enter into RAISING-TO-OBJECT structures in French (see endnote 2 for qualifications); (ii) verbs to which the DP has applied subcategorize for three complements, and do not subcategorize for a small clause; (iii) the DP constrains the semantic relationship between the denotata of two of these three complements to be one of extended-possession.

2. How to relate the two valences which DP verbs can enter into?

The question before us now is how to relate the two valences which DP verbs can enter into. To clarify the nature of the problem, I have diagrammed in figure 1 what we know so far. On the left is represented the relevant information contained in the entry for admettre when it takes a sentential complement. It contains two valence requirements (subcategorized-for complements, roughly speaking) corresponding respectively to the person making the admission and the admission arguments. On the right I have represented the information we already know admettre contains when it enters the DP pattern.
We know there is still a valence requirement corresponding to the person admitting the proposition. It is expressed by *je ‘I’* in (1a). We know *admettre* still subcategorizes for two other complements at least (fact 2 of section 1). One of them is always an *à-PP* bearing a complement or indirect grammatical function (*à certains criminels* in (1a)). The grammatical function of the other is not fixed by the DP pattern itself, as exemplified in sentences (1a) and (8)-(10). Finally, we know two things from the semantics of DP sentences (fact 3 of section 1): (i) the nature of the admitted proposition, namely that there is a relation of extended-possession between two entities; (ii) that the PP complement of sentences like (1a) does not correspond to the possessed entity, and conversely that the direct object does not correspond to the possessor. What we crucially do not know from the data presented in section 1, is whether the PP complement corresponds to the possessor or the possession relation and similarly whether the direct object corresponds to the possessed entity or the possession relation. These three *a priori* possibilities are represented in figure 2 and 3, where the arrows stand for correspondences between valence requirements and conceptual arguments, and conceptual arguments are represented by variables. I added a fourth analysis, according to which *admettre* when used in DP structures subcategorizes for an (unexpressed) requirement corresponding to the admitted proposition, as well as for requirements corresponding to the possessor and possessed entities.

The third analysis (represented in c) in figure 3) makes the hypothesis that the direct object of (1a) denotes the possession relation as well as the possessed object, whereas the PP complement of (1a) denotes the possessor argument. It is the least attractive of all four analyses. Firstly, if we adopt this analysis, we must posit a special NP construction to map the ordinary meaning of *des circonstances atténuantes* in (1a) onto a meaning paraphrasable by “has attenuating circumstances”. There is no evidence of such a zero-marked NP construction anywhere in French outside of this construction. Secondly, positing this construction does not save us from positing another special construction to account for the linking of the possessor argument to the *à-PP* complement in (1a) (see next section for more evidence on this point). Finally, the NP *des circonstances atténuantes* in (1a) does not behave like other predicative nouns, as we have seen above.

Analysis b) and d) are very similar. They both assume that the PP complement of (1a) corresponds to the possessor, and the direct object to the possessed entity. They only differ by the presence of a valence requirement corresponding to the admitted proposition argument of *admettre* in d). *Ceteris paribus*, analysis d) is to be preferred. First, the entry for *admettre* posited by analysis b) cannot be monotonically related to the ordinary entry for *admettre* partially diagrammed in figure 1, right column. Only the latter contains a valence requirement corresponding to the admitted proposition. The two entries of figure 1 would therefore have to be related via a (lexical) rule altering the subcategorization requirements of *admettre*. Allowing such a non-monotonic change of syntactic information adds power to the already needed monotonic superimposition of patterns (or unification of feature-structures) assumed in unification-based grammars. Second, analyses d) and a)--but not analysis b) and c)-- enable us to explain the similarities between DP and ordinary raising-to-object structures, not only with respect to the identity of the verbs they can apply to (fact 1 of section 1), but also with respect to the pragmatics of the construction. Ruwet (op.cit.) shows that the same “directness”/“focus of attention” effect noted by Borkin, 1984/1974 for English RAISING-TO-OBJECT occurs with DP sentences. By choosing either analysis d) or a), we *de facto* analyze DP sentences as special cases of RAISING-TO-
OBJECT, as I show below, and thus directly account for both facts. Analyses b) and c) do not allow this generalization to be captured.

Figure 1

Figure 2

Figure 3
To choose on an empirical basis between analyses a) and d) is difficult. Neither requires an enrichment of the grammatical mechanisms assumed here. Both minimize the amount of redundancy necessary to describe the DP construction by extracting all that can be predicted from other French linking patterns. I present analysis a) here, simply because of its ease of description. A very similar account could be provided, if one were to choose analysis d).4

The a) analysis assumes the PP à certains criminels codes an (extended)-possession relation, while its NP complement codes the possessor argument of this relation. Finally, the object NP des circonstances atténuantes denotes the possessed entity. Formally, the surface realization of à certains criminels and des circonstances atténuantes as sisters to admettre in (1a) depends on the application of two linking constructions to the verb admettre, the DP construction proper, and ordinary raising-to-object. These two constructions unify with the underspecified entry for admettre represented in the left of figure 1 to account for (1a) in the following way.

![Diagram](image)

Figure 4

The DP construction proper (see figure 8 for a formal representation and figure 4 for an informal diagram) specifies three pieces of information concerning the set of valence (subcategorization) requirements of verbs it applies to. (i) The cognized object of verbs the DP pattern applies to (the admitted proposition of admettre in (1a)) can be realized through an à-PP whose grammatical function is COMP.5 (ii) This PP denotes an extended-possession relation. (iii) The object of the PP corresponds to the possessor argument of this possession relation, and its subject to the possessed entity. By linking the possession relation to a predicate PP, the DP construction indirectly makes available an unsatisfied subject valence requirement, corresponding to the possessed entity, as other XP predicates do in ordinary raising-to-object structures (see heureux in (3)). In other words, as other predicate phrases, the à-PP subcategorizes for a subject requirement, which is not satisfied internally to the PP. It is this subject requirement which the ordinary RAISING-TO-OBJECT construction then “raises” onto the subcategorization set of the verb to which the DP applies (see the appendix for a formal representation of the raising-to-object construction, and figure 5 for an illustration of its application to the DP valence of admettre).6
Informally speaking, RAISING-TO-OBJECT in CG, (as in HPSG, see Pollard and Sag, op.cit.) simply consists in the identification of one of the valence requirements of the complement verb with one of the valence requirements of the governing verb. It is indicated by an equal sign on the dotted arrow connecting the subject of the PP and the element added to valence of *admettre* in figure 5. By identifying it with a requirement of *admettre*, this construction allows the subject requirement of the PP à certains criminels to be realized phrase-structurally within the VP headed by *admettre* in (1).

![Diagram](image)

**Figure 5**

As can be seen in figure 5, the raising-to-object construction does not by itself specify the grammatical function of the "raised" valence requirement. It simply "transmits" the subject subcategorization requirement of the PP to the valence set of the DP verb. Other French linking patterns are thus free to apply and assign it the object function, as in (1a), the subject function as in sentences (8) or (9) or an extraposed function as in (10). According to the analysis presented here, then, DP sentences like (1a) are the result of the interaction (technically, the unification) of ordinary French linking constructions, like raising-to-object, passive, extraposition... with a special linking pattern. This pattern, which must be learnt independently, associates the cognized object of certain verbs with a complement à-PP predicate, provided this predicate denotes a relation of extended possession.

Leaving aside now the technical details of the analysis briefly presented above, what does the DP linking pattern demonstrate concerning the nature of linking? It clearly shows the empirical inadequacy of the two assumptions often made about linking which I mentioned in the introduction. It contains a relatively large amount of information and some of the semantic information it specifies is not reducible to the ethereal theta-role labels. It is entirely consonant, on the other hand, with the alternative view that linking rules are word-level templates. As word-classes, linking patterns are expected to be able to access the entire informational structure specified within lexical entries.

As the reader might have noted, my argument rests on the implicit assumption that we cannot separate the semantic effect and the linking function of the DP pattern, and that, consequently, the assignment of an à-PP complement must idiosyncratically make reference to the rich semantic properties described in section 1. In the next section, I justify this assumption, by showing that any attempt to separate the two functions leads...
either to overgeneration or to a linking rule with essentially the same properties as the DP construction described in this section.

3. Is the linking of possessor to dative more general?

To make things more concrete, I have represented in figure 6 a plausible rival account of the DP pattern which does separate its semantic effect from its linking function. The proposal is based on the theory of argument-structure presented in Pinker, 1989. This account separates the mapping of semantic argument-structure onto grammatical functions into two parts. First, a DP lexical rule maps the basic entry for croire on the top left of the figure onto the derived entry on the top right by adding the extended-possession relation to the lexical conceptual structure associated with croire. Second, general linking rules associate the EXPERIENCER, THEME, and POSSESSOR of the derived entry to the subject, object, and indirect object functions respectively, without making reference to the application of the DP lexical rule or the rich semantics of its output. This analysis thus admits, like we do, that there are processes which can access the fine-grained semantics of lexical items (see the top of figure 6), but claims that linking rules do not. DP sentences, according to this analysis do not therefore illustrate an idiosyncratic linking pattern, but rather the combination of a lexical rule affecting the semantics of verbs belonging to certain narrowly defined classes, and a general rule linking the possessor to the indirect object.

Can we abstract the possessor linking rule from the DP lexical rule, as implicitly claimed in figure 6? Initially, there seems to be some support for this claim. French contains other structures where either possession relations or possessors are linked to indirect objects, as sentences (23) and (24) show:

(23) La table est à lui. ‘The table belongs to himher’
The table be.PR to.3SG

(24) Marc lui a brossé les cheveux. ‘Marc brushed her hair’
Marc to.3SG have.PR brush.PPT the hairs

Both structures intuitively express the possession by the referent of lui of the table in (23), and hair in (24). The analysis sketched in figure 6 seems supported. The indirect object linking rule must not be tied to the DP pattern per se.

In fact, such an analysis cannot stand as is. The reason is simple. The two patterns exemplified in (23) or (24) do not code the same notion of possession as the extended-possession characteristic of the DP pattern. Each pattern is dedicated to a specific set of possession relations. The construction exemplified in (23) constrains the relation between the denotata of the two NP’s to be one of literal possession, or ownership. In particular, it cannot be used when the relation is one of inalienable possession or of possession of an abstract property, as seen in (25)-(26):

(25) *La main est à moi (intended ‘This is my hand’) INALIENABLE POSSESSION
The hand be.PR to me

(26) *Du charme est à lui (intended ‘He has some charm’) ABSTRACT PROPERTY
INDEF charm is to him/her

Similarly, the construction illustrated in (24) is restricted to relations of inalienable possession. It cannot, for example, be used when the possession relation is true ownership (27) or when the possession is one of a social relationship (28):
(27) *Je lui ai brossé le tapis.
    I 3SG have.PR brush.PPT the carpet
    ‘I brushed his carpet’ [intended meaning]

(28) *Je lui ai tué les ennemis.
    I 3SG have.PR kill.PPT the enemies
    ‘I killed his enemies’ [intended meaning]

The contrast between the set of relations that can hold between the denotata of the two NP’s in the three constructions invalidates the claim that the linking of the indirect object in sentences like (1a) can be abstracted from the idiosyncratic notion of extended-possession characteristic of the DP pattern. If it could, this linking rule would be available for other structures, and (25)-(28) would be grammatical. Despite the obvious similarities between the DP construction and the two constructions exemplified in (23)-(24), all three indirect object linking patterns cannot therefore be conflated.

![Diagram](Figure 6)

![Diagram](Figure 7)

Of course, we could assume that the indirect object linking rule is much more complex than I have suggested, and is conditioned by the presence in a verb’s entry of a large chunk of conceptual structure. The simple-minded linking rules of figure 6 which
made reference only to the semantic role of the relevant arguments (i.e. EXPERIENCER, THEME and POSSESSOR) could be replaced by linking rules such as the one represented in figure 7, in the spirit of the linking rule proposed for the secondary object of English ditransitives by Pinker. By including much more conceptual structure in linking rules, we can avoid making reference to the DP lexical rule itself, while de facto restricting the application of the linking rule to the output of the lexical rule, since both now constrain the propositional argument to denote an extended-possession relation. But the cost of such a move is high. First, we have to assign a special semantic chunk to the linking rule that is, by coincidence, only found in entries that are the output of the DP lexical rule. Second, we have lost the main motivation for separating the semantic effect of the DP pattern from its linking function: we still need three different indirect object linking rules, and the possessor linking rule is not any simpler. The degree of semantic complexity necessary for its statement is of the same order of magnitude as that exhibited by the DP construction of figure 4. And it must be supplemented by the added machinery of lexical rules, which the constructional analysis presented above avoided.

This paper has described a productive French linking pattern which includes constraints that are both language and construction-specific and informationally complex. Within theories like CG where linking patterns are word-level templates, the existence of such patterns is not anomalous, since the overall informational structure needed for their statement is exactly that predicted to be available, if linking rules are word classes, i.e. abstractions over actual lexical entries.

Still, linking, as analyzed here, looks more complex than in many other theories. In fact, the “added complexity” is only apparent. For one thing, the increased vocabulary over which linking is defined is needed independently. After all, at one point or another, we have to deal with the full semantic representation of lexical entries. And if linking patterns are basically a classification of words according to how they map their semantic structure onto their subcategorization requirements, the potential informational complexity of patterns like the DP construction is simply that of lexical items. Second, by allowing more information to be available for the statement of linking constructions, we are not condemned to miss any language-specific or cross-linguistic generalizations. The analysis I proposed, for example, abstracted from the DP construction all that can be predicted from more ordinary linking constructions: RAISING-TO-OBJECT, PASSIVE... What is left is the truly idiosyncratic information, what the native speaker of French does not know when encountering a DP sentence for the first time. Third, by allowing linking patterns to have access to the entire information present in lexical items, we can actually simplify the overall structure of the grammar: we can model patterns of various degrees of generality without a change in the type of grammar. Both the usual passive or raising-to-object constructions, and the complex DP pattern are defined with the help of the same informational structure and formal apparatus. The latter only contains more of it.

Endnotes
* I would like to thank Adele Goldberg, George Lakoff, Sam Mchombo, Ivan Sag, and especially Paul Kay for their comments on previous versions of this paper. All remaining
errors are mine, of course.


2. Two remarks are in order here. First, although Ruwet (op.cit.) gives examples of minimal pairs where the same verb appears felicitously in a raising-to-object structure but not in a DP structure (and reciprocally), for any of the small set of such verbs, one can construct sentences involving the same verbs where the difference in acceptability is marginal. Ruwet, for example, cites estimer as unfelicitous in the DP structure, but it is good in sentences like (2a). These subtle differences in degree of acceptability do not therefore invalidate the general claim that the class of (alternating) DP verbs is identical to the class of (alternating) raising-to-object verbs.

   Second, the identity between the two classes of verbs holds only of verbs which alternate. Verbs of causation or perception--assuming they are raising verbs--only appear in ordinary raising-to-object structures. They do not enter in the DP pattern. Note that the absence of a DP valence in their case is due to semantic reasons (i.e. their predicative complement does not denote an extended-possession relation, see below). Conversely, some verbs, like the the epistemic use of donner in On lui donne vingt ans 'People think he is 20 yrs old' only occur in the DP pattern.

3. Whether we assign a complement or indirect object GF to the à-PP is a purely technical matter. The important point is that the GF of the PP is fixed by the DP construction. I use complement in the description of MY analysis, and indirect object when discussing OTHER possible analyses to conform to more traditional labels.

4. Analysis d) might have one slight advantage over analysis a): it would not require us to assume that a predicate can be realized by a complement PP headed by à. Since this advantage is more theoretical than empirical, I still choose solution a) for ease of description.

5. To simplify both the informal and formal statements of the construction, I have not represented the indexing of the verb classes to which the construction can apply within the diagrams. The reader should keep in mind that the construction diagrammed in figure 4 and 8 is restricted to the verb classes mentioned in section 1.

6. Note that we do not need to stipulate that the raising-to-object construction must apply whenever the DP construction applies. The necessity of the former construction's application is a consequence of independently motivated facts and principles of Construction Grammar (CG): (i) all subcategorization requirements must be satisfied; (ii) the subject of a PP or of a VP cannot be realized internal to this PP or VP (in French); (iii) raising and equi constructions are the only way to "transmit" a subject requirement to the next predicator up; (iv) the subject of the PP which is realized within the VP headed by admettre in (1a) (des ennuis), is not a semantic argument of the relation denoted by admettre, and (1a) is not therefore an "equi" structure.
7. The reader should keep in mind that in figure 6, the complex conceptual structure represented in the upper part of the diagram is not necessary for the statement of the linking rules. We only need to know the θ-roles of the relevant arguments. By contrast, the conceptual structure diagrammed in figure 7 is an integral part of the statement of the linking rule.

Works Cited


Appendix

THE DP CONSTRUCTION

Figure 8

THE NON-VERBAL OBJECT-RAISING CONSTRUCTION

non-verbal-raising-to-obj

Figure 9
Pauses in face-to-face and telephone conversations

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0. Introduction

In ordinary face-to-face interactions, the attention allocated by participants to talk and the activities which are peripheral to it can vary according to social constraints (Goffman 1967). Participants in telephone conversations are subject to more stringent interactive obligations. Unlike face-to-face interactions wherein conversation can be interleaved among other, nonverbal activities, interactions by telephone require at least the semblance of participants’ complete attention, lest disruptions to the social order occur:

Caller: So, uh,
(7.0)
Caller: Sam?
Recipient: Yeah?
Caller: Whaddya doin’?
Recipient: I’m correcting papers.
Caller: Oh, gee, thanks a lot.

But in general, on the telephone, spoken interaction between the two participants remains the sole activity, circumscribed in time, and isolated from other engagements. Indeed, the entire burden of the conversational work rests on the two participants in a telephone conversation.

1. Pauses

Pauses have been studied for their cognitive and interactional functions. With regard to their cognitive functions, a connection is made between a momentary break in conversation and the preparation of the utterance by the speaker or its processing by the listener. Thus pauses have been perceived as indications of the predictability of the utterance (O’Connell, Kowal, and Hörmann 1969), as related to its complexity or abstractness (Goldman-Eisler 1968), and facilitating comprehension (Reich 1975). Another focus has been on the assignment of interactional functions to pauses vis-à-vis their sequential locations. The more structuralist view of conversational analysts withholds the attribution of a priori significance to pauses, merely noting that they represent either a delay preceding the onset of the next speaker’s turn or a suspension of the turn-taking rules (Sacks, Schegloff, and Jefferson 1974). Nevertheless, correlations have been made between their occurrence and the content of certain types of responses (Levinson 1983). In an investigation which focuses explicitly on the meanings and functions of pauses, Tannen (1990) has shown how they are used to manage conflicts in literary dialogue.

Pauses in telephone conversations in particular have also been examined, but mostly in passing. Supporting Sacks et al.’s view of sequential phenomena, Hopper (1992) has demonstrated that pauses in telephone conversations are categorized by participants for their transition relevance, and that turns which begin after a gap are disagreements or repairs. Levinson (1983) has pointed out the social
significance of pauses in both face-to-face and in telephone conversations.

Schegloff (1979) has claimed that "the talk people do on the telephone is not fundamentally different from the other talk they do". We would expect though that the linearity of the telephone interaction constrains the context against which the meaning of pauses is interpreted. Thus the meaning and function of pauses ought to display an overwhelming dependence on sequentiality. Indeed, Butterworth, Hine, and Brady (1977) have shown that pauses occur with less frequency and duration in telephone conversations than in face-to-face conversation. Their findings suggest that the occurrence of pauses in the course of a telephone conversation is more marked than in face-to-face interactions, and therefore bears a social significance which does not necessarily hold in face-to-face conversations. Within face-to-face interactions however, pauses can also locate the intersection between sequentiality of talk and extralinguistic aspects of the interaction. The communicative context literally takes on another dimension to include the mutual experience of the other's presence. It is this potential departure from sequentiality which bears on the significance of pauses in face-to-face and telephone interactions.

2. Data

The data to be analyzed include a five minute excerpt of a face-to-face conversation and a ten minute excerpt of a telephone conversation between a male UCB graduate student, David, and his younger cousin, Emily, an undergraduate at a liberal arts college in Chicago. The face-to-face conversation takes place in Berkeley, in late August, just before Emily is to return to Chicago. David is preparing dinner for Emily. The telephone conversation takes place during the fall semester while both are at school. Emily has called David to talk about her old boyfriend.

Pauses lasting longer than .5 second were timed to the nearest tenth of a second. In the face-to-face interaction, talk consisted of a variety of topics, subtopics, and nontopics, each of which was set off by pauses. On the other hand, a single topic of conversation comprised most, if not all, of the telephone conversation. In the data analysis, the telephone conversation was treated as a unit for analysis while stretches of conversation within the face-to-face interaction were analyzed separately, according to topic.

3. Analysis

3.1 Face-to-face conversation

Among the basic units of conversational organization which drive the turn-taking mechanism is the adjacency pair, where a first utterance creates an expectation for a relevant second (Schegloff 1972). Indeed, Goffman (1976) has suggested that the adjacency pair is the fundamental unit of conversation. The face-to-face conversation examined here reveals that adjacency pairs (and their attendant insertion sequences) do organize a good portion of the conversation, and that they are delimited by pauses which serve as topic breaks. That is, topics are exhausted with the satisfaction of the conversational constraint imposed by a first utterance, usually a question. Furthermore, deviations from the pause-adjacency pair-pause pattern which involve abrupt topic shifts or utterances which are not interactive demonstrate how the physical context of the face-to-face interaction interferes with the spoken interaction. Yet, the occurrence of pauses in interactionally nonsensitive
locations within a sequence, i.e., following seconds of adjacency pairs, also reveals at what point participants become unwilling to let other activities supersede talk.

3.1.1 The pause-adjacency pair-pause pattern

The following exchange exemplifies a segment of talk which is structured by a question/answer adjacency pair. David and Emily are discussing whether the quantity of food being prepared by David will be sufficient for both.

{-} (0) (3.8)
(1) David: Well, do you think this is enough for us?
(2) Emily: Yes.

{-} (3) (2.8)
(4) David: Really?
(5) Emily: Yeah, why not?
(6) David: Okay. It'll fill us up. Well if it isn't we won't have eaten too much. And [that'll be good.
(7) Emily: [Good.] Yes. For once.

{-} (9) (1.1)

The discussion is initiated by David’s question in (1) (“Well, do you think this will be enough for us?”). Notice that questions here, as in the rest of the conversation, always receive immediate responses, irrespective of later reorientations to those responses. Pauses never disrupt, and frequently bracket, the question/answer adjacency pairs within talk surrounding a given topic. The first adjacency pair, David’s question in (1) and Emily’s reply in (2) (“Yes”), is delimited by pauses in (0) and (3).

David’s request for elaboration in (4) begins yet another series of utterances whose content is relevant but subordinate to Emily’s reply in (2). These utterances are also set off by pauses ((3) and (9)). Notice that in (3), David withholds his turn in an (unsuccessful) attempt to elicit more than the simple affirmative offered by Emily, i.e., reassurance that he is not going to be remiss in his duty as host if she is still hungry. The pause in (3) therefore serves both a structural and a communicative function.

Although space limitation precludes a thoroughgoing analysis, much of the remainder of the excerpt comprises discussions initiated by questions which project a sequence of several utterances. These are followed by lapses into silence, and reactivation of talk with more questions.

3.1.2 Deviations from the pause-adjacency pair-pause pattern

3.1.2.1 Abrupt topic shift

Interruptions were few, but when they happened, they marked topic shifts in the direction of greater immediacy. That is, interruptive talk always had to do with the activity at hand in contrast to the interrupted talk which revolved around an issue not relevant to the current setting.

In the following exchange, Emily and David are considering the possibility that David’s neighbor, Andrew, will move to another apartment. Emily introduces the topic by prefacing her utterance with “so”, which, in this instance, marks the transition to a new topic and starts up the conversation by presenting a comment for
David to evaluate (cf. Schiffrin 1987).

(25) (5.6)  
(26) Emily: So Andrew is thinking of moving into Wayne Heiser’s place.  
[discussion of details on Andrew’s possible living situation and reasons for moving]  
(37) Emily: Yeah, he doesn’t like his view.  
(38) David: Well I don’t know if I’d like being across from the construction.  
(39) Emily: Yeah.  
(40) (3.4)  
(41) David: That’s true.  
(42) Emily: He doesn’t like his view,  
(43) David: (He doesn’t like the person who lives in number two.)  
(44) Emily: hhh.h [?]  
-> (45) David: [See] now I- I think we can drink that much even though that’s all  
(46) we have. It’s that much each.

A discussion follows concerning Andrew’s living situation and his reasons for moving. The talk around this topic winds down as Emily begins to formulate a list of reasons. She repeats in (42) (“He doesn’t like his view,”) what she has already mentioned in (37) (“Yeah, he doesn’t like his view.”). Since she doesn’t offer any new information, David interjects a comment using a third person self-reference in (43) (“the person who lives in number two”). Emily reacts with silent laughter and begins to formulate an utterance, when David’s imperative “See” overlaps, to call her attention to the quantity of wine. Emily’s immediate withdrawal from speakership allows David to do some of the conversational work. At the same time, David’s redirection of the current topic to one which is more immediate, that is, within the physical setting, evinces the deteriorating salience of the current topic of conversation. This pattern occurs throughout the interaction, reinforced by gender differences in conversational styles (Zimmerman and West 1975). Emily’s concern is with keeping the conversation alive with the introduction of topics, typically with questions; while David’s preoccupation is with both his activity within the physical setting and in the spoken interaction. In this instance, discussion of the topic was not structured with an adjacency pair. Hence, closing the topic could not be done by issuing a second, at the end of which David could attend to his activities until Emily drummed up another topic. Without the neat structure of the adjacency pair, David’s activity, which forms the undercurrent of the interaction, makes its way abruptly into the spoken interaction. The verbal realization of David’s dinner preparation corresponds with the location and function of pauses which mark topic shifts within the sequence of talk.

3.1.2.2 Noninteractive utterances

In a couple of instances during the conversation, turn-taking was apparently inoperative between the termination of one topic and the beginning of another. In such instances, utterances neither initiate talk nor are coherent with the surrounding exchanges. The following is an example:

(20) (3.2)  
-> (21) David: (Sevodnya vecherom.)  
-> (22) (4.5)  
-> (23) David: Canola oil, high in polyunsaturated  
[(2.5)] oil  
[(hhh.h)]

-> (24) Emily:
David and Emily have just determined that he can satisfy her request for cheese. The pause in (20) ensues. David softly utters a phrase in Russian which is then followed by another pause. The silence in (22) reflects Emily’s construal of David’s utterance in (21), that it is not one which is intended to elicit a response. Contrastively, by producing an audience response in (24), Emily shows that she understands David’s contribution in (23) as interactive. Participants are aware that actions which seem to be interactive but aren’t can be correctly construed because of the context of copresence, as is demonstrated by Emily’s ability to distinguish between interactive and noninteractive utterances, and David’s freedom to produce them.

3.1.3 Pauses in interactionally nonsensitive locations

While pauses never followed a question, they often followed answers to questions. Returning to (12-19), Emily has initiated talk with her question in (12) (“Do you have cheese?”).

> (11) (1.5)
(12) Emily: Do you have cheese?
(13) David: I have hard cheese, like Peccorino Reggianito. Is that okay?
(14) Emily: mhm mhm
(15) David: =Do you like a strong, biting cheese?
(16) Emily: [Oh I like] any cheese except for, goat,
(17) and blue, and moldy, brie.

> (18) (6.1)
(19) David: Well I’ll be able to oblige.

> (20) (3.2)

David first responds affirmatively in (13) (“I have hard cheese, like Peccorino Reggianito”). However, he immediately reinterprets Emily’s question as a request for cheese. He issues queries in (13) (“Is that okay?”) and (15-16) (“Do you like a strong, biting cheese”) concerning her cheese preferences, to which Emily responds in (14) (“mhm”) and (16-17) (“Oh I like any cheese except for goat, and blue and moldy brie”). Notice that following Emily’s turn in (16-17), David’s response is delayed, which violates the minimal gap rule (Sacks et al. 1974). The unquestioned acceptance of the intervening pause in (18) on the part of both participants, illustrates their understanding that talk forms one aspect of the ongoing activity. In (19), “well” indexes David’s orientation to the conversation thus far, where he resumes the respondent role created by Emily’s question after having tended to other activities (cf. Schiffrin 1987).

Implicit in David and Emily’s management of interaction is a hierarchy of priorities. That pauses never occur at locations where speakers have been selected demonstrates the primacy of talk over other activities. Once the immediate interactive obligations have been tended to, other, nonverbal, activity can take over. Pauses in such locations reflect the management of multiple tasks.

3.1.4 Summary

The overall discussion shows that dinner preparation takes on varying degrees of salience for the interlocutors, from mere delays in turn-taking, to forming the topic of discussion such that it interrupts prior talk. The lack of smooth
transitions in turn-taking is tolerated as a result of each participant’s bearing mutual witness to the management of tasks other than the verbal interaction. Moreover, spoken interaction never takes a backseat to other activities when speakers are expected to produce seconds to adjacency pairs.

3.2 Pauses in telephone conversation

In face-to-face interactions, participants are obliged to acknowledge each other’s presence out of positive politeness, and therefore must continue talking (Lakoff, p.c.). By contrast, in telephone conversations, participants interact only for as long as either of them has something to say. The frequent occurrence of pauses in interactionally nonsensitive locations is thus improbable because each pause would signal to the participants that it was time to hang up. Thus, unlike face-to-face interactions where participants stay in contiguity with each other, in telephone conversations there is no obligation to keep the conversation going at all costs.

The structure of the telephone conversation can be seen as equivalent to a single instance of the pause-talk-pause pattern found within face-to-face interactions. Callers resemble those who initiate talk in face-to-face interactions. Both have reasons in mind for initiating an interaction, even if it is just to engage in chitchat. Talk proceeds until the task is felt to be accomplished. Pauses which occur within such stretches of talk are therefore more likely to serve a communicative function than simply to structure the interaction.

The analysis begins just after the greetings exchange.

(1) Emily: h::: OH I wa- I wanna tell you what I did, s- see if you think this is really stupid.
(2) David: All right. What.

It was mentioned previously that telephone calls were motivated by the objective of the caller. Emily’s pre-announcement (“OH I wa- I wanna tell you what I did,”) is appropriate because it supplies a motivation for the phone call. The second part of her utterance, “See if you think this is stupid”, is an indirect request for an evaluation of her action. Her bid to tell a story seeks ratification from David to suspend the turn taking rules, to which he agrees in (2) (“All right.”).

3.2.1 First opportunity

Emily, the caller, has been having trouble with her boyfriend. She describes the background events. When she reaches campus, she decides against her original plan to pile her old boyfriend’s clothes at his office door, and to permanently affix a note to his door. The following exchange ensues.

[Narration of background events.]
(19) Emily: What I did do though was um there was a poster uh on his door that he had
(20) hung up in his apartment, and uh, um, I removed the poster from his door, he shares a
(21) n office with some woman
(22) David: mhm
(23) Emily: And um, on the back of the poster I drew a skull ‘n’ crossbones, and then
(24) retaped the poster on his door.
(25) David: h:: so that the glue is firmly attached to the door.
(26) Emily: Oh no, I didn’t use th-
the glue though,
David: Well, then I don’t understand. You just drew a skull and crossbones.
Emily: Yeah I drew a skull ‘n’ crossbones and then I just put it ba- uh uh taped the
uh the poster back on the door with the original tape.
David: Then why did you bring up the glue?
Emily: Because I had planned on um attaching the uh note with [glue.
David: [Oh with that. Okay.
Emily: So I thought oh that was a really stupid thing to do you know as I left the campus.
David: (1.4) What?
Emily: Well dr- b- drawing a skull ‘n’ crossbones on the back of a poster.

Several cues demonstrate that the pause in (34) is functionally related to
Emily’s original statement in (1) (“See if you think this is stupid.”). Emily has
been narrating a sequence of activities which she had engaged in and she is seeking
David’s opinion of her behavior. Throughout her narration ((3-18), not listed),
speaker transition has been made irrelevant. Finally, in (23), Emily describes the
actual act in which she engaged (“and um, on the back of the poster I drew a skull
‘n’ crossbones, and then retaped the poster on his door.”). By taking the next turn
in (25), responding first with laughter and then an utterance which displays his
understanding of the story (“so that the glue is firmly attached to the door.”), David
conveys his awareness that the story is over, which makes relevant a display of
understanding and appreciation.

However, Emily’s repair in (26-27) (“Oh no I didn’t use the glue though.”) demonstrates that David has actually misunderstood. In the talk which follows,
Emily and David work to clear up his misconstrual of the events. After displaying
his achievement of understanding in (33) (“Oh with that. Okay.”), evidenced by
the overlap of his utterance with Emily’s reply, the pause in (34) ensues (Goldman-Eisler 1968). That Emily does not resume speaking signals that her story has
indeed come to an end, and also corroborates David’s response in (25). Since
Emily has told the story in order to elicit David’s opinion of her action, the pause is
the first opportunity for David to produce his opinion. Indeed, Emily then adds, as
an afterthought and since David did not, an opinion of her actions within the context
of the narrative in (35) (“So I thought oh that was a really stupid thing to do you
know as I left the campus.”), conveying the fact that the action she carried out has
been fully described. However, it isn’t clear to David what “that” is, and in (36),
he requests elaboration (“What.”). His misunderstanding is highlighted by the
pause which precedes his request.

In face-to-face conversations, pauses may or may not signal interactional
trouble. But given the tendency of telephone conversations to be purpose-directed,
pauses are much more likely to signal a breakdown of some kind. Although the
pause in (34) signals the end of Emily’s story and the first opportunity for David to
offer his opinion of Emily’s actions, he does not do so. In (36), David reveals a
problem in comprehension.

3.2.2 Second opportunity

Another pause occurs in (45), following discussion of the poster.

David: h-hh. Is it so he can see it?
Emily: He c- well he can’t see it you see the thing is I I retaped the poster
David: I just wondered if there’s a window or anything, to the back
(42) Emily: Yeah there is but, it's covered, oh yeah yeah I didn't think of that but, I think
(43) it's covered with other stuff.
(44) David: mhm.
->
(45) (5.2)
(46) Emily: So'm I gonna go to hell?

Again, this pause is relevant to the request posed by Emily in (1), as well as to the pause in (34). David has failed to respond to her implicit request for evaluation in the pause, and is now given the opportunity once again. After a duration greater than any pause thus far in the conversation, Emily explicitly makes David's turn relevant by asking "So'm I gonna go to hell?". Notice that, unlike pauses in face-to-face communication where their interactional status is questionable, pauses in telephone conversations are construed only as interactional unless there is explicit reason for not doing so.

3.2.3 Messages and metamessages

As her friend, David would attempt to maintain her positive face, and in (47) offers a negative reply to her question.

(47) David: I don’t think you’ll go to hell.
(48) Emily: Oh-h.
(49) (2.0)
(50) David: No:. I don’t think that that enters into it. (5.7) It’s just, um, how you’re
(51) gonna feel when he sees it.

Notice that David’s response contains the hedge “I don’t think”. Under ordinary circumstances, its presence would downgrade the degree of negation, or in conversational analytic terms, the preferred status of his response, in comparison to one containing a more directly asserted statement. (Compare “No you won’t go to hell.” as a more negative statement. Cf. Lakoff 1975). However, to make the statement without the hedge would be a violation of positive politeness since it is a joking response to a question that is also a joke. So either way David answers Emily’s question in (1) is a breach of politeness. Additionally, the lack of smooth transition between Emily’s turn in (48) and David’s turn in (50) enhances the dispreferred orientation of David’s response.

On the other hand, David’s overt utterances demonstrate his concern for her feelings regarding the consequences of her actions, regardless of the moral value of her actions. He avoids the value judgments transmitted by the terms she has been employing (“really stupid” in (1) and “[going] to hell” in (46), using the implicit deictic “that” to refer to them. But he acknowledges with the pauses preceding and after the first turn construction unit in (50) that she has engaged in somewhat negative behavior. A distinction arises between the message conveyed by his utterance and the meta-message conveyed by the pauses (Tannen 1986).

The absence of pauses and resumption of smooth transitions characterizes David’s talk when he is not called upon to judge her actions.

(52) Emily: Oh(hh). He’s probably gonna know who did it.
(53) David: mhm.
(54) Emily: Well the thing is too, I was kicking myself on the way back home
(55) cause um, you know I couldn’t decide whether or not I wanted him to see it,
(56) David: mhm
(57) Emily: and so I, I ended up taping the uh, poster sort of you know tilted, like one of
(58) the corners isn’t um secure with tape it’s just sort of um flapping
(59) David: What, as a clue?
(60) (1.3)
(61) Emily: Kind of.
(62) (3.2)
(63) Emily: And the other bad thing is that um somebody saw me.

The pause in (60) is a cognitive pause, attributable to Emily since she has to figure out what David means by “clue”. By contrast, the pause in (62) which follows Emily’s response in (61) to David’s request for clarification in (59) is an interactive pause. It sets off the set of utterances that are peripheral to the story (59-61) from those which are central, marking the new subtopic in (63).

3.2.4 Pauses “given” and “given off”

Apart from the message that an interlocutor intentionally and explicitly transmits, there are also messages communicated that are peripheral to its transmission. To use Goffman’s terms, messages are either “given” or “given off” (Goffman 1959:2). We shall see that pauses in the telephone conversations between Emily and David are joint productions, “given” from Emily’s point of view, and “given off” from David’s.

Note that the utterances in (72-81) are intercalated with pauses. Not surprisingly, the exchange involves David’s assessment of Emily’s behavior.

(71) David: \?\?.

-> (72) (9.5)

-> (73) David: Well I don’t know. (2.5) At least it’s nonviolent.

(74) Emily: hhh. h Yeah.

-> (75) (4.1)

(76) David: And if it made you feel better

(77) Emily: I don’t know I mean I felt like it was really um wimpy

(78) David: hh. Oh.

(79) Emily: You know like I was tryin’ to take control but I did in a r- very um, feeble way.

-> (80) (7.7)

-> (81) David: Well (2.9) I don’t know (7.5) I don’t think it’s (3.5) particularly bad, or anything.

-> (82) Emily: Yeah? Well ‘at’s good.

The impetus for the telephone conversation is the stated objective in (1), to which David agrees. Emily has announced that she wants to tell a story, “I wanna tell you something” and David has been selected to speak after completion of her story: “See if you think this is really stupid”. As long as the objective remains unaccomplished, any silence at which a relevant utterance could be supplied could be attributable to David. Thus, as mentioned earlier, (34) signals the end of the story, at which time David could, but does not offer a response. Additionally, the form of David’s utterance in (73), “Well I don’t know” indicates that it is projected from a prior utterance, which occurs initially as “See if you think this is stupid” in (1), and later “So’m I gonna go to hell?” in (46). Emily’s withholding of her turn in all three cases can be considered speaker-selecting devices to induce a response from David to the initial question. The sheer persistence of Emily in withholding her turn contributes to the pressure to supply an answer. Emily knows that in order for David to uphold her positive face, he must answer her question, and answer it
in a way which denies or reduces the immorality of her behavior. All of these factors contribute to her attempt to achieve her interactional objective.

While the pauses just mentioned pressured David to assume the floor in response to the utterance in (1), they were also an indication of his own reluctance to respond. Initially, he produces only short utterances to display current understanding, or to pass up speakership, simply avoiding attendance to her first in (1), as in (33) ("Oh with that. Okay.") and (44) ("mhm"). But, as the interaction proceeds and he is forced to respond, the mitigating devices and the pauses proliferate, showing just how much work it takes for David to eke out (and Emily to elicit) any sort of supportive response. Pauses in (72) and (73) signal the dispreferred nature of David’s response (Levinson 1983). Following the pause in (73) is a concessive ("At least it’s nonviolent"). Notice also that David initially talks about the effect of her behavior on her feelings (50, 76), or about the behavior itself (73). But when he finally offers his opinion of her actions (81) ("Well, I don’t know, I don’t think it’s particularly bad or anything"), or more specifically, his condonement, which is what she had been seeking, his turn is replete with gaps. As mentioned above, even offering her condonement would violate her positive face. Indeed, the effect of the pauses accompanying the responses to Emily’s request in (1), as well as the macro-level delay in supplying the one ultimately sought by her in (81), all reinforce the fact that condonement, although in the end expressed, was problematic for David. See Fig. 1 for an outline of pauses.

Note: Pauses "given" by Emily are marked with a lower case "e". Pauses "given off" by David are marked with a lower case "d".

(1)  Emily:  OH I wa- I wanna tell you what I did, s- see if you think this is really stupid.

(33)  David:  Oh with that. Okay.
(34)  (3.2)
(35)  Emily:  So I thought oh that was a really stupid thing to do you know as I left the campus.

(44)  David:  mhm.
(45)  (5.2)
(46)  Emily:  So’m I gonna go to hell?

(50)  David:  No:: I don’t think that that enters into it. (5.7) It’s just, um, how you’re gonna feel when he sees it.

(72)  (9.5)
(73)  David:  Well I don’t know. (2.5) At least it’s nonviolent.

(75)  (4.1)
(76)  David:  And if it made you feel better

(80)  (7.7)
(81)  David:  Well (2.9) I don’t know (7.5) I don’t think it’s (3.5) particularly bad, or anything.

Figure 1. Outline of pauses “given” and “given off”
4. Conclusion

The dynamics of the interaction as well as the social identities and relationships of the interlocutors supply the scaffoldings by which to give semantic shape to a particular utterance. Meaning cannot be assigned a priori if its creation depends on the relationship between the speaker and hearer at a given stage of an interaction within some specifiable physical, social, and psychological context. Similarly, the absence of meaning cannot be attributed to interactional products such as silences without a consideration of the surrounding social and interactional conditions.

In the face-to-face conversation, pauses are more frequent and of longer duration than in the telephone conversation. They manage the conversation, serving as signposts to guide the listener in distinguishing what is central to the conversation from what is peripheral. They create conversational space for new topics. The pattern of their occurrence within the sequence of talk shows participants' awareness of the social implications of allowing a pause to occupy a conversational slot where an utterance is expected. Situated in interactionally "safe" locations within the sequence of utterances, pauses demonstrate the management of multiple tasks, where attention is redirected from talk to nonverbal activities and back. Discussions stray from one topic to another, strung along the interactional thread of mutual presence, and indicating that talk is an explicit manifestation of the broader interactional experience.

Telephone conversations take place within a subset of conditions under which face-to-face conversations occur, the interactive obligations being more stringent for telephone participants. So, pauses in telephone conversations can be expected to serve the same functions as in face-to-face interactions: In addition to those mentioned above, pauses signal trouble if they occur within a turn, or if they precede an expected response (Levinson 1983). As a joint production, a pause can be the realization of very different intentions. One participant’s attempt to induce speech in the other conveys an unspoken message by the other in his refusal to comply. The crucial distinction however between telephone conversations and face-to-face interactions is that, unless explicitly stated otherwise, all pauses in telephone conversations are construed as communicative. Indeed, a transcript of a telephone conversation is much more likely to be mistaken for a face-to-face conversation than the reverse.

In face-to-face conversations, the setting, the ongoing activities, and the physical presence of each of the participants form part of the experience of the interaction. Interlocutors can drift in and out of the interaction without severing the social connection which an interaction establishes. In telephone conversations, the sensory experience of the interlocutor is attenuated. As a result, participants direct maximal attention to the interaction, ensuring that the interaction can proceed in spite of minimal access to the other. The absence of shared physical experiences means that the maintenance of human connection relies solely on talk. If there is silence over the wire, there is probably trouble in the interaction.

Endnotes

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comments and criticisms; and not least to Sara Rappe for helpful discussion and inspiration. I take responsibility for shortcomings.

2 It has also been noted that implicit in telephone interactions is a power imbalance between the caller and her recipient (e.g., Lakoff 1990, Hopper 1992). The caller is said to be in a one-up position. She has designated the recipient and formulated the objective of the call prior to the recipient’s knowledge of the caller or of the objective. The time at which she initiates the interaction forces a suspension of the recipient’s flow of activities, prioritizes the caller’s demands over that of the recipient. By keeping the line open, the recipient implicitly agrees to carry out the caller’s intention, and to make the conversation the primary focus of his attention. The recipient’s power therefore lies in his decision as to whether or not to participate in the interaction, and if he chooses not to, thereby nullifies the caller’s advantage. Because the consequences are more damaging to the relationship if the recipient chooses to exercise his power, the telephone conversation favors the caller whose hegemony is built into the situated identities.

However a potential recipient can reduce or reverse the power imbalance. She can choose to remove her number from the public listings, thereby reducing the pool of potential callers. She can decide beforehand not to answer her phone at all by ignoring any calls or by pulling the plug from her telephone, although when she plugs her phone back in, she becomes beholden to the caller again. But in the end it is with the help of technology by which the potential recipient erodes the caller’s advantage. The answering machine enables the recipient to do things the caller usually does. The recipient can identify the caller first if she is screening the call, and exercises the option to pick up the phone or not. Not only does the caller speaks first but he speaks to a nonsentient interlocutor, without knowing whether or not the intended recipient is actually away or hovering over the machine. In general, caller privacy, and hence power, may be a thing of the past, especially with new services such as Call Trace, which registers the phone number of the last caller with the phone company, and Call Return, which allows the recipient to dial the number of the last caller.

Key to transcription symbols

[ ] beginning and end of overlap
= latched utterances
h beat of silent laughter
h beat of voiced laughter
h intake of breath
- glottal stop, self-interruption
(n.x) n.x second pause
: length marker
, continuing intonation
? rising intonation
. falling intonation
italics syllables stressed by amplitude
CAPS syllables stressed by relatively high amplitude
/\ inaudible
[stage direction]
-> phenomenon under discussion
References

_____. personal communication, 5/93.
Gapping with shared operators*

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In the following type of example, which to my knowledge has not previously been noted, a conjoined sentence that has undergone Gapping has a determiner in the first conjunct that is shared by the corresponding NPs in the subsequent conjuncts, e.g. (1a) can be paraphrased as 'Too many Irish setters are named Kelly, too many German shepherds are named Fritz, and too many huskies are named Nanook':

(1) a. Too many Irish setters are named Kelly, German shepherds Fritz, and huskies Nanook. (William Safire column, 22 Dec 85)
   b. The Temple of Dagon, for example, whose exterior is seen in act one and interior in act three, rivals a movie set. (Chicago Reader opera review, 10 Nov 89)
   c. Your daughter is 16 and son, 17-1/2. (Chicago Sun-Times interview with Rajiv Gandhi, 4 May 88)
   d. The duck is dry and mussels tough, but Bocuse D'Or rehearsal goes well for chef Bumbaris. (Chicago Tribune food section caption, 17 Jan 91)
   e. ... the educated Chilean's Spanish is much more correct and fluent than that of the other South Americans, whose language is stiff and vocabulary scanty because they have first learnt some Indian language in childhood. (Jespersen, Language, 205)

Gapping is normally optional, but in these sentences Gapping usually must take place for the sharing of the determiner to be acceptable:

(2) a. *Too many Irish setters are named Kelly, German shepherds are named Fritz, and huskies are named Nanook.
   b. ??The Temple of Dagon, whose exterior is seen in act one and interior is seen in act three, rivals a movie set.
   c. *Your daughter is 16 and son is 17-1/2.
   d. *The duck is dry and mussels are tough.
   e. *...the other South Americans, whose language is stiff and vocabulary is scanty ...

The examples in (3) are the only attestations that I have come across in which a determiner is shared across conjoined clauses but there is no Gapping; the Shakespeare example, with its past tense in the second conjunct, sounds quite odd if recast in modern English (4a); however, a version with a gapped auxiliary verb is greatly improved (4b):

(3) a. Whilst any trumpet did sound or drum struck up, his sword did ne'er leave striking in the field. (Henry VI, part 1, i. iv. 80)
   b. ... I begun to wonder how many paintings will never be seen, songs will never be heard, and books will never be read because of wars yet to come. (Funky Winkerbean, 19 May 91)

(4) a. ??While any trumpet blew or drum beat,...
   b. While any trumpet was blowing or drum beating,...

The following are some further characteristics of such combinations. (i) The shared determiner can be a definite article, as in (1d), but cannot be an indefinite article:

(5) a. *A soup was too salty and pie too sweet, but otherwise the food was outstanding.
   b. *An Irish setter should be called Kelly and German shepherd Fritz.

(ii) The shared determiner has to be initial in all the conjuncts:
(6) a. How many states have a veterinary school or cities a zoo?
   a'. *In how many states is there a veterinary school or cities a zoo?
   b. How many good students did he give Fs to and bad students As?
   b'. ??To how many good students did he give Fs and bad students As?
   c. How many cathedrals are there in Hartford or opera houses in Detroit?
   c'. *In Hartford, how many cathedrals are there, or/and in Detroit, opera houses?
   d. Too many bars serve overcooked shrimps, restaurants exorbitantly priced soups, and
   cafeterias overseasoned stews.
   d'. *In too many bars shrimps are overcooked, restaurants exorbitantly priced, and
   cafeterias overseasoned.
   e. Too many films are reviewed by Ebert and concerts by von Rhein.
   e'. *Ebert reviews too many films and von Rhein concerts.

The restriction appears to require that the shared determiner be conjunct-initial rather
than clause-initial, in view of examples like (7) in which the surface conjuncts are less
than full clauses:

(7) a. He didn't give [any As to good students or Fs to bad students].
   b. There aren't [very many students here working on Oscan or faculty members teaching
courses on Tocharian].

A zero P appears to be as good as a non-zero one for making a determiner non-initial and
thus unacceptable:

(8) *Which day did you clean out your closet and week paint your kitchen?

However, it is not enough for the shared determiner to be merely initial in the word order of
the various conjuncts, since it cannot be contained within a larger determiner:

(9) ??Martha Washington, whose husband's honesty was legendary and father's courage
justly famous, was herself a remarkable person.

(iii) The shared constituent has to actually occupy the determiner position, i.e. paraphrases
in which its counterpart is an adjective or the object of a P are unacceptable:

(10) a. Italy's red wines are outstanding and white wines excellent.
   a'. *Italian red wines are outstanding and white wines excellent.
   a''. *Red wines from Italy are outstanding and white wines excellent.
   b. *The daughter of Rajiv Gandhi is 16 and son 17–1/2.

(iv) With a shared determiner, Gapping is possible even in some combinations that do not
normally allow Gapping, e.g. conjoined nonrestrictive relatives do not allow the relativized
expression as one of the retained constituents in the output of Gapping:

(11) a. *The temple of Dagon, whose exterior is seen in act I and whose interior in act III,
   ... (cf. (1b))
   b. Martha Washington, whose husband's honesty was legendary and courage justly
   famous, was herself a remarkable person.
   b'. Martha Washington, whose husband's honesty was legendary and whose father's
courage was/*Ø justly famous, was herself a remarkable person.

(v) There are cases in which the preferred conjunction in the gapped version with shared
determiner is *or but the preferred conjunction in a corresponding unreduced sentence is
and:

(12) a. Not enough linguists study Russian, literary scholars French, or and engineers Japanese.
    a'. Not enough linguists study Russian, not enough literary scholars French, and or not enough engineers Japanese.
    b. How many cathedrals are there in Hartford or and opera houses in Detroit? (= (2c))
    b'. How many cathedrals are there in Hartford and or how many opera houses are there in Detroit?
    c. No one’s duck was moist enough or and mussels tender enough.
    c’. No one’s duck was moist enough and or no one’s mussels tender enough.

Note further that the meanings of the gapped sentences here do not match those of their non-gapped counterparts. For example, the meaning of (12c: and) corresponds not to that of (12c: and) but rather of (12c: or): (12c: and) says that no one achieved both the goal of getting the duck moist enough and the mussels tender enough, leaving open the possibility that some of the contestants may have achieved one of the two goals, whereas (12c: or) and (12c: and) say that no one achieved either of the two goals.

Before considering (12) in detail, let us consider an example in which, as in (12c’), there is likewise an or in the scope of a negation, though here in combination not with Gapping but with Conjunction Reduction:

(13) a. No one read enough books or wrote enough articles.

Let us assume that the or’s of (12–13) are semantically or’s and not (as is argued in e.g. Seuren 1974) a form that and takes in certain combinations with negation. The logical form of (13a) then has the or in the scope of no one, and if one sets up a deep structure (13b) conforming to that logical form, one can derive (13a) straightforwardly — Conjunction Reduction applies with S1 as its domain, and Q’-Lowering, the transformation that moves quantified expressions into their hosts from the external position posited in such structures as (13b), can then apply with S0 as its domain, moving no one into the position occupied by x in [S x [V, read enough books or wrote enough articles]].

If we in general represent quantified expressions in deep structure as outside their host Ss, (12c: or) will then have the deep structure (14). The character of the problem posed by (12c) then changes somewhat. Gapping is applicable to S1, and whatever the rule is that allows determiners to be shared across conjuncts will also have S1 as its domain. The application of QL then becomes anomalous: it will apply to a domain (S0) containing a coordinate structure but will move the quantified expression into only one conjunct of that coordinate structure, thus violating Ross’s (1967) Coordinate Structure Constraint.

Interestingly, QL can apply in that way even if one does not eliminate repetitions of the shared determiner — (15a) is acceptable, as contrasted with (15b), in which there is no Gapping:

\[
(15) a. \text{All of the} \left[ x \left( x \text{read enough books or wrote enough articles} \right) \right].
\]

\[
(15) b. \text{All the} \left[ x \left( x \text{read enough books or wrote enough articles} \right) \right].
\]
(15) a. No one's duck was moist enough or his mussels were tender enough.
b. *No one's duck was moist enough or and his mussels were tender enough.

In (15b), *no one can only have the first conjunct as its scope and *his then violates the coherence conditions on variables, since the variable that it corresponds to is then outside the scope of the quantifier that binds it.

Another case in which an element in a sentence like (1) has the coordinate structure in its scope but appears in only one conjunct is that of examples like (16):

(16) the temple of Dagon, whose interior is not seen in act I or exterior in act III,

Here an analysis that posits a *not in each conjunct of (16) and deletes the second one by Gapping not only is semantically implausible (in virtue of the or) but also conflicts with the fact (noted in Ross 1970) that Gapping does not delete negative elements (17):

(17) a. Many linguists can't read German, and many musicians can't read French.
a'. *Many linguists can't read German, and/or many musicians French.

The analysis of (12a) is somewhat less clear than that of (12c): whereas (12c) had a single variable that turned up in both conjuncts, in (12a) we need to set up the logical structure in such a way as to allow the bound variable(s) to range over linguists in the first conjunct, literary scholars in the second, and engineers in the third. This requires either a polyadic quantifier (binding three variables, each with its own domain of values, one of the variables appearing in each conjunct) or an analysis as in (18), in which a single variable is involved in a respectively construction:

(18) (not enough, [x is a linguist, x is a literary scholar, or x is an engineer])
(x studies Russian, x studies French, or x studies Japanese, respectively)

Such a structure (or a polyadic counterpart of it) differs from the logical form of (12a' and) in an important way: whereas (12a' and) reports three separate judgements of "not enough", (18) reports what is apparently a single judgement of "not enough" in which the linguists, literary scholars, and engineers are pooled. In the case of (12a' or) and (12a' and), the difference is too subtle to allow one to judge whether they do in fact differ that way. However, it ought to be possible to find cases in which an analog to (12a' and) sounds normal but an analog to (12a' or) sounds odd because of the oddity of pooling things of types that would not normally be lumped together. Some possible examples of this type are given in (19):

(19) a. Not enough universities have been requiring language courses and not enough students have been taking them.
a'. *Not enough universities have been requiring language courses or students taking them.
b. Next time, let's hire somebody who doesn't give so many women Fs and so many dyslexics As.
b'. Next time, let's hire somebody who doesn't give so many women Fs and dyslexics As.
b". Next time, let's hire somebody who doesn't give so many good students Fs and bad students As.

In (19a), two different kinds of faults are being attributed to the universities and to the students are, and in (19b), giving women Fs and giving dyslexics As don't count as two instances of the same thing in the way that giving good students Fs and giving bad students As count as two instances of giving grossly inappropriate grades.

There are in fact a number of types of element that can appear in the first conjunct of a S but have the whole coordinate structure in their scope:

(20) a. John may love avocados and Mary hate them.
b. John hasn't cleaned the bathroom or Mary the kitchen.
c. John happened to be in the bathroom and Mary in the basement when the phone rang.
d. For all we know, John may be in New York and Mary in Los Angeles.
e. The Yankees have often finished first and the White Sox last.
f. New instruments like the electron microscope or new laws like Maxwell's may develop in one specialty and their assimilation create crisis in another. (Kuhn, Structure of Scientific Revolutions, 181)
g. I tried it in both positions, one of which must have been the locked position and the other one the unlocked position, but it wouldn't work either way.

Note that in (20g) must cannot be interpreted as having the first conjunct as its scope (with a deleted second occurrence of it taking the second conjunct as scope), since the speaker makes clear that he doesn't know which position was the locked position and thus could not say of either position that it must have been the locked one.

The elements of the first conjunct that have the whole coordinate structure in their scope include not only auxiliary verbs such as have, may, and must, but also other Raising-to-subject verbs such as happen, and S-modifying adverbials such as often. These sentences look like gapped sentences, but if the shared verbs and adverbs appear only once in the deep structures, then they can't involve Gapping, because there are no multiple occurrences of the verbs and adverbs to delete all but one of, e.g. in deep structure (20a) will have only one occurrence of may.

However, even if these sentences are not instances of Gapping, their resemblance to gapped sentences is more than just a matter of their gross shape, since the parts of the conjuncts are required to contrast the same way as in gapped sentences, e.g. the subjects cannot normally be coreferential and must have the same semantic role (using that term somewhat loosely) in relation to the predicate phrases:

(21) a. John lives in New York and he wants to move to California.
a'. *John may live in New York and he want to move to California.
a". *Johni drinks beer and he; wine.
b. John is in New York and Mary is under the impression that he is in London.
b'. *John may be in New York and Mary be under the impression that he is in London.
b". *John may be in New York and Mary under the impression that he is in London.
b"". *John is in New York and Mary under the impression that he is in London.

Hudson (1976) has proposed an analysis under which sentences as in (20) could in fact be regarded as instances of Gapping. Specifically, he treats Gapping-sentences as derived from a structure in which conjuncts are grouped as in a respectively construction,
via a 'Conjunct-postposing' transformation that moves conjuncts out of the conjoined pieces into positions at the end of the coordinate structure, e.g. (22b) would be derived from a structure that would otherwise underlie (22a):

(22) a. John and Bill invited Mary and Jane respectively.
    b. John invited Mary, and Bill Jane.

Under Hudson's proposal, {	extit{may}} would be combined with [John and Mary love avocados and hate them (respectively)], Raising could apply, yielding [John and Mary {	extit{may}} love avocados and hate them (respectively)]}, and Conjunct-postposing could then apply to the latter structure, yielding (20a) without any need for a step that moves {	extit{may}} into only one conjunct of a coordinate structure.

Hudson's 'Conjunct-postposing' rule has some very unappealing features: it requires what can be massive shifts of constituents to the right end of the affected domain, it has to impose a grouping of the postposed elements into units that would normally be thought of as conjuncts, it has to replace the separate occurrences of the conjunction in the input by a single occurrence of it in the output, and it has to apply in such a way as to keep track of the order of the elements in the various conjoined parts, points that becomes more obvious if one considers examples that have more than two conjuncts:

(23) a. Tom, Lucy, Edna, and Fred ordered spareribs, roast duck, steamed lobster, and sauerbraten respectively.
    b. Tom ordered spareribs, Lucy roast duck, Edna steamed lobster, and Fred sauerbraten.

However, his proposal has one important characteristic that has been sorely lacking in other treatments of coordination, namely that it posits structures that make explicit the organization of the conjuncts into sets of contrasting units that are relevant to both the {	extit{respectively}} construction and the Gapping construction. The problem with Hudson's deep structures for these constructions is that it leaves implicit another dimension of structure that is also relevant to the syntax of coordinate structures, namely the organization of the various pieces into conjunct Ss. I thus conjecture that a full analysis of coordination will require structures that specify not only the organization of a conjoined S into its conjuncts but also the relevant contrast relations across the conjuncts. The deep structure of (23a) and (23b) would still be a conjunction of Ss, but supplemented with a relation indicating the cross-conjunct contrast relations. Gapping and {	extit{respectively}} constructions could still be regarded, as by Hudson, as closely related, but would now differ with regard to which of these dimensions of structural organization was given overt realization.

I have no firm conclusion as to the surface constituent structure of sentences as in (20). The most obvious possibility is that of a coordinate S in which the 'shared' element appears only in the first conjunct. However, if that possibility is combined with the revision of Hudson's analysis that I just suggested, the surface structure will also contain information from which one can identify the underlying conjoined complement, namely the pair of contrast relations between the two subjects and the two V's (24). Here the broken lines indicate the contrast relations and the double line their link to a single coordinate structure. Other possibilities that one might seriously consider include a structure in which {	extit{may}} is represented as simultaneously belonging to both clauses, i.e. a one in which {	extit{may}} has two mothers, one in each conjunct, as in the treatment of Right-Node-Raising advanced in McCawley 1982, though appearing in a position in the word order that corresponds only to its role in the first conjunct.
The surface structure of shared determiners, as in (1), is likewise far from clear. The most obvious possibility is a structure in which the shared item is a constituent only of the first conjunct, and another possibility is one in which it is simultaneously a daughter of nodes in each of the conjuncts:

In either case, though, a constituent of the first conjunct has syntactic and semantic effects in all of the subsequent conjuncts, and for it to have those effects, Gapping must apply.

I will close by offering two rationales for allowing Raising and perhaps other transformations to skip over gapped conjuncts and localize their effects in the first conjunct. First, the symmetric status of the conjuncts is generally taken as the reason why there is across-the-board application of transformations to coordinate structures, as in the GPSG view of coordinate structures as having multiple heads and thus features such as slash-features that are to be transmitted to the head of a construction being transmitted to all the heads (Gazdar et al. 1985: chapter 8). However, Gapping, unlike Conjunction-reduction and Right-node-raising, introduces an asymmetry into a coordinate structure and leaves the first conjunct, as the only complete conjunct, uniquely qualified to stand for the whole coordinate structure. And second, the interaction noted here between shared determiners and Gapping is an instance of the phenomenon described in Borkin (1975), in which any sort of "reduction" of an embedded S serves to weaken its clause boundaries and thus facilitate the application of rules that are normally inhibited by clause boundaries; specifically, Gapping, by eliminating from the second and subsequent conjuncts material that contributes to the conjunct's status as a S, opens up possibilities for material in the first conjunct to behave as if it is a clause mate of material in the subsequent conjuncts.

Okay, but what about examples as in (20) in which, as I have argued, there really isn't any Gapping, although the sentence looks like one whose derivation would involve Gapping? The best that I can suggest here is that the contrast relation that I have posited is an asymmetric relation, taking the first conjunct as reference point and identifying other conjuncts as contrasting with it, and that that is enough to allow Raising to apply asymmetrically, localizing its effects in the first conjunct.6,7
NOTES

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1. In the following example, there is a shared determiner, but it is impossible to tell whether Gapping has applied, since the element that Gapping would delete (a form of be) is deleted anyway by an option that "absolute" constructions in English allow:

"Cordelia was nineteen, short but deliciously rounded, her features delicate and lips always slightly parted below a lustrous mass of brown hair" (Paul Anderson, Boat of a Million Years, 43)

2. The following may also be an example of this type; my uncertainty is as to whether the coordinate structure of relevance here is the underlying conjoined object of make or a conjoined non-constituent reflecting the application of Raising-to-object:

It makes one's blood boil, yet heart tremble, to think that we Englishmen and our American descendants, with their boastful cry of liberty, have been and are so guilty. (Charles Darwin, Voyage of the Beagle, quoted by S. J. Gould)

3. See McCawley 1988a for arguments that 'adverbial NPs' are prepositional phrases with a zero P, e.g. He left last Tuesday is like He left on Tuesday, except that where the latter has the overt on the former has a zero P.

4. Here I leave up in the air what exactly underlies a respectively construction. Examples like the following have caused me to entertain serious doubts about my previous claim (e.g., 1988b: 536–40) that that construction is derived by a generalized version of Conjunction Reduction that applies to a conjoined input whose conjuncts contrast at two or more places:

The typesetters have put in and omitted spaces virtually at random. About 90% of the corrections I've made consist in respectively removing and restoring spaces.

Since the antecedent of respectively here is in a separate S, it can't be derived by applying a version of CR to a domain containing the conjuncts of the antecedent.

5. One particularly attractive way of accomplishing this is through Wierzbicka's (1972) proposal that conjoined Ss be accompanied in deep structure by a specification of the semantic or pragmatic condition that licenses the conjoining, e.g. as where one can specify a general proposition of which the conjuncts are special cases and 'contrasting elements' correspond to the same part of the 'general proposition'.

6. Ivan Sag has reminded me of the class of German sentences discussed in Kathol (1992), in which a subject in the middle of a first conjunct is shared by subsequent conjuncts:

In den Wald ist der Jäger gegangen und hat einen Hasen gefangen.
'The hunter went into the forest and caught a hare'

Such sentences differ from those under discussion here in that the shared constituent is a whole NP rather than one of the various kinds of "operators" discussed here, and it occurs not at the beginning but in the middle of its conjunct; I have not yet formed a clear opinion as to how much of an analysis of German "shared subject" sentences can also apply to the sentences under discussion here. Kathol develops an analysis involving conjoined VPs, with the subject moved into the first conjunct when something else occupies the position before the finite V.

7. Emmon Bach has reminded me that in constructions with subject-auxiliary inversion, a
single auxiliary verb can appear with a conjoined complement:

Will John clean the bathroom and Mary wash the windows?

Such sentences pose an important problem for the approach to the syntax of auxiliary verbs developed in McCawley 1988b and other works, if they are to be given a deep structure in which a single occurrence of the auxiliary verb has a conjoined complement: since the deep structure would then be of the form \( S \ Q (S \ S \ and \ S \ will) \), \([S \ and \ S \ will]\) cannot undergo normal Raising to subject, since the complement of \emph{will} is not of \( [NP \ V'] \) form. A possible way out of this problem would be to say that Raising simply does not apply, and since Inversion will then apply with the top \emph{S} as domain, the anomaly of \emph{will} as making up a whole \( V' \) is eliminated. My most easily articulated worry about that answer is that it does not account for why such sentences require contrasting subjects the way that Gapping-Ss do:

\*Will John, clean the bathroom and he \_ wash the windows?

REFERENCES


--- 1988a. Adverbial NPs: bare or clad in see-through garb? \emph{Lg.} 64.355–65.


Galician Nasal Velarization as a Case against Structure-Preservation*
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In the theory of Lexical Phonology and Morphology, lexical rules may not introduce segments absent in the underlying inventory of a language, a property that follows from the principle of Structure Preservation (Kiparsky, 1985; Kaisse and Shaw 1985, Mohanan 1986, Pulleyblank 1986, Booij and Rubach 1988, Steriade 1988). However, a number of lexical rules have been reported in the recent literature that do not appear to be structure-preserving. For example, Booij and Rubach (1987) cite the case of Canadian French in which a rule of i-laxing applies in the lexicon, thereby introducing a lax high front vowel that otherwise does not function contrastively in the language. Mohanan and Mohanan (1984) and Mohanan (1986) discuss a lexical rule of homorganic nasal assimilation in Malayalam which produces seven distinct places of assimilation, although the underlying set is restricted to only three. Calabrese (1988) shows that the metaphony rules of the southern Italian dialect of Salentino and the Sardinian dialect of Campidanese, although lexical, do not observe Structure Preservation. A similar point is made in Hall (1986) regarding the ich- and ach-Laut type of alternations found in the German diminutive suffix -chen. Finally, John Harris (1987) motivates a rule of [ATR] harmony in some southeastern Bantu languages that creates a lexical distinction between tense and lax mid vowels although, he contends, such vowels must not carry an underlying specification for [ATR].

Three kinds of proposals have been made in order to deal with such counterexamples. First, Mohanan (1986) suggests that Structure Preservation must be regarded as an unmarked parameter, and not necessarily an absolute constraint on lexical derivations. Second, and partly on the basis of such phenomena as Canadian French i-laxing, Booij and Rubach (1987) establish a lexical distinction between cyclic and postcyclic rules. Following Kiparsky (1985), they propose that Structure Preservation must be enforced in the application of cyclic rules but it may be turned off at the word-level (see also Iverson and Salmons (1992)). Such weak version of Structure Preservation would probably take care of all but one of the counterexamples mentioned above, namely, the Bantu mid-vowel harmony rule, since, as argued by John Harris (1987), it applies in a cyclic domain. However, this case can be adequately handled by a third alternative. In discussing the German diminutive, Mcfarland and Pierrehumbert (1991) suggest that non-contrastive segments arising through the lexical application of assimilation rules should be contemplated as special cases, falling outside the purview of Structure Preservation. In German, there is no underlying contrast between palatal and velar fricatives, a fact that is to be captured by a marking condition barring obstruents from bearing any specification for [back], as in (1).

1

* [ +high 

  \alpha back ]

  | [-sonorant]
Mcfarland and Pierrehumbert argue that marking conditions such as (1) are subject to the Linking Constraint of Hayes (1986), which requires that association lines in structural descriptions of rules be interpreted as exhaustive. Condition (1) simply prohibits a one-to-one association of any value of the feature [back] to an obstruent. Interestingly, the ich/ach-Laut alternants arise through assimilation to the backness of the preceding vowel. Since assimilation rules normally involve autosegmental spreading of features they inevitable result in doubly-linked structures. In accordance with the Linking Constraint, such structures will not violate Structure Preservation because they fail to meet the one-to-one association stated in structural description of (1). The importance of this proposal, if empirically supported, can hardly be underestimated. For in appealing to an independently needed principle of autosegmental representation, it eliminates a substantial number of apparent contraventions to Structure Preservation, including that of southeastern Bantu, namely those that arise in the operation of lexical assimilation rules. It should be pointed out, however, Booj and Rubach's cyclic vs. non-cyclic distinction is still needed to account for non-structure preserving lexical rules which are non-assimilatory in nature (as, for example the French Canadian i-laxing rule). In short, both the status of Structure Preservation as a relevant principle of phonological theory, and the precise conditions that govern its enforcement in the course of lexical derivations largely remain an empirical issue, open to further evaluation. In fact, a genuine counterexample to the latter two weakened versions of Structure Preservation would be a non-assimilatory rule operating in a cyclic domain that creates a segment not present in underlying representations. In this paper, I present an instance of an demonstrably cyclic non-assimilation rule whose output is not structure-preserving. The evidence involves a process of nasal velarization in Galician, a Romance language closely related to Portuguese, spoken in northwestern Spain.¹

I will adopt here an N-bar theory of the syllable (Levin 1985) which generates representations such as that exemplified in (2) for the Galician word sol 'sun':

```
(2) N''
   /   /
  N'  N
 /   /
X   X
|   |
s  o  l
```

(N'' = Onset, Syllable)
(N' = Rime)
(N = Nucleus)

(Prosodic skeleton)

(Segmental melody)

I further assume the universal feature hierarchy in (3), in which the Root (R) node branches into the Laryngeal (L) and the Supralaryngeal (SL) nodes. The Place of Articulation (PA) node is organized into two major nodes: the Articulators (A) the Tongue Position (TP) nodes (see Lahiri and Evers 1991). I follow Clements (1989a, 1989b) in distinguishing four major articulator nodes: Labial (LAB), Coronal (COR), Dorsal (DOR), and Radical (RAD). In this model, back vowels and velar consonants are specified with a Dorsal node.²
As in Spanish (James Harris 1985, 1992), the canonical form of underived nouns and adjectives in Galician consists of a root followed by an inflexional suffix (or word marker), which encodes grammatical gender. The overt gender markers are \(-a/\) for the feminine, and \(/-o/\) for the masculine. In a fairly large number of cases (i.e., in consonant-final words) the gender desinence may be absent; in others, \(/-e/\) marks both masculine and feminine gender. Word markers are always located on the rightmost edge of a word. And the derivational suffixes appear between the root and the word marker (if there is one).

As shown in (4), underlying nasals in Galician exhibit a three-way contrast in place of articulation: labial, coronal, and palatal.  

(4)  
\[
\begin{array}{ccc}
\text{Underlying} & \text{Surface} & \text{English} \\
\hline
a. \quad \text{mora} & /\text{mɔr}+a/ & \text{mɔ}r.a \\
\quad \text{nora} & /\text{nɔr}+a/ & \text{nɔ}r.a \\
\quad \text{ñopa} & /\text{ɲɔ}p+\text{a}/ & \text{ɲɔ.p.a} \\
\hline
b. \quad \text{cama} & /\text{kam}+\text{a}/ & \text{ká}m.a \\
\quad \text{cana} & /\text{kan}+\text{a}/ & \text{ká}n.a \\
\quad \text{caña} & /\text{kaf}+\text{a}/ & \text{ká}f.a \\
\quad \text{camino} & /\text{kami}n+o/ & \text{ká.m}\text{n}o \\
\quad \text{aneco} & /\text{aneko}+o/ & \text{a.n}e.ko \\
\quad \text{cuñado} & /\text{kuñad}+o/ & \text{kuñ}n.\text{ako} \\
c. \quad */\text{kαn}+\text{a}, */\text{pɔn}+\text{a}/ & \quad */\text{kan}+\text{a}, */\text{pan}+\text{a}/ & \\
\quad */\text{kan}+\text{a}, */\text{pan}+\text{a}, */\text{kuñad}+o/ \\
\end{array}
\]

All three distinct nasals surface phonetically as such in prevocalic position: (i) root-initially, as in (4a); (ii) root-finally before the word marker, as in 6b); and (iii) root-internally, as in (4c). In all three cases, the nasal is predictably assigned to onset position in syllabic structure. Now, although velar nasals do occur in the language, there is unequivocal evidence that justifies their exclusion from the set of underlying segments. Perhaps the most compelling reason is that, unlike the other nasals, they are subject to severe distributional restrictions. Namely, *prevocalic* velar nasals are systematically excluded from appearing in
any of the three mentioned positions within the root (with only one exception, to which I will return shortly), while the other nasals occur freely, as shown in (4). Thus an explanation as to why the hypothetical forms in (4c) are not well-formed can solely be attributed to the fact that the velar nasals do not occur in underlying representations. It must be the case, then, that the lexical phonology of Galician must contain the condition in (5) prohibiting the association of Dorsal to a Supralaryngeal node if the latter is also specified as [+nasal].

(5)

\[
\begin{array}{c}
\ast \cdot SL \\
[+\text{nas}] \cdot DOR
\end{array}
\]

The facts, however, are more complex, because in Galician rhyme nasals are neutralized, surfaced with a velar point of articulation. The process has been described in standard grammars and dialectal studies of particular regions. From a descriptive point of view, the simplest instances of the velarization process occur in word-final position before pause, that is, when no other segment follows, as illustrated in (6a) (where word-final, of course, is cotextensive with syllable-final position). All documented dialects of Galician velarize syllable final nasals, so that the surface forms in (6b) are not possible words.

(6)

\[
\begin{array}{llll}
\text{a.} & \text{Underlying} & \text{Surface} & \text{b.} \\
\text{lan} & /\text{lan}/ & \text{lăn} & \text{b.} \ast \text{lám}, \ast \text{lán}, \ast \text{lán} \\
\text{son} & /\text{son}/ & \text{sôñ} & \ast \text{sóm}, \ast \text{són}, \ast \text{són} \\
\text{ben} & /\text{ben}/ & \text{béñ} & \ast \text{béñ}, \ast \text{béñ}, \ast \text{béñ} \\
\text{xoven} & /\text{xôben}/ & \text{ô\text{.}bëñ} & \text{‘young’} \\
\text{irmân} & /\text{irman}/ & \text{ir.mâñ} & \text{‘brother’} \\
\text{satron} & /\text{sairon}/ & \text{sa.f.rûñ} & \text{‘they left’} \\
\text{fervín} & /\text{fërbin}/ & \text{fîr.bëñ} & \text{‘I boiled’}
\end{array}
\]

In order to capture the fact that nasal places of articulation other that velar do not occur in rhymes, I follow James Harris’ analysis of Spanish nasals (1984a, 1984b), and propose that nasal neutralization involves delinking of the Place node, as in (7a). Nasals thus deprived of Place features are subject to a language specific default rule, which assigns them a Dorsal articulator, as in (7b). Both operations in (7) will be referred to as Nasal Velarization (henceforth, NV).

(7)

\[
\begin{array}{c}
\text{a. Nasal Neutralization} \\
N' \\
X \\
\ast \cdot R \\
\ast \cdot SL \\
[+\text{nas}] \cdot PA
\end{array}
\]

A plausible alternative to (7) would be to appeal to phonetic underspecification (cf. Keating 1988), so that after the application of (7a) rhyme nasals remain
unspecified in phonetic representations, velarity simply being the surface manifestation of the lack of an overt articulator.\textsuperscript{6} However, other facts of the language suggest that this explanation is untenable. In particular, nasals undergo a rule of homorganic assimilation to a following consonant, both word-internally and across word boundaries, a process to be captured autosegmentally by leftward spreading of the triggers’s Place features onto the nasal’s Supralaryngeal node. Interestingly, in these instances the nasal is actually coarticulated; its production involves a velar constriction simultaneous with whatever Place of articulation is borne by the following consonant, as illustrated in (8).\textsuperscript{7} Clearly, if nasal velarization is analyzed as an instance of phonetic underspecification, the coarticulation facts would be difficult to explain.

\begin{tabular}{l|l|l}
(8) & Underlying & Surface \\
--- & --- & --- \\
\textit{can parvo} & /kan parbo/ & kāŋmpärṭu ‘silly dog’ \\
\textit{can ferido} & /kan ferido/ & kāŋmfirīṭu ‘wounded dog’ \\
\textit{can tolo} & /kan tolo/ & kāŋmtōlū ‘crazy dog’ \\
\textit{can san} & /kan san/ & kāŋmsāṇ ‘healthy dog’ \\
\textit{can xoven} & /kan ʂ̥oven/ & kāŋmsōṁī ‘young dog’ \\
\textit{can choucho} & /kan ʂ̥ουčo/ & kāŋmgōwū ‘senile dog’ \\
\textit{can cativo} & /kan katibo/ & kāŋkmtīṭu ‘small dog’
\end{tabular}

On the other hand, when a rhyme nasal is followed by a vowel, it undergoes a general process of resyllabification, so that it is shifted from the coda of the preceding syllable to the onset of the following one. This rule can be stated along the lines of (9). As it will be shown later, resyllabification applies not only at the postlexically, but also at the lexical level to the output of morphological operations such as (productive) prefixation and compounding.

\begin{center}
\begin{tabular}{c|c|c|c}
(9) & N" & N" & N" & N" \\
N' & N' & N' & N' \\
N \Rightarrow N & N \Rightarrow N & N \Rightarrow N \\
V C V & V C V & V C V
\end{tabular}
\end{center}

In the reminder of this paper, I will attempt to demonstrate that NV is a lexical rule, and that it furthermore applies in a cyclic domain. We may start by observing that NV interacts with two postlexical rules of Galician. First, there is an optional rule of vowel epenthesis which inserts [i] ([e] in other dialects) after a consonant in word-final position (see Hualde and Martínez-Gil 1993). This rule is conditioned by both phonological and syntactic factors. The phonological condition prohibits the application of epenthesis to consonant-final words bearing final stress; the rule is blocked whenever its output would be a praparoxytonic stress pattern (e.g., \textit{fácil} ‘easy’ does not become *fácil[i]). The basis for this restriction seems clear: epenthesis generates an additional syllable; its application to paroxytonic words would automatically shift the locus of stress to the
antepenult, an occurring, although clearly marked stress pattern in the language. The rule is further subject to two general syntactic conditions: (i) the target word is either the last in a syntactic phrase, as in (10a), or it is topicalized, as in (10b). When the word is sentence-medial, the rule is blocked, as in (10c). Since vowel epenthesis is (partly) determined by syntactic factors, it must be postlexical.

(10) a. *hoxe comprei papel ~papel[i] ‘I bought (some) paper today’
     today I bought paper
b. o papel ~papel[i] comprei-no hoxe ‘I bought (some) paper today’
     the paper I bought-it today
c. comprei papel ~ *papel[i] bó hoxe ‘I bought (some) good paper today’
     I bought paper good today

The second rule is the postlexical version of resyllabification (9). As the examples in (11) and (12) show, a word-final nasal is resyllabified to the onset of the final syllable, created by vowel epenthesis. Clearly, NV must apply prior to both epenthesis and resyllabification, since otherwise the asterisked forms in (11)–(12) would be obtained.

(11)    Underlying          Surface

cen   /sen/   sé.ɲi ~ *sé.ni       ‘a hundred’
tren   /tren/   tré.ɲi ~ *tré.ni    ‘some, any’
alemán /aleman/   a.li.má.ɲi ~ *a.li.má.ni ‘German’

(12)    Underlying          Surface

cen horas  /sen # ðras/   sé.nɔ.ɾas ~ *sé.nɔ.ɾas    ‘a hundred hours’
tren alemán /tren # aleman/   tré.na.li.máŋ ~ tré.na.li.máŋ ‘German train’

Having established that NV is ordered before both postlexical epenthesis and resyllabification, we may inquire now as to whether NV is a lexical rule, and if so, in what lexical domain it operates. Consider the examples in (13).

(13)    Underlying          Surface

a. cana   /kan+a/   ká.na ~ *ká.ŋa ‘cane’
cano   /kan+o/   ká.nu ~ *ká.ŋu ‘pipe, gutter’
pano   /pan+o/   pá.nu ~ *pá.ŋu ‘cloth’
b. can   /kan/   kan ‘dog’
pan   /pan/   pan ‘bread’
lambón9   /lamb+on/   larʃm.ˈbɔŋ ‘sweet-toothed’
c. canil   /kan+il/   kan.ʃl ~ *ka.ŋil ‘doghouse’
panadeiro   /pan+ad+eir+o/   pa.na.ˈdej.ru ~ *pa.ŋa.ˈdej.ru ‘baker’
lambonada   /lamb+on+ad+a/   larʃm.ˈbu.ná.da ~ *larʃm.ˈbu.ŋá.da ‘tidbit’

In (13a), the base is followed by the gender marker. The fact that NV does not apply to the root-final nasal can be explained by assuming that it is assigned to an onset position by initial syllabification. Accordingly, at no subsequent point in the derivation will the nasal meet the structural description of NV, which is
only satisfied by a rhyme nasal. The same is true for the items in (13c), formed by suffixation of derivational morphemes to the respective roots in (13b) (of course, in lambonada the base is the stem /lam+bon/). There is, then, a lexical stratum in which both inflexional and derivational suffixes are attached. Once these morphological operations are carried out, the resulting string are subject to core syllabification. The only exception to this sequence is shown in (14b).

\[(14)\]

<table>
<thead>
<tr>
<th>Underlying</th>
<th>Surface</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. un</td>
<td>/un/</td>
<td>üŋ</td>
</tr>
<tr>
<td></td>
<td>algún</td>
<td>al.xũŋ</td>
</tr>
<tr>
<td></td>
<td>nengún</td>
<td>niŋ.gũŋ</td>
</tr>
<tr>
<td></td>
<td>d'ún</td>
<td>dúŋ</td>
</tr>
<tr>
<td></td>
<td>c'ún</td>
<td>kũŋ</td>
</tr>
<tr>
<td></td>
<td>n'ún</td>
<td>nũŋ</td>
</tr>
<tr>
<td>b. unha</td>
<td>/un+a/</td>
<td>üŋ.ŋa~*ũ.na</td>
</tr>
<tr>
<td></td>
<td>algunha</td>
<td>al.xũ.ŋa~*al.xũ.na</td>
</tr>
<tr>
<td></td>
<td>nengunha</td>
<td>niŋ.gũ.ŋa~*niŋ.gũ.na</td>
</tr>
<tr>
<td></td>
<td>d'unha</td>
<td>dú.ŋa~*dũ.na</td>
</tr>
<tr>
<td></td>
<td>c'unha</td>
<td>kũ.ŋa~*kũ.na</td>
</tr>
<tr>
<td></td>
<td>n'unha</td>
<td>kũ.ŋa~*kũ.na</td>
</tr>
</tbody>
</table>

The masculine of the indeterminate article un in (14a) (shown together with its derivatives and contracted forms) serves as the base for the feminine forms in (14b). However, in order for the root-final nasal to undergo NV, as required by the data in (14b), the root /un/ must undergo initial syllabification prior to suffixation of the feminine marker, since this operation will assign the nasal in question to a rhyme position, at which point it meets the structural description of NV. Exceptional suffixation of the feminine marker must, then, operate in a subsequent level, thus providing the conditions for the application of lexical resyllabification. In short, the derivation of the feminine forms in (14b) would appear to require two cycles. Initial syllabification and NV apply in the first cycle; exceptional inflexional suffixation (and resyllabification) in the second.\(^\text{10}\)

An analysis entirely analogous to the one just sketched is required by the data related to prefixation and compounding. The most productive among the nasal-final prefixes in Galician are in- (which negates the semantic content of the root) and, to a lesser extent, the inchoative en-. When these prefixes are added to vowel-initial roots, the nasal surfaces as an onset velar, as in the examples inhumano ‘inhuman’, inhabitable ‘uninhabitable’ in (15a), and enhebrar ‘to thread’, eneixar ‘to install a wheel’s axels’ in (15b).\(^\text{11}\)

\[(15)\]

<table>
<thead>
<tr>
<th>Underlying</th>
<th>Surface</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. inhumano</td>
<td>/in+uman+o/</td>
<td>i.ŋu.má.nu~*i.nu.má.nu</td>
</tr>
<tr>
<td>inhabitable</td>
<td>/in+abit+abl+e/</td>
<td>i.ŋa.bi.tá.bli~*i.na.bi.tá.bli</td>
</tr>
<tr>
<td>b. enhebrar</td>
<td>/en+ebr+a+r/</td>
<td>i.ŋi.brár~*i.ni.brár</td>
</tr>
<tr>
<td>eneixar</td>
<td>/en+eiš+a+r/</td>
<td>i.ŋej.šár~*i.nej.šár</td>
</tr>
</tbody>
</table>

Compounds exhibit precisely this behaviour. Thus, items representative of this class whose first member ends in a nasal consonant, such as those in (16a), the
nasal also surfaces resyllabified to onset position, as illustrated in (16b).

(16) a. *benestar
   castellán-aragones
   San Ignacio
   Underlying
   /bén estar/
   /kastelán araxones/
   /san ignasio/

   Surface
   bé́.tíis.tár ~ *bé́.nis.tár
   kas.tí.łá.ña.ra.xu.nés ~ *kas.tí.łá.na.ra.xu.nés
   sá́.ña.ná.sju ~ *sa.ní.ná.sju

Again, these facts suggest that prior to prefixation and compounding there must be an initial level in which NV is fed by core syllabification rules, and a second level where the appropriate conditions for lexical resyllabification are satisfied by morphological concatenation.13 It is worth noting at this point that for some forms containing the prefixes in-, en- followed by a vowel-initial root, the particular realization of the prefix nasal is subject to a certain degree of variation. In other forms, the phonetic value is consistent. The list in (17)-(19) is representative (although by no means exhaustive) of three general patterns:

(17) As an onset velar:

   a. inhabitable ‘uninhabitable’ inhabilidade ‘inability’
      inhibido ‘shy’ inhalar ‘to inhale’
      inhumano ‘inhuman’ inhonesto ‘dishonest’
      inhóspito ‘inhospitable’ inalterable ‘unchangeable’
      inodoro ‘odorless’ inapelable ‘unappealable’
      inestimable ‘inestimable’ inadmisible ‘inadmissible’
      inactividade ‘inactivity’ inadecuado ‘inadequate’
      inoportuno ‘untimely’ inoxidable ‘stainless’

   b. enhebrar ‘to thread’
      enherbar ‘to cure livestock with herbs’
      enexiar ‘to install a cart’s axles’

(18) As an onset velar or alveolar:

   inesperancia ‘inexperience’ inasequible ‘unreachable’
   inesperado ‘unexplored’ inofensivo ‘inoffensive’
   inestable ‘unstable’ inace(l)table ‘unacceptable’
   inesquecente ‘unforgettable’ inequivoco ‘unequivocal’

(19) As an onset alveolar:

   a. inimigo ‘enemy’ inicial ‘initial’
      inocente ‘innocent’ inorme ‘enormous’
      inaugurar ‘to inaugurate’ inauditó ‘unheard of’
      inexorable ‘inexorable’ inédito ‘unheard of’
      inepto ‘inept’ inerte ‘inert’

   b. enadir ‘to add’
      enexía ‘energy’
      enamorado ‘in love’
      enoxar ‘to annoy’
In (17), the prefix-final nasal always surfaces as an onset velar. In (18), however, the prefix nasal can be variably realized as a velar or an alveolar. This fact may seem somewhat puzzling, since these items, just as those in (17), clearly involve productive prefixation. In any event, the crucial observation is that in the examples shown in (19) the nasal in question can only surface as an (onset) alveolar, never as a velar. With respect to NV there is, then, a clear distinction between the items in (17)-(18) on the one hand, and those in (19) on the other. The key factor here seems to be that the former the morphological composition of the word is transparent. A word such as *inhabitable, for example, can be readily decomposed into the prefix in- plus the word habitable. In (19), however, the prefix is attached to a bound morpheme; stems such as *imigo, *ocente in inimigo, inocente do not enjoy independent status as words.

The morphophonological conditions that govern the derivation of Galician velar nasals are strikingly similar to those of the Spanish Nasal Depalatalization (ND) rule discussed by James Harris (1983: 52-55), and therefore a comparison is instructive. In Spanish we find alternations such as des.dé[n] ‘disdain (noun)’ des.de.[n]es ‘disdaïns’ vs. des.de.[ñ]es ‘you disdain (subj.), des.de.[ñ]o.so ‘disdainful’. James Harris argues that these contrasts can be naturally explained in terms of the interaction between syllabification and morphological structure. The derivation of the singular form desdè[n] is straightforward if we assume that the underlying root-final palatal is depalatalized in the domain of the root ([desdeñ]). This rule can be motivated in Spanish in a fashion almost identical to that adduced for Galician NV in (7). In Spanish palatal nasals do not occur syllable-finally (except, of course, when derived by nasal assimilation). When the underlying /ñ/ is assigned to a rhyme position by core syllabication, its Place features will be delinked. The only difference is that instead of Dorsal, as in Galician, in standard Spanish the default Articulator for nasals is Coronal (cf. fn 5; see also James Harris 1984a, 1984b). The derivation of the plural desdenes (morphologically [[desdeñ]es]) proceeds in two cycles. The root is syllabified in a first cycle, where the root-final /ñ/ is assigned to a rhyme. ND becomes applicable at this point, turning /ñ/ into [n]. The plural morpheme /-es/ is added in a second cycle, where lexical resyllabification will shifted it to the onset of the final syllable. By contrast, the derivation of the verb form desdeñes and the adjective desdeñoso involves only one cycle, namely [desdeñ+a+es] (the theme vowel /a/ is deleted by a general rule of Spanish) and [desdeñ+os+o], where the underlying /ñ/ is initially assigned to an onset position by core syllabification rules, and therefore it will fail to meet the structural description of ND. In terms of the lexical phonology framework, two implications can be drawn from James Harris’ analysis of the Spanish data. First, the lexical stratum in which plural suffixation takes place must be different from the stratum in which the derivational suffixes and the other inflexional morphemes are attached. And second, Nasal Depalatalization must be a cyclic rule, since it operates between two cyclic syllabification domains: the root cycle, and the plural suffix cycle.

The Galician data considered so far also support the organization of the lexical phonology into at least two strata. In fact, arguments similar to those advanced by James Harris for Spanish can be forwarded, mutatis mutandis, to account for
the contrast between two pairs of representative examples in Galician: *cana* in (13a) and *panadeiro* in (13c) on the one hand, and *unha* in (14b) and *inhumano* in (15a)) on the other. In the first pair, regular inflexional and derivational suffixation occurs in Level 1, followed by syllabification. Hence, the derivation proceeds in one cycle, as shown in (20) (where step (a) is regular derivational and inflexional suffixation, and step (b) reflects the application of core syllabification). Nothing else of interest occurs in the derivation of these items.

(20) *First (only) cycle:*

a. *cana* 'cane'*

\[
\begin{array}{ccc}
\text{[[kan]\ a]} & \rightarrow & \text{[kana]} & \rightarrow & \text{[k a. n a]} \\
\text{N''} & \rightarrow & \text{N'} & \rightarrow & \text{N}
\end{array}
\]

b. *panadeiro* 'baker':

\[
\begin{array}{ccc}
\text{[[pan]\ ad ] eir+o]} & \rightarrow & \text{[panadeiro]} & \rightarrow & \text{[p a.n a.d e j.r o]}
\end{array}
\]

By contrast, in order to explain the root-final velar nasal in the indefinite feminine article *unha*, it must be assumed, as stated earlier, that it bears some special mark which prevents it from undergoing regular inflexional suffixation at Level 1. This operation will apply exceptionally at Level 2. The relevant portions of such derivation are shown in (21):

(21) a. *First cycle:*

\[
\begin{array}{ccc}
\text{[[un ] a ]} & \rightarrow & \text{[[u \ n. ] a]} & \rightarrow & \text{[[u \ \eta. ] a]}
\end{array}
\]

b. *Second cycle (exceptional /-a/-suffixation):*

\[
\begin{array}{ccc}
\text{[[u \ \eta. ] a]} & \rightarrow & \text{[[u \ \eta. a]} & \rightarrow & \text{[[u \ \eta. a]}
\end{array}
\]

In (21a), syllable structure rules applying in the first cycle assign the underlying nasal to a rhyme position by step (a), thus allowing NV to apply in step (b). Step (c) is exceptional inflexional suffixation. Finally, lexical resyllabification in step (d) shifts the velar nasal to the following syllable. Assuming now that
prefixation also operates at Level 2, the derivation of *inhumano* will be as in (22) (only the relevant syllable structure is shown):

(22) a. *First cycle:*

\[
\begin{align*}
\text{[[i] n.][[u.m.a.no]]} & \rightarrow \text{[[i] n.][[u.m.a.no]]} \\
\end{align*}
\]

b. *Second cycle (in-prefixation):*

\[
\begin{align*}
\text{[[i] n.][[u.m.a.no]]} & \rightarrow \text{[[i] n.][u.m.a.no]} \\
\end{align*}
\]

Step (a) subsumes regular suffixation of the masculine gender morpheme /-o/ and initial syllabification. The remaining steps are just as in (21), except that step (c) now indicates the attachment of the prefix *in-*. Finally, compounding must also be placed in Level 2, so that the derivation of items such as those in (16) would be analogous in all relevant details to those in (21) and (22). The phonetic forms in (20)-(22) have the illustrative derivations in (23) (where (a) = derivational and regular inflexional suffixation; (b) = initial syllabification; (c) = NV; (d) = prefixation and exceptional inflexional suffixation; (e) = lexical resyllabification; and (f) = other rules (i.e., stress assignment and unstressed vowel raising). The Underlying representations are given with their morphological bracketings):

(23)  

<table>
<thead>
<tr>
<th></th>
<th>cana</th>
<th>panadeiro</th>
<th>unha</th>
<th>inhumano</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a):</td>
<td>[kana]</td>
<td>[panadeiro]</td>
<td>(exception)</td>
<td>[in][uman]o]</td>
</tr>
<tr>
<td>(b):</td>
<td>[ka.na]</td>
<td>[pa.na.dej.ro]</td>
<td>[un.a]</td>
<td>[in][u.m.a.no]</td>
</tr>
<tr>
<td>(c):</td>
<td></td>
<td></td>
<td>[un.a]</td>
<td>[in][u.m.a.no]</td>
</tr>
<tr>
<td>Level 2:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d):</td>
<td></td>
<td></td>
<td>[u.n.a]</td>
<td>[i.n.UMA.no]</td>
</tr>
<tr>
<td>(e):</td>
<td></td>
<td></td>
<td>[u.na]</td>
<td>[i.n.UMA.no]</td>
</tr>
<tr>
<td>(f):</td>
<td>ká.na</td>
<td>pa.na.déj.ru</td>
<td>ú.na</td>
<td>i.n.UMA.nu</td>
</tr>
</tbody>
</table>

In sum, as ND in the Spanish examples discusses earlier, NV in Galician must be cyclic, since it is both fed and followed by syllable structure rules, which are themselves cyclic. This takes us back to the claim made at the outset of this paper. NV is not structure-preserving, since its output, the velar nasal  pageNo does not belong to the underlying set of Galician consonants, thus violating the lexical marking condition in (5).
To conclude, the predictions made by the three weaker versions of Structure Preservation mentioned at the outset of this paper may now be briefly assessed in the light of the analysis of NV presented here. Macfarland and Pierrrehumbert (1991) appeal to Haye’s Linking Constraint in order to exempt structures from the scope of Structure Preservation when such structures are created by lexical assimilation rules. This condition is clearly irrelevant here, since NV does not involve assimilation. On the other hand, it is not immediately obvious as to why the output of lexical default rules such as (7b), should be exempt from Structure Preservation. Furthermore, insofar as my analysis of NV is justified, it openly contradicts the claim by Booij and Rubach (1987) that lexical cyclic domains are structure-preserving. The logical conclusion that can drawn at this point concurs with Mohanan’s position (1986) that Structure Preservation represents some sort of default parameter, not an absolute universal.

Notes

* This research was partly funded by a Georgetown University Summer Faculty Grant. Thanks to Donca Steriade for pointing out to me the counterexamples to Structure Preservation discussed in Calabrese (1988).

1. The dialect under study is spoken in the coastal areas across the bay of the city of Vigo, in the Pontevedra province, about twenty-five miles north of the Portuguese border. This dialect differs from standard (normative) Galician in that it lacks the voiceless interdental /θ/ but contains the voiceless velar fricative /x/ absent in other Galician dialects, including the normative variety. Furthermore, there is a general rule in this dialect that raises unstressed tense mid-vowels. The underlying vowel and consonantal systems are as follows:

<table>
<thead>
<tr>
<th>Vowels:</th>
<th>front unrounded</th>
<th>back unrounded</th>
<th>back rounded</th>
</tr>
</thead>
<tbody>
<tr>
<td>high</td>
<td>i</td>
<td>u</td>
<td></td>
</tr>
<tr>
<td>mid-high</td>
<td>e</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>mid-low</td>
<td>ε</td>
<td>ç</td>
<td></td>
</tr>
<tr>
<td>low</td>
<td>a</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Consonants:   | p               | t              | ċ             | k             |
|               | b               | d              | j             | g             |
|               | f               | s              | Š             | x             |
|               | m               | n              | ŋ             |               |
|               | l               | r              |               |               |
|               | r               |                |               |               |

2. The feature [back] is therefore dispensed with. It should be noted that the particular models of syllabic and segmental structure in (2) and (3) have been chosen for the sake of explicitness but they do not play any crucial role in my analysis.

3. Here and in subsequent examples Galician words are given in their standard orthographic form, followed by their underlying representations showing (whenever relevant) the morphological composition of the word, and these are followed in turn by their surface realizations (where syllable boundaries are indicated by periods).

4. See, for example, Santamarina (1973), Couceiro (1976), Veiga Arias (1976), Porto Dapena (1977), Carballo Calero (1979), Taboada (1979), Alvarez et al. (1986), and Fernández Rei (1990). However, I have not been able to find any systematic study of this phenomenon in any variety of Galician. NV also occurs in a considerable number of
5. By contrast, in standard Spanish dialects, the default value isCoronal, the universally unmarked articulator (cf. the collection of essays in Paradis and Prunet 1991).
6. This suggestion was made by a member of the audience at the Berkeley Linguistics Society Conference during my presentation.
7. The coarticulated segments in (8) are represented by a sequence of two nasals linked by a top ligature. Nasal coarticulation also occurs in a variety of Spanish dialects; cf. James Harris 1969: 15-16, Navarro Tomás 1977: 113; see Martínez-Gil 1991 for further details.
8. In dialects that insert [e]this condition is apparently not observed, so that eponthesis in items such as fácil[e] is, in fact, possible (cf. Caballo Calero 1979: 123). For further details on [i]-eponthesis in the dialect described here, see Hualde and Martínez-Gil (1993). 9. Literally 'licker' (cf. lamber 'to lick').
10. It is worth noting that the exceptional suffixation of the feminine marker in unha accounts for some apparent lexical contrasts involving a fourth point of articulation, as shown by the minimal pairs una 'I unite (subj.)' ~ una 'nail' ~ unha 'a, one (fem.)', cuna '(just) as' ~ cuna 'cradle' ~ cuña 'wedge' ~ c'unha 'with one (fem.)', and duna 'dune' ~ d'unha 'of one (fem.)'.
11. The symbol h in Galician is merely orthographic, with no phonetic realization.
12. When presented with two alternative pronunciations of items in (18), most speakers of this dialect I have consulted showed considerable hesitation, and no clear preference was given to one or the other (it should be mentioned that some of the speakers surveyed do not have all the words listed in (18) in their lexicon). Thus in an item such as inoxidable (in+oksid+abl+e), the prefix-final nasal may surface either as an onset velar ([i.no.si.d̠.β̠]), or as an onset alveolar ([i.no.si.d̠.β̠]). It may well be that the dialect in question is undergoing a stage of change in progress, where variable realizations would seem to indicate that NV is gradually expanding its domain into higher levels of the lexical phonology. This issue is interesting in its own right, but the type of discussion its merits cannot be undertaken here for lack of space.
13. There is a critical difference, however, between the two: ND in Spanish is structure preserving, Galician NV is not.
14. In the dialect I am describing, whether or not the (velar) nasal is delimited by the resyllabification rule (9) from its original rhyme position in the preceding syllable is optional and apparently determined by style. In fact, in rapid speech, the velar nasal is actually ambisyllabic, forming a sort of interlude between the preceding and the following vowel. This has also been observed by Santamarina (1973) in other varieties of Galician.

References


Defining the Affectedness Condition
Kaoru Ohta (CSULB/UCLA) and Kuo-ming Sung (UCLA)

1. Introduction

In this paper, we examine the nature of the Affectedness Condition which has been the topic of discussion (such as Anderson 1979, Tenny 1987, and Pesetsky 1990). In English, syntactic phenomena of the middle formation as in (1) and nominal passivization as in (2) are commonly known to be subject to this condition.

(1) a. This door opens easily. (cf. X opens this door.)
   b. This cinch tightens easily. (cf. X tightens this cinch.)
   c. *Flying fears easily. (cf. X fears flying.)
   d. *Cliffs this big avoid easily. (cf. X avoids cliffs this big.)

(2) a. Rome's destruction (cf. the destruction of Rome)
   b. the play's performance (cf. the performance of the play)
   c. *the play's enjoyment (cf. enjoyment of the play)
   d. *Mary's avoidance by John (cf. John's avoidance of Mary)

Roughly, NP-movement in these cases cannot extract [-affected] internal arguments to form middles and nominal passives.

Pesetsky 1990 characterizes Affectedness as a constraint applied to the cases that involve zero morphemes, or phonologically null elements. He argues that middle verbs and nominal passives have structure such as in (3).

(3) a. [ [ a \text{v} \text{MIDDLE} \text{v} ] ]
   b. [ [ a \text{N} \text{PASS} \text{N} ] ]

In agreement with Baker, Johnson, and Roberts' 1989 analysis of the sentential passive, Pesetsky assumes that the zero morphemes, MIDDLE and PASS in (3a and b) are responsible for the absorption of the subject \(\theta\)-role and case assigning ability to the internal argument.

On the other hand, Tenny 1987 characterizes Affectedness as delimitedness. The notion of delimitedness is summarized in (4).

(4) The sentence or event is delimited if it is understood to mean that there is some point in time after which the event is no longer continuing. (Tenny 1987, p. 17)

Thus, the possibility of syntactic operations such as middle formation and nominal passivization correlates with the delimitedness or non-delimitedness of the event.

In what follows, we examine Chinese and Japanese data which exhibit the Affectedness Effect. Then we argue that i) the Affectedness Effect is observed when [-affected] internal arguments are extracted by NP-movement even if an overt morpheme is involved and ii) the Affectedness Effect is observed when extraction of NP by NP-movement takes place in a non-tensed clause or when this NP-movement has an effect on the aspectual property of the clause. Our findings show that the
Affectedness Effect is not limited to cases with zero morphemes and that the English facts are representatives of two primary cases of the realization of the Affectedness Effect.

2. Chinese Data

In Mandarin Chinese, the Affectedness Effect is observed in three different constructions: the BEI construction as in (5), the BA construction as in (6), and QILAI construction as in (7).

(5) a. Wo sha-le Zhanhsan.
     I kill-Asp
     'I killed Zhanhsan.'

   b. Zhanhsan bei Lisi sha-le.
      BEI kill-Asp
      'Zhanhsan was killed by Lisi.'

(6) a. Wo sha-le Zhanhsan.
     I kill-Asp
     'I killed Zhanhsan.'

   b. Wo ba Zhanhsan sha-le.
      I BA kill-Asp
      'I killed Zhanhsan.'

(7) a. Ta men mai zhe ben shu.
     he pl. sell this CL. book
     'They sell this book.'

   b. Zhe ben shu mai qilai hen kuai.
      this CL. book sell QILAI very fast
     'This book sells very fast.'

With a verb with a [-affected] object, such as xihuan 'to enjoy', all of the constructions in (5)-(7) result in ungrammaticality as shown in (8)-(10)

(8) a. Women xihuan Zhanhsan de xi.
     we enjoy Gen play
     'We enjoyed Zhanhsan's play.'

   b. *Zhanhsan de xi bei women xihuan.
      Gen. play BEI we like
     'Zhanhsan's play was enjoyed by us.'

(9) a. Wo xihuan Zhanhsan.
     I like
     'I like Zhanhsan.'

   b. *Wo ba Zhanhsan xihuan.
      I BA like
      'I like Zhanhsan.'

(10) a. Zhanhsan hen xihuan zhe ben shu.
      very like this CL. book
      'Zhanhsan likes this book very much.'

   b. *Zhe ben shu xihuan qilai hen rongyi.
      this CL. book like QILAI very easy
      'This book enjoys easily.'

In this section, by examining the binding facts and the cases in which Partitive Case assignment is involved in the BA construction, we argue that all three constructions involve NP movement. Then, we argue that the Affectedness Condition must be obeyed whenever NP-movement is applied in Chinese.
First, consider the sentences in (11).

(11) a. Zhangsan j [qi ma] qi de Proj hen lei.²
    ride horse ride COMP very tired
    'Zhangsan rides the horse and (as a result) he is tired.'

b. Zhangsan ba maj qi de Proj hen lei.
    BA horse ride COMP very tired
    'Zhangsan rides the horse and (as a result) the horse is tired.'

Huang 1989 examines the pair in (11), and proposes a non-movement analysis of the BA construction using the theory of Generalized Control. He assumes that the bracketed [qi ma] 'ride the horse' in (11a) is an adjunct and that maj in (11b) is base-generated in the preverbal Spec of VP. Note that the subject Zhangsan is the only possible controller of Pro in (11a), whereas in (11b), the object ma 'the horse' in the Spec of VP is the closest possible controller. According to Huang, this is how the resultative clause in (11a) and in (11b) are interpreted as indicated by the English gloss.

However, there are cases where Huang's assumption that the preverbal NP is base-generated in situ is untenable such as in (12).

    beat beat COMP he can-not-stop
    'Zhangsan beat Lisi and Zhangsan couldn't stop it'

    beat beat COMP he nose-blue-face-bloated
    'Zhangsan beat Lisi and Lisi was all black and blue'

    beat beat COMP he watch-not-on particle
    'Zhangsan beat Lisi and someone else couldn't bear the scene'

d. Zhangsani da Lisik da de ziji
    beat beat COMP self very tired
    'Zhangsan beat Lisi and got himself tired'

The overt subject ta 'he' in the resultative clause in (12a, b and c) can refer to either the subject Zhangsan or the object Lisi. Furthermore, it is even possible for this pronoun to refer to someone else. On the other hand, in (12d), the anaphor ziji 'self' is long-distance bound by the c-commanding subject and not by the object, as expected. These binding properties clearly indicate that the resultative clause has its own binding domain.

In (13), which is different from (12a) only in that the object Lisi is suppressed, the binding domain is obviously changed, as the pronoun ta 'he' can no longer refer to the matrix subject Zhangsan.

(13) *Zhangsani da de tai yu-ba-bu-neng.
    beat COMP he can-not-stop

This fact suggests that ta 'he' is in the binding domain of the matrix clause.

Under Huang's account, which assumes the bracketed VP [da Lisi] 'beat Lisi' as an adjunct, the fact in (13) is unexpected because it is generally true
that the adjuncts are structurally irrelevant in determining/changing binding domains as the English sentence in (14) shows.

(14) John hit himself/ˈjɪ [ when Bill came].

Then, a question arises as to the categorial status of [da Lisi] in (12a). In this connection, the sentences in (11) contain Pro as the subject of the resultative clause. Compare (11) with (15).

   ride horse ride COMP he very tired
   'Zhangsan rides the horse and (as a result) he is tired.'

b. *Zhangsan ba maj qi de tai/j hen lei.
   BA horse ride COMP he very tired
   'Zhangsan rides the horse and (as a result) the horse is tired.'

In (15), the pronoun ta 'he' occupies the subject position of the resultative clause which Pro occupies in (11). What is crucial here is that while in (15a), the sentence is grammatical even with the pronominal subject in the resultative clause, the sentence in (15b) results in ungrammaticality when the subject of the resultative clause is pronominal.3 Under Huang's analysis, this fact requires another set of stipulations.

All of the above facts can be easily accounted for if we assume NP-movement in the formation of the BA construction. Namely, under our NP-movement analysis, the S-structure of the BA construction such as (11b) looks like the one in (16).

(16) Zhangsan ba mai qi [ de ti hen lei]
    Moreover, the sentences in (17) can be accounted for in a principled manner only under NP-movement analysis.

(17) a. Zhangsan chang de wo toutong.
    sing COMP I headache
    'Zhangsan sings (so bad) that I have a headache'

b. Zhangsan ba wo chang de toutong.
   BA I sing COMP headache

c. *Zhangsan chang wo chang de (wo) toutong.
   sing I sing COMP I headache

d. *Zhangsan chang wo ba wo chang de toutong.
   sing I BA I sing COMP headache

Under Huang's Control analysis, wo 'I' in (17b) is base-generated in the matrix clause. However, this NP wo 'I' is not an argument of the verb chang 'sing' and this clearly violates the projection principle. Moreover, following his account, it appears very difficult to rule out sentences such as those in (17c) and (17d).

In our NP-movement analysis, the sentence in (17b) is derived from the underlying (17a) via NP-movement. In addition, (17c) and (17d) are ruled out as violation of the projection principle.
So far we have shown that a movement analysis of the BA construction can account for the contrast in (11) with respect to the interpretation of the subject of the resultative clause. Next, we argue that this movement is NP-movement.

Sung 1993 argues that the "Definiteness Effect" observed in Chinese constructions can be accounted for by adopting Belletti 1988's theory of Partitive Case into Chinese. Now, consider the French sentence in (18).

(18) Il a été tué trois hommes/*l'homme. (Belletti 1988)
'There is killed three men/*the man.'

The impersonal passive sentence in (18) shows that this construction is subject to the Definiteness Condition, i.e. only indefinite NPs can appear postverbally with a verb lacking structural accusative Case. Belletti op cit. and Sportiche 1990 claim that inherent Partitive Case is assigned to the postverbal NP in this construction when the NP is indefinite. Hence, the definite NP cannot appear in the postverbal position in the impersonal passive construction because such an NP is not Case assigned.

As shown in (19), the Definiteness Effect is found in the BA and BEI constructions.

(19) a. Ta ba Zhangsan de fan chi le yiban/*ling yi ban.
he BA Zhangsan Gen meal eat Asp half the other half.
'He ate *(the) half of the Zhangsan's meal.'

b. Wo bei tou le yi ben/*na yi ben shu.
I BEI steal Asp one CL that one CL book.
'A/*The book of mine was stolen.'

First, let's assume that in the BA construction in (19a), the preverbal NP Zhangsan is extracted from the complement position of the verb to the subject position as an instance of NP-movement. Following Baker, Johnson, and Roberts 1988, the structural Case of the verb is absorbed by this NP-movement. Thus, the only way by which the postverbal NP can receive Case is through assignment of the Partitive Case. Since the Partitive Case is assigned only to indefinite NPs, definite NPs are excluded from this position. Similarly, the Definiteness Effect in the BEI construction can be accounted for solely by the theory of Partitive Case.

We also assume that the QILAI or middle construction as in (7) is derived by NP-movement. In (20), the reflexive ziji 'self' must be bound by the agent of verb zuo 'to do'. Note that the Chinese reflexive ziji refers to the subject NP. Hence, this shows that the surface subject of the sentence in (20a) is derived by NP-movement.

(20) Zhe zhong shi zuo qilai dui ziji mei haochu.
this type thing do qilai for self no advantage.
'Proi doing such a thing is not good for self.'

The sentences in (21) also indicate that the external argument of the verb must be present. In (21a), control of PRO must be the external argument.
of the verb *fenshua 'to paint*. In addition, in (21b), the agent-oriented adverb *chongman cuozhengan 'full of frustration' requires the existence of the external argument.

(21) a. Zhe mian qiangbi fenshua qilai PRO yao tebie liuyi.
    this CL wall paint qilai PRO must especially careful
    'For a person x, the wall needs x to be especially careful when x paints it.'

b. Zhe men ke xiu qilai chongman cuozhengan.
    this CL course take qilai full=of frustration.
    'Taking this course makes one feel frustrated.'

Therefore, in Chinese, the Affectedness Effect is observed in constructions where NP-movement is applied. We will return to the theoretical significance of this fact after examining Japanese data.

3. Japanese Data

In Japanese, the Affectedness Effect is observed in the tough construction, desiderative construction and resultative intransitivization construction as shown in (22)-(24).

(22) a. Taroo-ga tomodati-no si-o kanasin-da.
    -nom. friend-gen. death-acc. sadden-past
    'Taro was saddened by his friends' death.'

    'For Taro, it is easy to be saddened by his friends' death.'

(23) a. Boku-wa Hanako-o ais-si-ta.
    I-top. -acc. love-do-past 'I love Hanako.'

b. *?Boku-wa Hanako-ga ais-si-ta-i.
    I-top. -nom. love-want-pres.
    'I want to love Hanako.'

    -nom. bus-acc. wait-past 'Ziro waited for a bus.'

b. *Basu-ga mat-te ar-u.
    bus-nom. wait-TE exist-pres. 'A bus has been waited.'

These constructions apparently involve NP-movement. First, let's take the Japanese tough construction as an example. It has been argued by Kuroda 1987 that the nominative NP in the sentence in (25a) is base generated as an internal argument of the embedded verb as shown in (25b) and the (optional) application of NP movement moves this NP to the position where Nominative Case is assigned.5

(25) a. Sei-no hikui hito-ni(-wa) kono mado-ga same-height-gen. low person-dat.(-top.) this window-nom. close-niku-i (daroo).
    difficult-pres. (perhaps)
'For a small person, (perhaps) this window is difficult to close.'

b. Sei-no hikui hito-ga kono mado-o ake-ru.
   height-gen. low person-nom. this window-acc. open-pres.
   'A small person opens this window.'

Following Baker 1988 and Hasegawa 1988, we assume that NP movement in (25a) is triggered by verb movement which forms a complex predicate *sime-niku-i* 'is difficult to open' for Case theoretic reasons. To put it simply, as a result of movement of the embedded verb to form a complex predicate, the internal argument must move in order to receive Case. In the spirit of Burzio’s generalization, the external argument of the embedded verb cannot receive structural Case; perhaps an inherent Case, namely dative is assigned by the complex predicate.

Note that this derivation is assumed to take place in syntax. In this regard, compare (25a) with (26).

(26) Sei-no hikui hito-ga kono mado-o ake-niku-i.
    height-gen. low person-nom. this window-acc. open-difficult-pres.
    'Small people are not likely to open this window.'

The sentence in (26) contains a nominative external argument and an accusative internal argument of the embedded verb. In addition, this sentence differs semantically from (25a). While (25a) denotes the easiness/difficulty of the event, the sentence in (26) expresses tendency/likelihood of the event. We assume that the complex predicate in (26) is formed after the S-structure, perhaps at PF level. To illustrate schematically, S-structure of (25a) looks roughly like (27) and (28) represents the S-structure of (26)

(27) [sei-no hikui hito] kono mado[ti tk] ake-niku-i
(28) [ [sei-no hikui hito kono mado ake] -niki-i]

Now, consider the sentences in (29) and (30).

    -dat.(top.) can-nom. flat-adv. crush-easy-pres.
    'For Taro, it is cans that he can easily crush flat.'

b. ?Yoko-ni(-wa) hana-ga barabara-ni si-yausu-i.
    -dat.(top.) flower-nom. into=pieces-adv. do-easy-pres.
    'For Yoko, it is flowers that she can easily break into pieces.'

(30) a. Taro-o kan-o petyanko-ni tsubusi-yausu-i.
    Taro-nom. can-acc. flat-adv. crush-easy-pres.
    'Taro is likely to crush cans/the can flat.'

b. Yoko-ga hana-o barabara-ni si-yausu-i.
    -nom. flower-acc. into=pieces-adv. do-easy-pres.
    'Yoko is likely to break flowers/the flower into pieces.'

The difference between (29) and (30) is that both the generic and specific reading is possible for the accusative bare NP in (30) whereas only the generic interpretation is possible for the nominative bare NP in (29).
Following Diesing 1990, we assume that existential closure has a scope over VP. Then, the fact that nominative bare NP allows only the generic reading can be accounted for by assuming that syntactic NP-movement is involved in (29): namely, by syntactic NP movement, this NP moves out of the scope of the existential closure. Meanwhile, the fact that the accusative bare NP allows both specific and generic readings in (30) is accounted for by assuming a post-syntactic NP-movement, and therefore the accusative NP remains in the scope of the existential closure at LF. In other words, being inside VP contributes to its specific interpretation.⁷

This appears to be common among constructions in which a nominative object is involved as shown in (31)-(32). Thus, the nominative objects in the desiderative sentences in (31a) and the resultative intransitivization construction in (32a) tend to be interpreted as generic whereas accusative objects are interpreted as either generic or specific.

   -top. new car-nom. buy-want-pres. fact-be=pres.
   'The fact is that Yoko wants to buy a(ny) new car.'

   b. Yoko-wa atarasii kuruma-o kai-ta-i no-da.
   -top. new car-acc. buy-want-pres. fact-be=pres.
   'The fact is that Yoko wants to buy a (specific) new car.'

   window-nom. open-TE exist-pres. 'Windows have been opened.'

   b. Mado-o ake-te ar-u.
   window-acc. open-TE exist-pres.
   'Windows have/The window has been opened.'

Common to these constructions is that the aspectual properties of the predicates of these constructions are different from those of embedded verbs. The embedded verbs of sentences in (25), (29a), (31), and (32) are all eventive in that they are compatible with locative adjuncts and specific-time denoting adverbs indicate an onset of the event as shown in (33).

(33) a. Kono heya-de gozi-ni mado-o ake-ru.
   this room-in five-o'clock window-acc. open-pres.
   'In this room, I will open this window at five o'clock.'

   b. Gozi-ni sono mise-de kuruma-o ka-u.
   five=o'clock-in that shop-in car-acc. buy-pres.
   'I will buy a car at five o'clock in that shop.'

   c. Taroo-wa gozi-ni koko-de kan-o tubus-u.
   -top. five=o'clock-in this-place-in can-acc. crush-pres.
   'Taro will crush a can at five o'clock here.'

However, in the tough construction, desiderative construction and resultative intransitivization construction, locative adjuncts are incompatible as shown in (34).
(34) a. *?Mado-ga kono heya-de ake-te-ar-u.
    window-nom. this room-in open-cont.-exist-pres.
    'The window has been opened in this room.'

b. *?Nihon-zin-ni (wa) hasi-no hoo-ga
    Nihon-degohan-ga tabe-yasu-i.
    Japan-in meal-nom. eat-easy-pres.
    'For Japanese, it is easier in Japan to eat meals with chopsticks.'

c. *Watasi-wa uti-de kuruma-ga kai-ta-i.
    I-top. home-in car-nom. buy-want-pres.
    'In my house, I want to buy a car.'

Furthermore, specific-time denoting adverbs do not indicate the time when the state described by the predicate starts to hold true as shown in (35). In these cases, the sentences are true even if the states described by the predicates hold true prior to the time specified by the adverbs.

    window-nom. fiv=о'clock-at open-cont.-exist-pres.
    'The window will have been opened by five o'clock.'

b. Taroo-ni-(wa) sonoyoona hon-ga gozi-ni
    -dat.-(top.) such book-nom. fiv=о'clock-at
    yomi-yasu-i.
    read-easy-pres.
    'At five o'clock, such books are easy for Taro to read.'

c. Boku-wa gozi-ni hon-ga kai-ta-i.
    'I want to buy books at five o'clock.'

Hence, for Japanese, it seems plausible to characterize the Affectedness Effect as the effect observed in cases where the aspectual properties of the predicates are changed by NP movement.

4. Defining the Affectedness Effect

To summarize so far, we have observed cases where the Affectedness Effect holds in both Chinese and Japanese. We have argued that in Chinese, cases where the surface forms are derived via NP-movement are subject to this constraint, whereas in Japanese, the Affectedness Effect is observed when NP-movement affects the aspectual properties of the predicates.

Now, let's return once again to the English cases where the Affectedness Effect is observed. In English, this effect is observed in nominal passivization and middle formation. Now, the question is whether English and Chinese/Japanese cases have anything in common. One commonality among these constructions is the application of NP-movement. As Pesetsky 1990 argues, both passive nominals and middle
constructions involve NP-movement. By examining sentences such as in (36), he argues that NP-movement is involved in nominal passives.

(36) a. The election of Clinton as president
       b. Clinton's election as president
       c. *the election as president

In (36), the as-phrase is predicated of the object. In the passive example in (36), this predication relation is preserved. Furthermore, since the possessive may not be deleted as (36c) shows, it is plausible to argue that the possessive NP is an argument. Therefore, the argument possessive NP in (36), which is predicated of the object, is assumed to be moved from the object position. He accounts for this fact by assuming that passive nominals contain a trace of object as in (37).

(37) Clinton's election to as president

Details aside, a similar fact is observed in the middle, too, as (38) shows.

(38) a. Plastic tires wear flat easily.
       b. This envelope steams open easily.

The other commonality between English and Chinese/Japanese cases is found in Tense and Aspect properties among these constructions. Thus, while both passive nominals and Chinese cases do not contain Tense elements, English middle and Japanese constructions in question contain predicates whose aspeuctual properties are changed.

First, Chinese lacks tense and English nominal passive lacks tense since it is a nominal. Secondly, the middle construction illustrates the same aspeuctual properties that Japanese constructions in question do. As Parodi-Lewin 1991 points out, the English middle is incompatible with locative adjuncts, and specific-time denoting adverbs do not indicate the onset of the event described by the verb as shown in (39) and (40).

(39) a. *This door opens easily in this room.
       b. *Hot bread cuts easily here.

(40) a. This door opens easily at five o'clock.
       b. Hot bread cuts easily at five o'clock.

All of these facts suggest that Tenny's approach to the Affectedness Effect is on the right track, i.e. the Affectedness Effect is an aspeuctual property of the predicate. In addition, as is clear from Chinese and Japanese cases, the Affectedness Effect is found in cases where overt elements are involved, suggesting that Pesetsky's proposal is tenable only for English facts.

It is beyond the scope of our present study of the Affectedness Effect to discuss the reason why this effect emerges when NP-movement is applied to tense-less clauses and aspeuctual-changing operations. The real reason for this still remains obscure. But the conclusion of our study that Affectedness is relevant in NP-movement which is related to Tense and Aspect property of the predicates is clearly a step forward to the better understanding of the Affectedness Condition.
Notes

1. For analysis of QILAI construction as the Chinese equivalent of the middle construction, see Sung 1992.

2. The clause which is headed by the complementizer de is referred to as a resultative clause. Note that this clause must be immediately preceded by a verb. Hence, when the matrix clause contains a transitive verb, the verb is reduplicated to meet this surface condition due to the fact that Chinese has SVO order.

3. The sentence in (15b) is not ruled out because the pronoun ta 'he' cannot refer to an animal such as ma 'horse'. Even when the position of ma is replaced with a proper noun such as Lisi (a typical male name), this sentence is ungrammatical as shown in (i).

   (i) *Zhangsan\textsubscript{i} ba Lisi\textsubscript{j} da de ta\textsubscript{i,j} hen tong.
      BA hit COMP he very hurt
      'Zhangsan hit Lisi and as a result it hurt someone.'

4. Zou 1992 argues that the Definiteness Effect in the BA construction can be accounted for by the Specified Subject Condition. However, according to his account the sentences such as (19a) and (19b) require an additional explanation.

5. For an argument against Kuroda's view, see Takezawa 1987, who argues that the Japanese tough construction is derived through null operator movement, a sort of wh-movement, along the line of Chomsky 1977.

6. The specific interpretation requires the following context: suppose there are several objects to crush, such as a vase, a glass, a coffee cup, and a can. In addition, the participants in crushing these objects know that Taro has an inclination to crush a can. Under such context, the accusative NP in (30a) is interpreted as specific. Similar context enables the specific interpretation for the accusative NP in (30b). However, such an interpretation is not available for the sentences in (29) unless a modal such as yoodat-ta 'it appeared' enables us to interpret the sentence as expressing a single event.

7. I assume that the generic interpretation, which is prominent in (30) is due to the fact that the NP in question is under the scope of the generic tense operator. For more discussion, see Ohta 1992.

8. The interpretation in question here is the one in which uti-de 'in my house' directly modifies -ta(i) want'. Thus, this sentence is ungrammatical under the reading in which the speaker has a desire at home and that desire is buying a car. If this locative adjunct is interpreted as modifying only kai 'buy', then the sentence is grammatical.
References


Speakin' and Spokin' in Jamaica:
Conflict and Consensus in Sociolinguistics

by Peter L. Patrick (Georgetown University)
and Bonnie McElhinny (Stanford University)

1. Introduction: Language as Commodity

Given the material and social rewards attached to speaking standard language, why do some speakers prefer non-standard varieties? One explanation sees the standard as a commodity (Gal 1989). Although the supply of symbolic resources is not limited in the same ways that material ones are— one can easily imagine all speakers in a community using the standard— access to standard language is controlled by institutions like schools (Bourdieu 1977), so that some speakers are not permitted to learn the standard even if they want to speak it.

This control enhances the value of elite varieties, which become defined as standard. Since speakers may claim to value one variety yet behave as if they value another, responses vary when access to the standard is limited. Speakers may all agree that the standard is valuable and aspire to speak it— this has come to be called the consensus model of a speech community. Conflict models, on the other hand, have been used to describe an array of cases in which non-elite speakers value their own variety more than the standard (Rickford 1986a, b).

The choice between consensus and conflict models of the speech community reflects the analyst’s orientation to different models of the social world. Consensus is linked with Parsonian structural-functionalist models (Rickford 1986, Williams 1992.) Conflict is linked with Marxist and neo-Marxist social theories, like those of Bourdieu, Dahrendorf, and Gramsci.

2. Sociolinguistic Models: Consensus and Conflict

William Labov’s (1966) study of New York City exemplifies the consensus model of speech communities. Labov (1966:5) argues that because New Yorkers are similar in their evaluations of language use, and their patterns of shifting between formal and informal speech styles, they constitute a single speech community even though the speech they produce is quite diverse.

John Rickford (1986a,b) and Kathryn Woolard (1985) have focused attention on disagreements between speakers’ evaluations and their actual behavior. While Labov asked New Yorkers to rate speech varieties according to the most statusful job such a speaker could hold, Rickford and Woolard further investigated the degree of solidarity subjects felt with speakers, and portrayed speech communities in more conflictual terms.
Rickford and Woolard also differ from Labov, however, in explaining agreement on linguistic norms. Rickford’s (1979, 1986) work on Guyanese Creole in the village of Cane Walk investigates both evaluative norms and language use. The principal social classes in Cane Walk are Estate (plantation workers) and Non-Estate (petty bourgeois). He describes speech acts and attitudes illustrating both consensus and conflict ("concord and contrast"): 

Table 1: Speech Norms and Speech Use in Cane Walk, Guyana

<table>
<thead>
<tr>
<th>Consensus</th>
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<tbody>
<tr>
<td>Shared use/interpretation of <em>Rowing</em></td>
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<tr>
<td>(public verbal disagreement)</td>
</tr>
<tr>
<td>Agreement on association of speech styles with certain occupations</td>
</tr>
<tr>
<td>(status measure)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Conflict</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Talkin' Nansi</em> (telling African-derived folktales-- done by Estate Class</td>
</tr>
<tr>
<td>only)</td>
</tr>
<tr>
<td>Disagreement on which speech styles are most likely to be used by</td>
</tr>
<tr>
<td>those they would label &quot;friends&quot; (solidarity measure)</td>
</tr>
</tbody>
</table>

Given such differences in ways of speaking within a small village, Rickford concludes that the defining characteristic of a speech community cannot be consensus on the value of speech: even small speech communities may have internally contrasting patterns of language use/evaluation.

Woolard (1985) considers language norms in Barcelona. Castilian is the main language of school instruction, mass media and government. Yet Catalan speakers were rated higher on both status and solidarity measures, by both Catalans and Castilians. Woolard explains this surprising result (1985:743):

"no linguistic market is ever so integrated that there are not private markets where the vernacular can be used, and where standards are relaxed".

For Woolard, unlike Rickford, it is not conflict which must be explained (by reference, e.g., to social and economic history). Instead, as for Bourdieu and other reproduction theorists, consensus requires explanation: Why do speakers hold norms which devalue their own preferred language?

Woolard argues that such norms result from linguistic hegemony, "the legitimation of the cultural authority of the dominant group" (1985: 739). She takes the positive evaluation of Catalan (the non-official language in Barcelona), or urban vernaculars in many Western cities, as evidence that non-elite speakers actively contest standard norms (see Trudgill 1974 on covert prestige).
3. Speaky-Spoky: An Overview

We now turn to a phenomenon in Jamaican speech which raises new questions about how consensus and conflict are expressed in language use. This section describes a mode of talk known to speakers of Jamaican Patwa (an English-related Caribbean Creole) as Speaky-Spoky, or Speakin' and Spokin'. The data for our account were gathered by Patrick in 1989-90. During a year's fieldwork in a mixed-class neighborhood of East Kingston, he recorded 150 hours of sociolinguistic interviews, language questionnaires, tests, group sessions and spontaneous discussions with 60 speakers (Patrick 1992).

To label another Jamaican's talk as "Speaky-Spoky" is to challenge its social appropriateness, to claim that the speaker is using (Standard Jamaican) English when they should be using Patwa-- and to ridicule them. At first glance, therefore, it seems a straightforward example of Patwa speakers contesting standard language norms by castigating other Patwa speakers for valuing and using the standard. But Speaky-Spoky often implies two other claims:

(i) the speaker is laying linguistic claim to a social status higher than they deserve (they "pass their place", as Jamaicans say); and

(ii) the speaker is disqualified from the desired higher status because their very talk is not "English" enough (i.e., it contains "mistakes").

We argue that the picture of Patwa speakers challenging the hegemony of standard language oversimplifies language allegiance, evaluation and use in Jamaica. Though Speakin' and Spokin' is possible only for speakers who primarily use Patwa, we believe the negative evaluation of this mode of talk is NOT always best understood as a clash between lower-class and higher-class speakers-- in fact, such conflict also occurs among speakers of the same class.

4. Speaky-Spoky as Linguistic Hyper-correction

Speaky-Spoky is a type of qualitative hyper-correction. In a recent discussion, Janda and Auger (1992) distinguish qualitative hyper-correction from its quantitative counterpart. Qualitative hyper-correction refers to a phenomenon known to scholars of historical linguistics and dialectology since the early 19th century. It occurs when non-elite speakers generalize a prestigious linguistic form to inappropriate environments, producing utterances which the grammar of the elite would not generate-- for example, in American English, \textit{WHOM did you say is calling}?

Quantitative hyper-correction, in contrast, is exemplified in Labov's (1966) classic description of the stratification of post-vocalic (r) production in
New York City, where lower-middle class speakers used a significantly and unexpectedly greater frequency of consonantal (r)—the prestige variant—in their most formal speech styles than the social class above them.

Jamaican Patwa differs from the relevant metropolitan varieties—North American, British or Jamaican Standard Englishes—in several ways that are exploited in modelling Speaky-Spoky. Two linguistic features characterizing Speaky-Spoky are syllable-initial /#h/ and the back round lax vowel /œ/.

Jamaican Patwa has in its phoneme inventory no mid- or low-back rounded vowel corresponding to /œ/ (see Patrick 1992). The relevant word-classes here are known as Short-O, Long Open-O, and O-(before-)R; or in Wells’ (1982) exemplifying labels, the Lot, Thought and North word-classes. Also absent is initial velar fricative /h/, which does not occur in Patwa words or morphemes whose metropolitan counterparts do have it: thus Patwa Hat, Heart, Hit and Hold are homophonous with At, Art, It, Old.

However, Jamaicans realize that these sounds occur regularly in more prestigious standard varieties. If Speaky-Spoky is an attempt to claim the social status which normally accompanies standard speech in Jamaica, the linguistic path towards this goal involves incorporating these prestigious /œ/ and initial /#h-/ sounds into one’s speech. The difficulty for speakers is in systematically placing these features in the precise linguistic environments where they occur in the metropolitan varieties. When a prestigious sound occurs in places where standard speakers would not natively use it, it is an instance of qualitative hyper-correction.

5. Initial /#h-/ Insertion

Consider initial /#h-/). The Patwa norm is /#h-/ Absence as in (1), while the typical Speaky-Spoky pattern is /#h-/ Insertion as in (2):

(1) /oot a di oos/ "out of the House"
   /put im ed pan i han/ "put Him Head upon He Han"

(2) /hoot pan di ruod/ "_out on the road"
   /hop a di yaad/ "_up at the yard"

(/#h-/ also occasionally occurs as a purely emphatic marker in words of extra-heavy lexical stress, which is possible in Jamaican Patwa precisely because /h/ lacks phonemic status). /#h-/ Insertion is a well-known feature of upwardly mobile speakers; it crops up in many Jamaican jokes, including one about a student/teacher interaction. The student’s line always involves salient /#h-/ Absence; the teacher’s response, however, is invariably /#h-/ Inserting:
(3) Hemphasize you Haitches, you Hignorant Hass!

Among Patwa speakers /#h-/ Absence and -Insertion frequently co-occur in the same breath. This is not surprising inasmuch as Speaky-Spoky is not a separate code but an overlay of particular highly-salient features, including /#h-/ Insertion, upon the speaker's native Patwa, which includes /#h-/ Absence. The excerpt in (5) was recorded from Opal (a young working-class woman in Kingston, a high school graduate, and like most Jamaicans a native Patwa speaker). Asked to read the printed sentence (4), she produced it as (5):

(4) Half-hour to Christmas dinner, Henry, and you eat off the whole ham already? Lord help me!

(5) _alf_our to Christmas dinner, _enry, and you _H_eat off the wheHole _am already? Lord Help me!

(An underline indicates /#h-/ Absence, the capital H indicates /#h-/ presence, and _H_ indicates /#h/- Insertion). The reading passage is a classic example mixing all three patterns: /#h/- Absence in half, Henry, ham; hyper-correct Insertion in eat; and the standard initial vowel in hour and initial /#h/- in whole, help. Since reading is a formally learned behavior based on a non-native dialect (Standard Jamaican), this performance parallels the hypercorrection that occurs in Speaky-Spoky.

Consider now the incidence of /#h/- Absence and /#h/- Insertion in one-hour segments of informal interviews recorded with two elderly Kingston residents. Tamas, 70, is a retired shoemaker, factory worker, and agricultural laborer who completed the 3rd grade before leaving school. Rose, 82, is a former head nurse of the island’s largest public hospital, who completed secondary school and technical training and is a long-established member of the urban middle-class. As they contrast in material indicators of socio-economic status (housing type and repair, dress, residence), as well as occupation and education, so they contrast in their frequencies of /#h/- Insertion and Absence:

<table>
<thead>
<tr>
<th></th>
<th>Tamas</th>
<th>Rose</th>
</tr>
</thead>
<tbody>
<tr>
<td>(h)-Absence</td>
<td>222/331</td>
<td>138/388</td>
</tr>
<tr>
<td></td>
<td>67%</td>
<td>36%</td>
</tr>
<tr>
<td>(h)-Insertion</td>
<td>61 cases/hour</td>
<td>10 cases/hour</td>
</tr>
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</table>

Hyper-correction in the context of such informal interviews complements the reading-passage data and reflects a broader tendency to shift towards features of the standard language, of which Speaky-Spoky is one manifestation.
6. Vowel Substitution with /ɔ/

Jamaican Patwa lacks the rounded back vowel /ɔ/ entirely, and always has a low central vowel /a/ where standard varieties would have /ɔ/. We can clearly see this lack of a front/back, unround/round distinction of /a/ and /ɔ/ in Figure 1, which charts a subset of Tamas’s vowel system in acoustic space.

The first and second formant reversed scales closely mimic conventional triangular plots of vowel space. The chart (from Patrick 1992) contrasts the vowel formants for Tamas in all the historically A-words (eg Cat, Calm, Cart, represented here with solid triangles) with their O-word counterparts (such as Cot, Caught, Cord, represented here with empty squares).

In Standard Englishes these word-classes may comprise four different phonemes: /æl, /a/, /ɑ/ (unrounded low back) and /ɔ/ (rounded mid or low back). But lower mesolectal Patwa speakers like Tamas lack the low front /æl/ and back round /ɔ/ phonetic variants entirely, assigning all word-classes to one phoneme: low central /a/. Thus Cat, Cot, Cart, Calm, Caught are realized /kat/, /kat/, /ka:t/, /ka:m/ and /ka:t/ with only a length distinction among the vowels. (Jamaican Patwa is non-rhotic in this environment.)

There is no regular rounding or backing difference among the A- and O-word classes for Tamas: the two overlap heavily, and there is little basis here for calling them distinct. In contrast, Rose in Figure 2 shows essentially no overlap; the clear separation in F1/F2 space at 1400 Hz is evidence for the kind of phonetic distinctness in production that must underlie a system-level phonemic distinction, such as exists in standard varieties.

But to speak as the metropolitan speakers do, it is not enough simply to have a distinct acoustic target for /ɔ/: the problem is knowing which words to use it in. A clear example of this comes from a dramatic skit Patrick observed in Kingston in 1989. A working-class Jamaican man leaves his girlfriend Madge (/madj/, with a low central vowel ) to go to New York City. He returns laden with metropolitan symbols—a Yankees cap, a fancy boombox, an expensive track suit—and bearing a linguistic symbol of prestige. He now repeatedly calls his girlfriend /mɔdj/, to her bewilderment and the audience’s delight.

Never mind that the actual North American pronunciation of this name uses the much fronter vowel /æl/, even raising up to /Iə/ in /mIədj/ for many New Yorkers. What the actor, the audience and Madge herself responded to was the prestigious sound /ɔ/—even though its placement in that environment marks it as hyper-correction, and a clear case of Speaky-Spoky.

The quote in (7) from a formal language-attitudes interview illustrates these Speaky-Spoky features (hypercorrection is again indicated by _H_−_O_). Opal was asked to describe situations in which "proper English" is appropriate:

(7) You are in /_H_in/ a business place... speaking to somebody, or you are making a complaint /k_O_mpleynt/ to a particular /p_O_rtkyula/ teacher or principal... or you are in /_H_in/ a conference /k_O_nfrens/.
Fig. 1: Tamas, A-words vs. O-words

Fig. 2: Rose, A-words vs. O-words
Yet the use of hyper-correct /#h-/ and /ɔ/ is neither necessary nor sufficient to evoke the label of Speaky-Spoky. Rose, above, showed 10 tokens of /#h-/ Insertion in an hour; but as a woman who has long since achieved a recognized high status, she would probably not ever be labelled as Speakin’ and Spokin’. When asked directly to define Speaky-Spoky talk, Patrick’s subjects could not agree among themselves whether it implied "mistakes" or incorrect English structures. Many insisted that perfectly correct English could be labeled Speaky-Spoky if the social criterion applied: the intention to present oneself as a standard speaker. Opal again illustrates this in the language-attitudes interview:

(8) Patrick: Suppose you can speak quite well, and you don’t make any mistakes: is [it] still speaky-spoky?
     Opal: Yeh, they still call you Speaky-Spoky, it depends on who... the person is.

Hyper-correction, then, is neither a sufficient nor a necessary criterion for Speaky-Spoky. Though it has a characteristic linguistic shape, the phenomenon is primarily socially constituted. Let us take a closer look at the social criteria for using Speaky-Spoky which distinguish it from ordinary hyper-correction.

7. Social Description of Speaky-Spoky

We have identified Speaky-Spoky talk as laying claim to a higher social status than the speaker’s normal Patwa implies. In colonial days, the highest social status in Jamaica was claimed by the British and Anglophile white ruling-class, native speakers of a foreign metropolitan variety. Differential access to the standard has long been a feature of Jamaican social life, and is closely associated with the rise of the middle-class and the expansion of education. Education is crucial to the acquisition of social status and prestige, and the appropriate use of standard language is both an unambiguous symbol of that achievement and a prerequisite to further advancement.

But the degree of education necessary for a Patwa speaker to acquire Standard English as a non-native variety is far from universally available; consequently, though the standard’s symbolic value is recognized by all, competence in its grammatical structure is stratified by socio-economic status.

In contrast, all the Jamaican speakers surveyed in Patrick (1992) not only recognized Patwa patterns, but showed great consistency when asked to produce examples of them—what Rickford has called concord of Patwa norms and use. Patwa, the non-prestige vernacular, is nevertheless a shared linguistic base for most Jamaicans— the language of everyday life, friends and family, local community and indeed of national identity— which marks the Jamaican situation off from the familiar opposition of regional dialect vs. national standard.
Jamaicans whose competence in the standard is similarly incomplete, like many working-class residents of Kingston, nevertheless often take part in situations where the value of prestige speech is invoked for social ends. For example, at a youth-club meeting a speaker, Roasta, was charged by a leading club member (the cricket team Manager) with speaking English badly.

Roasta began his reply in mock-parliamentary English ("With your permission, Mr. President, I would like to address this charge..") and then completed his rejoinder in very down-to-earth Patwa. The audience’s sentiments were originally with Manager, but Roasta’s ability to command both Patwa and Standard English forms at strategic moments won them over, marking him as not only a skillful speaker but one who has not abandoned the "local-team" norms and values (Blom & Gumperz 1972) embodied in the Patwa.

Since the benefits and opportunities to which the standard is linked are valuable and limited, people of the same class and community compete for them. Such claims and invocations are frequently contested. The charge of Speaky-Spokey is a powerful way to expose a community member’s ambitions—to brand them a social climber, opportunist or betrayer of local values.

Patwa speakers do sometimes use Speaky-Spokey to perceived elites. In this literary example, Miss Clemmie is described as using "her best speaky-spokey voice" to a white American visitor (from Ascot in Senior 1986):

(9) Yes’m, Hascot is de Heldes' but is not de same fader.
    "Yes’m, Ascot is the eldest, but he doesn’t have the same father."

(Note the /#h-/ Insertion in Ascot, eldest.) Frequently, however, speakers use Speaky-Spokey talk in interaction with others of a similar social level. Below Miss Myrtella, an elderly Jamaican woman who has travelled abroad, talks Speaky-Spokey to her distant cousin Horace, in the course of an ultimately successful courtship. Example (10), from Real Old-time Ting in Senior (1986), shows both /#h-/ Insertion (in oh, it is, awful, a woman, all alone) and hyper-correct low-back rounded vowels (in I, what, alone):

(10) "Ho, Cousin Orris", she call out. "Oi don’t know wot to do hit his so howful to be ha woman hol holone hin this worl."

Speaky-Spokey is often negatively evaluated (Senior 1986:57ff; emphasis added):

(11) "Miss Myrtella... talk in a little-little voice like she caan mash ants... <They> used to laugh at Myrtella for... her foreign ways and the way she talk funny... Patricia always there passing word about Myrtella... How she don’t have no class. How she can’t speak properly... [But people] getting to love Miss Myrtella for once you get used to her speaky-spokey ways you find out she have a heart of gold inside."
Unlike *Talking Nansi* in Cane Walk, Speaky-Spoky is not simply a case where one social group, identifiable by class or ethnicity, employs a unique code. Though Speaky-Spoky is associated with lower mesolectal speakers—acrolectal and upper mesolectal creole speakers are more often seen as appropriately using Standard Jamaican English, and not making linguistic errors in its use—it is not associated with all such speakers at all times. There is certainly conflict, but it is not always conflict between social groups: it is often among comparable members of the same group.

For it is not actually Standard English as a code that is being used to claim benefits. Speaky-Spoky talk manipulates a few highly salient, prestigious sociolinguistic variables, rather than an entire grammatical system; it is widely available to Patwa speakers, whatever their command of the standard. What is necessary is that the intention to speak "proper English" be made visible; the substitution of /ɔ/ and insertion of initial /#h-/ are clear signals of that.

Because someone who challenges talk as Speaky-Spoky is in part objecting to perceived errors in Standard English, labelling talk Speaky-Spoky can be seen as policing Standard language norms. But since the challenger may also be objecting to the speaker distancing themself from the Patwa, the Speaky-Spoky label can also be used to enforce "local-team" Patwa language values.

The respect generally accorded to "proper English" motivates individual speakers to employ Speaky-Spoky to claim higher social status. The positive values widely (if covertly) associated with Patwa allow the community to unite in ridicule Speaky-Spoky and opposing such strategies. In these shared evaluations, we see something akin to consensus across the Jamaican speech community.

"Proper English" and the Patwa are in constant conflict, yet both are part of culturally available discourses; either position may be invoked in any given verbal interaction, by any speaker. This linguistic conflict in Jamaica makes available to core Patwa speakers a variety of resources: they can define themselves against one another by their choice of linguistic variety, claiming different kinds of social status, appealing to contrasting norms, and asserting distinct positionings at strategic moments of conflict.

Speaky-Spoky as a mode of talk is only partially constrained by the unequal allocation of economic and educational resources that underpins the neo-Marxist analyses of both Rickford and Woolard (see the latter’s use of the concept of hegemony). It allows Jamaicans to construct identities among fellow group members by drawing on symbolic resources of *between*-group conflict that are generally available. Speaky-Spoky simultaneously resists and constructs the authority of the standard, by using linguistic resources drawn from the standard in non-standard ways, and thus further enriches our understanding of how social conflict and collaboration are expressed in language.
REFERENCES


--------. 1986b. The need for new approaches to social class analysis in sociolinguistics. Language and Communication 6.215-221.


The Areal Distribution of a Slavic Language Shift Feature
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University of Southern California

0. Introduction
An interesting feature shared by many eastern European languages is the compound formation for the numbers '11' through '19', based on the pattern '1 on 10', '2 on 10', etc. Examples of this number construction, henceforth designated the 'locative' (LOC) number pattern, following Reichenkron (1968), are in (1a-e):

(1) The locative number pattern
(a) OCS: (j)edin² na desete '11'...devet½ na desete '19'
   1 LOC 10 9 LOC 10
(b) Latvian: vien-pa-dsmi+t '11'...devi+p-dsmi+t '19'
   1-LOC-10 9-LOC-10
(c) Rumanian: un-spre-zece '11'...nouă-spre-zece '19'
   1-LOC-10 9-LOC-10
(d) Albanian: një-mbë-dhjetë '11'...nëntë-mbë-dhjetë '19'
   1-LOC-10 9-LOC-10
(e) Hungarian: tiz-en-egy '11'...tiz-en-kilenc '19'
   10-LOC-1 10-LOC-9

It is important to note that the locative pattern is common to all Slavic languages. Also, in Hungarian the decad precedes, rather than follows, the unit digit.

This paper makes two arguments. First, it is argued that the locative number pattern is an inherent feature of Slavic (or, possibly, Balto-Slavic). This is widely accepted by most scholars. Second, and more important, it is argued that the locative pattern later spread from Slavic to Rumanian, Albanian, Hungarian (and, possibly, Latvian) by means of Thomason and Kaufman's (1988) notion of language shift. In other words, different groups of early Slavic speakers shifted to these languages and, in the process, transferred their native Slavic morphological structure for the numbers '11' through '19', ultimately accounting for the distribution of the locative number pattern in the languages.

Before proceeding, it is necessary to introduce an assumption upon which the language shift analysis in this paper (as well as earlier language contact analyses) is based. Namely, in order to treat the data in some of the languages as a feature of language contact, it must be assumed that the locative number pattern is typologically uncommon, thus minimizing the possibility that its development among the languages in (1) is coincidental.
This assumption is in fact supported by Greenberg (1978) who, although citing no exact statistics, claims that the locative number pattern is uncommon cross-linguistically; the only examples he cites, in addition to those in (1), are Logbara, a Central Sudanic language, and Welsh, as in (2) and (3), respectively.

(2) Locative pattern in Logbara
moodri dri-ni alo 'll'
10 LOC-it one

(3) Locative pattern in Welsh
un ar ddeg 'll'
1 LOC ten

1. The Slavic origin of the locative pattern

This section argues that the locative number pattern originated in some early form of Slavic; note that this is not a new proposal, as this is the position of a number of earlier researchers like Rosetti (1964), Schaller (1975), and Sala (1988). The main line of reasoning behind the Slavic theory of origin is the fact that the locative pattern occurs in all of the Slavic languages, whereas in the Romance, Baltic, and Finno-Ugric languages it is restricted to Rumanian, Latvian, and Hungarian, respectively.

The same cannot be said about Albanian, however. Because there are no early attested records for Albanian, together with the fact that the language has no sister languages to which it can be compared, it is conceivable that the locative pattern originated in Albanian and then spread to the other languages. In fact, a few earlier works, namely Simonyi (1907), the Rumanian Academy's account of the history of the Rumanian language, and Hamp (1992), claim that the locative number pattern originated in the Balkan substrate language Thraco-Phrygian or Illyrian, from which Albanian purportedly developed, and that later the pattern was incorporated by Rumanian and Hungarian either via contact with the original Balkan substrate language or with Albanian; note that these scholars do not discuss the origins of the pattern in Slavic or Latvian.

However, this theory for Balkan origin is problematic for three reasons. First, and most important, there is no attested evidence for the locative pattern in the earlier Balkan languages. In fact, concerning Thraco-Phrygian, Polomé (1992) notes that evidence for the numbers is limited to five base numbers: '2', '4', '8', '9', and '100'. Consequently, as with other appeals to a prehistoric substrate, the Balkan theory of origin suffers from the fact that the substrate language which supposedly provided the feature is itself represented by very little attested evidence. Second, since the aforementioned scholars only discuss the origins of the locative pattern in Albanian, Rumanian, and Hungarian, they are suggesting that the identical pattern in the Slavic languages and Latvian is a mere coincidence, which goes against the typologically-based assumption stated earlier. Finally, in the case of Hungarian, the Balkan theory of origin is problematic both geographically and
chronologically. That is, since historians maintain that the substrate Balkan population left the northern portions of the Balkan peninsula in the sixth century AD, and since the Hungarians did not arrive to the Carpathian Basin until the late ninth century AD, it is doubtful that the Hungarian speakers were ever in contact with any large group of speakers of the substrate Balkan language.

These problems can be avoided by treating the locative number pattern as an inherent feature of Slavic. Unlike the Balkan-Albanian theory of origin, there is early attested evidence for this treatment: the pattern occurs in Old Church Slavic, as shown in (1a), which in turn accounts for the distribution of the pattern in each of the modern Slavic languages. Furthermore, treating the locative pattern as a Slavic feature which later spread to Rumanian, Albanian, and Hungarian is historically very plausible because the Slavic languages are found across a wide portion of Europe and, consequently, have been in extended contact with each of the non-Slavic languages in question. Specifically: Rumanian has been in contact with the Slavic languages since the first half of the sixth century AD (Rosetti 1964); Albanian has been in contact with Slavic since at least the seventh century AD (Pollo and Puto 1981); and Hungarian has been in contact with Slavic since the beginning of the seventh century AD, first, in Levedia near the Don river, then in Etelköz in present-day Ukraine, and finally in the Carpathian Basin (Benkő 1972). Certainly, if we are to maintain the claim that the locative pattern originated in an early form of one of the languages in (1a-e) and then later spread via contact to the other languages, linguistic, chronological, and geographical concerns reveal that the Slavic theory of origin of the feature is the most reasonable.

At this point, the Latvian locative number pattern in (1b) and repeated in (4) should be briefly discussed. As Comrie (1992) suggests, there are two possible ways to treat the Latvian facts. First, the locative teens may be an inherent feature of Latvian and, therefore, the locative number pattern should be treated as a Balto-Slavic rather than Slavic feature. If this is the case, then the Lithuanian teens as shown in (5), need to be accounted for; incidentally, the Lithuanian teens may bear a resemblance to the compound formations for '11' and '12' in the Germanic languages, as in (6).

(4) Latvian locative pattern in the teens
    viēn-pa-dsmi't '11',...devin-pa-dsmi't '19'
    1-LOC-10               9-LOC-10

(5) Lithuanian teens
    vienúo-lik'A '11',...devynió-lik'a '19'
    1-extra                9-extra
(6) Germanic '11' and '12'
   Gothic: ain-libim '11' > E. eleven; G. elf; Frisian alf; etc.
   1-left over
   twa-libim '12' > E. twelve; G. zwölf; F tweelf; etc.
   2-left over

The second possibility is that the Latvian facts, similar to the Albanian, Rumanian, and Hungarian data, may be treated as a result of contact with Slavic. According to Spekke (1951), speakers of early East Slavic came into contact with Latvian from the tenth or eleventh century AD onward. Unfortunately, however, there is no early attested evidence, i.e., from Old Prussian, which can ultimately resolve this mystery, and the remainder of this paper is consequently limited to those non-Slavic languages other than Latvian.

The question arises as to why early Slavic speakers developed the locative teen pattern in the first place. Here too there is no attested evidence which accounts for this development. However, it is possible that, although the structure itself is typologically uncommon, the development of the locative pattern and its restriction to the teens represents a tendency of language where compound teens are formed with structures that are distinct from the higher compound decades. Some examples of these distinct structures from Indo-European and Finno-Ugric are shown in (7a-d); an example of a language where the structures are similar is Japanese, as in (8).

(7) Distinct patterns for the compound teens in Indo-European and Finno-Ugric

(a) Latin:
   ūn-decim '11'...duo-dē-unīgintī '18'...unīgintī '20'
   1-10 2-from-20 20
   unīgintī unus/unus et unīgintī '21', unīgintī duo '22', etc.
   20 1 1 and 20 20 2

(b) Bulgarian:
   edi-nā-deset '11', dva-nā-deset '12'...dvā-deset '20'
   1-LOC-10 2-LOC-10 2-10
   dvā-deset i edina '21', dvā-deset i dva '22', etc.
   2-10 and 1 2-10 and 2

(c) English: eleven, twelve, thirteen, fourteen...twenty
      twenty-one, twenty-two, etc.

(d) Finnish:
   yksi-toista '11', kaksi-toista '12'...kaksikymmentä '20'
   1-of the 2nd (10) 2-of the 2nd (10) 2 10
   kaksi-kymmentä yksi '21', kaksi-kymmentä kaksi '22', etc.
   2 10 1 2 10 2
(8) **Similarities between Japanese compound teens and decades**

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<td>2-10-1</td>
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Interestingly, this type of distinctive teen structure, as shown in (7a-d), plays a role in the language shift analysis to follow.

2. **Treating the locative pattern in Rumanian, Albanian, and Hungarian as a Slavic language shift feature**

To this point, this paper has proposed that the locative pattern in (1a-e) is an inherent feature of the Slavic languages which later spread via language contact to the other languages. The precise language contact process by which the locative number pattern was incorporated into the non-Slavic languages is now discussed.

The paper assumes the theoretical framework of Thomason and Kaufman (1988), who note that there are two ways in which a language can incorporate one or more foreign features from a neighboring language. The first type of contact is borrowing, defined as:

"the incorporation of foreign features into a group's native language by speakers of that language...[resulting in a situation where] the native language is maintained but changed by the addition of the incorporated features." (37)

In ideal terms, borrowing refers to those situations where one language has incorporated a number of loanwords from another, like the case of English loanwords in Japanese.

The second type of contact is language shift, defined as:

"[a situation where] a group of speakers shifting to a target language (TL) fails to learn the TL perfectly. The errors made by members of the shifting group in speaking the TL then spread to the TL as a whole when they are imitated by original speakers of that language." (39)

Language shift generally refers to those situations where a language has foreign structural features, with few representative lexical items, like the often cited case of Gaelic structural influence on Irish English.

Assuming that the locative number pattern in Rumanian, Albanian, and Hungarian, is a result of contact with Slavic speakers, the question arises as to whether the structure was incorporated into these languages via borrowing or via language shift. Significantly, each of these languages, in addition to the Slavic locative pattern, has a considerable number of Slavic loanwords. Therefore, unlike the ideal language contact situations just mentioned, it is more difficult to determine whether the pattern is a borrowing or language shift feature.
However, upon closer examination, it is most likely that the locative pattern in each of the non-Slavic languages is indeed a result of Slavic-induced language shift. The best way to see this is by first asking what it would mean to attribute the Slavic locative pattern to borrowing. Any claim that the non-Slavic languages borrowed the locative pattern from Slavic is based on one of two implausible assumptions: First, a borrowing treatment implies that the speakers of these languages felt a need to borrow the pattern, because their native number systems were insufficient, that is, limited to say ten base digits prior to contact with Slavic. This insufficiency is highly unlikely as internal evidence reveals that each language had a number system which went beyond ten. For Rumanian this naturally follows from the fact that Latin has an extensive attested number system; similarly, although lacking early attested evidence, Hungarian and Albanian can also be assumed to have had an extensive number system because of the presence of one or more native numbers above ten: specifically, Hungarian has the native form húsz which signifies the number '20', and Albanian has the native vigesimal base form -zet as well as gind, meaning '100'. Second, the borrowing claim implies that the three languages borrowed the pattern because Slavic was considered a prestige language. If this were indeed true, however, we would expect the languages to have borrowed the Slavic teens outright, that is, to have borrowed both the pattern and the lexical units from, say, the Old Church Slavic forms in (1a); furthermore, if the feature were a result of prestige borrowing, we would expect the languages to have borrowed more Slavic numbers than just '11' through '19'.

By contrast, the locative pattern in Rumanian, Albanian, and Hungarian can be efficiently treated as a Slavic language shift feature. Recall that a considerable number of Slavic speakers were in historical contact with the languages. Moreover, it is also maintained that many Slavs ultimately assimilated to the language groups. For example, Rossetti (1984) notes that by the twelfth century AD the Rumanian speaking population included a large group of ethnic Slavs. Similarly, Benkő (1978) claims that Slavic groups assimilated to Hungarian, first in Ukraine, and later in the Carpathian Basin. If this is correct, then we have a very plausible language shift situation. That is, Slavic speakers learning Rumanian, Albanian, or Hungarian as a target language found the target language compound teen structures difficult and consequently replaced the structures with their native Slavic morphological locative structure, albeit with target language morphemes; then, native speakers of the target languages adopted the feature.

The compound teen structures were difficult for two interrelated reasons. First, as discussed earlier, compound teen structures are often morphologically distinct. In fact, as partially demonstrated by the modern Lower Engadinisch Romansch, French, and Portuguese reflexes of the Latin teens in (9), it is common for the individual morphemes of the teen compound to lose their transparency.
(9) Development of the compound teens in Romance (Price 1982)
L un-decim '11' > Lower Engadinisch Undesch, French onze, 
1-10 Portuguese onze
L duo-decim '12' > LE dudesch, F douze, P doze 
2-10
L tre-decim '13' > LE traidesch, F treize, P treze 
3-10
etc.

Therefore, assuming that the teens in early Rumanian, Albanian, and 
Hungarian, underwent a similar type of conflation, it is conceivable 
that shifting Slavic speakers had difficulties in acquiring these 
target language forms.

The second factor which would have made the acquisition of the 
target language teens difficult concerns their overall frequency in 
the spoken language. In other words, although the teens are low 
ough in the number system that shifting speakers would need to 
 learn them relatively early, the teens occur with less frequency 
than the base numbers, so it is plausible that the shifting Slavic 
speakers were not sufficiently exposed to the target language teen 
forms.

Together, these facts would have rendered the target Rumanian, 
Albanian, or Hungarian teens difficult to acquire, resulting in the 
shifting Slavic speakers to devise a new system using the Slavic 
locative pattern, albeit with target language morphemes.

Before concluding this analysis, it should be noted that the 
Hungarian locative teen pattern, in which the decad precedes the 
digit, is the reverse order of that of the other languages in (1). 
The question arises as to why the order of the locative pattern in 
Hungarian, assuming it is a Slavic language shift feature, does not 
more closely resemble that of Slavic. Interestingly, this reverse 
order can be accounted for. In the earliest attestations of the 
locative pattern, that is Old Church Slavic, the preposition na 
assigns locative case to the following noun deset-, which in turn 
indicates that the locative preposition formed a constituent with 
the decad noun, as shown in the derivation for the number '11' in 
(10).

(10) Locative case assignment to the decad in OCS '11'
   (j)edin* na deset- -> (j)edin* na deset-e
   1   LOC 10-       -loc. case

In view of this, the only way that the Hungarian locative 
postposition -en can form a constituent with the decad tiz in the 
locative pattern and still occur medially is if the decad precedes 
the digit, as in (11); brackets indicate constituency.

(11) Locative constituency in the Hungarian teen pattern for '11'
    ([tiz-en]-egy] 
    10-LOC-1
This order actually reflects a universal proposed by Greenberg (1978). That is,

"if a link for addition [in the case at hand, the locative adposition] occurs medially, it always goes with the following numeral in a prepositional language and with the preceding numeral in a postpositional language."

So, it appears that Slavic speakers shifting to Hungarian and introducing the locative number pattern switched the order of the target Hungarian digit and decade in order to replicate the Slavic pattern where the decade forms a constituent with the medial locative preposition.

Finally, it should be noted that in two of the languages, namely Hungarian and the Arumanian dialect of Rumânian, the locative pattern has been extended to '29', as shown in (12a-b); note that the locative postposition in Hungarian is subject to vowel harmony.

(12) Extension of the locative pattern to '21' through '29' in Hungarian and Arumanian

(a) Hungarian:
   tiz-en-kilenc '19', húsz '20', húsz-on-egy '21'...
   10-LOC-9
   húsz-on-kilenc '29'
   20-LOC-9

(b) Arumanian:
   nouă-sprâ-đat '19', yingiț '20', un-sprâ-yingiț '21'...
   9-LOC-10
   nouă-sprâ-yingiț '29'
   9-LOC-20

It would appear that, since it is distinct from the Slavic pattern, this extension of the locative was a later analogical development initiated by perhaps both native and non-native speakers of the target language.

3. Conclusion

To summarize, this paper has argued that the locative pattern is an inherent feature of the Slavic languages which was transferred to Rumanian, Albanian, and Hungarian via Slavic-induced language shift. If accurate, this analysis reveals two interesting characteristics of language shift. First, it suggests that the same language shift feature can appear in a number of distantly related or non-related languages. And, second, assuming the aforementioned dates of contact between Slavic and the other languages, the analysis implies that the same language shift feature can appear in different languages at different times. These characteristics are a result of the fact that shifting speakers had difficulties acquiring similar structures in a number of different target languages.
References


AN ASPECTUAL ANALYSIS OF FRENCH DEMONSTRATIVE CE*  
Lisa Reed  
University of Ottawa

I  INTRODUCTION
French demonstrative ce is a pronominal element which has received relatively little attention in syntactic and pragmatic fields of inquiry and virtually none in semantic circles. The sentence given in (1) below contains a demonstrative ce and, as the translation indicates, ce in this example is roughly equivalent to English she.

(1) Cette femme là-bas, c'est l'avocate de Jean.  
‘That woman over there, she’s Jean’s lawyer.’

It has been noted in, e.g., the work of Burston (1983), Coppieters (1974, 1975), Kupferman (1979), and Wagner (1966), among others, that demonstrative ce has an extremely limited distribution: it is found only with the class of Raising Verbs and even within that environment, it competes with the personal pronoun for the subject position. Thus, while demonstrative ce is licit in (1) above, it is ruled out in (2) below, which is parallel to (1) except for the addition of the adverb meaning now.

(2) Marie vient d'accoucher. Elle est maintenant la mère de deux enfants.  
‘Marie has just given birth. She’s now the mother of two children.’

My goal in this paper is to offer a semantic account of this distributional characteristic of demonstrative ce as well as many others which will be introduced below in section III.

II  THE FOUR MEANINGS OF CE
Before fully exploring demonstrative ce's distribution, I would first like to make it clear that I am assuming, in contrast to all previous work done on this topic, that the lexical item ce is homonymic and that it, in fact, has minimally four distinct meanings. Since the analysis I will be proposing in the present work is intended to cover just one of these - the demonstrative ce - it would be useful at this point to very briefly consider all four homonyms and, in particular, the features that distinguish them from each other in order to avoid potential confusion as the discussion proceeds.

Briefly, I am assuming, for the reasons discussed in detail in Reed (1993:173-210), that ce has a demonstrative, an expletive, a neuter, and a generic reading and, furthermore, that these four ce's can be distinguished from one another on the basis of three semantic features, these being the features of thematicity, the presence or absence of implicit gender features, and genericity. To clarify the nature of these features, first, thematicity refers to whether or not the ce is assigned a thematic role. Secondly, the gender feature refers to whether or not the ce is interpreted as bearing the same gender features as its antecedent. Finally, genericity refers to whether the ce does or does not receive a theta-role from an individual-level predicate.1 To illustrate, consider the table given below in (3). As indicated in (3), demonstrative ce is analyzed as receiving an external theta-role from the embedded predicate nominal; it is also understood to bear the same gender features as its antecedent; and, finally, it clearly is not predicated of an individual-level predicate since the property denoted by the predicate nominal is not an inherent or permanent characteristic of the individual picked out by ce. Comparing demonstrative ce with expletive ce, these two are assumed to contrast with respect to the features of thematicity and the presence or absence of morphologically
implicit features of gender since expletive ce is not assigned a thematic role nor does it bear any gender features at all, not being anaphoric. Similar contrasts distinguish the other two homonyms.2

(3) THE FOUR TYPES OF CE

<table>
<thead>
<tr>
<th>Type of ce</th>
<th>Thematic</th>
<th>Bears Implicit Gender Features of Antecedent</th>
<th>Generic</th>
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</thead>
<tbody>
<tr>
<td>Demonstrative ce</td>
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<tr>
<td>ex. Cette femme là-bas, c’est l’avocate de Jean. ‘That woman over there, she’s Jean’s lawyer.’</td>
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<tr>
<td>Expletive ce</td>
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<td>ex. Dans la nouvelle Russie de l’an 2000, ce sera naturel de vouloir se détendre. ‘In the new Russia of the year 2000, it will be natural to want to relax.’</td>
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<tr>
<td>Neuter ce</td>
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<td>ex. Regarde-moi cet imbécile: quand ça se retrouvera en terminale ça ne saura même pas compter. ‘Will you just look at that idiot: when it’s in 12th grade, it won’t even know how to add.’</td>
<td></td>
<td>-</td>
<td>-</td>
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<tr>
<td>Type of ce</td>
<td>Thematic</td>
<td>Bears Implicit Gender Features of Antecedent</td>
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</table>
| **Generic ce**  
ex. *Le canard domestique, ç’est souvent blanc, tandis que le canard sauvage, ç’est souvent brun.*  
‘The domestic duck, it’s usually white whereas the wild duck, it’s brown.’ | + | + | + |

### III THE DISTRIBUTION OF DEMONSTRATIVE CE

It was mentioned above that previous work on demonstrative *ce* has established that this pronoun alternates with the personal pronoun only in a very specific environment, typified by (1) and (2) above. This environment can be described as one which contains the copula with a DP complement in the present tense. While this fact has been noted in previous work on this topic, a thorough testing of the data across the entire set of Raising Verbs and in a variety of tenses reveals a number of interesting new patterns, which have been summarized in the table given in (4) below.

First, the table reveals that the distribution of demonstrative *ce* across the class of Raising Verbs, in fact, splits into two subclasses in every tense except the future. That is, in all tenses except the future, the subclass of Raising Verbs which includes the French equivalents of *to become* and *to remain the same* all exhibit one set of distributional characteristics for the demonstrative versus the personal pronoun, while the group of Raising verbs which includes the French equivalents of *to appear, to be* and, *to be left* all exhibit the exact opposite distribution. In particular, the first group of Raising Verbs were found to disallow the demonstrative pronoun in the imperfect and the present tenses, but to allow both pronouns in the compound past. In contrast, the second subclass of verbs allowed both pronouns in the imperfect and the present tenses, but disallowed demonstrative *ce* in the compound past. When one considers these findings in light of semantic analysis, an interesting correlation emerges: this split into two subclasses of Raising Verbs correlates with a core lexical aspeccual distinction. Specifically, the first subclass of Raising Verbs, which includes *to become* and *to remain the same*, is composed of non-stative predicates, whereas the second group of Raising Verbs are all stative predicates. Thus, it appears justified to conclude that one factor which conditions the distribution of demonstrative *ce* is the aspeccual distinction commonly referred to in the literature as “semantic verb class”.

There is a second pattern which emerges from the data in (4) as well. In particular, if one controls for verb class, it becomes obvious the tenses are also influencing the distribution of the demonstrative pronoun. Specifically, within the same verb class, the tenses known as the *imparfait* ‘imperfect’ and the present
always exhibit the same distributional patterns, and these patterns are the exact opposite of the pattern found with the tense known as the compound past. That is, if the verb is non-stative, the imperfect and the present tenses exhibit the same pattern (both disallow the demonstrative *ce*) and this is the opposite of the distribution found in the compound past (in which demonstrative *ce* is permitted). Similarly, when the Raising Verb is stative, the imperfect and the present tense once again show the same distributional pattern (they both allow demonstrative *ce*) and this distribution is again the opposite of that of the compound past (which disallows demonstrative *ce*). Curiously, these facts also correlate with a well-known aspectual contrast: the imperfective versus perfective distinction. That is, it has been noted in the literature on aspect in French (see e.g., Comrie (1976) and Garey (1957)) that the two “tenses” known as the imperfect and the present both encode imperfective aspect, whereas the compound past encodes perfective aspect. In section IV I will formulate a model-theoretic definition of these terms, as well as the analysis which explains their role in conditioning demonstrative *ce*’s distribution, however, I would like to close the present one by simply noting that there does appear to be adequate evidence for drawing the conclusion that demonstrative *ce*’s distribution is being conditioned by semantic factors, specifically, aspectual considerations.

**THE DISTRIBUTION OF DEMONSTRATIVE CE**

<table>
<thead>
<tr>
<th>NON-STATIVE VERBS</th>
<th>IMPARFAIT ‘Imperfect’</th>
<th>PASSE COMPOSE ‘Compound Past’</th>
<th>PRESENT</th>
<th>FUTURE</th>
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<tr>
<td>e.g., <em>devenir</em> ‘to become’, <em>rester</em> ‘to remain the same’</td>
<td>personal pronoun only</td>
<td>both</td>
<td>personal pronoun only</td>
<td>both</td>
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<td><em>Quant au fils du voisin,</em></td>
<td><em>Quart du fils du voisin,</em></td>
<td><em>Quart au fils du voisin,</em></td>
<td><em>Marie et moi,</em></td>
<td><em>Marie et moi,</em></td>
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<td>{ <em>ça</em> }</td>
<td>{ <em>il</em> }</td>
<td>{ <em>ça</em> }</td>
<td>{ <em>ça</em> }</td>
<td>{ <em>ça</em> }</td>
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<td><em>devenait un homme instruit</em></td>
<td><em>est devenu un homme instruit,</em></td>
<td><em>devient un homme instruit</em></td>
<td><em>bien entendues,</em></td>
<td><em>bien entendues,</em></td>
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<td><em>un peu plus chaque jour,</em></td>
<td><em>ce qui m’enchante au plus haut point.</em></td>
<td><em>un peu plus chaque jour.</em></td>
<td><em>mais qui sait?</em></td>
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<td><em>ce qui nous ravissait.</em></td>
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<td><em>Peut-être qu’un jour</em></td>
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<td><em>‘As for the neighbor’s boy,</em></td>
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<td>{ <em>ça</em> }</td>
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<td><em>he was becoming more</em></td>
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<td><em>elle</em></td>
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<td><em>and more of an</em></td>
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<td><em>deviendra ma meilleure amie.</em></td>
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<td><em>educated man</em></td>
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<td><em>each day,</em></td>
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<td><em>much to our delight.</em></td>
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<td>STATIVE VERBS</td>
<td>IMPARFAIT ‘Imperfect’</td>
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<td>e.g., avoir l'air ‘to appear’ être ‘to be’, rester ‘to be left’</td>
<td>both</td>
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<td>Jean, {c’ } était un homme instruit.</td>
<td>Marie, { *ça } a été son avocate.</td>
<td>Jean, { c’ } est un homme instruit.</td>
<td>‘Jean, he was an educated man.’</td>
<td>‘In one week, the enemy will take our city. He will be a merciless conqueror and I want everybody to realize that.’</td>
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<td>‘Jean, he was an educated man.’</td>
<td>‘Marie, she was his lawyer.’</td>
<td>‘Jean, he was an educated man.’</td>
<td>‘Dans une semaine, l’ennemi va conquérir notre ville. { Ce } sera un vainqueur impitoyable et je veux que tous le sachent.’</td>
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<td>Jean se rendit compte qu’il venait de commettre un meurtre et il se mit à courir. { *?C’ }</td>
<td>Il était désormais un fugitif recherché par toutes les polices.</td>
<td>Regarde notre chef de section! Le général lui épingle sa nouvelle médaille et voilà! { *?C’ } est maintenant l’homme le plus décoré de la compagnie.</td>
<td>‘Jean realized that he had just committed a murder and he began to run. From then on, he was a fugitive sought by every police force.’</td>
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IV THE ANALYSIS

There is a substantial body of previous research on both lexical aspect (that which pertains to distinctions like the stative/non-stative contrast), as well as morphological aspect (i.e. contrasts like the perfective/imperfective one). Within the model-theoretic semantic framework which I am adopting, Dowty (1979) has proposed a number of truth conditions and meaning postulates to capture these contrasts, as well as many others. The process of developing an analysis of demonstrative ce is, as a consequence, somewhat simplified. The strategy to do so will be as follows. First, I will make some minor modifications to Dowty's proposals regarding the relevant lexical and morphological aspecltual distinctions in English in order to capture similar, although in some cases not identical, contrasts in the French language. From these proposals, I will then go on to deduce the semantic nature of demonstrative ce itself.

I will begin with the stative/non-stative distinction. As is well-known, one can discriminate between these two semantic verb classes on the basis of whether or not the property in question crucially requires reference to two distinct moments in time before one can truthfully say that it holds of some entity. In particular, stative verbs like to be do not require reference to two distinct moments since, for example, one may truthfully say of some entity that he is or is not one's best friend by simply selecting one moment in time and verifying whether or not he has that property at that moment. In contrast, non-stative predicates like to become do require two distinct moments before they can be said to truthfully hold since one must first select one moment in time at which the individual did not have the property of, e.g., being one's best friend and then a subsequent moment at which he does have that property before one can truthfully say of that individual that he has become one's best friend, and similarly for the other stative and non-stative predicates. To capture this distinction formally, Dowty (1979:361,141) has put forth meaning postulates and truth conditions which are identical in theoretical import to the truth conditions I am adopting in (5) and (6) below.4,5

(5) STATITIVE TRUTH CONDITIONS:
   a. Where δ is either être 'to be' or rester 'to be left', [δ(p)] is true at an interval i in a world w iff [p] is true at every moment of i in w.
   b. Where δ is avoir l'air 'to appear', [δ(p)] is true at an interval i in a world w iff [p] is true at every moment of i in some world w'.

(6) NON-STATITIVE TRUTH CONDITIONS:
   a. [become (p)] is true at an interval i in a world w iff there is an interval j containing the initial bound of i such that ¬ [p] is true at <j,w> and there is another interval k which contains the final bound of i such that [p] is true at <k,w> and there is no interval i' contained within i that meets these two conditions.
      (Note: The initial bound is the last moment just before i; the final bound is the first moment after i.)
   b. [remain (p)] is true at an interval i and a world w iff there is an interval j containing the initial bound of i such that [p] is true at <j,w> and there is another interval k which contains the final bound of i such that [p] is true at <k,w> and [p] is true at all subintervals of i ∪ k ∪ j in w.
I turn next to the perfective/imperfective distinction. As discussed extensively in the literature, this contrast relates to events which are completed versus those which are not. Following Comrie (1976) and Garey (1957), the French compound past and the future "tenses" both encode perfective aspect since, as the examples in (7) illustrate, it is always impossible to deny the truth of propositions they modify.

(7) a. !Jean est devenu un homme instruit, mais en fait, il n’est pas devenu un homme instruit.
   Jean is become a man educated, but in fact, he NEG is not become a man educated
   ‘Jean became an educated man, but in fact he didn’t become an educated man.’

b. !Jean deviendra un homme instruit, mais en fait, il ne deviendra pas un homme instruit.
   Jean will-become a man educated, but in fact, he NEG will-become not a man educated.
   ‘Jean will become an educated man, but he won’t become an educated man.’

In contrast, the imperfect and present "tenses" encode imperfective aspect; that is, they express ongoing events, as illustrated by the examples in (8) in which it proves possible to deny the truth of certain formulas modified by these tense operators.

(8) a. A ce stade, il était évident que Jean devenait un homme instruit, mais en fait, il ne l’est jamais vraiment devenu parce qu’il a été obligé de quitter l’université.
   at that stage, it was obvious that Jean was-becoming a man educated, but in fact, he NEG it-ACC is never truly become because that he has been obliged of to-leave the university
   ‘At that stage, it was obvious that Jean was becoming an educated man, but he never actually became one because he had to drop out of the university.’

b. Il est évident que Jean devient un homme instruit, mais il est probable qu’il ne le deviendra jamais complètement parce qu’il sera obligé de quitter l’université.
   it is obvious that Jean is-becoming a man educated, but it is likely that he NEG it-ACC will-become never completely because that he will-be obliged of to-leave the university
   ‘It’s obvious that Jean is becoming an educated man, but he’ll probably never actually become one because he’ll have to drop out of the university.’

To formally capture the imperfective/perfective distinction, I will adopt the truth conditions given in (9) below, which are inspired by similar clauses in Dowty (1979: 353). The clause "φ is true at <i,w>" in (9a,b) captures the notion of perfectivity and the clause "φ is true at <i',w'>", where w' is the set of inertia worlds accessible from w, captures imperfectivity in w.

(9) a. TRUTH CONDITIONS FOR THE COMPOUND PAST:
   Where φ is a sentence, [PC φ] is true at <i₀,w> iff there is an index <i,w> such that i is a closed interval, i.e., an interval whose beginning point and endpoint are included, i< i₀, and φ is true at <i,w>.
(9) b. **TRUTH CONDITIONS FOR THE FUTURE:**
Where \( \phi \) is a sentence, \([\text{FUT } \phi]\) is true at an index \(<i_0, w>\) iff there is an interval \(i\) such that \(i > i_0\) and \(\phi\) is true at \(<i, w>\).

c. **TRUTH CONDITIONS FOR THE IMPERFECT:**
Where \( \phi \) is a sentence, \([\text{IMP } \phi]\) is true at an index \(<i_0, w>\) iff there is an interval \(i\) such that \(i < i_0\) and there is another interval \(i'\) such that \(i \subset i'\) and \(i\) is not a final subinterval for \(i'\), and for all \(w'\) such that \(w' \in \text{Inr}(<i, w>), \phi\) is true at \(<i', w'>\).

d. **TRUTH CONDITIONS FOR THE PRESENT:**
Where \( \phi \) is a sentence, \([\text{PRES } \phi]\) is true at an index \(<i_0, w>\) iff there is an interval \(i\) such that \(i = i_0\) and there is some other interval \(i'\) such that \(i \subset i'\) and \(i\) is not a final subinterval for \(i'\), and for all \(w'\) such that \(w' \in \text{Inr}(<i, w>), \phi\) is true at \(<i', w'>\).

As was mentioned above, the preceding truth conditions are almost identical in semantic content to those Dowty (1979) has proposed for the English tense and aspectual system. However, it is important to note that there is one crucial difference between the two languages. In particular, I have included as one aspect of the meaning of the French compound past the requirement that it select a closed interval of time. This modification is necessary in order to account for the contrast between (10) and (11) below. Specifically, the example in (10) clearly shows that the compound past must select closed intervals (intervals which are separated by their endpoints from all subsequent intervals, however brief the separation) since selecting an open interval results in a contradiction in (10). As (11) shows, the obligatory selection of a closed interval is not shared by either the imperfective tenses or the perfective future.

(10) J'ai habité à Paris en 1976 et je n'ai jamais cessé d'y habiter.
I have lived at Paris in 1976 and I NÉG have never stopped of there
to-live
'I lived in Paris in 1976 and I still do now.'

(11) J'habitaïs à Paris en 1976, j'y habite toujours, et j'y habiterai jusqu'à
ma mort.
I lived at Paris in 1976, I there live still, and I there will-continue at
to-live until at my death
'I lived in Paris in 1976, still live there now, and I will continue to live
there until the day I die.'

Having established the semantics of the two core aspectual distinctions at work in determining demonstrative ce's distribution, it is now possible to deduce the semantics of the pronoun itself. This will be achieved by returning to the data in the table in (4) and examining in turn each of those environments which disallow the demonstrative pronoun. The first environment I will consider is that of a stative predicate in the compound past, as opposed to the same verb in the imperfect, the present, or the future. The relevant question that must be answered is the following: How does the compound past differ from the other tenses when one considers the class of Stative Raising Verbs? According to the stative truth conditions in (5) above, these verbs modify propositions which are asserted to be true at every moment of the interval selected by the tense. By the truth conditions for the
imperfect, present, and the future, provided in (9b)-(9d) above, this means that the formula is true of potentially open or closed intervals since these tenses allow both options. In contrast, the compound past in (9a) is specified to select only closed intervals. This means that the first three tenses differ from the compound past with respect to the following feature: They do not necessarily denote states of affairs which hold at endpoints. Therefore, from this, I would like to propose that the semantics of demonstrative *ce* must be formulated so as to make it incompatible with propositions asserted to hold at endpoints.

Interestingly, this hypothesis receives further support when one examines those stative sentences in the imperfect and the present which also disallow demonstrative *ce*; that is, sentences like *Jean se rendit compte qu’il venait de commettre un meurtre et il se mit à courir.* “C’était désormais un fugitif recherché par toutes les polices.” ‘Jean realized that he had just committed a murder and he began to run. From then on, he was a fugitive sought by every police force.’ If one makes the assumption that the semantic effect of the adverb *from then on* is to introduce an endpoint, in this case an initial endpoint, then one can immediately account for the fact that demonstrative *ce* becomes illicit in these examples; namely, the semantics of stative verb will entail the truth of the proposition it modifies at that endpoint. Similar considerations will, of course, also explain the judgement for the stative verbs in the present tense, assuming that the adverb *maintenant* ‘now’ may also close the interval selected. Finally, in the case of the stative example in the future tense, both pronouns are licit simply because no adverbs have been inserted, thus allowing one to select either an open or a closed interval of time, in which case one obtains demonstrative *ce* and the personal pronoun respectively.

Having established (albeit in informal terms for the moment) what type of aspectual constraint is at work in the stative data, I turn next to the non-stative facts in the table in (4). Recall that with this group of Raising Verbs, demonstrative *ce* is ruled out in the imperfective tenses, i.e. the *imparfait* and the present, while it is acceptable in the perfective ones - the compound past and the future. It is immediately obvious that the restriction on demonstrative *ce* in the imperfective tenses cannot reduce to the proposal just given since non-stative predicates do not require the truth of propositions they modify at all of the moments of the interval picked out by the tense. (See the truth conditions given in (6a,b) above.) How then do the non-stative examples in the *imparfait* and the present tense differ from the same predicates in the compound past and the future? According to the truth conditions for non-stative predicates given in (6a,b) above, these verbs crucially require reference to two distinct moments in time, the initial and the final bound of the interval selected by the tense, before the proposition they denote can be truthfully said to hold. In the case of the imperfective tenses, the very ones which disallow demonstrative *ce*, one does not have access to one of those moments since formulas modified by imperfective operators denote ongoing events - events for which one is unable to determine what state of affairs obtains at the final bound. In contrast, when a formula is modified by a perfective operator, the formula denotes a complete event, one for which one does assert what state of affairs obtains at the final bound. So, the difference between examples which disallow demonstrative *ce*, i.e., the French equivalents of *He was becoming an educated man* and *He became an educated man*, is simply that only the latter requires the truth of the proposition [*John become an educated man*] at the index under consideration. Therefore, these facts could be accommodated if one formulates the semantics of demonstrative *ce* so as to require that it only be compatible with propositions whose truth is asserted at the index under consideration.
This type of analysis would also account for the remaining non-stative data in the table in (4) above. In particular, demonstrative ce is licit with non-stative predicates in the compound past and the future because these tenses do require the truth of propositions they modify. Of course, the personal pronoun is also an option in these tenses since one may select an interval consisting of just a single moment. If this is the case, the use of the personal pronoun becomes obligatory since the proposition is now asserted to be true at the endpoints of that interval, the single moment serving as both the initial and the final endpoint.

Having deduced an informal analysis of demonstrative ce on the basis of the data in the table in (4), I would like to conclude the present section by proposing the meaning postulate for demonstrative ce given in (12) below. As required, this postulate integrates the two aspectual constraints on demonstrative ce discussed above. The syntactic motivation for treating ce as a propositional operator will be made clear in the next and final section of this paper, which provides a (partial) fragment of French which incorporates the preceding proposals.

(12) ∀p L [ce p ↔ p is true at the index <i,w>, but not at an initial or final endpoint of i in w].

V A FRAGMENT OF FRENCH

Having formulated the meaning postulate which accounts for the aspectual nature of demonstrative ce's distribution, the remainder of this paper will be devoted to developing the translation rules needed to integrate my proposals into a fragment like the one put forth in Dowty (1979: 351-354).

First, as concerns the syntactic component, I have adopted the Government-Binding (GB) framework and in particular the Raising analysis of the copula, which has been defended in Couquaux (1979), Heggie (1988), and Stowell (1978, 1983). Thus, I am assuming, on the basis of their arguments, that predicate nominal sentences are associated with the structure given for example (13) below.

(13)
Since I am adopting an "indirect" model-theoretic semantic treatment, parallel to the one originally put forth in Montague (1973), I require the clauses in (14) below in order to effect a conversion of each of the GB syntactic categories in the tree in (13) into their Intensional Logic (IL) equivalents.

(14) f is a function from the set of GB syntactic categories to the set of logical types of IL such that:
   a. f(\mathit{XP}_{\text{NL}}) = f(\mathit{X'}_{\text{NL}}) = f(\mathit{VP}_r) = f(\mathit{V'}_r) = f(\mathit{CFC}) = t
   b. f(\mathit{X'_{\text{NL}}}) = f(\mathit{V}_r) = \langle\langle s, t, t, t, t\rangle, t\rangle
   c. f(D'_{\text{non-predicative}}) = f(DP_{\text{non-predicative}}) = \langle\langle s, c, e, t, t, t\rangle, t\rangle
   d. f(N) = f(N') = f(NP) = f(\mathit{ADJ}_{\text{predicative}}) = f(\mathit{ADJP}_{\text{predicative}})
      = f(D'_{\text{predicative}}) = f(DP_{\text{predicative}}) = \langle\langle s, c, e, t\rangle, t\rangle
   e. f(DDP_{\text{predicative}}) = f(PP_{\text{predicative}}) = \langle\langle s, c, e, t, t, t\rangle, t\rangle
   f. f(D_{\text{non-predicative}}) = \langle\langle s, c, e, t, t, t\rangle, t\rangle

Secondly, the clauses in (15) are needed to translate the majority of the lexical items of French into expressions of IL. Those lexical items which are not translated by (15) are associated with the special translations in (16). Finally, the translation procedure is complete once one adds in the clauses in (17), which affect expressions beyond the lexical level.

(15) a. g is a function from \mathit{X'}^{0}_{\alpha} to \text{CON}_{f(\mathit{X})}^{\text{IL}}, except for the exceptions to follow.
b. If \alpha \neq \beta, then g(\alpha) \neq g(\beta).

(16) a. \mathit{DP}_{\text{non-predicative}} \longrightarrow \lambda Y \lambda X \exists z (\forall Y(z) \land \forall X(z))
b. \mathit{DP}_{\text{predicative}} \longrightarrow \lambda Y \lambda x \exists z (\forall Y(z) \land (z = x))
c. \emptyset \text{definite det} \longrightarrow \lambda Y \lambda X \exists x (\forall y (\forall Y(y) \leftrightarrow (x = y)) \land \forall X(x))
d. \text{Marie}_{\text{DP}_{\text{non-predicative}}} \longrightarrow \lambda P \forall P(m)
eq\text{Marie}_{\text{DP}_{\text{predicative}}} \longrightarrow \lambda y (y = m)
f. \text{pro} \longrightarrow Z_n
g. \text{Raising Verb} \longrightarrow \lambda p \text{ RV } \forall p
h. \text{(CLITIC)}_{\text{Agr-O/s}} \longrightarrow \lambda p (\text{CLITIC}) \forall p
i. \text{(COMPLEMENTIZER)}_{\text{C}} \longrightarrow \lambda p (\text{COMP}) \forall p

(17) a. Translation rule for \mathit{X'^{0}}s:
   If \alpha \in \mathit{P}_X^{0} and \beta is a lexical item of the same syntactic category, and \alpha immediately dominates \beta, and \beta \longrightarrow \beta', then \alpha \longrightarrow \beta'.
b. Translation rule for non-branching \mathit{X'}s:
   If \alpha is a non-branching \mathit{X'} category and \beta is an \mathit{X'^{0}} immediately dominated by \alpha and \beta \longrightarrow \beta', then \alpha \longrightarrow \beta'.
c. Translation rule for internal arguments:
   If \alpha is an \mathit{X'^{0}} category and \beta is an XP and \alpha subcategorizes for \beta and \alpha \longrightarrow \alpha' and \beta \longrightarrow \beta', then the \mathit{X'} or XP immediately dominating \alpha and \beta, \gamma, \longrightarrow \alpha'(^{\gamma}^{\beta}).
(17) d. Translation rule for XPs:
   If \( \alpha \in P_{XP} \) and \( \beta \in P_{X'} \) or \( \chi \) and \( \alpha \) immediately dominates \( \beta \)
   and possibly the SPEC of \( \beta \) and \( \beta \rightarrow \beta' \), then \( \alpha \rightarrow \beta' \).

   e. Translation rule for CFC:
   If \( \alpha \in P_{XP} \) and \( \beta \in P_{DP} \) or \( \chi \) and \( \alpha \) assigns an external theta-
   role to \( \beta \) and \( \alpha \rightarrow \alpha' \) and \( \beta \rightarrow \beta' \), then the XP immediately
   dominating \( \alpha \) and \( \beta, \chi, \gamma, \rightarrow \beta' (\wedge \alpha') \)

Once the preceding translation rules have been applied to the syntactic tree in (13),
the IL equivalent in (18) below is derived. As desired, this expression is recognized
as both syntactically and semantically well-formed by the version of IL found in
Dowty (1979:352-354), assuming, of course, that one incorporates the clauses in
(5), (6), and (9) into this fragment. Furthermore, these rules will also correctly
recognize the appropriate examples in the table in (4) above to be contradictory -
thus arriving at the model-theoretic aspectual account of demonstrative ce promised
at the onset of this discussion.

(18) CE PRES [\wedge ETRE [\exists w (\forall v (Z_n(v) \leftrightarrow w = v)) \land \exists (\text{IMBECILE}(z)) \land (z = w))]], t, T(17d)

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   omissions are, of course, my own. A more extensive discussion of this topic can
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   of Canada (# 756-92-0036).

1 See, e.g., Carlson (1977, 1979) for discussion of the individual/stage-
   level predicate distinction.

2 The data provided in the table in (3) have been drawn from previous
   work on this topic. In particular, the examples of demonstrative ce and generic ce
   were adapted from Coppierers (1974, 1975), while those of expletive and neuter ce
   were inspired by similar facts noted in Burston (1983) and Wagner (1966)
   respectively.

3 See Comrie (1976), Dowty (1979), Garey (1957), and Reed (1993),
   among many others for discussion of the notion of verbal aspect.

4 Dowty’s (1979) proposals have only been modified to reflect the fact that
   these are Raising Verbs, i.e. propositional operators, rather than thematic verbs.

5 I would like to thank Emmon Bach for pointing out a flaw in my original
   truth conditions for the stative Raising Verbs. Specifically, my original truth
   conditions collapsed all stative Raising Verbs under the clause in (5a), which had,
   as an undesirable consequence, the entailment of the truth of the proposition [John
   be your best friend] in sentences like Jean appears to be your best friend in the
   world under consideration.
BIBLIOGRAPHY

Burston, Jack (1983)

Carlson, Greg (1977)
A Unified Analysis of the English Bare Plural; in: Linguistics and Philosophy 1, 413-457.

Carlson, Greg (1979)
Generics and Atemporal When; in: Linguistics and Philosophy 3, 49-98.

Comrie, Bernard (1976)
Aspect; Cambridge University Press, Cambridge.

Coppieters, René (1974)
Pronouns and Adjectives in French, A Further Confrontation; in NELS V, 1-12.

Coppieters, René (1975)

Couquaux, Daniel (1979)
Sur la syntaxe des phrases prédicatives en français; in: Linguisticae Investigationes III:2, 245-284.

Dowty, David (1979)

Garey, Howard (1957)
Verbal Aspect in French; in: Language 33, 91-110.

Heggie, Lorie (1988)
The Syntax of Copular Sentences; Ph.D. dissertation; University of Southern California, Los Angeles.

Kupferman, Lucien (1979)
Les constructions Il est médecin/C'est un médecin: Essai de solution; in: Cahiers de linguistiques: No. 9, 131-164.

Montague, Richard (1973)

Reed, Lisa (1993)
Non-Truth-Conditional Aspects of Meaning and the Level of LF; Ph.D. dissertation; University of Ottawa, Ottawa, Ontario.

Stowell, Tim (1978)
What Was There Before There Was There; in: D. Farkas, W. Jacobsen, and K.Todry (eds.) Papers from the Fourteenth Regional Meeting of the Chicago Linguistic Society, 458-471.

Stowell, Tim (1983)

Wagner, Robert-Léon (1966)
A propos de c'est; in: Mélanges de grammaire française offerts à M. Maurice Grevisse; Editions J. Duculot, S.A., Gembloux, 335-342.
DISCOURSE TOPIC CONTINUITY AND SYNTACTIC REDUCTION

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An important aspect of current syntax theory is to define environments in which certain grammatical processes are prevented from taking place. Within the generative grammar framework, for example, the structure preserving hypothesis (e.g. Emonds 1976), the lexical integrity hypothesis (e.g. Chomsky 1970, Selkirk 1982), the Condition on Extraction Domain (e.g. Huang 1982, Chomsky 1986) and the Empty category principle (e.g. Chomsky 1986, Baltin 1991) are all designed to restrict syntactic movements in such a way.

These constraints are usually assumed to be universals. Problems arise when examples are discovered that do not fit the general patterns which form the basis of these constraints. The common practice is to look for explanations for the exceptions instead of abandoning the constraints. This is also the approach adopted in this paper in an attempt to account for a unique reduction process at the sentence level.

1. A Peculiar Reduction Process

It is generally agreed that many Chinese syntactic processes, such as passivization, relativization and topicalization, are similar to corresponding processes in other languages since they operate in comparable ways and are subject to the same constraints. It is also widely acknowledged that certain processes at the sentence level in Chinese behave so unusual that they cannot be easily classified as any commonly assumed syntactic operation. The most often cited example is a reduction process represented by the contrast between (1a) and (1b), first pointed out by Chao (1968). The sentence (1a) is taken from field work notes of actual conversation and is meant to be understood as 'my maid is a Japanese woman', but its surface form can hardly be interpreted as such. The only transparent reading for (1a) is 'I am a Japanese woman'. In order to obtain the intended reading directly from the surface form, the sentence would have to assume the form of (1b).

(1) a. Wo shi Riben nüren.
   I be Japan woman
   'l(itterally) I am a Japanese woman.'

   b. Wo de yongren shi Riben nüren.
   I Poss. maid be Japan woman
   'My maid is a Japanese woman.'

The intended reading of (1a) is available, however, when (1a) appears as part of a conversation about the maid in every participant's home. If the first speaker utters a sentence like (2a), the second speaker can express his opinion about the same subject matter with a sentence like (2b), which has a structure similar to (2a) but has a reduced subject NP. When the third speaker repeats the same proposition, he can
choose (1a) as his turn, with the subject NP further reduced. In this context, (1a) will produce the same interpretation as (1b) does.

(2) a. *Wo de* yongren shi Zhongguo nüren.
    I Poss. maid be China woman
    'My maid is a Chinese woman.'

b. *Wo de* shi Feilübin nüren.
    I Poss. be Philippines woman
    'Mine is a Filipino woman.'

Given the fact that (1a) can produce the same interpretation as (1b) does but (1a) has less constituents, it can be assumed that (1a) is derived from (1b) via some type of reduction process. The same line of analysis can be applied to the contrast between (3a) and (3b). The intended reading for (3a) is 'I donate one hundred and fifty catty of wheat', but it is impossible to get this reading from (3a) without any context. As a matter of fact, most native speakers consider (3a) unacceptable. There are a few who accept (3a), but they interpret it as 'I weigh one hundred and fifty catty.' A sentence like (3b) is needed in order to produce the intended reading.

(3) a. *Wo yibai wushi jin.*
    I one hundred fifty catty (half-kilo)

b. *Wo juan yibai wushi jin maizi.*
    I donate one hundred fifty catty wheat
    'I donate one hundred and fifty catty (half-kilo) of wheat.'

The most fascinating feature of (3a) is that it is an excerpt from a short story by an author well-known for his colloquial style (Haoran 1965), and no one has complained about unacceptable sentences or discrepancies in the flow of thought when people are asked to read the story. Apparently, (3a) is acceptable in the context of the short story. The story describes a community meeting on the funding for a public project. After two participants of the meeting have pledged certain amount of wheat (as fund for the project) by saying (4a) and (4b), the hero of the story utters the statement in (3a) to make his pledge of donating a larger amount of wheat.

(4) a. *Wo juan bashi jin maizi.*
    I donate eighty catty wheat
    'I donate eighty catty (half-kilo) of wheat.'

b. *Wo juan yibai jin.*
    I donate one hundred catty
    'I donate one hundred catty (half-kilo).'

The speakers of (4a), (4b) and (3a) are discussing the same subject matter and expressing the same idea even though (4b) only contains some of the constituents of (4a) and (3a) has even less constituents. Given the fact that the propositions in these three sentences are the same and what is not overtly mentioned in (4b) and (3a) is clearly understood, it is reasonable to assume that these speakers choose the same sentence structure to make their pledge. In other words, (4b) has the same
structure as (4a) does and its surface form is produced by a reduction process. The same process is also responsible for the derivation of the surface form of (3a) but the reduction is more thorough in this case.

The contrast between (5a) and (5b) can also be attributed to this type of reduction. (5a) is taken from a comedy talk show about misunderstanding in restaurants. A waitress is taking orders from her customers. When she summarizes the orders, she says (5a) to one of the customers to mean 'the dish you ordered is stir-fried pork-liver'. The customer interprets the sentence literally according to its surface form and is offended. The waitress then apologizes by claiming that the sentence she intended to say is (5b).

(5) a. Ni shi chao zhugan.
    you be stir-fry pork-liver
    '(literally) you are stir-fried pork liver.'

b. Ni dian de cai shi chao zhugan.
    you order Comp. dish be stir-fry pork-liver
    'The dish which you ordered is stir-fried pork-liver.'

The incident is actually not the waitress's fault. In summing up the orders, she says (6a) first and then (6b). The sequence of (6a), (6b) and (5a) sounds very natural to the native ears. The misunderstanding occurs because this particular customer is not paying attention to the context and the surface form of (5a) happens to allow a literal reading that is offensive.

(6) a. Ni dian de cai shi Gongbao jiding.
    you order Comp. dish be Kungpao chicken-cube
    'The dish which you ordered is Kungpao chicken.'

b. Ni dian de shi tangcu yu.
    you order Comp. be sugar-vinegar fish
    'The one you ordered is sweet-sour fish.'

Apparently, (6a), (6b) and (5a) have the same sentence structure and are about the same subject matter. What is not said in (6b) and (5a) is the portion which is identical the corresponding part of (6a) and is clearly recoverable from the context. The surface form differences among these sentences are due to the reduction process under discussion here.

A very important characteristic of this reduction process is its power. In (3a), the process cuts across constituent boundaries and operates on the verb and part of its complement. In (1a), the reduction invades a single noun phrase and takes away the head of the subject NP as well as the morpheme de which is usually needed to signify the headSpecifier relation within an NP. In (5a), the operation invades an island and strips the complex NP of most of its components. This reduction is obviously more powerful than most syntactic processes.

Another characteristic of this reduction process is its context dependency. This type of reduction does not apply randomly. It takes place only when there exists a sequence of sentences that have identical structure and are about the same subject
matter. Only the terminal sentences in the sequence are reducible and only the repetitive part of the sentences can be reduced. The context is a necessary condition for the reduction. The interpretation of the reduced sentences depends on the context as well. The surface form of these reduced sentences may or may not have a literal reading and their full interpretation is seldom directly detectable from their surface form. Only when the deleted parts can be recovered, namely, when there is a clear context to indicate what has been deleted, can the complete interpretation of the reduced sentences be inferred from their surface form.

Since the interpretation of this type of reduced sentences depends on the context, such reduced sentences are always ambiguous in isolation. Sentence (1a), for example, has the literal reading 'I am a Japanese woman' and numerous possible interpretations. Given an appropriate context, the sentence can mean 'My maid is a Japanese woman', 'My friend is a Japanese woman', 'My teacher is a Japanese woman' and many others. The surface form of (3a) does not have a literal interpretation, but it allows almost infinite number of readings when contexts are provided. The reading 'I weigh one hundred and fifty catty' is the easiest to get because the most common connection between a person and a weight measurement is perhaps the person's own weight. Given a context of any other connection between a person and the weight of anything, (3a) will yield a relevant reading.

Note that these reduced sentences are ambiguous only when they appear in isolation. If there is a well defined context, there is usually only one possible reading for each of such sentences. The potential ambiguity of these sentences thus does not hamper proper communication.

2. The Nature of the Reduction

The reduction under discussion here seems to have so many unusual properties that its classification and analysis is inevitably problematical. An easy solution to this problem is to simply refute the acceptability of these reduced sentences. Tsao (1979), for example, claims that sentences like (1a) are syntactically ill-formed and semantically anomalous. Anyone who utters such a sentence is said to be subject to ridicule. If all the reduced sentences are ill-formed, the reduction process itself must be illegitimate and there would be no need to account for it.

This line of analysis, though simple and straightforward, is not built on a solid data base. These reduced sentences are not made-up examples from some armchair linguists, but are all cited from field work notes or quoted from works of well known authors. Given the appropriate context, people accept all of them and do not complain about anomaly. These sentences cannot be simply brushed aside and there should be an account for their derivation and properties. Tsao's argument that these reduced sentences are ill-formed syntactically is partially correct, though. Given the fact that the reduced elements in these sentences are not directly recoverable from within the sentences themselves, the reduction is not a pure syntactic process and may not be licit in the syntax. An account for the properties of these reduced sentences has to be found in the interface between syntax and other components of the grammar.

Another line of analysis is to eliminate the process of reduction altogether and
appeal to direct generation of all these sentences. This is in essence the approach of Chao (1968). Within his framework, 'the grammatical meaning of subject and predicate in a Chinese sentence is topic and comment, rather than actor and action' (Chao 1968:69). For him, 'the subject is literally the subject matter to talk about, and the predicate is what the speaker comments on when a subject is presented to be talked about' (Chao 1968:70). A sentence is acceptable 'so long as there is some general relationship of topic and comment between subject and predicate' (Chao 1968:70). Given this loose aboutness relation between a topic and its comment, Chao can treat sentences like (1a), (3a) and (5a) all as legitimate topic comment constructions without further stipulation.

An obvious problem for Chao's analysis is that the so-called aboutness relation is not a well defined notion. It is too vague to have any significant impact on any meaningful analysis. According to his analysis, the NP yibai wushi jin 'one hundred and fifty half-kilo' in (3a) should be the comment of the topic pronoun wo 'I', but it is really hard to imagine how a weight measurement is about a person when there is no verb to signify the actual relationship. The surface form of (3a) allows numerous types of relationship to be established between the two NPs. To classify all these relationships as aboutness will have little theoretic significance, since any relation would qualify as that of aboutness. Such a classification does not have much practical value either, because it does not solve any existing problem. Even if (3a) is analyzed as denoting an aboutness relation between two NPs, the actual nature of this relation is still almost impossible to infer from its surface form.

The only advantage of this line of analysis is the correct prediction it makes that all the reduced sentences discussed here are acceptable. However, this analysis does not distinguish sentences which depend on the context for clues of interpretation from those which are independent of the context. Sentences like (1a), (3a) and (5a) are thus considered the same as simple subject predicate sentences like (7) and ordinary topic comment constructions like (8). The context dependency properties of the reduced sentences (1a), (3a) and (5a) become an unexpected pattern under this analysis and remain unexplained.

(7) Wo de gou paodiaole.
    I Poss. dog run-away Asp.
    'My dog has run away.'

(8) Zheben shu wo bu yao.
    this Cl. book I not want
    'This book, I do not want.'

To account for the context dependency properties of sentences like (9) and (10) is the main goal of an analysis proposed by Chen (1989). Assuming that these sentences are derived via reduction processes, he treats the reduced parts in these sentences as so-called zero anaphors, namely, phonetically null anaphoric forms which depend on antecedents for reference. Within his framework, the antecedent of a zero anaphor occurs in the previous discourse. A sentence with a zero anaphor inside will become uninterpretable if it appears in isolation, because there is no discourse context to provide an antecedent for the zero anaphor. On the other hand, such a sentence allows a wide range of interpretations when there is a previous discourse. The zero anaphor will assume whatever reference the antecedent
provides and the sentence will have a relevant interpretation. The subject of sentence (9), for example, can be any person, persons or any animate entities as long as there is a context in which the persons or entities have been mentioned. For the same reason, the object of (10) can be anything or things so long as they have appeared in the discourse. Either 'I didn't take the money' or 'I didn't take the chickens' will be a possible interpretation for (10) if the money or the chickens are the things being discussed.

(9) Chao menwai yi kan.
    toward door-outside one look
    '(the person/persons) look outside the door.'

(10) Wo mei na.
    I not take
    'I did not take (it/them).' 

Chen's analysis provides a plausible explanation for the context dependency of the reduction process under discussion here, but its application is severely limited by the postulation of a zero anaphor. By definition, a zero anaphor is a phonetically null NP. Although the reduced part of (9) or (10) fits this category very well, the reduced part of (1a), (3a) and (5a) cannot be classified as a null NP. What has been reduced in (1a) is the head of a noun phrase and the nominal modifier particle de. The two are usually not considered as a single constituent. The reduced part in (3a) consists of the verb and the head of the verb's complement NP. These two constituents definitely do not form one NP. In (5a), the head of a complex NP, the complementizer of its relative clause and the VP of the relative clause have been reduced. It is obviously impossible to argue that these three parts can be treated as one NP.

Apparently, the explanatory power of Chen's analysis is weakened tremendously by the postulation of zero anaphors. Any explanation for the context dependency of this reduction process has to go beyond the boundary of a single constituent. This is the approach of this paper as presented in the next section.

3. Beyond Syntax

Any analysis of this reduction process has to address two issues. One is that the interpretation of the reduced sentences depends on an appropriate discourse context; and the other is that elements from different constituents may be affected at the same time. The proposal made here is to account for the two properties by assuming that the reduction process in question is triggered by discourse topic continuity.

In the recent literature, two phenomena have been analyzed as involving discourse topic continuity. The first type of continuity concerns only single NPs. When a sequence of topic comment constructions share the same topic, as in the case of (11a), the usual trend is for the topic to appear in its full NP form only in the first occurrence, i.e., in the initial position of the first topic comment construction. The shared topic is reduced to a null form in all the other occurrences, as in case of (11b). Since each topic usually binds an empty category inside its comment clause, a topic comment construction with a null topic will have the appearance of a simple sentence having an empty NP (EC) inside. The second and
third topic comment constructions in (11b) fall into this category.

(11) a. Zheke shu, hua tai xiao, zheke shu_1 EC_1 yezi tai da,
this Cl. tree flower too small this Cl. tree leave too big
zheke shu_1 wo bu xiang mai EC_1.
this Cl. tree I not want buy

'This tree, (its) flowers are too small; this tree, (its) leaves are
too big; this tree, I do not want to buy.'

b. Zheke shu, hua tai xiao, Null-Topic_1 EC_1 yezi tai da,
this Cl. tree flower too small leave too big
Null-Topic_1 wo bu xiang mai EC_1.
I not want buy

'This tree, (its) flowers are too small; (its) leaves are too big;
(and) I do not want to buy (it).'

The empty NP (EC) inside the sequence of topic comment constructions is eventually co-referential with the shared topic that occurs in full form at the beginning of the sequence. Since the antecedent of the empty NP is beyond the commonly assumed boundary of its own sentence, it is plausible to analyze the reduction process as a discourse phenomenon. The crucial assumption of this line of analysis is that the topic NP at the beginning of a sequence of topic comment constructions is a discourse topic, which licenses the reduction of identical topic NPs in the sequence (e.g. Tsao 1979, Huang 1984). In essence, Chen's (1989) analysis also follows this line.

It is not consequential to the analysis proposed in this paper whether the topic NP at the initial position of a sequence of topic comment constructions is indeed a discourse topic. Our main concern is that the single NP discourse topic analysis does not apply to the phenomenon under consideration here. The reduction patterns displayed in (1a), (3a) and (5a) cannot be attributed to discourse topic continuity if the discourse topic is assumed to be a single NP, as indicated in the discussion on Chen's (1989) analysis.

The concept of discourse topic can be defined in another way. Keenan and Schieffelin (1976) suggest that a discourse topic is a proposition that has been established during the evolution of a piece of discourse. When all the participants in a conversation have accepted the proposition as the topic of the discourse, each of them will substitute certain part of the proposition for new information to make a similar proposition. Given Keenan and Schieffelin's theory of discourse topic, the reduction process operating in (1a), (3a) and (5a) can be considered a result of discourse topic continuity. The discourse topic is assumed to be a proposition that has the structure of a full sentence, with all the necessary elements like modality, tense and aspect. Some positions in the structure are filled with variables at the relevant stage and the other positions are filled with constants, i.e., ordinary lexical items. A typical proposition has the form in (12).
(12) X does Y (in Z location) (at T time) (for P purpose).

Any position in the proposition structure can be filled with a variable so that the variables can be arguments, verbs or some other elements. The proposition structure for (1a) is (13) at some stage. The proposition structures for (3a) and (5a) are (14) and (15) respectively.

(13) X de yongren shi Y-guo nüren.
X Poss. maid be Y-country woman
'X's maid is a woman from Y country.'

(14) X juan Y jin maizi.
X donate Y catty wheat
'X donates Y catty (half-kilo) of wheat.'

(15) X dian de cai shi Y.
X order Comp. dish be Y
'The dish which X ordered is Y.'

The variables are assigned different values in each occurrence of the discourse topic, namely, replaced by appropriate lexical items, to produce a proper interpretation for the proposition structure. All the constants are present in the first appearance of the discourse topic to produce a full form of the proposition. The constants can be omitted, either individually or altogether, in the subsequential occurrences of the discourse topic and a reduced form of the proposition is created. When all the constants are dropped from the structure, the proposition becomes a 'skeleton sentence' with only the lexical items that have replaced the variables but probably without any functional words to signify the relationship between these lexical items, as in the case of (3a).

The skeleton sentence is understood as an occurrence of the discourse topic, namely, as a realizations of the proposition structure even though only the variables are visible in this case. It will yield the reading of the complete proposition with all the invisible constants fully interpreted. The same applies to the reduced sentence. The omitted constants are fully interpreted so that the reduced sentence will yield the reading of the full form.

The reduced sentences and skeleton sentences are interpretable only when they are understood as realizations of the discourse topic, i.e., only when there is a clear context to indicate what the full form of the proposition structure is. The context dependency of the reduction process discussed so far is thus the expected pattern.

The variables in the proposition structure of a discourse topic represent the new information each sentence provides. The constants represent the old information provided by the context. The context is usually the actual discourse but it can be the real world situation as well. The skeleton sentence in (3a), for example, is acceptable and interpretable if it is uttered by someone stepping down from the scales in a physical check-up. The discourse topic in this case is the proposition 'X weighs Y catty (half-kilo)', which is appropriate and understandable without overt utterance in this particular setting, and (3a) will yield the interpretation 'I weigh 150
catty'.

Since there is no overt marking to indicate the nature of invisible constants in the reduced sentences and skeleton sentences, the proper interpretation of these sentences depends on the co-operation among all participants of a conversation (c.f. Grice 1975, 1978). They must all accept the same proposition as the discourse topic. Otherwise the conversation cannot continue smoothly. The misunderstanding with regard to (5a) arises simply because one of the customers does not accept, for reasons of absent-mindedness, the discourse topic assumed by all the other parties in the conversation.

The same principle of co-operation applies to the proper interpretation of written genres as well. Reduced and skeleton sentences are common in written Chinese. These sentences must be interpreted within the discourse where they are located, namely, according to the discourse topic designated to them by the author. A common tactic in Chinese rhetoric is duanzhang quyī 'dismantling the passage to distort the meaning', in which a sentence is taken out of context and assigned to it an interpretation different from the one intended by the author. This tactic is possible partly because a sentence reduced under discourse topic continuity may allow a literal reading and can always be given many readings if different discourse topics are assumed.

4. Concluding Remarks

The phenomenon discussed in this paper is observed at the sentence level, but it is determined mainly by discourse factors. A comprehensive analysis of this reduction process must be built on the interface of syntax and discourse analysis. An appropriate account for this phenomenon is not to posit a set of obligatory rules, which are common in formal syntax, but to provide a framework within which the reduction will operate if the speakers choose to simplify their language production. How the final production looks like depends on the balance of several factors.

A very prominent feature of Chinese, in both the spoken and the written registers, is to avoid repetition (e.g. LH 1988). The reduction process triggered by discourse topic continuity is actual a means to implement this general tendency. If all the constants in the proposition structure of a discourse topic are kept intact in all its occurrences, the discourse will become repetitive and boring to native ears. People usually drop repetitive elements whenever it is possible to do so. On the other hand, since certain reduced sentences allow offensive or misleading literal readings, people may not use these particular reduced forms and opt to use fuller forms to avoid misunderstanding, especially in written genres or carefully planned speeches. How to keep an appropriate balance between the two tendencies, namely, how to make the contribution as informative as is required for the current purpose of exchange but not more informative than is required (Grice 1975, 1978), depends on how formal the occasion is, how familiar the participants are with the general situation, and above all, how a particular piece of discourse is perceived by all the participants. In order to understand the relationship between these factors, further studies, not necessarily limited to syntax and discourse analysis, are needed (cf. Horn 1989).
REFERENCES:


Asia Minor Greek: Contact-Induced Change and Retention
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I. Introduction

One area where the aims of sociolinguistics can be applied to historical linguistics with great benefit is in looking at the causes of language variation and the actuation of language change, as proposed by Weinreich, Labov, and Herzog (1968). An example of such cause is situations where contact between languages leads to structural change. To invoke language contact as the cause of language change is a difficult proposition, however, since it must be argued convincingly that the shift is not due to the natural course of change that the language would have taken without contact with the second language, or to influences either internal to the language itself or from other dialects (Lightfoot, 1979); borrowing, like analogy, is too often given as a convenient and spurious answer to complicated questions of language change. Thomason and Kaufman (1988) provide a model for analyzing contact-induced change, and there are indeed numerous clear cases where influence from another language has caused a systematic shift in the phonology, morphology, or syntax of a language. Contact-induced retention is somewhat less common, and more difficult to argue conclusively, than contact-induced change. Such influence is most apparent in contact situations where the two languages have widely divergent typological structures, as in the case of Greek, a richly inflected Indo-European language, and Turkish, an agglutinative Altaic language. In the development of the Asia Minor dialects of Modern Greek, changes have occurred in the structure that diverge from the structure of the standard (Athenian) language, but that converge with the structure of Turkish; examination of these changes, and comparison with Modern Standard Greek, reveals that they are very likely indeed to have been due to the influence of Turkish. This situation has been studied extensively by Dawkins (1916) in the case of three of the dialects of Asia Minor Greek; Dawkins' data was used by Thomason and Kaufman (1988) in a case study illustrating the heaviest level of borrowing within their framework. These and other subdialects of Asia Minor Greek have also been discussed by Mirambel, Mackridge (1987) and others.

Previous researchers have tended to focus on phonological and morphological influence, so here I will discuss syntactic and morphosyntactic changes, with particular emphasis on those features that are prevalent in narrative and are therefore pragmatic in nature. Furthermore, contact-induced retention has not previously been noted
in this language; I will discuss an interesting case of contact-induced retention of an archaic form.

II. Historical Background

Greeks and the Greek language have been present in Asia Minor since very ancient times. By the end of the Hellenistic period (300 AD.), almost all the dialects of Classical Greek had converged into Koine ('Common') Greek, the language of the New Testament. The dialects of the modern language known as Modern Standard Greek are the descendents of Koine Greek, not of the Classical dialects; the history of their divergence can be traced to the relatively recent common ancestor. These dialects of Greek were the dominant language in Greece and Asia Minor for many centuries. The long decline and fall of the Byzantine Empire, culminating in the capture of Constantinople (Istanbul) by the Ottoman Turks in 1453, led to a new structure of power in the Eastern Mediterranean and Asia Minor, and Turkish became the language of administration, government, and culture. Dawkins (1931), however, concludes that the Pontic and Cappadocian dialects were separated from common Greek as early as the Seljuk invasions of Asia Minor in the 11th century.

Throughout the Ottoman hegemony, the Greek communities of Asia Minor coexisted with the Turks and other local nationalities relatively peacefully, primarily in the Black Sea area (known as Pontus), Cappadocia and neighboring areas (including the villages of Fertek and Silli), Istanbul, and Izmir; they used Greek as the language of the home, of religion, and often of education and trade as well. Although there were a number of monolingual Greek speakers, most were bilingual in Turkish and Greek. After the dissolution of the empire, the governments of Greece and the newly-formed Republic of Turkey organized the population exchange of 1923, when Christian Turkish citizens of Greek ethnicity were relocated to Greece while Muslim Turkish ethnics living in Greece were relocated to Turkey, with the exception of residents of Northern Thrace and of Istanbul. Pitman (1988) estimates that there are approximately 25,000 ethnic Greeks living in Turkey today, mostly in Istanbul, which remains the seat of the Patriarch of the Greek Orthodox Church. During the population exchange, however, many people remained illicitly in their traditional homes and have since become submerged populations in both countries. Turkish law until very recently forbade the use of languages other than Turkish, and thus the Greek-speaking population exists as such underground; Greek is seldom spoken except in the home, and to the best of my knowledge language education and literature are almost non-existent. All or most Greek-speakers seem to
use Turkish most of the time. As an illustration of the situation, I have heard people in Trabzon (formerly Trebizond) speaking Greek, but when I approached them, they insisted that they had been speaking Turkish.

As a result of the awkward situation of Greek in Turkey today, recent data is largely unavailable; little fieldwork has been done since the population exchange, and much of what exists is clearly outdated. It is imperative that data be gathered, since these groups are growing more assimilated to the surrounding culture in each generation, and their unique dialects will soon be lost.

III. Contact-Induced Change

I will now discuss some aspects of Asia Minor Greek syntax which show clear influence from Turkish. Since much of the fieldwork available (from Dawkins 1916) is in the form of folktales, I will concentrate on narrative structures.

III.1 Reduplication

In Turkish, intensification of an adjective or adverb can be indicated by reduplication of an entire form. This process is highly productive and is used often by speakers, particularly in narration.

1. čabuk čabuk yükseldi
   fast rise-Past-3rd-Sg

   'he advanced very quickly'

No such process exists in Modern Standard Greek; there are a small number of reduplicated adverbials, but these are lexical. In Asia Minor Greek, however, the process is productive and frequent and, as in Turkish, is frequently used for narrative effect:

2. From Cappadocia (Dawkins 316):

   eki to kuči üzé üzé pígen s éna mikró xoriós
   that the box swim\textsuperscript{X2} go-Past-3rd-Sg to a small village

   'that box, floating and floating, went to a small village'

3. From Cappadocia (Dawkins 308):

   ge to pedi estáθin ša'qín ša'qín so dengiziú so kenér
   and the boy stand-Past-3rd-Sg, be bewildered\textsuperscript{X2} on the sea on the shore
'and the boy stood very bewildered on the shore of the lake'

4. From Silli  (Dawkins 290)

os pagénnuši, enískiti mniá vroši; kalá kalá islandúsı
as go-Pres-3rd-Pl become-3rd-Sg a rain wellX2 wet-3rd-Pl
(Tk ilšanmak)

'as they go, a shower of rain falls, and they are well wetted'

In the examples (2) and (3), the lexical items üze 'by swimming' and šašqîn 'bewildered' are directly borrowed from the Turkish verbs yüzmek 'to swim' and šašmak 'to be bewildered'; it could therefore be argued that these reduplicated forms are borrowed intact from Turkish. In (4), however, the reduplicated form kalá is purely Greek, and it is clear that the Turkish process has been applied productively.

III.2 Conjunction and Asyndeton

As I discussed in Sikkenga (1990), Turkish conjoins verb phrases in three ways: 1) with a conjunctive particle, such as ve 'and' or de 'and also'; 2) by conjunction reduction of the first verb and affixation of the enclitic conjunction -(y)ıp; or 3) by simple juxtaposition of conjuncts, or parataxis. Other types of phrases are conjoined either by a conjunctive particle or suffix, or by juxtaposition.

5. Ayhan eve geldi ve yemek yedi
Ayhan home come-Past-3rd-Sg and food eat-Past-3rd-Sg

6. Ayhan eve gelip yemek yedi
Ayhan home come-end food eat-Past-3rd-Sg

7. Ayhan eve geldi yemek yedi
'Ayhan came home and ate food'

Of these, parataxis, as in (7), is by far the most common usage; some speakers avoid using the connective particles altogether, according to Lewis (1967).

Modern Standard Greek conjunction, on the other hand, is formed only rarely by juxtaposition; this construction is used primarily for narrative effect, and is marked.
8. δουλεύω, δουλεύω, δεν κιμάτω
   work-Pres-3rd-Sg work-Pres-3rd-Sg Neg sleep-Pres-3rd-Sg

   'She works (and) works (and) doesn't sleep'

Thumb (1964) points out that the same effect is achieved by repetition, as in both the above and the following examples:

9. mavros itan, katamavros, mavro ke t'αλογό tou
   black-Masc be-Past-3rd-Sg very black black-Neu also the horse his

   'Black he was, all black, black too (was) his horse

   Parataxis as such is unusual and marked in Modern Standard Greek; the Greek of Asia Minor, however, uses asyndetic conjunction productively where no literary force is apparent:

10. From Cappadocia (Dawkins, 328)

   itou ένα παιδί κ'ένα άνήκε δεν έχει πάνω
   be- a child and a woman Neg have- bread Subj Part eat-
   Past-3rd-Pl            Past-3rd-Pl             Subj-3rd-Pl

   MSG: itan ena pedi ke mia yineka, ke/pou den ikan psomi na fane
        and/rel. pronoun

   'there was a child and a woman they didn't have bread to eat'

11. From Ophis, in the Pontic region (Mackridge 1987):

   επέπλεξεν εστάθεν apán si strátan
   go-Past-3rd-Sg stand-Past-3rd-Sg on on the road

   'he went, stood on the road' (sequential)

Asyndeton exists in other dialects of Modern Greek, as noted above, but it is not common and does not correspond to the unmarked usage of Asia Minor Greek; syndetic conjunction is also common in Asia Minor Greek. The Turkish-like pattern of asyndetic conjunction in these dialects is striking, and is very possibly a result of contact. Moreover, the Asia Minor Greek data in (10) could instead be interpreted as a degenerate relative construction, with loss of the relative pronoun. But this in itself is interesting, since Turkish is
known to have no relative construction per se; these data would then be due to the weakening of the Asia Minor Greek relative construction, again possibly as a result of Turkish influence.

III.3 Aspect

In both Modern Standard Greek and Turkish, aspect is of primary importance both psychologically and formally; the aspectual choices speakers make are morphologically overt in finite and non-finite verb forms in most tenses. Both languages have a perfective and imperfective viewpoint, as well as a neutral viewpoint according to the criteria established in Smith (1991). (In accordance with standard terminology, I use ‘imperfective’ to refer to the viewpoint aspect, while ‘imperfect’ refers to the tense). In standard Greek narrative, as in many languages, the imperfective serves a backgrounding function; it provides descriptive information as a backdrop against which the plot, using the perfective viewpoint, is advanced. In Turkish narrative, however, the imperfective has a somewhat broader and more crosslinguistically marked use; it can be used to foreground an ongoing situation, as in the following example from Bir Hatıra by Yakup Kadri:

12. köşe başlarında, şaşkin şaşkin bakişan kimselerden kümeler görünüyordu
appear-Impf 3rd

‘on the street corners, heaps of them kept appearing, looking around, quite bewildered’

Interestingly, the use of the imperfective in narrative in the Silli dialect of Asia Minor Greek seem to pattern with Turkish rather than Standard Greek; the imperfective is the foregrounded action, even in the case of a stative verb:

13. From Silli (Dawkins 302)

ýurbeçi ren peyenninönüjiski; fovinóski čin enéka
outside Neg go-Impf-3rd-Sg fear-Impf-3rd-Sg the wife

MSG: ðen piyene ékso apó to spíti tu, foviðike ya tin yinéka tu
Aor

Tk: gurbet gitmiyordu, eşi içiç korkuyordu
Impf Impf

‘he used not to go away from home; he was (being) afraid for his wife’
14. (ibid., 304)

ficúnun du op róreka forás ándras ke enéka
spit-Pres-3rd-pl him twelve times man and wife
arkadašis tu fovíiski na gípi doyrú
friend his fear-Impf-3rd-Sg Subj Part speak-Subj-3rd-Sg true

MSG: ...o filos tu fovíthike na pi aliθiná
Aor
Tk: ...arkadaši doraθu soylemekten korkuyordu
Impf
'The man and his wife spit upon him twelve times. His friend
was afraid to speak the truth'

15. Cappadocia (Dawkins 314)

ke ándo k’ értan na paršán t’ålogo,
and when and come-Aor-3rd-Pl Subj take-Aor-3rd-Pl the horse
dómushkan na to párun
be unable-Impf-3rd-Pl Subj it catch-Aor-3st-Pl

'and when they came to get the horse, they couldn't catch it'

MSG: ðen borésun na to párun
Aor
Tk: ona tutmuyordular
Impf

In (13) above, the habitual imperfective peyenninónjiski 'he was
going' is typical of both Modern Standard and Asia Minor Greek; here
it serves to background the second clause, which in Modern Standard
Greek would have a perfective viewpoint. Instead, the imperfective
fovíiski of (14) and dómushkan of (15) are strikingly Turkish in their
aspeсtual choice. This shift is particularly interesting because it shows
a depth of structural influence reaching into the categorial systems of
the language.

IV. Contact-Induced Retention

These imperfect forms are also interesting morphologically. In
Silli, the imperfect has endings in inónjiska or inóska, which parallel
the imperfect -iška found in Cappadocia. Dawkins (1916) attributes the
-njí- of the Silli forms to a spreading of the palatalized -n- of the 3rd
plural of the imperfect passive, bleached of its voice meaning, and
agglutinized to the active imperfect ending '-ina-' and followed by the
personal endings.
The -sk- of -inónjiska or -inóskā, however, is left unexplained. It may be reasonably suggested that this is in fact a reflex of the ancient Ionic durative, habitual, and iterative marker -ske- which is found productively in Ionic Greek (the dialect of Homer and Herodotus), and in isolated lexical forms in later stages of the language, including Modern Standard Greek. Some scholars reconstruct this suffix in Proto-Indo-European as mainly iterative in function, based on isolated lexical forms found in a number of Indo-European languages, and on productive suffixes maintained in Armenian and Ionic Greek. In Armenian, the *-ské/o- morpheme was retained in its expected form '-ç-' as the weak aorist, for example in yusay 'I hope,' aor. yușaçay; the same outcome of the suffix is apparent in the general Ancient Greek preterites in -sk- such as phaskon 'I said.' Meillet (1936) points out that the aorist in Armenian is not a proper aorist, but rather is derived secondarily from an ancient imperfect. In Ionic Greek, -ske- acts as a durative, habitual or iterative marker, as in the following Homeric examples:

**Iterative:**

ou'de ti tw'n mέmnetai. òi oi mála pollákic uión
teirómoenon swesokon up' Eýrusbētos áëthan
h'toi ò mén klaiske próç ouranón

Iliad 8.362-4

oudé ti ton memneilai, ho hoi mala pollakis uion

teiromenon soeskon hup' Eurustheios aethlon

etoi ho men klaiske pros ouranon

'nor does he remember, that very many times I would save

his son, oppressed by the tasks of Eurystheos,

truly he would cry out to heaven'

**Habitual:**

tn avtòs filēsskeiwi. átímájekse δ' ákoitiv,

mhter' émhn· ò δ' aie èmè lisséskei to gounov
pallakidi proujghnai

Iliad 9.450-2

tin autos phileskeiwi, atimazeske d'akoitini,

meiter emein, ei d' aien eme lisseskei gounon

pallakidi promigeinai

'he himself used to make love to her, and would dishonor his lawful wife

my mother, and she was always clasping my knees and begging me
to lie with the concubine'

**Durative:**

állothe méν te Nótoç Boréi probaláskhe férēsothai,
állothe δ' aut' Eýros Zepfrw eikaste diówkein.

Odyssey 5.331-2

allote men te Notos Boreei probaleske pheresthai
allote d' aut' Euros Zephuro: eikaske diekein
(while Odysseus' raft is at sea)

'sometimes the South and North Winds pushed to carry it,
sometimes the East and West Winds followed to chase'
The semantic shift from habitual or iterative to exclusively imperfective is negligible, since these functions are within the usual scope of the imperfective; the shift can be seen as a broadening of function. The categorical shift from a strictly aspectual marker to an aspect/tense portmanteau is likewise quite common crosslinguistically, as in the case of the Turkish perfective -d-. There are numerous examples of similarly archaic features in the Asia Minor dialects. The Ophitic subdialect of the Pontic dialect, which shares a number of features with Cappadocian, resisted the post-Koine development of the aorist in -ik-, e.g. MSG foviðika, and retained instead efovéθe 'he became afraid', as is discussed in Mackridge (1987); this dialect also retains archaic suppletive forms such as present féro 'I carry' and aorist énga, compare the AG aorist énegkon and MSG aorist éfera. The Tsakonian dialect of Modern Greek, spoken in the Peloponnese, has been shown to be the direct descendant of the ancient Laconian dialect, and not of Koine Greek, as are the other dialects (Browning 1983); it retains a number of archaic features. Cypriot Greek also exhibits structural archaisms.

It is not then unlikely that an archaic form such as 'ske/o-' could have survived the Koine period, during which many archaisms were leveled, in so isolated a dialect. It would be still more likely to be retained if, as is the case, its form conforms to the typology of the language which exerts as strong an influence as Turkish does on Asia Minor Greek. In MSG, the imperfect is marked by an accent shift and the use of past tense personal inflectional endings. Turkish is of course the exemplar of the agglutinative type language; the imperfect is marked by the imperfective aspect marker -iyor- plus a tense marker plus personal endings. The piling on of suffixes as is seen in -inónjiska or -inóskas is characteristic of Turkish but not of Greek. If this is indeed the reflex of the ancient -ske/o-, then I propose that it was retained due to its 'agglutinative' appearance in this context; if this is so, it is a case of contact-induced retention of a productive and archaic feature which was lost everywhere else.

V. Conclusion and desiderata

The structures of Asia Minor Greek presented here as divergent from Modern Standard Greek and convergent with Turkish are only a small part of the body of data belonging to the set of borrowings, however, a current comprehensive descriptive analysis of this dialect group is needed. There are two reasons to recommend such an analysis. First, the Greek language is perhaps the greatest resource of the historical linguist, due to the fact that we have records from almost every stage of the last few thousands of years of its development. To
lose any part of that resource would create a permanent lacuna in our knowledge of the language, and since the Greek dialects of Asia Minor are rapidly disappearing, one such lacuna appears imminent. Second, the structure and typology of Greek and of Turkish are highly divergent, and thus in a diglossic situation present an ideal vehicle for the study of contact phenomena. For this reason, it would be extremely interesting to compare these Greek dialects with the dialects of Turkish that are spoken in Northern Greece for similar contact-induced phenomena.
References


Orality and markedness

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1. Introduction

Most of the phenomena discussed in this paper involve the realization of a nasal stop as a pre- or postnasal (mb or bm) in the environment of oral vowels. Thus Guaraní nasals are reported as postoralized before oral vowels (1), whereas Land Dayak nasals are transcribed as preoralized when they follow oral vowels (2).

(1) Postoralization: ma -> mba
   (contrast mā, which remains mā.)

(2) Preoralization: am -> abm
   (contrast ām, which remains ām.)

My interest in this class of processes stems from the fact that both preoralization and postoralization are usually viewed as assimilatory phenomena: the stops appear to acquire the orality of the neighboring vowel. For there to be assimilation in such cases, we would have to assume that the feature [nasal] is binary, in the sense that a segment's orality is phonologically represented.

(3) a. An assimilatory analysis of postoralization:
   spread [-nasal] from vowel onto preceding nasal C.
   b. An assimilatory analysis of preoralization:
   spread [-nasal] from vowel onto following nasal C.

Yet there are good reasons to assume that [nasal] is a privative feature, in the sense that oral segments are distinguished from their nasal counterparts simply in terms of the absence of [nasal]. In fact, when we enumerate the relevant arguments, it appears that pre- and postoralization are the only well-documented phenomena that stand between us and a successful privative analysis of nasality. I intend to show that neither of these processes is best analyzed as assimilatory: neither requires manipulating orality. We will conclude that nasal can - indeed must - be a single-valued feature.

What is the connection between privative nasality and markedness? [Nasal] belongs to a larger class of features which display context-free markedness: by which I mean that their cross-linguistic distribution is such that they lend themselves to the formulation of context-free implicational universals of the type shown in (4):

(4) a. If a language possesses a [+nasal] series of sounds then it will possess the corresponding [-nasal] series.
   b. If a language possesses a [+spread] series of sounds then it will possess the corresponding [-spread] series.
   c. If a language possesses a [+constricted] series of sounds then it will possess the corresponding [-constricted] series.

It will be my suggestion that the features listed in (4) are all single-valued; and, more generally, that only features for which markedness statements such as those given in (4) are universally defensible should be considered single-valued. A substantial number of other features appear to pattern in very
different ways, in the sense that no cross-linguistic context-free tendency can be observed for one of their values to imply the other. The last part of this paper will contain some speculations on the reasons why such a contrast might exist between seemingly binary and seemingly single-valued features.

2. An overview of the phonological uses of [-nasal]

If we inventory the phonological uses of the specification [-nasal], the list will include the following structures and processes:

(5) Conceivable uses of [-nasal]
   a. Nasal contours: [+nas][-nas] (mb) or [-nas][+nas] (b^m)
   b. Blocking [nasal] harmony:
      [-nas] morph blocks spreading from [+nas] morph.

Interestingly, among the candidate analyses making use of [-nasal] values, we do not encounter long-distance oralization harmonies: no language known to me can be shown to spread the orality of some segment class onto a longer span (as imagined in (6)). Nor do we encounter oral disharmonies: no language I have seen described disallows the cooccurrence of oral segments, within any domain, at close range or distantly. An imaginary case of this type is outlined in (7).

(6) Non uses of [-nasal]: unbounded/ non-local harmony
   i. Fictive Guarani: all segments, including m, n, become fully oral before stressed oral vowel.
   ii. Contrast real Guarani (Rivas 1975, Kiparsky 1985): m,n maintain at least partial nasality before oral V: amá -> ambá.

(7) Non-uses of [-nasal]: disharmony requires [α nasal] [-α nasal]
   i. Fictive Mazateco: *ná and *ta are disallowed but tā, na ok.

Both the unattested orality harmony (6.i) and the unattested orality disharmony (7.i) are to be compared with the widely attested harmony and disharmony processes involving [+nasal]. The obvious question is: why should [-nasal] be underutilized in these ways? The only answer that seems fully satisfying is that oral segments do not carry [-nasal] specifications: [nasal] is privative, as anticipated by Trubetzkoy (1939) <1>. If [-nasal] does not exist, it cannot spread or dissipate. This interpretation requires some reanalysis of the phenomena listed in (5) and answers to a more basic question: why does phonetic orality lack a phonological counterpart in the form of a [-nasal] value?

3. Nasal contours

Let's begin then by taking a second look at the phenomena in (5). I would like to first briefly dispose of the first two - nasal contours and oral blockers. The subject of distinctive nasal contours was taken up in Steriade (1993) where it is shown that they should be analyzed as released plosives, whose closure and release are separately represented. (The relevance of the closure/release distinction in phonology was also signalled by Kingston 1985). Nasality can be realized on closure (in the case of prenasals), on release (in the case of postnasals) or on both positions (for fully nasal stops). The notation below
involves the following elements: closure (or aperture zero) abbreviated as $A_0$, and approximant release (or maximal aperture) abbreviated as $A_{\max}$. These definitions of aperture positions are inspired by Ladefoged (1971) and have been defended in greater detail elsewhere:

\[
\begin{array}{ccc}
\text{nasal stop} & \text{prenasal stop} & \text{postnasal stop} \\
/\ & / & / \\
A_0 & A_{\max} & A_0 & A_{\max} \\
[m] & [\text{mb}] & [b\text{m}] \\
\end{array}
\]

In support of the structures in (8), I note that the possibility of contours disappears when the segment is a continuant (because continuants lack the segment internal discontinuity that justifies the closure/release distinction in plosives) or when the plosive is unreleased (because an unreleased stop has just closure, $A_0$). The representations in (8) show that this closure/release distinction allows us to have distinct structures for fully and partially nasal segments without using [-nasal].

4. Oral blockers

Consider now the phenomenon of oral blockers in nasal harmony processes. A subset of the relevant cases has been analyzed by Cole (1987) and Pulleyblank (ms.): these are cases in which a voiceless segment blocks both the association and the subsequent spreading of nasality. Cole and Pulleyblank suggest that such cases do not require that the voiceless segments be specified [-nasal], but only that the relevant nasal harmony processes be limited to apply between strictly adjacent segments: non-undergoers will then necessarily become blockers, whether or not they carry a phonological mark of orality. This scenario can be exemplified using the Terena data below (from Bendor-Samuel 1966):

\[
\begin{array}{l}
\text{owoku} & \rightarrow & \text{owoku} \\
\quad & \rightarrow & [\text{owongu}] \ 'my \ house'; \ cf. \ [\text{owoku}] \ 'house' \\
[\text{nas}] & & [\text{nas}] \\
\end{array}
\]

Blockage of nasality spreading beyond $k$ is due to (a) the cooccurrence filter *+[nasal, -voice] and (b) to the fact that spreading must be strictly local.

Blockers of this type may involve any segments possessing a feature that is incompatible with the optimal realization or perception of nasality: consonantal continuants (cf. Ohala 1975, Poser 1981, Cohn 1993), laterals, voiceless segments. It is the incompatibility between nasality and these other features that arrests the spreading, not - or not necessarily - the presence of a [-nasal] value.

A more challenging case is that of oral morphemes which appear to idiosyncratically block the unbounded spread of nasality in certain languages. The cases I have in mind involve Tucanoan languages - Desano and Tatuyó - that have been discussed in this context by Kaye (1971) and Gomez-Imbert (1980). Both languages are described as dividing their morphemes into four categories:
(10) Morphemes of Eastern Tucanoan (after Gomez Imbert 1980)

class A: [+nasal, +nasalizing]:
class B: [+nasal, -nasalizing]
class C: [-nasal, +nasalizable]
class D: [-nasal, -nasalizable]

The dominant classes A,D tend to be stems, roots, and content morphemes: "les lexèmes appartiennent, à quelques exceptions près, au classes A et D, les classes fortes: autrement dit, les éléments léxématicques sont déterminants pour l'harmonie nasale dans le mot." (Gomez-Imbert 1980:79). Lexical classifiers may also belong to classes A-D. Class B consists of nasal affixes: they fail to have a nasalizing effect on adjacent oral stems. Class C consists of oral affixes: these regularly become nasal next to a class A morpheme. The two recessive classes, B and C, are thus function morphemes: [there is] "convergence entre grammème et propriété nasale/non-nasale faible." (Gomez-Imbert 1980: 82). They are not tonally specified, in contrast to morphemes belonging to classes A, D. Kaye and Gomez-Imbert (1980, 1993 per litt.) analyze class D as possessing [-nasal] specifications. Tatuyó examples of the data this classification is meant to describe are given below. Morphemic nasality is indicated as a proposed tilde:

(11) Morpheme combinations in Tatuyó (Gomez-Imbert 1980, and 1993 p.c.)

(i) A + C: ~kedoo - bi → kënnôomi
make 1sg

(ii) A + D: ~hido - bi → hînombi
manioc crusher - tubular classifier

(iii) C + C + A + D + C:
ki - ha - ~dodi - hoo - wi → kîhânôîhoowi
we incl. gave sent him

(iv) B + D: ~bi - pak - o → mîpako
you mother classifier

(v) B + A: ~bi - ~bak - o → mîmâkô
you daughter classifier

(vi) C + D + C + C + B:
ki - pak - i - re - ~da → kipakirenâ
he father class. object own

One is obviously tempted to analyze the distinction between the two oral classes - the recessive class C and the dominant class D - as stemming from the presence or absence of a [-nasal] value. An analysis of mîpako 'your mother' (11.iv above) along these lines would work as follows: nasal values would associate cyclically to their tautomorphemic segments, in such a way that all segments would be fully specified as [+nasal] or [-nasal] on the second cycle. This will preclude any spreading across morpheme boundaries:

(12) D morphemes analyzed as possessing [-nasal]:

\[
\begin{array}{ccc}
\wedge & /\wedge & /\\
bi & pako & mî & pako
\end{array}
\]

class B class D
But this analysis takes no account of Gomez-Imbert's point about the correlations between morpheme class and spreading/blocking function. We should therefore consider the possibility of utilizing just the distinction between content and function morphemes - without recourse to a distinction between [-nasal] and [0 nasal] - in accounting for the difference between oral undergoers (class C) and oral blockers (class D). Notice first that we must assume that function morphemes can be specified for the feature [nasal]: this conjunction of properties is what characterizes class B. Given this, the immediate question to ask is why there are no function morphemes that can be specified as [-nasal]: if there were any, we would have function morphemes that are invariably oral, i.e. belonged to class D. The answer is that [-nasal] is not a phonological value and that nasality spreads from content morphemes to function morphemes: both content and function morphemes may be specified as [nasal] or unspecified, but only the lexemes, the content morphemes, may initiate spreading. There is perhaps a prosodic interpretation of this analysis: most function morphemes belong to the prosodic domain defined by an adjacent content morpheme and it is conceivable that nasality spreads within the prosodic domains thus defined.

A proposal along these lines was recently made by Zsiga (1992), who succeeds in analyzing ATR harmony in Igbo without reference to the recessive [-ATR] value by relying on prosodic delimitation of the domain of harmonic spreading. For Tatuyó too this interpretation may be the most attractive one, but without additional restrictions it does not account for the fact that harmony takes place in C+A, A+C combinations 11.(i) but not in B+D, D+C+B combinations (11.iv, 11 vi). At the very least we must add the condition that spreading may only be initiated by a content morpheme.

(13) An conjecture about morpheme class and nasality in Tatuyó:
   a. Prosodic domains are defined by content morphemes (lexemes).
   b. Function morphemes are incorporated into existing domains, without projecting their own.
   c. [nasal] spreads within the domains thus defined, from content onto function morphemes.

(14) Examples (cf. 11.iii and vi). Bold characters indicate content morphemes.
   (iii) [C + C + A] [D + C]:
   ki -ha - ~ dodi - hoo - wi -> kihānōnōhoowi
   we incl. gave sent him

   (vi) [C + D + C + C + B]:
   ki - pak - i - re - ~da -> kipakirena
   he father class. object own

Aside from the possibility of analyzing this data without recourse to [-nasal], do we learn something more general from this discussion of oral blockers? What is significant in the case of Eastern Tucanoan is that the properties we were tempted to describe as due to [-nasal] specifications are not freely distributed within the lexicon: only content morphemes possess them. In contrast, nasality did turn out to have the wide distribution we expect of a true phonological feature, since both content and function morphemes possess it. Our analysis did justice to this contrast. It is not clear how an analysis relying on representing dominant orality as [-nasal] - along the lines of (12) - can do this.
5. Postoralization

A much more common use of [-nasal] is the analysis of local postoralization first considered by Anderson (1976): in languages like Guaraní, voiced plosives are realized as prenasal before oral vowels and as fully nasal before nasal vowels. Anderson's interpretation of this fact, and that of subsequent writers - aside from Glynne Piggott and myself - has been that the nasals are basic and the prenasals derived by spreading the orality of the following vowel:

(15) Guarani (Kiparsky 1985, Piggott 1992)
   a. p t k i i u u
      m n ü a å o ō
      s f
      w r y h
   b. Iterative spreading leftwards:
      seretá- -> [sɛɾɛtá]- 'country'
      no-ro-henui -> [nɔɾɔˈɛɲdui] 'not hear'
   c. Nasal stops are prenasal before oral: no-ro-haihui -> [nɔdoɾoˈhaihui]
   d. Stressed syllables arrest leftward spread:
      āmð̩-gwaré 'there-from' (*ām̩bó-gwaré)
      maæ -> [mbaæ] 'thing'
      ò-maæ-mbá 'they all looked' (*òmbaʔè-mbá)
      maæ -> [mææ] 'to see'

(16) Assimilatory postoralization (Rivas 1975 to Kiparsky 1985):
      spread [-nas] from stressed V and [+nas] from C and stressed V

\[
\begin{array}{ll}
\text{[mbaæ]} & \text{[mææ]} \\
\text{m a æ} & \text{m a ?è} \\
\text{[+nas] [-nas]} & \text{[+nas] [+nas]}
\end{array}
\]

Several questions arise about the analysis in (16). The first, raised by Piggott (1992), is: why should [-nasal] spread onto m in [mbaæ], despite its preexisting [+nasal] specification? The second, raised by Steriade (1993), is: why does [-nasal] fail to spread onto stressed ò in āmð̩-gwaré? Why don't we get a prenasalized vowel ð₀?

To get an explanation, we turn again to the representations introduced earlier, in which stops are shown as having closure and release, while continuants - including vowels - have only one position. This is the analysis in (17). We will assume that the nasal series of Guaraní is underlyingly composed of voiced stops, realized with [nasal] on closure. Thus prenasals are the default realization of voiced stops, not the effect of orality assimilation. Full nasals result from the spread of nasality onto the release of the prenasals. Harmony is bound by the stress foot, as suggested by van der Hulst and Smith (1982), Flemming (1993).

(17) [mbaæ] [mææ]
    UR: /baæ/ /baæ/

\[
\begin{array}{ll}
- & A_0\text{A}_{\text{max}} V A_{\text{max}} V \\
\mid & [\text{voi}] \\
\mid & \text{[nas]}
\end{array}
\]

\[
\begin{array}{ll}
A_0\text{A}_{\text{max}} V A_{\text{max}} V \\
\mid & [\text{voi}] \\
\mid & \text{[nas]}
\end{array}
\]
It should be noted here that although both the analysis I suggest in (17) and that in (16) characterize the central facts of Guarani, they have rather different implications when we consider the details. In his 1985 paper on the connection between lexical phonology and underspecification theory, Kiparsky has considered the assumptions that allow one to claim that the oral vowels have a [-nasal] value to spread: what is at issue here is the fact that only stressed oral vowels appear to spread orality. The question is this: why do only the oral stressed vowels have the ability to spread orality? Why not some other oral segments? Kiparsky's answer - somewhat abbreviated - is that in Guarani nasality is distinctive for vowels only and within stressed syllables only: this means that orality can be lexically specified in stressed vowels but nowhere else. Hence the only lexical sources for oral spreading will be the stressed vowels. What is puzzling, however, is that when we apply a similar logic to the stops we must conclude that the nasality of voiced stops (items like m/mb) is non-distinctive, since it can be predicted from their voicing. Hence it should be unavailable lexically and thus unable to spread, contrary to fact. Thus it is not possible to uphold consistently, within the framework of (16), the view that only distinctive nasal-orality spreads in Guarani.

Aside from avoiding this conundrum, a distinct advantage of the analysis in (17) is the fact that it relies on a theory of representations that explains why nasal contours are impossible on continuants. Suppose now that one wanted to maintain an assimilatory analysis of postoralization but, at the same time, one tried to adopt the sort of representations that explain the questions about contours: could we adopt the aperture-based representations in (17) and still derive postoralization by spreading orality from a following vowel? The answer is no: a rule that derives the prenasals by spreading orality onto the release of a nasal stop will be feature-changing, when given an A-position analysis, as shown in (18). This will incorrectly entail that the same feature-changing rule might be able to apply and eliminate the nasality of vowels.

(18) [+nasal] / [-nasal] 
\[ \text{A}_0\text{A}_{\text{max}}\text{A}_{\text{max}}\text{V} \]
\[ \text{m} \quad \text{a} \]
\[ \text{ma'æ} \rightarrow [\text{mba'æ}] 'thing' \]
\[ \text{δ-γwaré} \rightarrow *\text{δγwaré} \]

The conclusion is this. If we believe that prenasals derive from assimilatory postoralization, we can implement this idea only in a notational framework that cannot answer basic questions about the distribution of nasal contours. Once we abandon that framework, we have to abandon the notion that postoralization is assimilation. We have no choice in this case.
6. Preoralization

Perhaps the most challenging phenomenon for a supporter of privative nasality is the existence of cases which look like the mirror-image of Guarani postoralization. This family of processes turns a fully nasal stop into a postnasal (or preoral) when preceded by an oral vowel. The best known instance of what looks like assimilatory preoralization is the Land Dayak process analyzed by Scott (1964) and later by Kenstowicz and Kisseberth (1978).

(19) Apparent assimilatory preoralization: m -> bm/ a __

Land Dayak (Scott 1964, Kenstowicz and Kisseberth 1978)
a. Nasal harmony:
målù 'strike', umō 'water', näbur 'sow, siŋānù 'cat'
b. Preoralization evidence:
ntakàdn 'taste', pəlamb 'mango', padagn 'field', tuʔadn 'open'
kinām 'feeling' pilmān 'a game', pəmīn 'dizzy', nūʔān 'open'

If preoralization is assimilation, then what spreads is orality. Viewed in these terms, the rule will have to be bled by nasal harmony:

(20) [-nas] [+nas]
  \~ \ ~ \l
\ V C#

A partial inventory of cases similar to Land Dayak has been made by Poser (1978). I hope to add a few new instances of preoralization here. But before we turn to a survey of these cases, I'd like to point out that the facts summarized in (19) can in principle lend themselves to a non-assimilatory analysis, which does not rely on [-nasal]. This is the analysis in (21), which assumes that word-final stops in Dayak are released.

(21) Preoralization as final delinking: [nas]
  \ t \ \\ #
A₀ Aₘₐₓ

If we adopt (21), the perceived lack of preoralization in kinām, pilmān etc. will be attributed to phonetic interpolation across the nasally unspecified closure (cf. Cohn 1990). The interesting question is therefore not whether we can do without [-nasal] in this case: (21) shows we can. Rather, we should ask whether anything is gained by doing so, in addition to upholding the more restrictive theory of privative nasality. In particular, we seek to understand the cross-linguistic properties of preoralization, which have not been investigated so far. A first issue raised by the Land Dayak data is: why do only final stops preoralize?

Some light is shed on this question when we observe that stress falls on the final in Land Dayak: "The position of maximum differentiation for consonantal phonemes is introducing the final syllable, and for vowels is the peak of the final syllable." (Court 1967:203, on Mentu Land Dayak). No long vowels or mid vowels or laryngeals occur in prefinal syllables. These distributional facts suggest strongly that the final is stressed: it is typically the case that stressed syllables can anchor more features and more complex feature combinations than stressless ones. We have therefore two possible leads to investigate: one is the
restriction of preoralization to final syllables; the other is its possible connection to stress.

The results of the cross-linguistic survey begun by Poser, summarized in (22), support both the connection between preoralization and stress and its restriction to final syllables. Preoralizations are found in: Kendayan Dayak, Khmu? Halang, Mal, Semang Chewong, Stieng, some Thai dialects (for all the preceding: Poser 1978); and also in Diyari, Arabana, Lappish and Icelandic (discussed below)

(22) Cross-linguistic properties of preoralization:
   a. Preoralization tends to apply in final syllables; and, when non-final, in stressed syllables only (Lappish, Icelandic, Arabana, Diyari.)

   b. The target of preoralization is frequently a long consonant, either underlyingly geminate (Lappish, Icelandic) or geminated by rule (Arabana, Diyari). If non-geminate, the target may well be phonetically long: all other cases occur in final syllables, where the nasal is subject to final lengthening or lengthening under stress.

   c. Preoralization is frequently accompanied by prestopping of laterals: l -> dl in final syllables, and/or in geminate clusters (Halang, Mal, Stieng, Arabana, Diyari, Icelandic.)

   d. All preoralized nasals are either prevocalic (if geminate) or final, and hence can be assumed to be released.

   e. There may exist instances of preoralization after nasal vowels: Stieng (Poser 1978).

   It appears then that preoralization correlates strongly with length: the nasals subject to it are frequently geminate and, if non-geminate, occur word-finally, where they could be suspected of being at least phonetically longer than their non-final counterparts. Preoralization is generally accompanied by prestopping of laterals: geminate or word-final l's are partially delateralized in the same contexts where geminate or word-final nasals are preoralized. Further, there are no cases of preoralization of the form shown in (23), where a short intervocalic nasal acquires an oral half from a preceding oral vowel.

(23) Unattested preoralizations: ama -> a^bma<2> or ama -> aba

This should in itself cast doubt on the validity of the assimilatory analysis in (20), since [+nasal] harmonies most frequently target intervocalic non-geminate consonants: why should the corresponding oralization harmony fail to occur?

A further indication that we're not dealing with orality assimilation is the existence of at least one language - Stieng, reported by Poser - in which the prestopping takes place after nasal as well as oral vowels: e.g. âm -> âbm. The prestopped nasals of Stieng clearly do not arise via spreading orality.

However what I believe is decisive for the analysis of preoralization is the frequent association with lateral prestopping. Of the twelve languages seen by Poser or myself, fully six combine prestopping with delateralization. This is not what we expect from a rule that spreads orality. Three examples of languages where preoralization and delateralization are combined appear below.
(24) Diyari (Austin 1981): stress on first syllable, preoralization/prestopping only in first syllable:
   a. Preoralization: kani ~ kadni, wana ~ wadna, kanini ~ kadnini,
      but nana (*nadna)
   b. Prestopping of laterals: yula ~ yudla, nulu ~ nudlu, mula ~ mudla

   a. Preoralization: dólna -> dídna, gúnn -> gúdna, wímma -> wíbma,
      but náninda, máninda
   b. Prestopping: nálía -> nádlia, wálła -> wádlía

(26) Icelandic (Einarsson 1945): preoralization/prestopping applies only to geminated stops, which occur only under stress. Pre-obstruent C's do not undergo this process.
   a. Preoralization: brunn -> brudn, einnri -> eidnri, thougn -> thoudn,
      mann, minna
      [compare vani -> vaːni, lan -> lauːn, sandur -> [sandyr]
   b. Prestopping: allur -> adlyr, allra -> adlra, hella -> hedla, fjall -> fjadl
      [compare alit -> auːlit, ol -> oːl, alt [aːlt], alls [aːls]

The observations made so far suggest several reasons not to view preoralization as spreading of [-nasal]. The connection of preoralization with stress/gemination suggests that the preoralized nasals are always long, whether or not recorded as such. If so, one contributing factor to preoralization could be the tendency to initiate more slowly a long gesture (Smith 1992), in this case velum lowering. Preoralization would in part result from the fact that the initial portion of the long closure tends to remain oral. More significant are, as noted, the instances of preoralization accompanied by prestopping of laterals. They indicate that the primary phenomenon is not assimilation of the nasal to the orality of the vowel: an account based [-nasal] spreading will not extend to the lateral cases. Rather, what unifies preoralization and prestopping is (non-assimilatory) obstruentization. Why are stressed codas obstruentized? Edwards and Beckman (1988) suggest that stress induces a hypercharacterization of the sonority contrasts within the syllable: in this case, the sonority contrast is being exaggerated by turning the coda consonant into an obstruent. A related factor may be the tendency to strengthen (i.e. reduce sonority) of geminates. In the cases discussed here, the obstruentization is only partial and affects the essential portion of the geminate stop: its closure. Instances of full geminate strengthening include the Berber stopping of geminate fricatives (θθ -> tt, ĉĉ -> kk) and the North Germanic, and Fula stopping of geminate glides (yy -> ggy, ww -> ggw).

What is then the statement of preoralization? We take the central phenomenon to be obstruentization and write (27): the long (moraic) closure of a sonorant loses its association to the features that render it a sonorant, chiefly [nasal] and [lateral]. The sonorancy-inducing features remain associated to the (non-moraic) release, probably as a means of ensuring that the underlying features will be recoverable in the phonetic output. This recoverability clause explains the restriction to nasals occurring in prevocalic or word-final position, i.e. a position where they may preserve their release. Obstruentization of an unreleased nasal -
a plain A₀ linked to [nasal] - would necessarily eliminate [nasal] from the representation.

(27) \[
\begin{array}{c}
\text{sonorant} \\
\downarrow \\
A₀ \ A_{\text{max}} \\
\end{array}
\mu
\]

Language specific restrictions will have to be added to (27), in the form of parameters such as: (a) Does the rule apply to laterals? (b) Is it limited to coronals? (c) Does it affect underlying long sonorants only or also sonorants lengthened derivationally? But the core of the phenomenon can be securely identified as the loss of sonorancy in the coda. This is not orality assimilation.

7. Conclusions and speculations

Having disposed of all reasons to maintain [-nasal], we conclude that phonetic orality does not possess a phonological mark.

Why doesn't it? Other articulatory dimensions - such as the tongue root movement <³⁵>, the ab ducted or adducted position of the vocal cords <⁴>, and many others - have at least two corresponding phonological values. Let us compare only nasality, the clearly privative feature, and tongue root movement (ATR) <⁵>, the clearly equipollent one. We note that there exists a correlated difference in markedness patterns between them: when we factor out enhancement relations - such as the role of nasality as an auxiliary feature in the voicing of non-continuants - [nasal] segments always imply the presence of the corresponding oral ones, in all segment inventories. In contrast, neither [+ATR] nor [-ATR] segments imply the other class cross-linguistically: either category may be found without the other, or both simultaneously in the same system (Ladefoged and Maddieson 1990). There is - pace Kiparsky 1985, Archangeli and Pulleyblank 1989 - no reason to assume that tongue root advancement is the marked or the unmarked position relative to tongue root retraction. Advancement or retraction may be unmarked when in combination with other features - such as height - but not by themselves. This is not the case with nasality: as noted, nasal sounds always imply the corresponding oral ones.

We may hypothesize then that features like nasality - and others, such as those listed in (4) above - display context-free markedness because they are privative. And, correspondingly, that features like ATR - whose values may be marked or not only in combination with other feature values - lack context-free markedness because they are equipollent. It remains to understand why distinctive features might differ in such ways.

The observations made here suggest the following conjecture: there exists a neutral position, in the sense of SPE (Chomsky and Halle, 1968:300). Gestures involving a deviation from the neutral position carry a linguistic mark, i.e. a feature specification. Absence of deviation along some dimension results in absence of specification for the corresponding feature. Some articulatory dimensions are inherently asymmetric, in that only one perceptually salient deviation from the neutral position is possible: the example discussed here has been velum lowering or, equivalently, nasal airflow. Other possible examples may be lip pursing, which corresponds to the arguably privative feature [round]
Other articulatory dimensions are inherently symmetric, in that the neutral position is so located as to permit two opposite deviations: the tongue root may be neutral, advanced or retracted, the tongue body may be neutral, backed or fronted. Since two distinct deviations from the neutral position are possible, the relevant articulatory dimension corresponds to two equally marked feature values. Tongue root retraction and advancement should therefore correspond to two marked specifications, say ATR and RTR. Markedness can be equated then, in the articulatory domain, with deviation from this yet to be defined neutral position. Phonologically speaking, markedness is encoded simply by assigning the articulation that deviates from neutrality some corresponding feature. The unmarked articulation carries none.

Footnotes

<1> I cannot do justice in this paper to a number of alternative hypotheses about the role of markedness in phonology. I list them, inviting the reader to infer from the following discussion why they are not being explored further. One possibility is that [-nasal] is an available feature value, but that it is unmarked relative to [+nasal]: one could hypothesize that only marked values give rise to assimilation/dissimilation. A related possibility is that [-nasal], the unmarked value, is absent in underlying representations precisely because it is unmarked (cf. Kiparsky 1985 on this connection between markedness and underspecification): perhaps long-distance assimilation and dissimilation apply to relatively early, maximally underspecified stages in the derivation, where [-nasal] is absent. This assumption, however, makes it almost impossible to detect the active presence of [-nasal] in the phonological representations: it then becomes imperative to show that [-nasal] values are needed at all. With respect to the absence of orality dissimilations, one may also consider the applicability of Ohala's (1981) general scenario for dissimilation to sequences of oral segments: perhaps listeners will seek a non-local source for a given feature value only when that value is marked and hence unexpected. If [-nasal] is the unmarked value, no listener will need to assume that a given sound is [-nasal] by assimilation to some other sound, since [-nasal] is the a priori expected value. All these hypotheses bank on the markedness difference between [+nasal] and [-nasal], but leave unexplained the central issues: How is the difference in markedness between nasality and orality encoded in representations? If orality is unmarked why is it represented at all? What is the effect of markedness on rules: why should only marked features spread or appear underlyingly? Further discussion of this subject appears in Steriade (forthcoming).

<2> Kaingang and Apinayé (Anderson 1976 and refs. there) are not instances of a phonological process turning ama into a^b^ma. These are languages with distinctively nasal vowels where the prestopping of m after oral vowels is an instance of "environmental shielding" (Herbert 1986): the nasal gesture is phonetically delayed to prevent a coarticulatory effect on preceding vowel. A coarticulatorily nasalized vowel will jeopardize, in such languages, the contrast between lexically oral and lexically nasal vowels. Guarani falls into a distinct class of cases, since only its stressed vowels can be nasal: the lexical contrast between nasal and oral vowels is safeguarded in Guarani too, as nasal harmony applies only within the foot. Further analysis of Apinayé and Kaingang nasality appears in Steriade (1992).


<5> ATR is a misnomer for this feature, since it refers to advancement only. So is the alternative RTR or CP (Constricted Pharynx). The right name would be TRM: tongue root movement. I continue to employ standard terminology, so that references to other linguists' works will be intelligible.

References


Avery, P. and K.Rice 1989 Segment structure and coronal underspecification. Phonology, 179-201


Court, C. 1967 A Distinctive feature analysis of phonemes in Mentu Land Dayak. Phonetica 17, 193-202

Edwards, J. and M.Beckman Articulatory Timing and Prosodic Interpretation of Syllable Duration. Journal of Phonetics, 45, 156


Kiparsky, P. 1985 Some consequences of Lexical Phonology. Phonology
Ladefoged and Maddieson 1990 Vowels of the world's languages. Journal of Phonetics 18, 93-122


Poser, W. 1981 Nasal stops and nasal fricatives, ms. MIT.


Rivas, A. 1975 Nasalization in Guarani. NELS 5, Harvard University, Linguistics Dept.


Steriade, D. 1987 Redundant values. in A. Bosch, B. Need and E. Schiller (eds) Papers from the 23rd CLS: Parasession on Metrical and Autosegmental Phonology, University of Chicago.


Steriade, D. (forthcoming) Underspecification and markedness. ms. UCLA.


Zsiga, L. 1992 A mismatch between morphological and prosodic domains. Phonology, 9, 101-135
THE CONFLICT PROMISES/THREATENS TO ESCALATE INTO WAR

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1. Introduction

As has been shown by Verhagen (1991, 1992), promise and threaten can be used epistemically, as in Tomorrow promises to be a fine day: "Promise is construed here as an evaluation (on the part of the conceptualizer) of the applicability of the predicate 'to be a fine day'. That is, promise does not provide any information about the subject independent of the rest of the sentence" (Verhagen 1991) (put another way, we could say that promise and threaten have become subject-to-subject raising verbs). Verhagen discusses sentences like The incident threatened to destroy his chances, and shows that the equivalents of epistemic promise/threaten in Dutch (beloven/ dreigen) require OV (subordinate) word order in the complement, whereas their epistemic counterparts require VO (main clause/coordinate order). He assumes that both verbs are identical except with respect to the evaluation, and that both arose from earlier illocutionary uses.

My primary purpose here is to show that the verbs are not identical and that the epistemic meanings did not arise directly from illocutionary uses of these verbs. I will also briefly suggest that promise and threaten show evidence of some changes typical of those associated with grammaticalization.

Promise and threaten are usually thought of as commissive verbs. For example, the only difference between threaten and other commissives like promise, vow, pledge, guarantee, according to Palmer (1986:115), "seems to be in what the hearer wants". However, while promise can be used performatively, threaten cannot (Searle 1979). In a comment that anticipates speech act theory by some three hundred years, Hobbes noted: "though the promise of good, bind the promiser; yet threats, that is to say, promises of evil, bind them not" (1651, Leviathan, p.456). We may add that promises must be communicated, but threats and warnings need not (Sperber and Wilson 1986:145).

The epistemic meanings of both promise and threaten are non-illocutionary. In this respect, the development of promise and threaten is quite different from that of insist or suggest, which show a change from directive to assertive (epistemic) illocutionary
meaning, as in I insist that Kim go vs. I insist that Kim goes (Traugott 1989). What is the path to the non-illocutionary meanings of promise and threaten?

I will first give a brief sketch of threaten, since this is the older verb, and then go on to promise.

2. Threaten: a historical sketch

Threaten has persisted from Old English (OE) on in the sense of "intend to inflict something negative on someone" (the OE form is usually _preatian; the OED cites it through the beginning of the twentieth century; _preatnian (with -n) was rare till Middle English. It occurs intransitively (unergatively), and with nominal object complements, with non-finite to-complements, and with finite that-complements.

From OE till the 19th century there was a meaning "force, torment", which will not concern us here, except to note that the forcing can be verbal or non-verbal as in (1):

(1) ᵇu ᵇeast and bregst ᵇa ᶡoda ᵇe us ᵇreatigaš
you harass and terrify the nations that us threaten
(850-950 Paris Psalter p.15 [HCET])

Stage 1. The first stage of relevance to us is the use from OE on of threaten in the sense "signal intention of inflicting something negative" (often, but not always illocutionary). (2-3) have nominal objects, (4-5) have non-finite complements, and (6) has a finite complement:

(2) On wuda wildeor wordum _preatast
In woods wild-beasts words-Dat rebuke-2sg
'You rebuke the wild beasts in the woods with words'
(c 1000 Ags, Ps (Th) lxvii. 27 [OED])

(3) Mid word he _pretneþ muche & lute deþ in dede
With words he threatens mucho & little does in deed
(1297 R. Glouc. (Rolls) 9383 [HCET])

(4) wyrde...œ oft _reatap œa yflan to witnianne
fate:Dat...that often threatens the evil-ones to punish
(c.880 Boethius 40) [HCET]

(5) for which they are both confined in separate prisons and are threatened to be treated with rigour
(1760 Knox [ARCHER])

(6) and to threaten her that I will have her hanged
(1593, Gifford, Witches B1V [HCET])
Stage 2 involves the development in the 16th century of an epistemic meaning characterized in the OED as "portend, presage", with nominal object complements only. This is a non-intentional, non-commissive use. In (7-10) the subject is construed as the source of the threat, i.e., it is an argument of the predicate.

(7) This fire was the more terrible, by reasons it was in a conspicuous place, and threatened danger unto many, and was altogether unapproachable for remedy

(bef. 1627 John Hayward Annals of the 1st 4 yrs of Elizabeth's Reign p.87 [HCET])

(8) the house of STUART is an inconvenience of a much deeper dye, and would threaten us with much more dismal consequences

(c. 1650 Hume: ESSAY Pt. 2 E. 15 p. 478)

(9) The Turks retake Belgrade by storme putting all to the sword, & repassing the bridge at Esseck, with the successe of Tekely, threaten a reverse of their hitherto unprosperousnesse, & this, as too apparent by the tretchery of the Jesuites

(bef. 1689-90 John Evelyn, Diary, p. 932 [HCET])

(10) The croupous symptoms had appeared early and gone on rapidly so that suffocation was threatened.

(1864 Spen [ARCHER])

Stage 3 involves the development in the 18th century of non-intentional epistemic uses with non-finite complements. Syntactically, this can be regarded as the shift from control to raising verb status. The syntactic subject is no longer the source of the threat. Rather the speaker views the proposition as likely, and evaluates it negatively:

(11) I am sometimes frightened with the dangers that threaten to diminish it [my estate]

(1780 Mirror No.81 [OED])

(Note the presumed equivalence of the passive typical of raising verbs: My estate threatened to be diminished by the dangers; contrast the presumed non-equivalence of She threatened to turn him out of doors, He threatened to be turned out of doors.) More recent examples are:

(12) ...the prevailing scarcity of corn, an evil that threatens to increase in consequence of the late inclement weather

(1802 Joh2 [ARCHER])
(13) a confrontation with Iraqi aggressors that threatens to escalate into war
(1991, UPI)

(14) the hapless, aggrieved house-husband threatens to become as rigid and unexamined a comic invention as the grotesquely intrusive mother-in-law once was
(1992 Independent [HECTOR])

The development of raising threaten, and, to anticipate, promise, cannot be reduced to a generalization to inanimate subjects; if it were, (14) and the hypothetical utterance in (15) would not be ambiguous:

(15) Marianne threatens/promises to be a good President.

3. Promise: a historical sketch

Promise etymologically is derived from the past participle of Lat. pro-mittere "send forward".

Stage 1. Promise was borrowed into early 15th century English from French as an illocutionary and performative verb meaning "give verbal assurance of". It is future-oriented; and it implies that what is assured is advantageous to the persons being assured. It can be intransitive (unergative). Example (16) has a nominal complement, (17-18) have non-finite complements, and (19) has a finite complement.

(16) and there asked hym a gyffe that he promised her whan she gaff hym the swerde
(bef. 1470 Works of Thomas Malory p.48 [HCET])

(17) And promised Kyng Herowde without delay
To come ageyn by hym--this is no nay
(c.1500 Digby Plays p.97 [HCET])

(18) his pardon was granted him, and a lettar written to him from my counsel, in wich he was promised to be considered and holpen
(1550 Edward VI Diary Vol.2 p.476 [HCET])

(19) And I beseech your Grace to promise to his Highness for mee that I will not onely fill my pockeits with papers...
(1570-1640 Official Letters 2 p. 156-7 [HCET])

Stage 2 involves the development in the later 15th century of an illocutionary (and performative) epistemic use of the verb. This is assertive, unlike any of the other uses of threaten and promise with sentential complements. It is present- (NOT future-)
oriented. Many examples occur in parenthetical clauses, but others occur with zero-that complements, as in (22):

(20) He losythe sore hys tyme here, I promise yow
     (1469 Paston Lett II.349 [OED])

(21) Out on it, says the king, that is the foulest, for hee is dutty up to the elbows. I, sayes Will; but then he washes him cleane againe, and eats his meate cleanly enough, I promise thee
     (1608 Robert Armin, Nest of Ninnies p.45) [HCET]

(22) I promise thee nourse I favour her
     (1566 Udall, Roister Doister [HCET])

Stage 3, starting in the 16th century, involves nominal complements only. This use is epistemic, but unlike Stage 2, it is non-illocutionary, non-volitional, and future-oriented. It means "give pre-indication of NP":

(23) "Yf any man all this can gett, shall he haue the greatest felicite, shall he fynde her in these [honor, glory, pleasure] that we haue shewed you, promise more than they give?"
     (1593 Queen Elizabeth, Trans of Boethius p.57 [HCET])

(24) the Title of this Paper promising some Experiments about the Production of Electricity, I must not omit to recite...
     (1675-6 Boyle, Electricity and Magnetism p. 20-1 [HCET])

(25) As the morning promised a fair day we set out
     (1784 Muhl [ARCHER])

(26) The largest gathering ever of world leaders this weekend promises tactical headaches, gridlock nightmares and a whopping overtime bill for the Big Apple's police department
     (1991 UPI)

Stage 4. By the early 18th century non-finite complements appear with epistemic, non-illocutionary promise. The data suggest that at first promise in these constructions means much the same as give promise of, hold promise for, etc., and that complements are limited to inchoative ("become") events. This is the "give pre-indication that S" sense:

(27) He promised to be stout when he grew up
     (1722 Defoe [OED])

(28) As poor Jane promises to be pretty, she may be married off my hands
     (1832 Bulw [ARCHER])
(29) Congressmen on both sides of the aisle, backed by Bush, revived what promises to be a divisive drive for a constitutional amendment to ban flag burning.

(1991 UPI)

Note that the subject seems to have at least some semantic relation to the verb: there is "something about" the baby that suggests he will grow to be strong (27), something about Jane that suggests she will grow to be beautiful (28); there is something about the drive that promises to be divisive (29). However, the judgements are not entirely clear, and one cannot use passive tests here.

At Stage 5, which starts in the late 18th century, the "give pre-indication that" sense is used to introduce complements with non-inchoative copulas and action verbs. The argument relationship of the subject to the predicate is either demoted or non-existent, in other words, the syntactic subject-to-subject raising structure is more prominent:

(30) The Capitol promised to be a large and handsome building, judging from the part about two thirds already above ground.

(1795 Twin [ARCHER])

(31) the Pet Shop Boy's tour promises to be orchestrated with an imagination and attention to detail that makes most of their competitors look positively pedestrian.

(1992 Guardian [HECTOR])

(32) Today promises to be hectic in the markets.

(1992 Independent [HECTOR])

(33) The issue of Frank's homosexuality promises to play a prominent role in the forthcoming House battle over the level of severity of the sanctions.

(1991 UPI)

The development of epistemic promise provides further evidence that an absolute distinction between control and raising verbs cannot be maintained (as suggested already in Dowty 1985)--the distinctions between Stages 4 and 5 are simply too fine-grained. The examples also show further evidence of increased subjunctification over time, in other words, meanings (or at least modal-type meanings) become increasingly based in speaker point of view (cf. the change from motion verb to future (e.g. be going to), temporal to concessive (e.g. while) and the
development of scalar and stance particles (such as even, let alone, precisely) (for a summary, see Traugott 1992).

4. Summary of the changes
The changes sketched so far are summarized in Table I. All stages, once started, continue in existence.

<table>
<thead>
<tr>
<th>THREATEN</th>
<th>PROMISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>OE 1) +Illoc-E+F+Cont+OBJ+/NFC</td>
<td>1) +Illoc-E+F+Cont+OBJ+/NFC</td>
</tr>
<tr>
<td>LME</td>
<td>2) +Illoc+E-F+Cont-NFC</td>
</tr>
<tr>
<td>ENE 2) -Illoc+E+F+OBJ</td>
<td>3) -Illoc+E+F+OBJ</td>
</tr>
<tr>
<td>EPDE 3) -Illoc+E+F-Cont+NFC</td>
<td>4) -Illoc+E+F?Cont+NFC[+inc]</td>
</tr>
<tr>
<td>PDE</td>
<td>5) -Illoc+E+F-Cont+NFC</td>
</tr>
</tbody>
</table>

Legend:
OE = Old English (650-1125)  
LME = Late Middle Eng (1400-1470)  
ENE = Early New Eng (1470-1710)  
EPDE = Early Present-Day Eng (1710-1800)  
PDE = Present-Day Eng (1800-)
Illoc = illocutionary verb  
E = epistemic  
F = future-oriented  
Cont = control verb  
Inc = inchoative  
+OBJ = object nominal comp  
+NFC = non-finite comp clause  
-NFC = finite comp clause

TABLE I: HISTORY OF THREATEN AND PROMISE

The crucial step in the development of the epistemic constructions appears to have been the development of the "pre-indication/portend" sense with non-sentential complements (Stage (2) for threaten, Stage (3) for promise). In the case of promise, the development of the assertive sense (Stage 2) seems to have been coincidental to the development of the raising verb sense since threaten did not undergo such a change. Note also that the assertive has no constraint on the predicate, other than a general pragmatic one of making sense in the world, whereas promise in
the raising sense requires the complement to be inchoative at first).

The particulars of change outlined here do not support easy assumptions about syntactic reanalysis from a control to a raising verb, but rather suggest a fine-grained path of semantic change via loss of intentionality (first in the environment of non-sentential complements). The semantic changes involved are entirely consistent with two well-known changes: a) the shift from deontic (or at least non-epistemic) meaning to epistemic meaning, as evidenced by the English modals (e.g. the must of obligation) (Bybee and Pagliuca 1985, Sweetser 1990), directive speech act verbs (e.g. insist that X do Y) (Traugott 1989), manner adverbs (e.g. probably, precisely) (Hanson 1987); b) the shift to greater subjectivity mentioned above. These fine-grained semantic changes precede and motivate above. These fine-grained semantic changes precede and motivate the syntactic changes.

5. Evidence for grammaticalization

Given the evidence so far, we might conclude that the two verbs have simply become subject-to-subject raising verbs like appear, seem, tend, be likely, and so forth. But there is evidence that they are losing their main verb characteristics and show incipient grammaticalization. Grammaticalization is the process whereby lexical items and constructions come in certain linguistic contexts to serve grammatical functions, and once grammatical then come to serve even more grammatical functions (Hopper and Traugott 1993). Loss of categoriality, initially semantically, and then syntactically, is a prime criterion for grammaticalization.

Like other raising verbs, e.g. seem, and modals, raising promise (and sometimes threaten) cannot coocur with progressive aspect.

(34) a. Marianne is promising to be a good president (locutionary)

b. Marianne promises to be a good president (epistemic)

Since the subjects of subject-to-subject raising verbs have no semantic argument relationship to them, and in general do not allow progressives, it may be that all subject-to-subject raising verbs are potentially seeds for grammaticalization.

Be that as it may, epistemic promise and threaten differ from other full lexical raising verbs like seem, appear, in that they...
occur with epistemic modals only, while full lexical verbs occur with both root and epistemic modal auxiliaries Thus (35-7) are ambiguous:

(35) She **must appear** to be a good attorney
    i) so that we can expose them (a Portia-like situation; root)
    ii) or she would not have been so successful (E)

(36) The confrontation **may appear** to escalate into war
    i) so that we can persuade Bill to declare war (root)
    ii) but it's not doing so (E)

(37) She **must promise/threaten** to be a good attorney (control only)
    i) the law requires it
    ii) everyone is so scared of her

However, in the raising verb meaning, the modal auxiliaries are understood as epistemic only:

(38) Marianne **must promise** to be a good President
    or the voters wouldn't have supported her so overwhelmingly (something a Martian might conclude; E)

(39) The house-husband **may threaten** to become a stereotype
    i) but we'll put an end to that
    ii) *I'll permit that

Where an auxiliary modal precedes another modal or a quasi-modal, the first must be epistemic (Shepherd 1981):

(40) a. She **may have to/need to** visit her uncle
    b. You **might ought to** tie that tree from the other side

(Butters 1973:277)

The restriction on cooccurrence with modals suggests that **promise** and **threaten** are losing even more categorical properties than other subject-to-subject raising verbs such as **appear, seem, tend,** etc. Loss of categoriality, initially semantically, and then syntactically, is a prime criterion for grammaticalization. It appears that **promise** and **threaten** in their epistemic senses are potential additions to the growing list of examples of grammaticalization in progress in English (see Thompson and Mulac 1991 on the development of epistemic parenthetical I think, Romaine and Lange 1991 on the development of like as a marker of indirect speech and thought).
ACKNOWLEDGMENTS

Thanks to Arie Verhagen for drawing my attention to the topic of epistemic promise and threaten, and to members of the Stanford Historical Workshop group for comments on an earlier version of this paper, especially to Paul Kiparsky, Peter Sells and Whitney Tabor.

CORPORA

The computerized corpora used for this study are: a) for the earlier periods (750-1710) Diachronic Part of the Helsinki Corpus of English Texts (abbreviated HCET), courtesy of Matti Rissanen and Merja Kytö; b) for the later periods (1650-1990) A Representative Corpus of Historical English Registers (ARCHER), courtesy of Douglas Biber and Edward Finegan; c) for contemporary English the HECTOR Corpus, part of the Oxford Corpus of British English, courtesy of Susan Atkins, and a corpus of 1991 United Press International (UPI) press releases, courtesy of Academic Text Services at Stanford University.

REFERENCES


PARASESSION:
SEMANTIC TYPOLOGY
AND SEMANTIC UNIVERSALS
ON THE SEMANTICS OF POLYSYNTHESIS

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UMass (Amherst)
BLS 2/13/93

I. Preliminaries.

The basic question I want to pursue here is this:

a) What differences, if any, are there between the kinds of meanings that
are expressed in the grammar of words and the grammar of phrases?

Or more succinctly: Where do languages express what? We will pursue this
question in the context of a traditional typology that characterizes languages
according to the number of morphemes that can go into individual words. We'll
first explore a bit a number of ways in which languages (and subsystems of
languages) can be "polysynthetic," and then narrow our focus to a manageable
subpart of this large topic, looking at some of the kinds of meanings that are
expressed in lexical and grammatical affixes in a few languages.

Let me first give the word to Edward Sapir:

An analytic language is one that either does not combine concepts into
single words at all (Chinese) or does so economically (English, French).
In an analytic language the sentence is always of prime importance, the
word is of minor interest. In a synthetic language (Latin, Arabic,
Finnish) the concepts cluster more thickly, the words are more richly
chambered but there is a tendency, on the whole, to keep the range of
concrete significance in a single word down to a moderate compass. A
polysynthetic language, as its name implies, is more than ordinarily
synthetic. The elaboration of the word is extreme. Concepts which we
should never dream of treating in a subordinate fashion are symbolized by
derivational affixes or "symbolic" changes in the radical element, while
the more abstract notions, including the syntactic relations, may also be
conveyed by the word. A polysynthetic language illustrates no principles
that are not already exemplified in the more familiar synthetic
languages. It is related to them very much as a synthetic language is
related to our own analytic English. The three terms are purely
quantitative -- and relative, that is, a language may be "analytic" from
one standpoint, "synthetic" from another. I believe the terms are more
useful in defining certain drifts than as absolute counters.

Edward Sapir (1921: p. 128 [paper bound
edition])

We'd better replace 'concept' or 'idea' in such characterizations by
'morpheme' or 'morphological operation.' Consider for example this Westcoast
(Nootka, Nuuchahnuatl) root and its gloss as given in Sapir and Swadesh (1939:
256):

1. ṣyaḥ- 'to shout in a prescribed manner in the woods as a daily morning
practice for a mother of twins for a year after their birth'

Although simple words formed from this root surely contain a lot of concepts,
I doubt if Sapir would take this root to exemplify polysynthesis. In his
Language (141 f.) he discusses words like the following in the context of
the typology I'm invoking, again from Westcoast (my retranscription):

2. ?inikwil'm'inih?isita 'several small fires were burning in the house'

   analysis: (forms from Sapir and Swadesh, 1939)
   ?ink(') 'fire; burning'
   '-it('),m..... 'in the house, on the floor'
   -?inh plural [incremental suffix]
   -?is, -?ic- diminutive [incremental]
   -(m)it [?] past [incremental]
   - ma?; -a (with past -(m)it) (? for variable vowel marking) 3p indic

Probably everyone would accept this example and the language from which it is
taken as bona fide examples of polysynthesis.

So we have:

   analytic - one morpheme or morphological operation per word
   synthetic - more than one morpheme or morphological operation per word
   polysynthetic - many morphemes or morphological operations per word

Given this general comparative attribute of the analytic-synthetic
dimension, there are still lots of different ways in which languages can
exhibit polysynthesis. One way relates to the relative independence of the
elements that go into a complex word. If the elements are all more or less
free forms (or closely related to free forms, perhaps roots or stems) we have
what is usually called compounding. People don't usually include compounding
under the heading of polysynthesis. For example, Chinese is usually adduced
as near the analytic extreme of the analytic - synthetic scale. Yet most
words in Mandarin Chinese are synthetic, as a perusal of a modern dictionary
will confirm. It's just that the pieces of the complex words are usually free
forms or potential words, and the language has a minimal number of
derivational affixes (just one, if I'm not wrong). So we have to amend the
traditional definition of synthesis (and polysynthesis) and restrict its
application to affixal or bound elements. For the rest of this paper I will
exclude straight compounding from consideration and concentrate on
derivational and inflectional synthesis, except for purposes of comparison.

Another important dimension rests on the distinction between inflectional or
grammatical markings on the one hand and derivational or word formation
processes on the other. Even if you don't accept a sharp difference in kind
between these two sorts of affixations and other operations (as e.g. di
Sciullo and Williams, 1987, do not) there is still a pretty clear difference
between elements on one end and the other of a scale from grammatical to
word-formational.

Finally, there is a different scale of comparison (and one that Sapir seems to
appeal to in the very notion of polysynthesis): from the concrete and specific
meanings to very abstract relations such as those encoded in typical
grammatical paradigms. The few linguists that I know of who have tackled the
basic question I started from -- where do languages express what? -- seem to
have looked at the question mainly with an eye on things on the grammatical
end of this scale (Bybee, 1985; Carlson, 1983).
For a space of possible meanings, I will take the structured universe of possible denotations standardly assumed in many model theoretic approaches, to wit:

3.  
   A: set of possible individuals;
   BOOL: truth values \{ \emptyset, 1 \} (possibly supplemented by some impossible objects);
   W: set of possible worlds;
   F: hierarchy of functions built out of the preceding.

As a matter of convenience, I will also assume a loosely categorial framework for our comparisons of the meanings of words and affixes. By way of illustration consider the following analysis of a short English sentence, which shows what I suppose to be the canonical external semantics of Nouns, Verbs, and Adjectives:

4.  
   Every __little__ dog __barks.\n   DET ADJECTIVE NOUN VERB
   \langle \langle e, t \rangle, \langle e, t \rangle, t \rangle \langle \langle e, t \rangle, \langle e, t \rangle \rangle \langle e, t \rangle \langle \langle e, t \rangle, \langle e, t \rangle, t \rangle, t \rangle

This example also serves to illustrate the Montagovian category system I'll follow for general meaning-types:

5.  
   e : entities
   t : truth values
   \langle b, a \rangle : functions from b-type things to a-type things

(Mostly, I'll ignore the intensional aspects of our theme, to be coded into categories using the further symbols either syncategorematically as in Montague, or as representing the further primitive category of possible worlds.) When I say "loosely" I mean that I will entertain the possibility that some functional categories are expressed as operations with possibly no direct segmental identity as pieces of an expression.

With these preliminaries given we can now consider some further questions:

b) How are the categories of subword elements or operations related to the categories of phrases?

That is, are the sets of meanings of phrases and words a subset or superset of those of parts of words, or are they incomparable, and if so do they overlap? An example of an affixal meaning that is never phrasal might be furnished by the subject-object portmanteaus that occur in quite a few languages (e.g. the transitive pronominal affixes of Iroquoian languages). An example of a phrasal meaning type that is never encoded into a single affix might be the meaning of declarative sentences (say of category \( t \), that of truth-values). As a part of this question, or closely related to it, is the question whether the relations among elements within a word show the same possibilities as those in higher, phrasal constructions.

Next, we might ask about semantic connections that might cross the word-phrase boundaries:
c) How are the interactions among the meanings of subparts of words and phrasal elements constrained?

For example, if there are scope-relevant elements within words to what extent can there be scopal interactions between these elements and elements at higher levels? Here also belong questions about words as anaphoric islands and so on. Note for example the limitations in English on the interpretations of sentences like (7):

6. Some animals are omnivorous. (≠ everything has some animal that eats it!)

Finally, let me mention a pervasive idea about (some) polysynthetic languages:

d) Are complex words in (some) polysynthetic languages just little (or not so little!) sentences?

This question is obviously related to previous ones. If the full range of structured sentence meanings can be encoded into words, then we would have to expect that the full range of meanings available for constructing sentences would be available below the word level. If only some limited set of such sentence meanings can be be reproduced morphologically then we have to ask just what the limitations of word-internal meanings (or means for combining them) are that lead to the constraints.

II. Some examples.

In the remainder of the time I have here I will present some exhibits of complex words and their parts. A number of my examples come from the North Wakashan language Haisla, spoken in Kitamaat, B.C. I wish to acknowledge gratefully the help that I have had from a number of members of that community over the years. I take all responsibility for misunderstandings and mistakes. Here's a general scheme to show the structure of words in Haisla:

Haisla: \( \text{EXT} (\text{ROOT}) \text{DerAff}^n \text{GrAff}^n \) \( (n = 0, 1, 2, 3, 4) \)

Here, \( \text{EXT} \) refers to some operation (including the identity operation) on a root to form an extended stem, as the basis for derivational suffixation. Items in the last place -- grammatical affixes -- might also be called clitics. To give some idea of the relative size of these various types of elements, there are about 1400 - 1500 roots, around 500 derivational affixes, and some dozens of grammatical affixes.

Haisla is syntactically VSO, exclusively suffixing, and is a prime candidate for a language with no lexical contrast between nouns, verbs, and adjectives. Boas (1947) remarks about the related Wakashan languages (Kwak'wala, Westcoast) and several other languages of the area on the relatively large number of lexical or derivational affixes.

To give some idea of the kinds of words that exist in Haisla, let's look at a few examples:

7. 'i'ksduqwia (s.v. in LR) : 'i̕k̓-sdú-qí-a bald eagle
The root *y'k (in LR's underlying form) means 'good, clean, bright' etc. +
-\[s\]du 'eye, color, appearance' (Boas 47.343: cf.239--) round
opening, eye, color) (/s/ absent after /lh/)
these two yield 'iksdu 'bright-colored, white' (one of a whole bunch of
color words based on -sdu) +
-qi(a) (morphophonemic rounding) means 'head'

Here are a couple more items with this suffix:

8. lhamwemec'uaqiaala have a headache
(-c'ua means 'inside', the stem means 'hurt'), but the combination -c'uaqi(a)
seems to also mean 'head' and not just interior of head (as we might expect
with 'hurt'), cf. mexc'uaqia 'punch (mexe-) sb. on the head. Note: in the
spelling I'm using here, e = e, many of these schwas are epenthetic.)

9. Xuc'eqia close hair cut (mallet head) (Xuc' mallet)
10. 'um'aseqia (have a) big head (LR)
(the final element is the 'terminal' -- a that often rounds off words with no
apparent meaning and under mysterious circumstances, cf. Boas,1947.308 f. and
elsewhere).

There is a formal contrast between a word like the last example and a phrase
like the following (this is 'um'as -s hixt'i) with a 'connective' --i.e.
syntactic -- -s).

11. 'um'mac hl'xt'i 'big head'

Note that there is no connection between the independent word for 'head' and
the suffix -qi(a). In general this is the case for the derivational suffixes.
Haisla has no compounds. Note further, however, that the original word for
bald eagle that we started from is a typical kind of compound (bahuwrihi) in
its meaning.

Words and sentences:

The next example shows that the there are words that can express an entire
sentential meaning.

12. keta'tinugwutl(a) 'I'm gonna shoot you'
   ket- 'shoot' -(a)tl Future, -nugw(a) 'I' -utl 'you'

Note that the last two elements are grammatical affixes or clitics. In
general, there is complementary distribution between these pronominal clitics
and full NP's. I conclude that Haisla is not a pronominal argument language in
the sense of Jelinek, 1984.

Relations among formatives?

Wordbuilding in Haisla is accretional, in general. In accordance with what we
might call 'Frege's projection principle' (functions need arguments) and in
the categorial framework I'm assuming, affixes will be functors and will be
interpreted as functions:
Function (affix), argument (stem)

By function composition, many affixes are conventionally combined into complex affixes that can and do then acquire noncompositional or idiomatic meanings (compare -c'uaqI(a) 'head' above).

There has been a great deal of discussion of 'incorporation' (note scare quotes) in recent generative literature (Baker, 1988; Sadock, 1991). Accordingly, research on the more special semantic/syntactic relations among the elements of complex words has laid heavy stress on argument structures. In Haisla, there is no incorporation and in general the affixes never seem to encode the primary arguments of stems. There is no incorporation, perhaps because there is no compounding. (See Sapir, 1911.)

The basic semantic relation that is encoded by lexical suffixes is that of an adjunct or optional modifier to its argument. Here are some examples of two of the popular kinds of affixes, locational and somatic.

Adjunctive relationships:

[-SUF : softening, voicing]
[-!SUF : hardening, glottalizing]

-\1lh  'inside, in house'
-\ls  'on field or beach'
-\Rs  'in boat or vehicle'
-\bt  'in(to) hole'
-\t\Xd  'on(behind), buttocks'
-\[x]s\ls  'on foot, lower leg'
-\Xd\la  'on back'
-\Xina  'on shoulder or upper arm'

As I try to indicate in the glosses, these items don't act as arguments of stems with verbal meanings (with an apparent exception I'll mention in a minute). If they did, then we would expect them to yield items with one less argument place when added to a stem (e.g. an intransitive from a transitive, for example). Instead they yield items with a narrower, more specific meaning of the same general type: e.g. men'e\Xd (< me\- and -!\Xd) means to punch someone on the behind). I believe the apparent exceptions to this, where a stem seems to impart an adjectival specification to a body-part for example, are in fact (like the 'eagle' word mentioned above) bahuvrihis. gel't'e\Xd doesn't mean 'long ass' but 'long-assed, tall.' This fact is sometimes obscured, I think, by translations like 'Long River' for Gelda'Ila (i.e. Kildala) a local place-name, which follow English rather than Haisla habits of nominal place naming.

There are functional (bound) roots, generally forming anchors for locational and somatic suffixes. We can think of these as type-lifted higher order functions taking fundamentally functional elements as arguments (just as in English, a word like treat wants to have a manner adverbial -- usually an adjunct -- as one of its arguments):

Functional (bound) roots:

\1'\u-  locative, place where:
   'u\xwina'  'shoulder'
   'u'bt\a  'hole'
'u'qwia 'head of an inlet' (cf. -qi 'head' above)

One area of special interest in connection with the relations between the meanings of word-internal and word-external syntax is quantification. Since I want to deal with this question elsewhere, I'll confine myself here to a couple of observations.

Quantificational meanings are expressed in both roots and affixes, as these examples show:

y'ay'uqwa'lh rain constantly (y'u'gwa 'rain, be raining')
q'íutl to catch a lot (q'í- much, many)

If words are just little sentences, we might expect the whole machinery of quantification to be expressible within word-grammar (including question formation and so on). It isn't, and I think this is generally true. (One way of looking at this within some theories would be to say that the maximal category in word grammar is VP or maybe IP, but never CP.) So there is no binding of variables within words (NB: I mean binder and bindee within a word), no WH-movement in words, no QR or whatever.

We have to be careful here: in general, words can contain all kinds of complex meanings. These meanings might include meanings that could be otherwise expressed by the formal machinery of quantification, but still we would not want to literally assimilate the words to this formal machinery (I assume). As an analogy: the word increase does not literally contain or involve the comparative constructions of English, even though it clearly involves ideas that could be expressed by comparative constructions: get, make bigger, more abundant.

I will close with some examples intended to show that the meanings of word-internal and word-external grammar are incomparable (although it's obvious that they overlap).

Here are some affixal meanings that are not possible meanings for phrasal constituents:

Lakhota etc. Instrumental causatives: 'cause to V by means of foot':
na- 'to cause with the foot x to V':
nawahomni 'l (wa-) turn it with my foot'
ka- '...by impact'
ya- 'with the mouth' (cf. English etc. Passive)

Incorporated common nouns? (Type-lifted CN's combining by function composition with e.g. transitive verbs to make functions from determiners to intransitive verbs, cf. Baker, Sadock and others.)

What about the opposite case: are there supra-word meanings that are not possible as meanings of subword elements? Here's a possibility.

Speaking from a categorial viewpoint, I assume that all affixes are functors. It then follows that none of the real argument categories of natural language can be encoded into affixes: that is: t, e, and on some views whatever the correct semantic type of common nouns is. But this is a very theory-internal
constraint, and given the flexible sorts of categorial systems that seem to be indicated for natural languages, it’s not clear that the constraint has much force. Clearly, there’s a lot more to be done in the area of semantic research I have tried to exemplify in this paper.

References.

A noun is a noun is a noun—or is it?

Some reflections on the universality of semantics

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1. INTRODUCTION. One of the central claims of cognitively oriented linguists, e.g. Dwight Bolinger, Anna Wierzbicka, Charles Fillmore, Ronald Langacker, George Lakoff etc., is the argument that different grammatical constructions that appear to be used to describe the "same" objective scene, construe or conceptualize that scene in different ways. Even differences attributable to purely grammatical processes, such as active vs. passive, dative shifted vs. unshifted clauses, and even the basic categories noun vs. adjective, appear to have a conceptual content, overlooked because they do not usually change the truth-conditional character of the description.1 These observations, which are central to the cognitive linguistic principle that even the most "syntactic" structure has a semantic-pragmatic value associated with it, have not gone unnoticed in everyday life. The commerical world has found it useful to reconceptualize used cars as preowned cars, and a beauty salon in Ann Arbor advertises one of its services as "hair color correction". On a more serious note, the periodic changes in the term used to refer to Americans of African descent over the past century represent a search for a new conceptualization of their identity as well as the avoidance of the connotations of the older term.

If we accept this hypothesis—a corollary of the principle of iconicity in language—as an accurate description of a fundamental property of language, then we must presumably accept its consequences if we are to believe in a coherent and consistent theory of language. And one of those consequences appears to be semantic relativism, a philosophical position that appears to be attracting more interest now than it has for some time. (Note that if one does not accept the hypothesis of differences in grammar or lexicon encoding alternative conceptualizations, then one cannot draw inferences about the relativity or universality of semantics from linguistic evidence.) This consequence has not gone undrawn by functionally and cognitively oriented linguists. For instance, Ronald Langacker, who has presented probably the most rigorous cognitive linguistic model currently in print, makes the following assertion near the beginning of his magnum opus on cognitive grammar:

'If one language says I am cold, a second I have cold, and a third It is cold to me, these expressions differ semantically even though they refer to the
same experience, for they employ different images to structure the same basic conceptual content' (Langacker 1987:47)

Now, such a statement seems to be quite in line with the hypothesis presented at the beginning of this paper, and not an unreasonable conclusion to draw. And in fact, many linguists (and anthropologists) who do not subscribe to cognitive grammar have made similar claims. Although on the face of it, it seems to be a fairly strongly relativistic position, it is hedged in certain significant ways, to which I will return at the end of this paper. But languages differ grammatically in more fundamental ways than in Langacker’s example. In fact, languages differ significantly in the basic constructions constituting clauses and phrases. This has led some linguists, such as Hans-Jürgen Sasse, to propose radically different syntactic analyses for the basic constructions of languages such as English, Tongan, Cayuga and Tagalog. Sasse makes clear that he considers the implications of his syntactic analyses of these languages to be semantic as well, and ends one of his papers on this topic with a strong statement of the relativist position:

‘...if there are differences in expression, there are also differences in meaning. This fundamental unity of expression and meaning defines meaning as language-specific and rules out universal semantics as a legitimate field of study’ (Sasse 1991:93)

Depending on one’s view of semantics, this may or may not be a dramatic or interesting claim. If one views linguistic semantics as independent of conceptual structure, then Sasse’s position would reduce to the assertion that linguistic semantic representations are language-specific, and in fact quite closely mirror morphosyntactic representations in that language. Such a view would say nothing about the relation of language to thought. But this is clearly not Langacker’s or, I suspect, Sasse’s view: they assume that “semantic structure is conceptual structure” (cf. Jackendoff), in which case Sasse’s assertion is a radical relativistic view of the relation between language and thought.

In this paper, I will argue that one can accept the hypothesis that different constructions for describing the “same” experience in a single language encode different conceptualizations of that experience and the hypothesis that semantic structure is conceptual structure, accept the existence of typological variation in language, and still consider universal semantics as a legitimate field of study. That is, the premises stated in the last sentence are not sufficient to draw the conclusion of (radical) relativism. Specifically, I will argue that there are hidden premises in the reasoning from the iconic principle to radical relativism; if we discard those premises by making certain reasonable assumptions about other aspects of language, then the radical relativist position does not follow automatically. In particular, if we assume the existence of polysemy, redundancy in expression, conventionalization, and the integration of variation and change into a speaker’s knowledge of language, then it is possible to believe in the possibility of universal semantics.

2. HIDDEN ASSUMPTIONS.
2.1. CONTRAST AND POLYSEMY. Let us begin with the example from Langacker regarding the three ways to express the sensation of coldness, illustrating more concretely with three languages that actually differ in that way:

English: *I am cold.*
Spanish: *Tengo frío.*  ['I have cold']
German: *Mir ist kalt.*  ['It is cold to me']

Langacker’s conclusion contains a hidden premise. There is an important difference between the within-language principle described at the beginning of this paper and the cross-linguistic inference drawn here from it. The within-language principle (particularly as espoused by Bolinger and Wierzbicka) depends critically on the notion of contrast: if two grammatical structures occur in the same language to describe the “same” experience, they will differ in their conceptualization of that experience in accordance with the difference in the two structures. But if two grammatical structures do not occur in the same language, and so no contrast exists in the mind of any particular speaker, does the same difference in conceptualization hold? Instead, whatever way the language has chosen—‘I am hungry’, ‘I have hunger’, etc.—is the only conventional way to express the experience, which I’ll group together as ‘states’ for short. So the speakers do not have available to them alternative ways to conceptualize the experience, and so it may not be the case that the conventional expression encodes any particular conceptualization.2

There is a response to this argument. The different ways to express cold, hunger etc. across languages do exist in the same language. For simplicity, let us stick to the first two possibilities, ‘I am cold’ and ‘I have cold’. Even if a language uses only ‘I am cold’, there will exist ‘I have X’ or the appropriate possessive construction in that language, which contrasts with ‘I am cold’. Conversely, a language using exclusively ‘I have cold’ will have ‘I am X’ or the appropriate predicate adjectival construction which contrasts with ‘I have cold’. The conceptualization is encoded by the constructions SBJ PRED ADJ vs. SBJ POSS OBJ—or whatever the predicate adjectival and possessive constructions are; these too vary considerably across languages. The conceptualization of cold, hunger etc. depends on whether it is categorized as the ascription of a property (the predicate adjectival construction) or as the possession of an object (the possessive construction).

There is another important hidden assumption here though. This assumption is that the semantics of SBJ PRED ADJ is identical to that of SBJ PRED STATE, and that the semantics of SBJ POSS OBJ is identical to that of SBJ POSS STATE.3 But polysemy is rampant in languages, especially among grammatical morphemes and constructions. It is at least as reasonable to assume that there is a semantic extension—metaphor, perhaps—from the adjective or possession experience to the sensation-of-a-state experience. And a polysemy analysis does not require semantic identity of related meanings, which would imply semantic relativity, but only the recognition of resemblance. And this does not necessarily lead to relativity, since our experience of internal states can simultaneously resemble both
our experience of physical properties and our experience of possession without any change in its conceptualization from language to language.

Before going on, let us summarize the alternative analyses in terms of postulated syntactic and semantic structures. In the analysis which lends itself to a relativistic interpretation, there is a single construction covering both states and the “basic” function of that construction (ascription of a property, possession of an object). Also, there is a single semantic structure, identical for both states and the other function; and the cross-linguistic variation as to which semantic structure is assigned to states leads to the strongly relativistic interpretation. In the alternative analysis, there are two uses of the construction, that is to say, the construction is polysemous.4 This may seem to violate the principle of “one expression, one meaning” that is the essence of iconicity, but another principle of cognitive linguistics repairs this particular problem. In cognitive grammar, and also in grammatical construction theory, there can be two separate constructions involved, one for states and one for the basic function of the construction, since constructions are autonomously stored elements in the mental representation of the grammar. The two constructions can also be subsumed under a superordinate category that covers both cases (and which can be, but need not be, given a unitary semantic conceptualization). These two variants are equivalent at the semantic level, because either one permits the possibility of two different uses of the same construction, which can differ semantically, and thus not require a relativistic analysis; the difference at the syntactic level will become relevant in section 2.4.

The less relativistic position is a reasonable view in this particular example, because ‘cold’, ‘hunger’, ‘fear’, etc. are not prototypical, either as members of the categories Noun and Adjective, or as types of predications (note the use of copula, possession, and impersonal constructions, all indicators of nonprototypical predicativity). The cross-linguistic variation in how they are encoded is one manifestation of their nonprototypicality as members of these lexical categories and as predications. One can argue that they share some conceptual properties with prototypical nouns and some with prototypical adjectives, without claiming that they are wholly conceptualized as one or the other. (Note the hedge, ‘wholly conceptualized’.)

However, this position does not seem to be so reasonable when applied to the prototypes themselves, that is, the basic constructions used for prototypical nouns and verbs, and their “projections”, phrases and clauses. Let us now turn to those examples and examine them more closely.

2.2. REDUNDANCY IN EXPRESSION. The first example I will describe, regarding nouns, illustrates another hidden assumption about how meaning is encoded in form that may reasonably be called into question. This is a claim that has been made about languages with numeral classifiers, that there are no count nouns, and “count” nouns are in fact “mass” nouns. In such languages, any noun in combination with a numeral must also have a classifier accompanying it (in fact, the classifier and the numeral form a constituent). In a number of classifier languages, demonstratives also require classifiers, and in a small number of languages, a classifier is found with a large range of modifiers.
In these languages, entities that would be expressed as mass nouns in non-classifier languages such as English also require classifiers. These classifiers are the equivalent of partitives or measures in English: *two pieces of bread, two cups of sugar*. There are also classifiers that are applied to "count" nouns that indicate groups or arrangements, the equivalents of *two flocks of sheep, three rows of trees*. But what differentiates such languages from English is the requirement of a classifying morpheme for phrases such as *three books, two women*; the following example is from Lahu (Matisoff 1976:98):

Lâhû nî  gà
Lahu two CLF.PERSON
'two Lahu'

This has led a number of researchers to argue that the apparent translation equivalents of 'book' and 'woman' do not refer to specific individuated tokens, but only to the undifferentiated types of 'bookhood' or 'womanness'.

Now, it cannot be argued that count nouns belong to a marginal category of nouns that happens to vary in its encoding across languages because it shares conceptual features with more than one neighboring prototype. Count nouns are generally taken to be the prototypical or paradigm class of nouns. Nevertheless, the same hidden assumptions required for the relativistic account of the expression of internal states also apply to the relativistic interpretation of classified nouns. As with the constructions for describing internal states, it is assumed that the classifiers for "count" nouns are the same syntactically and semantically as those for "mass" nouns. Although it is the same syntactic construction in question, it does not use the same classifiers, and it is possible to consider the count classifiers as somewhat different in their grammatical status and therefore also in their conceptual consequences. Greenberg has noted, for instance, that count classifiers are associated with particular count nouns, while there is no single classifier associated with particular mass nouns, since various part and measure classifiers are used with each classifier; and Berlin (1968) has noted that the "inherent" count noun classifiers have a somewhat special status in the classifier system of Tzeltal.

There is another assumption about the relation of meaning to form found in this example, however. The reasoning for the relativistic interpretation is that since individuation is encoded in the classifier, it is not encoded in the noun itself. This presupposes nonredundancy in expression: if semantic content is expressed overtly in one place, it is not encoded elsewhere. But evidence suggests that if anything, language is highly redundant in its communication of information. This is true in grammatical expression as well. One example of this is the phenomenon of modal harmony described by Jennifer Coates in her study of the English modals (Coates 1983). For some complements, the expression of irrealis modality does not necessarily follow from the semantics of the matrix verb; for these verbs, the use of a modal auxiliary in the complement contributes additional meaning to the complement. Other complement-taking verbs such as 'ask', however, do entail an irrealis modality for the complement. Modal auxiliaries come to be used with those verbs as well, even though their semantic contribution is "redundant". This is what Coates calls modal harmony: the modal in the complement is semantically
harmonious with the semantic requirements of the matrix verb. But we would probably not want to say of a language that employs modal markings in this way that the propositional attitude expressed by main verb is conceptualized as lacking a modal specification for the complement.

2.3. THE "SEMANTIC UNCERTAINTY PRINCIPLE". But there is a still more radical analysis of variation in the semantics of nounhood and verbhood, which we can examine in order to uncover a still more important assumption underlying the relativistic analysis. We will illustrate it from a recent article taking this position, the one by Sasse quoted above. Sasse argues that there are radical differences between the syntactic structures of certain non-European languages, such as the Iroquoian languages and certain Austronesian languages, and a "typical" European language. This can be illustrated by the following examples and glosses:

Tongan (Sasse 1991:79):

na’e ui ’a Sione
PRET call ABS/GEN S.

'It was calling of Sione.' [Sasse’s "literal translation"]
'Sione called/was called.'

Cayuga (Sasse 1991:84):

a- hó- hto’’ ho- tkwë’t -a’ nę:kyę  h-  őkwęh’
PAST- 3SGN/3SGM- lose 3SGN- wallet -NOM’ this 3SGM- man

'It was lost to him, it is his wallet, this one, he is a man' ['literal translation’]
'The man lost his wallet.'

Sasse argues that in the Tongan example, what Eurocentric types would call a "predicate" is really a verbal noun, that is, a referring expression, with a genitive dependent. On the other hand, in the Cayuga example, what we would call an "argument" is really a predication, in apposition to the "true" predicate ('it was lost to him'). Sasse thus argues that 'reference' and 'predication' (and the categories of 'noun' and 'verb' that are motivated by them) are expressed in radically different ways. Since he concludes the article with the passage quoted above, it is clear that this implies for him a radical difference in how events, objects etc. are conceptualized in these languages in contrast to each other and to European languages.

Sasse’s argument rests on the identity of the constructions involved for reference and predication in both Tongan and Cayuga. In Tongan, what one traditionally would call the absolutive marker is identical to the genitive (and the ergative, by the way, is identical to an oblique preposition, which can modify a noun as much as a "verb"), and at least in one case that he gives, the verb stem can also be used as a referring expression without any additional morphology. In Cayuga, what one would traditionally call the gender marker is identical with one
or the other of the “agent” and “patient” personal affixes of the verb, depending on the “noun” root, and so the “noun phrase” would presumably be identical in form to a predicate nominal construction. In fact, Sasse’s argument overlooks certain important differences between the “predication” and the “referring expression” in both languages—there is a tense-mood auxiliary in Tongan and a tense prefix in Cayuga, and Cayuga has a nominal suffix on one of the “NP”s. These critical differences in themselves suggest that the “predicate” and “subject” are in fact syntactically not the same despite some sharing of morphology (see Croft 1991, Chapter 2). Nevertheless, we will ignore these differences and examine the implications of the similarities.

And it is the assumption of similarity, or rather identity, that is the source of the most important hidden assumption in the argument. Not only is it assumed that the relevant grammatical elements in Tongan and Cayuga are semantically unitary in meaning, rather than being merely polysemous between a phrasal function and a clausal function—the hidden assumption discussed in 2.1 above. It is also assumed that the grammatical elements and/or constructions are invariant in meaning across languages: it is assumed that we can identify the genitive marker of Tongan with that of English and other languages, thereby demonstrating the “nominality” of Tongan clauses; and likewise identify the pronominal affixes of Cayuga with those of other languages, thereby demonstrating the “predicational” character of Cayuga noun phrases. The argument for the relativity of the lexical categories with respect to their functions in an utterance is based on the assumption of the universality of the grammatical constructions that encode those functions. But one could just as easily argue that it is the genitive relation that is conceptualized differently in Tongan, rather than the predication of an event expressed by the verb; and it is the pronominal’s relation to its head that is conceptualized differently in Cayuga, rather than the act of referring to the person or thing denoted by the noun. There is a kind of semantic uncertainty principle involved here: determining the relativity of the conceptualization provided by one element in a sentence can only be done by assuming the universality of an associated element in that sentence.

This argument also applies to the case of ‘cold’. The alleged difference in conceptualization of states/sensations can only be asserted by assuming the universal semantics of the predicate adjective and possessive constructions. One could equally reasonably argue that the predicate adjective and possessive constructions of Spanish differ conceptually from those in English. Likewise, the relativistic interpretation of nouns in classifier languages can only be asserted by assuming the universal semantics of partitive, measure and group expressions (as well as the identity of those expressions with “true” count noun classifiers).

Because of this, it is a priori undecidable where the semantic relativity lies in grammatical variation across languages. But we can get some sort of idea by taking a diachronic perspective on the problem.

2.4. GRAMMATICALIZATION AND CONCEPTUALIZATION. From a diachronic perspective, it is fairly clear what is going on in Tongan, Cayuga and other languages that Sasse and others have cited. We can begin with the Tongan example. There is a common grammaticalization path in which finite main clause morphosyntax—the morphosyntax of predication—historically develops from
nonfinite, particularly nominalized, constructions. In this process, the genitive form of NP dependents often gets carried over into the main clause construction, as the marking of one or the other or both of the core (subject and object) NPs, and the nominalized form of the verb also can get carried over into the finite verb form. This is presumably what went on in Tongan, and also in Jacaltec and Tagalog, which Sasse cites, and many other languages. Concomitant to this process, and often the driving force behind it, is the grammaticalization of finite verbs that originally governed these nonfinite or nominalized forms into auxiliary verbs. These auxiliaries often continue to bear the markings of finiteness, and thereby “deprive” the main verb of its predicational character, as in Basque, another “atypical” predicational type according to Sasse. Eventually, the inflected auxiliaries often affix onto the reanalyzed main verbs, as happened in Japanese and the Dravidian languages, and the verb regains its predicational characteristics. And a new genitive construction arises, or the genitive-become-subject-marker erodes, and so the verbal arguments no longer look like noun phrase dependents.

The Cayuga case is somewhat different. Presumably the pronominal affixes originated as independent pronouns that affixed onto the stems they are now found on. The question is what was their syntactic function when this happened, and how they spread through the grammar. It appears that the pronominal prefixes on verbs are older than those on nouns. In fact, the nominal prefixes are not completely identical to the verbal ones, and their identity is determined by the stem to which they are attached, in contrast to the verbal prefixes, which are determined by the agent or patient involved in the event. It is worth noting in this regard that the gender affixes of Bantu languages are similar or identical to the verbal subject and object affixes. The Bantu system resembles the Iroquoian one, though the Iroquoian system goes one step further in that the pronominal affixes are also possessive affixes; in Bantu languages, the pronominal affixes are possessive only in combination with a possessive root to which they are affixed. Nevertheless, it is worth pointing out that the Bantu languages are not usually represented as conceptualizing objects in a predicational fashion.

In general, the diachronic scenario is fairly straightforward: the morphosyntax of finite clauses often evolves from that of noun phrases; it is possible that the reverse also happens, or at least some parallel development can occur. The languages that have posed the interesting questions from the point of view of the semantic relativity hypothesis are those in which this evolutionary path is somewhere in the middle of its progress: clause and phrase share significant morphosyntactic features by virtue of one extending to the other, but no further evolution grammatically separating the two (through replacement, renewal or split) has occurred yet.

What is the significance of this diachronic perspective for the conceptual semantics that cognitive linguists associate with the basic lexical categories and the constructions that characterize them? The gradual character of grammaticalization suggests that the grammatical constructions involved are polysemous, acquiring new functions over time. Another argument in favor of polysemy is that these constructions may end up going separate ways. An ergative marker that arose from a genitive or an instrumental will develop grammatical peculiarities differentiating it from its source case, and phonological ones as well;
at that point, it reveals that it is no longer considered by speakers to be the “same” as its genitive or instrumental source, phonologically as well as semantically. These are examples of a split in grammaticalization, many examples of which are documented by Heine & Reh 1984. These phenomena can easily be modeled in the cognitive grammar/construction grammar model, which allows for the possibility that two constructions that begin as syntactically identical but diverge semantically at some point in time may no longer be perceived as identical by speakers; they become two independent constructions and will go their own way syntactically as well as semantically.

This is found in lexicon, morphology and syntax. But in general it is the semantic conceptualization of the denotation of the lexical item that appears to cause the change in its status, rather than a new grammatical construction causing a change in the conceptualization of the lexical root’s meaning. A lexical example, orthographically actually, is the split between flour and flower. They originally began as one word, a metaphor borrowed from French, and are now orthographically distinct, and I doubt that contemporary speakers of English mentally represent them as the same word. It is also likely that there was not a change in conceptualization of the cereal product during this time, but rather that awareness of the conceptual differences between the botanical entity and the cereal product led to lexical divergence. A syntactic example of the same thing is the fusion of the infinitival to and the perfective have in the quasimodals hafta, gonna, oughta, shoulda, musta, gotta, woulda. There is a syntactic reanalysis from a compositional Verb + to + complement or Verb + have + complement structure. At some point, these instances of the Verb + complement construction became cognitively autonomous from the more general infinitival and perfective complement constructions, and realigned themselves with the to-less auxiliary construction. This is manifested in the phonological erosion of to and have in the quasimodals. But I suspect that it was not because speakers reconceptualized the nature of the concepts encoded by those forms, but because the evolution of the meaning of those forms towards the tense-mood domain made the syntactic change to the “conceptually appropriate” auxiliary construction more likely. In other words, the conceptual structure is not dictated by the syntactic structure, but is in fact partly independent of it, and can cause changes in the syntactic structure to make the latter conform with the former.

Variation and change in grammatical structure suggests that it may not be the case that there are radically different conceptual structures for similar meanings, but that the form-meaning relation is often in a state of flux because of the complex analogies and differences between conceptual structures, which can be reflected in syntactic structures. Variation and change in linguistic structures in a single language suggest that the conceptualizations underlying different structures are not only not incommensurable, but also simultaneously available to speakers of a language at any given time. It also means that “new” conceptualizations, that is, ones not encoded by existing grammatical constructions, must be latent or immanent in speakers’ minds, since speakers innovate novel grammatical constructions that encode those conceptualizations. In fact, the “different conceptualizations” are unified in that they all belong to a single path of grammaticalization path (‘transitory category’ [Croft 1991] or ‘grammaticalization chain’ [Heine 1993]). More important, it suggests that the
relation between form and meaning (that is, between language and thought) is not as rigid as the quotations at the beginning of this paper appear to claim.

3. **Semantic Relativity and Semantic Universals.** What, then, do the observations in this paper suggest as a model for the relationship between language and thought? It suggests that human conceptualizations of various semantic structures encoded by language are not as radically different as the variation in grammatical constructions and their uses across languages appears to imply. Linguistic variation is the manifestation of common, in fact universal, evolutionary processes. These processes demonstrate that some conceptual structures that appear to be "radically different", such as those underlying reference and predication, must share some semantic features, and that those features motivate the extension of phrasal morphosyntax to clauses (and possibly vice versa). This is also true in the more prosaic case of internal states, which share characteristics with ascribed properties and possessed objects.

This is not to say that the universalist position is the last word on the matter. It only argues against a radical relativistic position, in which alternative conceptualizations are mutually exclusive semantic structures. All that I have said so far is harmonic with a view of semantic differences among languages described by Lakoff & Johnson (1980) with respect to the metaphors we live by, and by Langacker in a footnote shortly after the passage quoted at the beginning of this paper:

> [I]t is a matter of convention (not cognitive necessity) that scissors, pants, glasses, binoculars, etc. are plural in form (and largely in behavior)...The plurality of these expressions reflects conventional imagery: they highlight the bipartite character of the objects named, so the assumption that they are semantically singular is incorrect. Contrasting forms like nostrils vs. nose, buns/buttocks vs. ass/bottom, stars vs. constellation, etc. similarly construe the conceived entity by emphasizing either internal multiplicity or overall unity (Langacker 1987:47, fn. 28)

Construal (including metaphor) is a matter of shifting attention, of highlighting or emphasizing certain aspects of a complex experience at the expense of others by virtue of the linguistic form or metaphor chosen to describe it. The choice of a different grammatical construction, either by the same speaker in the same language on a different occasion, or by a different speaker in a different language, does not deny the speaker's awareness of the complexity of the phenomenon which is fully captured by neither construction. In fact, the speaker must have that awareness in order to choose or create a new linguistic form and thereby initiate a grammatical change. But the choice does influence the speaker's view of their experience, relative to the degree that a contrasting construction is available to encode the same or a similar experience.

This interpretation of semantic relativity fits well with the cases that have been the topic of this paper, the interaction of lexical roots ("content words") with the grammatical inflections and constructions that combine with them in phrases and clauses. It also fits well with another class of cases that have been proposed as candidates for semantic relativity. It has sometimes been claimed (e.g. by Whorf)
that cross-linguistic variation in obligatoriness of certain inflectional categories (particularly tense and number) reflects a different world-view regarding time and measure. It seems reasonable to propose that this is also a matter of difference in focus of attention. Research on the acquisition of spatial distinctions by Soonja Choi and Melissa Bowerman (Choi and Bowerman 1991) supports this view. Spatial features encoded in linguistic forms are learned earlier than ones that are not, and this varies depending on which spatial distinctions are encoded in language. This is presumably due to the fact that children’s attention is focused on those features obligatorily encoded in the language. But it does not follow that the children in either culture do not eventually gain awareness of the spatial distinctions not obligatorily encoded in their language.

Nevertheless, the cross-linguistic variation that has led linguists to postulate at least some degree of conceptual variation across individuals and cultures themselves fit into patterns that are universal. These patterns are manifested in individual speech communities by internal variation and change over time; in fact, the universal patterns appear to be ultimately dynamic in character. The existence of these patterns, underlying the fundamental grammatical categories discussed here as well as many other linguistic categories, call for an analysis of conceptual structures underlying language that reaffirms the universality of human mental abilities while acknowledging differences in the conceptualization of individual experiences.

1Ironically, part of the impetus for these observations arose from the interpretive semantic critique of generative semantics, when for instance it was shown that kill was not semantically identical to the surface construction cause to die.

2In fact, Langacker himself makes this point in the second volume of his major work on cognitive grammar: in considering the semantic differences in encoding the causee of a causative construction using the accusative vs. an oblique (dative or instrumental case), he writes: ‘That is, it does so [the oblique confers a greater degree of volition on the causee—WAC] when the language allows an option [between accusative and oblique case for causees—WAC]. If the same case is used in all circumstances, its meaning is neutral in regard to agentivity and directness of causation’ (Langacker 1991:412, fn. 14).

3This is central to Sasse’s argument; in a footnote to his paper, he argues that one should assume that identity of form entails identity of meaning—that is, there is a single general meaning—unless proven otherwise (Sasse 1991:94, fn. 8).

4In grammatical models without constructions as meaning-bearing units, the polysemy can be associated with a particular morpheme, in this case ‘be’ or ‘have’.

5An alternative analysis would be that mass nouns are the prototype, but there is other evidence suggesting that this is not the case.

6I am indebted to Marianne Mithun for filling in the historical and grammatical details. She also informs me that the Cayuga predicate nominal construction is in fact different from the NP construction illustrated in the example above, and that speakers, when asked to translate a Cayuga “nominal”, respond with an English noun, not an English predicate nominal sentence.
References

Choi, Soonja & Melissa Bowerman. 1991. Learning to express motion events in
English and Korean: The influence of language-specific lexicalization
Helm.
Croft, William. 1991. *Syntactic categories and grammatical relations: the
Heine, Bernd and Mechthild Reh. 1984. *Grammaticalization and reanalysis in
Lakoff, George & Mark Johnson. 1980. *Metaphors we live by*. Chicago:
University of Chicago Press.
Matisoff, James. 1976. *The grammar of Lahu*. (University of California
perspective. *Semantic universals and universal semantics* (Groningen-
Amsterdam Studies in Semantics, 12), ed. Dietmar Zaefferer, 75-95. Berlin:
Foris.

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1 Introduction

An English sentence like Bill likes his wife, and Al does too is elliptical in that part of the second conjunct necessary for the proper interpretations of the entire sentence is left out. Less obvious but equally interesting instances of ellipsis (or 'gapping') are found in Japanese with respect to its post-verbal bound morphemes such as tense, modals, control morphemes, etc. An example of such morphological gapping involving the tense morpheme -ta is given in (1). It is noted that, though there are two independent coordinated sentences in (1), both of which describe a state of affairs in the past (not necessarily simultaneous—more on this point below), the bound tense morpheme is attached only to the verb of the second conjunct. Thus the situation can be characterized as gapping of the tense morpheme from the first conjunct.

(1) [s Taroo -ga uta-i] (sosite) [s Hanako -ga odot-ta]  
-NOM sing-CONJ (and) -NOM dance-PAST  
"[s Taroo sang] and [s Hanako danced]"

Numerous attempts at ellipsis resolution (predominantly for English) found in the literature (Sag 1976, Williams 1977, Roberts 1987, Gawron and Peters 1990, McCawley 1993, among others) witness the intriguing complexity and tenacity of the phenomenon, which does not readily render itself to adequate linguistic analyses. Recently, a new approach to elliptical English sentences like our example above has been proposed by Dalrymple, Shieber, and Pereira (DSP) (1991). DSP's HIGHER-ORDER UNIFICATION approach (described below) departs from the common assumption on ellipsis resolution shared by the previous authors mentioned above in order to achieve a wider and more adequate coverage of the relevant facts.

Given such a new strategy, the first task of the present paper is investigating further applications of DSP's idea specifically to the interpretations of bound morphemes such as post-verbal expressions in Japanese. It is shown that the higher-order unification method offers a desirable account for morphological gapping in the language which, in particular, is able to solve morphology-semantics mismatch involving the post-verbal expressions. Thus the universality potential of DSP's system for ellipsis resolution is demonstrated. The second task of the paper is to shed light on cross-linguistic variations concerning the constraints on recoverability of 'elided' properties.

2 DSP on Ellipsis resolution

Let us come back to our English example (repeated in (2a)) and examine how ellipsis is dealt with in DSP's framework. For sentences like (2a), unlike their predecessors,
DSP presuppose no syntactic/semantic ambiguity of the source (*Bill likes his wife*) to attain the interpretations of the target (*Al does too*). *Properties* (P) that hold of the parallel element in the target (*Al*) is recovered from the source by solving the equation given in (2b) via higher-order unification. There are four possible solutions for the equation in question, indicated in (2c-f).

(2) a. Bill\(_i\) likes his\(_{i/j}\) wife and Al\(_j\) does too
   
b. P(bill) = likes(bill, wife-of(bill))
   
c. λx.likes(bill, wife-of(bill))
   
d. λx.likes(bill, wife-of(x))
   
e. λx.likes(x, wife-of(bill)) [strict reading]
   
f. λx.likes(x, wife-of(x)) [sloppy reading]

In (2b), the parallel element in the source (*bill*) is underlined and is called the primary occurrence, which is given a special status with respect to abstraction. DSP stipulate that the primary occurrence has to be abstracted when solving an equation like (2b). This forces (2c) and (2d) to be discarded because the primary occurrence (*bill*) is not abstracted. The solutions in (2e) and (2f) correspond to 'strict' and 'sloppy' readings of the target, respectively. This difference obtains depending on whether the secondary occurrence (as opposed to the primary one) is abstracted or not. Now, applying (2e) and (2f) to *al* will produce strict and sloppy interpretations of the target.

3 Morphological ellipsis

Though DSP mention non-constituent and non-syntactic parallelisms in English, all relevant instances they offer seem to involve free morphemes. However, ellipsis involving bound morphemes is possible, as the Japanese example above suggests. To establish this point firmly, let us examine the relevant data involving the past tense morpheme -*ta* in more detail. (Other bound morphemes are introduced in section 4.2.) Gapping of the tense morpheme gives rise to an additional problem, namely morphology-semantics mismatch. Putative analyses for the tense gapping and the mismatch are also reviewed in this section and shown to be unsatisfactory.

3.1 Ellipsis and morphology-semantics mismatch

As seen in (3a, b), gapping of the past tense morpheme -*ta* can occur on different levels in a sentence. (The bracketing reflects the morphological structures.) In (3a) two IVPs are coordinated but only the second IVP is affixed with -*ta*. It is two Ss that are conjoined in (3b) and, again, the morpheme in question attaches to the verb of the second S. It is noted that the verbs in the first conjuncts of (3a, b) are in the conjunctive form, excluding the possibility of the attachment of -*ta* to them.
(3) a. Taroo -ga [ivp [ivp uta-i] (sosite) [ivp odot-ta]]
    -NOM sing-CONJ (and) dance-PAST
    'Taroo [ivp sang and danced]' 

b. [s Taroo -ga uta-i] (sosite) [s Taroo -ga odot-ta]
    -NOM sing-CONJ (and) -NOM dance-PAST
    '[s Taroo sang] and [s Taroo danced]' 

c. [PAST[Taroo sing] and PAST[Taroo dance]]

Contradicting the morphological bracketing, however, semantics requires—assuming that tense is an operator on tenseless Ss—(3c) for (3a,b). We need to have two distinct tense operators here since singing and dancing do not have to take place simultaneously.

A similar point can be made more vividly with transitive verbs. (4) involves coordination of TVPs, IVPs, and Ss. Here too, as the morphological bracketing indicates, only the verbs of the second conjuncts are suffixed with -ta. Semantics, of course, calls for different bracketing.

(4) a. Hanako -ga Taroo -o [tvp [tvp but-i] (sosite) [tvp kusugut-ta]]
    -NOM -ACC hit-CONJ (and) tickle-PAST
    'Hanako [tvp hit and tickled] Taroo'

b. Hanako -ga [ivp [ivp Taroo -o but-i] (sosite) [ivp Ziroo -o kusugut-ta]]
    -NOM -ACC hit-CONJ (and) -ACC tickle-PAST
    'Hanako [ivp hit Taroo] and [ivp tickled Ziroo]' 

c. [s Hanako -ga Taroo -o but-i] (sosite) [s Masako -ga Ziroo -o kusugut-ta]
    -NOM -ACC hit-CONJ (and) -NOM -ACC tickle-PAST
    '[s Hanako hit Taroo] and [s Masako tickled Ziroo]'

3.2 Putative analyses

Let us examine what sort of analyses have been or might be formulated to accommodate the morphological ellipsis seen above.

3.2.1 Multiple entry analysis

The most straightforward analysis to account for the morphological property of the tense morpheme would be to suppose (assuming that no appeal is made to the use of empty pronominals—see below) that it syntactically selects a TVP (for (4a)), IVP (for (4b)), or S (for (4c)), regardless of the internal syntactic structure of the selected item. The morpheme -ta then cliticizes onto the rightmost verb of the selected item. However, this is unsatisfactory in three ways. First, phonologically and semantically identical but syntactically distinct multiple past tense morphemes have to be assumed. If we count ditransitive verbs (DTVPs), then there are totally four such entries. Moreover, as we see later, since other items such as the modal and control morphemes, etc. exhibit similar gapping properties, the multiple entry
analysis quickly ends up being very unattractive. Second, it fails to account for the morphology-semantics mismatch, except when -ta combines with an S. For other combinations (i.e., DTVP, TVP, and IVP), there have to be unmotivated semantic rules that interpret the tense morpheme at the S-level. Third, since there is only one tense morpheme, the analysis incorrectly predicts the simultaneity of the dancing and singing events, for example, in (3) above.

3.2.2 Empty pronominal analyses

Introducing an empty pronominal, pro, might seem to solve the problem easily. Such an element occupies the argument positions in the absence of phonetically realized subjects and objects. Thus an analysis employing pro is able to retain the position that tense is an S-operator—all the seemingly diverse gapping cases seen above can be subsumed under sentence coordination. All that has to be said is that the tense morpheme syntactically selects an S (coordinated or otherwise) and a morphological rule ‘hops’ -ta on the rightmost verb of the S that it has selected. Two versions of such an analysis come to mind immediately: One is what is actually suggested by Steele et al. (1981) and the other is an account similar to Van Valin’s (1986) proposal for a null subject in English.

To account for cases like (3a), Steele et al. (1981) propose (in essence) a structure like (5) in which -ta syntactically selects and combines with coordinated Ss and takes scope over both. The subject positions of the conjoined Ss are occupied by empty pronominals with which the subject Taroo in an unknown structural position is to be coreferential.

(5)  pro analysis version 1

Tarooi-ga [s [s pro; utai] (sosite) [s pro; odot]]-ta

Alternatively, if we follow Van Valin (1986), (3a) will be analyzed as in (6) below. The cases involving object gapping are treated accordingly by either version.

(6)  pro analysis version 2

[s [s Tarooi-ga utai] (sosite) [s pro; odot]]-ta

Though both pro analyses above are able to retain the S-operator status of tense, there are shortcomings of these. First, such analyses encourage the proliferation and unconstrained use of empty pronominals that is difficult to motivate empirically. (See Iida (1992) for empirical evidence against pro in Japanese.) Version one, in addition, has to motivate the unorthodox complex embedding structure. Second, as pointed out Van Valin himself, pro in these examples is expected to behave as dictated by Principle B of GB Binding Theory—it can be coreferential with any NP outside of its governing category. But pro here indeed acts as an anaphor. In (6), for example, pro cannot refer to anybody but Taroo. Replacing pro with PRO will betray the original motivation of using pro, which appears in governed positions. Third, as the first putative analysis above, either version predicts that the two events expressed by the conjoined Ss have to take place simultaneously. After all, there is only one tense operator employed here. This is a false prediction.
3.2.3 LF morpheme-raising analysis

A third possible analysis can be formulated according to Kitagawa’s (1986) proposal. He proposes that the effect of morphology, e.g., the attachment of the tense morpheme in the lexicon, can be ‘undone’ in LF and the detached tense morpheme can (and in fact, must) be raised to the level where its syntactic subcategorization is satisfied. This analysis allows us to treat simple IVP or TVP coordination as is, not as coordination of Ss. Kitagawa’s approach shares a core assumption about morphology with the current proposal offered below—all morphological processes are lexical and the attachment of bound morphemes occurs in the lexicon. A Kitagawa-type analysis will map an S-structure like (7a) to an LF representation like (7b). We see that -ta is morphologically part of the verb odot-ta in (7a) but is raised in (7b) from the IVP-internal position to the outside of the entire S, selecting and taking scope over the S. This in effect treats tense as an S-operator.

(7) a. SS: [S Taroo-ga [IVP [IVP utai] (sosite) [IVP odot-ta]]

       b. LF: [S Taroo-ga [IP [IVP utai] (sosite) [IVP odot ti]]-ta_i

Simple and attractive though it may appear to be, there are problems with such an account. First, again, the single tense operator will incorrectly predict the simultaneity of the dancing and singing events as do the two analyses above. Second, and more seriously, the movement of -ta from within the innermost IVP violates the coordinated structure constraint, which is to be observed even in LF. In summary, none of the putative analyses reviewed here appears to be satisfactory.

4 Current proposal

Having examined the properties of morphological ellipsis involving the past tense marker -ta and establishing that the putative accounts fail, we are ready to explore a new account based on DSP’s higher-order unification framework. Let us begin with the current assumptions.

(8) Assumptions

   a. All morphological processes (including tense affixation) are located in the lexicon.

   b. Coordination takes place in syntax.

   c. Only a (lexically) tensed verb carries the tense operator.

4.1 Analysis of tense ellipsis

Let us consider (3a) (repeated in (9a)). (Again, the example reflects the morphological properties.)
(9) a. Taroo -ga [IVP [IVP utai] sosite [IVP odot-ta]]
    -NOM sing and dance-PAST
    'Taroo [IVP sang and danced]'

b. λx.(sing(x)) [first conjunct]
c. λy.PAST(dance(y)) [second conjunct]
d. λx.((sing(x)) & PAST(dance(x))]
e. (sing(taroo)) & PAST(dance(taroo))

The semantic (lexical) translations for the verbs of the first and second conjuncts are given in (9b) and (9c), respectively. (I represent the semantics of the Japanese examples using English glosses.) Only the latter conjunct carries the tense operator in accord with the first assumption above. When the coordinated IVP is formed in syntax, its translation will be (9d). Applying taroo to this gives (9e). Since tense in the first conjunct (i.e., the target) is gapped but necessary for the interpretation of the entire S, it has to be recovered and applied to the parallel element of the target which is the S itself, since the parallel elements here are the two tenseless Ss. The tenseless S in the second conjunct is the primary occurrence. The relevant property P to be recovered is (10b), gotten by solving the equation in (10a). The application of this to the target yields the complete interpretation (10c) for the entire S. It is easy to see that other examples introduced above are accounted for similarly.

(10) a. P(dance(taroo)) = PAST(dance(taroo))
b. P → AS.(PAST(S))
c. PAST(sing(taroo)) & PAST(dance(taroo))

We note the following three points about the proposed account. First, the desired reading (10c) is obtained from the ‘surface’ string without supposing multiple lexical entries of a single tense suffix, unmotivated empty pronominal elements, or the problematic assumption of morpheme raising in LF. Second, a recovered (i.e., elided) property is not limited to those corresponding to free morphemes. It is suggested that, in principle, any semantically potent property should be recoverable via higher order unification (modulo abstraction of the primary occurrence(s)) regardless of its free/bound morphological status. Third, however, relevant properties represented by bound morphemes are not recovered randomly. To this last point we turn immediately.

4.2 Constraints on morphological ellipsis resolution

The need for more constraints on the recoverability of gapped properties corresponding to bound morphemes is obvious from the following contrast in (11) involving the control verb hazime ‘begin’ and the modal daroo ‘might’ in addition to the familiar tense marker -ta. (The English translations below do not accurately depict what
the morphemes in question mean. Please consult the gloss carefully.) We see that all three morphemes in question can be gapped from and recovered for the target in (11b) (call this the strict reading). Also, as in (11c), it is possible to recover only the modal and tense for the target (call this the sloppy reading). However, recovering the control verb and tense in the absence of the modal is not allowed as (11d) attests.

(11) a. [s Taroo -ga utai] sosite [s Ziroo -ga odori-hazime-ta-daroo]  
    -NOM sing and -NOM dance-BEGIN-PAST-MIGHT

b. ‘Taroo might have begun to sing and Ziroo might have begun to dance’ [strict reading]

c. ‘Taroo might have sung and Ziroo might have begun to dance’ [sloppy reading]

d. ≠ ‘Taroo had begun to sing and Ziroo might have begun to dance’ [impossible reading]

The strict reading property in (12b) below needed for (11b) is gotten by abstracting only the primary occurrences, dance and ziroo in the interpretation of the source given in (12a). Note that the first argument of the control predicate BEGIN, ziroo, has to be abstracted as well, though it is not primary. This is due to the independent lexical property of the control predicate the subject argument of which has to be identical to that of the embedded property dance. Applying this to taroo and sing will obtain the desired strict reading of the target: MIGHT(PAST(BEGIN(taroo, sing(taroo)))�).

(12) a. MIGHT(PAST(BEGIN(ziroo, dance (ziroo))))

b. λP.λx.MIGHT(PAST(BEGIN (x, P(x))))

c. λQ.λP.λx.MIGHT(PAST (Q(x, P(x))))

The sloppy reading property (12c) for (11c) is the result of the abstraction over not only the primary occurrences, dance and ziroo, but also a secondary occurrence, namely the control property BEGIN. There is a technical problem here in applying the recovered property (12c) to the parallel elements of the target—there are not enough parallel elements! What we need is some property that discharges the first argument of (12c) corresponding to a control predicate. I propose that the following property, PLAIN, in (13a) does this job. With this the target interpretation for (11c) is translated as in (13b).3

(13) a. PLAIN: <x, P(x)> → P(x)

b. MIGHT(PAST(sing(taroo)))
With respect to the contrast in (11b-d), we observe that tense (unlike the control verb) cannot be skipped when recovering a property of the parallel element(s) of the target. This seems to be a general semantic requirement that tense is needed (hence obligatorily recovered) for interpreting an independent sentence. However, at the moment, nothing predicts the impossibility of (11d). What seems to be going on is that items (e.g., the modal) taking scope over the obligatorily recovered property (e.g., tense) have to be recovered along with it. It is suggested that these two additional observations concerning optional/obligatory recovery of a given property should also be incorporated into DSP’s system of ellipsis resolution to adequately cover bound morphemes.

(14) More constraints on property recovery with respect to bound morphemes

- Elements necessary for a proper interpretation (like tense but unlike control predicates) cannot be abstracted (i.e., ‘skipped’) when recovering a property of the parallel element(s) of the target.

- Bound morphemes (such as the modal) taking scope over an obligatorily recovered property have to be recovered along with it.

5 Concluding remarks

We have seen an account for morphological gapping involving post-verbal expressions in Japanese based on DSP’s framework of higher-order unification. The account is desirable in that it offers a simple solution for one kind of morphology-semantics mismatch which is problematic for the alternative analyses reviewed above. In addition to solving the empirical problems, this paper entertained the question concerning the range of recoverability of semantically potent properties when DSP’s system is applied specifically to bound morphemes. It was suggested that with the additional constraints on parallelism and property recoverability noted in the previous section, DSP’s system is capable of being applied to a wider range of phenomena and languages. However, the preliminary nature of the present study is obvious not only from the fact that the set of bound morphemes in Japanese examined excluded other significant members such as passives, causatives, benefactives, etc. but also from the limited number of languages examined—namely one.

Notes

1We can also find ellipsis of a ‘regular’ flavor similar to the English example:

(i) Taroo -ga okaasan -o tasuke-ta, Ziroo -mo soo si-ta
-NOM mother -ACC help-PAST -also so do-PAST

‘Taroo helped his mother and Ziroo did so too’

Relevant though it may be to the discussion of ellipsis in Japanese, this type of ellipsis is ignored. It is not difficult to see how an account along the lines of Dalrymple, Shieber, and Pereira (1991) (see below) can be furnished.
Godard (1989) points out more problems with empty pronominal subjects in English.

It is not the case that PLAIN is devised to save only this particular example. It can be widely used for gapping involving other (subject) control predicates: -tai ‘want’, -temiru ‘try’, etc. Also, for English examples like (i) mentioned by DSP (their (35a)), something like PLAIN is needed.

(i) “I want to leave.” “Well, do”

In addition to the difference in mood between the first and second utterances, we note that the elided property for the second utterance is not want to leave but rather leave. Thus it is necessary to ‘skip’ want (to) when recovering the elided property.

References


TAGALOG SEMANTICS

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1. Introduction
What are the ways in which languages may differ from each other semantically?

Consider a single Tagalog word, bangkero and its closest English equivalent, boatman. A lexicologist might note that the extension of bangkero is somewhat more restricted than that of its English counterpart, in that the boats in question must be of a particular size and shape. A grammarian might then observe that since bangkero is unmarked for number, it is more general than its purported English translation boatman, which is marked as singular. Most studies of cross-linguistic variation in semantics are concerned with patterns such as these, either lexical, or pertaining to grammatical categories such as number, gender, and tense-aspect.

However, languages may differ from each other semantically in ways more subtle yet more fundamental than these. In spite of the above differences between bangkero and boatman, most lexicologists would still agree that these two words are, up to a point, "notionally equivalent", sharing a common core meaning of person associated with a water vessel. Moreover, most semanticists would characterize the meanings of bangkero and boatman as objects, in contrast to the meanings of, say, bumalik and its counterpart returned, which would be characterized as activities. In fact, many semanticists would go one step further and conclude that the meanings of bangkero and boatman belong to the same logical type, for example that of properties, as opposed to those of bumalik and returned, belonging to a different logical type, for example that of predicates.

This paper explores the possibility that the latter conclusion may be unwarranted, suggesting that languages may vary also with respect to their logical types. More specifically, this paper presents some preliminary evidence in support of the following general claim:

(1) Notional-Logical Diversity
Notionally equivalent expressions may belong to different logical types in different languages.

For example, whereas English boatman and returned belong to distinct logical types, Tagalog bangkero and bumalik may belong to the same logical type.

The logical type of a particular expression is not readily accessible to introspection in the same way as various other meaning properties often are. Instead, it can only be established within the framework of an articulated theory of semantics. However, semantic theory is an integral part of a theory of grammar, one of whose major goals is to specify form-meaning correspondences. In particular, the postulation of logical types within semantic theory is often based on the working hypothesis that logical types correspond in one-to-one fashion with syntactic categories. Thus, in order to establish the logical types of a language, it is necessary, among other things, to determine its range of syntactic categories.

The bulk of this paper is accordingly concerned with syntactic matters. Section 2 sketches a formal theory of syntactic categories designed to account for patterns of cross-linguistic variation in syntactic category inventories. Section 3 presents an exploration of the inventory of syntactic categories of Tagalog, lending support to the following conclusion:
(2) *The Syntactic Category Inventory of Tagalog*
   In Tagalog there is only one open syntactic category.

Section 4 provides some tentative semantic evidence in favour of the following further conclusion:

(3) *The Logical Type Inventory of Tagalog*
   In Tagalog there is only one open logical type.

This in turn supports the existence of notional-logical diversity, in accordance with (1) above.

2. Syntactic Categories in Universal Grammar
   The principles governing the putting together of words to form sentences differ in numerous fundamental ways from the principles determining the internal constitution of words, and from the principles specifying the ways in which sentences group together to form larger texts: it is this commonplace observation that underlies the autonomy of syntax vis à vis morphology on the one hand and discourse on the other. Moreover, the principles governing the form of sentences differ in many crucial aspects from the principles determining the structure of sentence meanings: it is this equally well-known fact that motivates the autonomy of syntax with respect to semantics.

   The autonomy of syntax motivates definitions of syntactic categories making exclusive reference to syntactic properties. Such categories may be based on the following membership criteria:

(4) *Syntactic Category Membership Criteria*
   (a) For \(x\) to be a member of a syntactic category \(X\), \(x\) must be a word or string of words.

   (b) For \(x\) and \(y\) to be members of the same syntactic category \(X\), \(x\) and \(y\) must share an array of syntactic properties, such as distributional privileges, and participation in relations such as government, binding, and agreement.

Criterion (4a) asserts that syntactic trees stop at words: terminal nodes must contain exactly one word each. It thus rules out items such as the English past or present tense affixes as possible members of a syntactic category, since they are formally part of morphology, not syntax. (However, it leaves open the possibility that a word undergo cliticization to another word, or that it be phonologically null.) Criterion (4b) specifies that membership in syntactic categories is determined solely by shared syntactic behaviour. Morphological criteria are irrelevant; for example, if English has a set of words that may be inflected for tense, this constitutes a morphological word class, not a syntactic category. Similarly, semantic criteria play no role whatsoever; for example, if English has a class of words that denote activities, this constitutes a semantic, not a syntactic category.

   Syntactic categories are thus sets of words and word strings sharing syntactic properties. Like other categories, in grammar and elsewhere in cognition, they comprise prototypical members, exhibiting a large number of shared properties, and less typical members, displaying a smaller number of shared properties. Moreover, different syntactic categories may exhibit different degrees of productivity. Open syntactic categories, usually based on "content words", may contain an infinite set
of members, whereas closed syntactic categories, often based on "function words", typically contain a small number of members.

Universal Grammar provides a set of syntactic categories from which particular languages may choose. Syntactic categories are of the form X^n, where X is some symbol, and n is a non-negative integer. (When n = 0, the superscript may sometimes be omitted.) The set of syntactic categories in Universal Grammar is defined in terms of a single initial or primitive syntactic category S^0, and two category-formation operators, a unary operator \textit{kernel} and a binary operator \textit{slash}, which apply to syntactic categories to form new syntactic categories:

(5) \textbf{Syntactic Category Formation (Paradigmatic)}

(a) \textit{Initial Syntactic Category: S^0}

(b) \textit{Category Formation Operators:}

(i) \textit{Kernel}: For any category X^n, X^{n+1} is a category, "the kernel category of X^n".

(ii) \textit{Slash}: For any two categories X and Y, X/Y is a category, "X slash Y".

For example, from the initial category S^0, application of kernel will form the category S^1, while application of slash will yield the category S^0/S^0. These two categories may then form the basis for further applications of these operators. For example, application of kernel to S^1 will form the category S^2, while application of kernel to S^0/S^0 will yield the category (S^0/S^0)^1; similarly, applications of slash to S^0, S^1 and S^0/S^0 will produce categories such as S^0/S^1, S^1/S^0, S^0/(S^0/S^0), and so forth. As is evident, the number of syntactic categories is infinite^3.

The names of syntactic categories encode their syntactic behaviour, in accordance with the following two rules:

(6) \textbf{Syntactic Category Combination (Syntagmatic)}

(a) \textit{Slash Combination:} \quad X \rightarrow \{Y, X/Y, X/Y \ldots\}

(b) \textit{Identity Combination:} \quad X \rightarrow \{X, X \ldots\}

Rule (6a), Slash Combination, states that an X may consist of one Y plus one or more X/Ys: for example, an S^0 may consist of one S^1 plus one or more S^0/S^1s, alternatively it may consist of one S^0 plus one or more S^0/S^0s. Rule (6b), Identity Combination, specifies that an X may consist of two or more Xs: for example, an S^0 may consist of several S^0s.

The Syntactic Category Combination Rules are associated with specific values of headedness. If X = \{Y, X/Y, X/Y \ldots\}, in accordance with Slash Combination, then Y is the head of X. (A corollary of this is that whenever Y is the kernel category of X and the daughter of X, then Y is the head of X.) However, if X = \{X, X \ldots\}, in accordance with Identity Combination, then either (a) one of the daughter Xs is head, or (b) the construction is headless.

For any syntactic category X, the parents of X are the categories from which X is formed by a single application of a category-formation operator. Two cases may be distinguished. First, if X is the kernel category of Y, for some Y, then Y is the single parent of X. For example, S^0 is the single parent of S^1. Secondly, if X is of form Y/Z, for some Y and Z, then Y and Z are the two parents of X. For example, S^0 and S^1 are the two parents of S^0/S^1. Generalizing from here, for any category X, the ancestors of X are the categories from which X is formed by one or
more applications of category-formation operators. For example, the ancestors of \((S^0/S^0)^1\) are \(S^0/S^0\), its only parent, and \(S^0\). Note, specifically, that the initial category \(S^0\) is the ancestor of every syntactic category.

The above framework sets the stage for the formulation of constraints on permissible syntactic category inventories in Universal Grammar:

(7) Constraints on Syntactic Category Inventories
   (a) The Ancestral Constraint
       If \(X\) is a syntactic category in a language \(L\), then all \(X\)'s ancestors are syntactic categories in \(L\). Moreover, if \(X\) is an open syntactic category in \(L\), then all \(X\)'s ancestors are open syntactic categories in \(L\).
   (b) The Construction Constraint
       If \(X\) and \(Y\) are syntactic categories in a language \(L\), then \(L\) must have constructions formed from \(X\) and \(Y\).
   (c) The Kernel Category Constraint
       If \(X/Y\) is an open category in a language \(L\), then \(Y\) is the kernel category of \(X\).

For example, in accordance with the first clause of the Ancestral Constraint in (7a), \(\{S^0\}, \{S^0,S^1\}, \text{ and } \{S^0,S^1,S^0/S^1\}\) are possible syntactic category inventories, while \(\{S^1,S^0/S^1\}\) is not, since \(S^0\), ancestor to both \(S^1\) and \(S^0/S^1\), is lacking. Furthermore, taking \(\{S^0,S^1,S^0/S^1\}\) as the inventory of syntactic categories, the second clause of the Ancestral Constraint allows for the possibility that \(S^0\) and \(S^1\) be open but \(S^0/S^1\) closed, while ruling out the possibility that \(S^0\) and \(S^1\) be closed but \(S^0/S^1\) open. In fact, the Ancestral Constraint entails that the initial category \(S^0\) is a member of every permissible syntactic category inventory. The Construction Constraint in (7b) rules out inventories such as, for example, \(\{S^0,S^1\}\), since the rules of Syntactic Category Combination stated in (6) would not permit a single construction to contain both \(S^0\) and \(S^1\) without a further syntactic category, such as \(S^0/S^1\). Finally, the Kernel Category Constraint in (7c) specifies, for example, that among such categories as \(S^0/S^1, S^1/S^0, \text{ and } S^0/(S^0/S^0)\), only \(S^0/S^1\) may be open. Together, the above three constraints effect a substantial restriction of the possible syntactic category inventories in Universal Grammar.

The syntactic categories proposed herein are motivated exclusively by syntactic behaviour, and hence do not correspond to familiar syntactic categories such as noun, verb, adjective, preposition, sentence, and so forth, justified by a combination of morphological, syntactic, and semantic criteria. Moreover, since syntactic behaviour is often less transparent than either morphological or semantic properties, the determination of syntactic category membership can only be achieved through careful grammatical analysis. It is to this task that we now turn.

3. Syntactic Categories in Tagalog
   Virtually all words and word strings in Tagalog belong to the single open syntactic category \(S^0\). In addition, however, a small class of words belong to the closed syntactic category \(S^0/S^0\). That is to say, Tagalog has only one open syntactic category, and only one additional closed syntactic category.

   In accordance with criterion (4b) above, this means that almost all words and word strings exhibit similar syntactic behaviour, with regard to distributional privileges and participation in relations such as government, binding, and agreement. Indeed, this seems to be the case.
In particular, since practically all words and word strings belong to the same syntactic category, *anything can go anywhere*. From an Anglocentric perspective, at least, this is, perhaps, the most salient feature of Tagalog syntax.

Some evidence supporting the claim that anything can go anywhere is presented in (8) - (10) below, illustrating three of the most basic construction types in Tagalog. Examples (8) - (10) provide templates into which words or phrases may be inserted. Under each template, examples are given of words traditionally assumed to belong to different syntactic categories; these are marked as "E-nouns", "E-verbs" and "E-adjectives" respectively, where the prefix "E-" stands for "English". That is to say, these are words whose equivalents in English are nouns, verbs and adjectives respectively, and are commonly assumed to be so also in Tagalog. However, as evidenced in (8) - (10), E-nouns, E-verbs and E-adjectives can occur anywhere in the templates: the resulting constructions, listed below each template, are all grammatical. 

Example (8) illustrates the "predicate-argument" construction, characterized by a template of the form $P\text{ ang }B$, where $P$ and $B$ are arbitrary $S_0$s, and $ang$ is a grammatical marker associated with $B^8$:

(8) __________ ang __________

| pulubi | bangkero | E-nouns |
| beggar | boatman  | E-verbs |
| pinatay| bumalik  |         |
| PT:PFV-kill | AT:PFV-return | E-adjectives |
| mapayat | mabait  |         |
| STAT-thin | STAT-kind |         |

(a) Pulubi ang bangkero "The boatman is a beggar"
(b) Pulubi ang bumalik "The one who returned is a beggar"
(c) Pulubi ang mabait "The kind one is a beggar"
(d) Pinatay ang bangkero "The boatman was killed"
(e) Pinatay ang bumalik "The one who returned was killed"
(f) Pinatay ang mabait "The kind one was killed"
(g) Mapayat ang bangkero "The boatman is thin"
(h) Mapayat ang bumalik "The one who returned is thin"
(i) Mapayat ang mabait "The kind one is thin"

As evidenced by constructions (8a-i), E-nouns, E-verbs and E-adjectives may occur in either position in the template; all nine combinations are grammatical. Moreover, there seems to be no evidence to suggest that some of the combinations are more complex, unusual, or highly marked than others. 

Example (9) illustrates the "modifier" construction, involving a template of the form $P\text{-ng/na }B$, where $P$ and $B$ are arbitrary $S_0$s, and -ng/na is the ligature:

(9) __________ -ng/na __________

| pulubi | bangkero | E-nouns |
| beggar | boatman  | E-verbs |
| pinatay| bumalik  |         |
| PT:PFV-kill | AT:PFV-return | E-adjectives |
| mapayat | mabait  |         |
| STAT-thin | STAT-kind |         |
(a) pulubing bangkero  "a beggar who's a boatman"
(b) pulubing bumalik  "a boatman who's a beggar"
(c) pulubing mabait   "a beggar who returned"
(d) pinatay na bangkero "one who returned who's a beggar"
(e) pinatay na bumalik "one who returned who's kind"
(f) pinatay na mabait  "one who returned who's killed"
(g) mapayat na bangkero "a kind one who's a boatman"
(h) mapayat na bumalik "a kind one who's thin"
(i) mapayat na mabait  "a kind thin one"

Again, as evidenced by constructions (9a-i), E-nouns, E-verbs and E-adjectives may occur in either position in the template; all nine combinations are grammatical. In fact, each of the constructions is ambiguous, and can be interpreted either as head-followed-by-modifier (as in the first translation), or as modifier-followed-by-head (as in the second translation).

Example (10) illustrates constructions containing the marker *ng*, associated with a template of the form *P ng B*, where *P* and *B* are arbitrary *S0*s:

| (10) |  |  |  |  |  |
|------|----------------|----------------|
| pulubi | ng | bangkero |  |  | E-nouns |
| beggar |  | boatman |  |  | E-verbs |
| pinatay |  | bumalik |  |  |  |
| PT:PFV-kil |  | AT:PFV-return |  |  |  |
| mapayat |  | mabait |  |  |  |
| STAT-thin |  | STAT-kind |  |  |  |

In traditional terminology, *ng* is characterized, alternatively, as either a "case marker", mediating between verb and noun, or a "genitive marker", connecting two nouns. However, such a dual characterization is an artifact of an unwarranted distinction between verbal and nominal categories. Thus, as evidenced by constructions (10a-i), E-nouns, E-verbs and E-adjectives may occur in either position in the *ng* template; all nine combinations are grammatical.
Examples (8) - (10) show that E-nouns, E-verbs and E-adjectives may occur in any position in three basic constructions in Tagalog. Similar facts hold also for E-determiners, E-quantifiers, E-prepositional-phrases, E-verb-phrases, E-sentences, and so forth. Moreover, a similar freedom obtains with respect to a variety of other basic and more complex constructions. Thus, anything can go anywhere; this in turn supports the claim that virtually all words and word strings in Tagalog belong to a single open syntactic category $S^0$.

The existence of a single open syntactic category $S^0$ in Tagalog underlies a variety of syntactic properties that are unusual from a cross-linguistic, typological perspective. The first such property is free constituent order. Although scrambling of the Warlpiri variety is not possible -- Tagalog provides ample evidence for the existence of hierarchic binary-branching constituent structure -- the relative order of sister constituents is quite unconstrained. Consider the following examples, providing further instantiations of the "modifier" construction in template (9) above:

(11) (a) itong bangkero
        TOP: this-LIG boatman
        "this boatman"
(b) bangkerong ito
        boatman-LIG TOP: this

(12) (a) mapayat na bangkero (= (9g))
        STAT-thin LIG boatman
(b) bangkerong mapayat
        boatman-LIG STAT-thin
        "thin boatman"

(13) (a) nasa bahay na bangkero
        in house LIG boatman
(b) bangkerong nasa bahay
        boatman-LIG in house
        "boatman in the house"

(14) (a) pinatay na bangkero (= (9d))
        PT: PFV-kill LIG boatman
(b) bangkerong pinatay
        boatman-LIG PT: PFV-kill
        "boatman who was killed"

Examples (11) - (14) illustrate the relative order of E-nouns modified by E-determiners, E-adjectives, E-prepositional-phrases and E-relative-clauses respectively. While in English and in most other languages, the relative order of nouns and their modifiers is fixed, in Tagalog, as shown above, the corresponding orders are quite free. The reason, of course, is that Tagalog does not have nouns, determiners, adjectives, prepositional phrases and relative clauses: they are all $S^0$s.

The second unusual property of Tagalog resulting from the existence of a single open syntactic category is the absence of grammatical relations such as subject and object. Consider the following constructions, illustrating the "predicate-argument" template in (8) above:
(15) (a) Sumulat ang bata
AT:PFV-write TOP child
"The child wrote"

(b) Isinulat ang liham
PT:PFV-write TOP letter
"(Someone) wrote the letter"

(c) Sinulatan ang pangulo
DT:PFV-write TOP president
"(Someone) wrote to the president"

(d) Pinagsulatan ang mesa
LT:PFV-write TOP table
"(Someone) wrote on the table"

(e) Ipinansulat ang lapis
IT:PFV-write TOP pencil
"(Someone) wrote with the pencil"

Example (15) presents a typical paradigm in which the stem sulat "write" is marked with five different voice affixes determining the thematic role of the ang-phrase: actor, patient, direction, locative and instrumental respectively. However, whereas in English and most other languages, the unmarked voice associates actor with topic, as in (15a), in Tagalog, if any of the voices is unmarked, it is that which associates the patient with topic, as in (15b). Thus, typical subject properties such as actorhood and topichood do not pick out a unique expression; similarly, typical object properties fail to converge. These observations have accordingly led some scholars to suggest that Tagalog lacks the familiar grammatical relations of subject and object.

The absence of grammatical relations in Tagalog is a straightforward consequence of the absence of distinct open syntactic categories. Grammatical relations result from a verb governing its nominal arguments. Accordingly, if there are no verbs or nominal arguments, there can be no government, and hence no grammatical relations. The renowned voice affixes of Tagalog may be viewed as an alternative means for expressing thematic roles, in the absence of an ordinary nominal case marking system.

The third noteworthy property of Tagalog resulting from the existence of a single open syntactic category is the absence of NP-movement: this is a straightforward consequence of the absence of NPs. Thus, WH-question words, although usually construction-initial, are actually in situ, in the first, or so-called "predicate" position of the template illustrated in (8) above:

(16) (a) * Kaninoi ang sumulat ang bata ng liham [e1]
OBL-who TOP AT:PFV-write TOP child DIR letter

(b) * Kaninoi ang isinulat ng bata ang liham [e1]
OBL-who TOP PT:PFV-write DIR child TOP letter

(c) Sino ang sinulatan ng bata ng liham
TOP-who TOP DT:PFV-write DIR child DIR letter

"Who did the child write a letter to?"

Similarly, instead of relative clauses, a complex but gapless S0 modifies its head in accordance with the template illustrated in (9) above:
(17) (a) * pangulong; president-LIG sumulat ang bata ng liham [e1]
      AT:PFV-write TOP child DIR letter
(b) * pangulong; president-LIG isinulat ng bata ang liham [e1]
      PT:PFV-write DIR child TOP letter
(c) pangulong president-LIG simulatan ng bata ng liham
      DT:PFV-write DIR child DIR letter

"the president that the child wrote a letter to"

In both cases, it is of course the productive voice affixes that prevent massive loss of expressive power, permitting phrases of various thematic roles -- in (16) and (17) above the direction -- to be questioned and relativized.

Thus, as argued in this section, almost all words and word strings in Tagalog belong to a single open syntactic category $S^0$. The only exception is a set of clitics, consisting of 15 person forms, or E-pronouns, and 18 other forms with variegated meanings, such as ba, forming yes-no questions; po indicating politeness; na, marking aspect; and din, meaning "also". The most salient characteristic of these clitics is that they typically occur in Wackernagel's sentence-second position. These clitics accordingly belong to the closed syntactic category $S^0/S^0$; in accordance with the Slash Combination rule in (6a), they may combine with $S^0$s to yield other $S^0$s. Thus, the syntactic category inventory of Tagalog consists of the open syntactic category $S^0$ and the closed syntactic category $S^0/S^0$.

4. Logical Types in Tagalog
Following are three hypotheses regarding the relationship between syntactic categories and semantic interpretation, presented in order of decreasing strength:

(18) **Absolute Isomorphism Hypothesis**
For any syntactic category $X$, the meanings associated with $X$ are identical for all languages possessing $X$.

(19) **Prototypical Isomorphism Hypothesis**
For any syntactic category $X$, the prototypical meanings associated with $X$ are identical for all languages possessing $X$.

(20) **Logical-Type Isomorphism Hypothesis**
For any syntactic category $X$, the logical type associated with $X$ is identical for all languages possessing $X$.

The Absolute Isomorphism Hypothesis is trivially false. The Prototypical Isomorphism Hypothesis is also false, though perhaps non-trivially so. Consider the category $S^0/S^0$. In Tagalog, as noted above, $S^0/S^0$ is a closed category of semantically diverse clitics, whose only prototypical meanings are those of the personal forms. However, in English, $S^0/S^0$ is an open category, corresponding roughly to sentential adverb, which contains, among its prototypical members, expressions of place, time and manner. Thus, contrasting the category $S^0/S^0$ in Tagalog and English, the Prototypical Isomorphism Hypothesis is refuted.

However, the third and weakest hypothesis, the Logical-Type Isomorphism Hypothesis, derives some tentative support from various facts about Tagalog semantics. Among other things, the Logical-Type Isomorphism Hypothesis predicts that the all $S^0$ expressions in Tagalog will be interpreted just as $S^0$ expressions in English, namely as propositions. In fact, this seems to be the case. Consider the following examples:
(21) (a) Bunalik  
E-verb  
(AT:PFV-return  
"(Someone) returned"
(b) (Si) Bong (o)  
E-proper-noun  
PERS.TOP Bong EXCL  
"(Someone is) Bong" / "Here's Bong"

As S0s, virtually all single words in Tagalog may stand alone. However, whereas (21a), with E-verb *bunalik*, looks superficially like "pro-drop" constructions in other languages, (21b), with E-proper-noun *Bong*, resembles nothing whatsoever in familiar "pro-drop" languages. Nevertheless, with optional *si* (the personal variant of *ang*) and *o* (an exclamation "look!"), (21b) is the most natural way in Tagalog to say "Here's Bong". Accordingly, just as S0 *bunalik* expresses a complete proposition, "x returned", so S0 *Bong* expresses a complete proposition, "x is Bong". Thus, although the membership of S0 in Tagalog and English is very different, the logical type of S0 in Tagalog and English appears to be the same.

Further evidence for the Logical-Type Isomorphism Hypothesis derives from the interpretation of sentences in which *bawat*18 "every" occurs in a construction resembling English "each-shift"19. Consider the following Tagalog sentence and its two possible interpretations20:

(22) Nagdala ng *bawat* tatlong maleta ang dalawang lalaki  
AT:PFV-carry DIR every three-LIG suitcase TOP two-LIG man

(a) Interpretation A: "Two men carried three suitcases each"  
(b) Interpretation B: "Two men carried (the) suitcases three at a time"

<table>
<thead>
<tr>
<th>Interpretation A</th>
<th>Interpretation B</th>
</tr>
</thead>
<tbody>
<tr>
<td>three suitcases per man</td>
<td>three suitcases per carrying</td>
</tr>
</tbody>
</table>

Tagalog sentence (22) thus contrasts semantically with its English calque in (23), which is unambiguous, having only Interpretation A -- Interpretation B being unobtainable:

(23) Two men carried three suitcases *each*

The contrast between (22) and (23) may be represented as follows:

(24) (a) Nagdala ng *[bawat]_i* tatlong maleta [ang dalawang lalaki]_i  
B
(b) [Nagdala]_i ng *[bawat]_i* tatlong maleta ang dalawang lalaki

(25) (a) [Two men]_i carried three suitcases [each]_i  
A
(b) * Two men [carried]_i three suitcases [each]_i  
B
In Tagalog, *bawat* may take as its antecedent either *ang dalawang lalaki* "two men", as in (24a), yielding Interpretation A, or else *Nagdala* "carried", as in (24b), yielding Interpretation B. However, in English, *each* may only take *Two men* as its antecedent, as in (25a), yielding Interpretation A: *carried* is unavailable as a potential antecedent, as in (25b), and hence Interpretation B is unobtainable. These facts suggest that whereas in English, *Two men* and *carried* belong to different logical types, differing with respect to antecedent eligibility, in Tagalog, *ang dalawang lalaki* and *Nagdala* belong to the same logical type, which may be interpreted as the antecedent of *bawat*. Thus, given that these two expressions are both S0s, the above facts provide further support for the Logical-Type Isomorphism Hypothesis.

In accordance with the preceding observations, the following tentative logical forms may be proposed for some basic constructions in Tagalog:

\[(26) \quad \text{construction} \quad \text{logical form} \]

(a) B \quad B(x) \quad \text{(template (8))}
(b) P ang B \quad P(x|B(x)) \quad \text{(template (9))}
(c) P -ng/na B \quad (P|P(y|B(y)))(x) \quad \text{(template (10))}
(d) P ng B \quad (P/(y|B(y)))(x) \quad \text{(template (10))}

As specified in (26a), a single word B has the logical form B(x), a predicate applying to a free variable. For example, *bangkero* means "x is a boatman", *bumalik* means "x returned", *mabait* means "x is kind", and *Bong* means "x is Bong". As suggested in (26b-d), larger phrases are associated with more complex logical forms, involving a relativizational operator "I" (read: "such that") and an associational operator "/" (read: "of").

The preceding observations suggest that Tagalog expressions such *bangkero*, *bumalik*, *mabait*, even *Bong* may belong to logical types different from their notional equivalents *boatman*, *returned*, *kind*, and *Bong* in English. Thus, Tagalog and English exhibit Notional-Logical Diversity, as defined in (1). In doing so, they illustrate one of the subtle but fundamental ways in which languages may differ from each other semantically.

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Footnotes

1Of course, in addition to principles unique to syntax and thereby justifying its autonomy in relation to morphology, discourse and semantics, there may also exist principles shared by syntax and by morphology, discourse and/or semantics (for example, those of x-bar structure -- see Gil 1985). In fact, a substantive parallel between syntax and semantics is provided by the assumption, mentioned above, that syntactic categories and logical types are in one-to-one correspondence.

2Considerations of space preclude a discussion of the ways in which the notion of syntactic category outlined above is similar to and/or different from various other notions of syntactic category that have been proposed in the course of linguistic studies. Suffice it to say that the generative enterprise, although adopting the autonomy of syntax as its motto, has largely failed to practice what it preaches. Thus, in the "Aspects" model, syntax and morphology are conflated, in that the terminal nodes of trees contain formatives, rather than words; in the "Generative Semantics" approach, syntax and semantics are identified, through the positing of abstract, semantically-motivated deep structures; and in the "Government and Binding" framework, syntax, morphology, and semantics are all brought together at the level of Logical Form, with "syntactic categories" bearing names such as "inflection" and "determiner" accurately reflecting their morphological and semantic provenance. Of course, the conflation of morphology, syntax, and semantics is hardly unique to the generative tradition. Thus, the definition of, say, verb as a part of speech containing words that may be inflected for tense and that characteristically denote activities can be traced back to the grammarians of antiquity.

3Again, limitations of space preclude an adequate acknowledgement of the sources underlying the above proposal. In brief, the kernel operator is an "upside-down" version of x-bar-theoretic category formation, starting at the top and working downwards, whereas the slash operator resembles that commonly assumed within categorial grammar, albeit allowing for multiple branching.

4For example, whereas in a simple intransitive English expression such as John sings, John sings belongs to the category S0, sings to the category S1, and John to the category S0/S1, in the corresponding sentence in Abkhaz, John sings and sings both belong to the category S0, while John belongs to the category S0/S0. This reflects the observation that in Abkhaz, as in many other languages, words corresponding to sings may function as complete sentences, while words corresponding to John have some of the characteristics of adjuncts.

5Within current linguistic theories, many researchers, for example Carrier-Duncan (1985) in GB, and Kroeger (1991) in LFG, either argue or else take for granted that Tagalog possesses the same rich inventory of syntactic categories generally assumed unquestioningly for all languages. However, a number of scholars, for example Schachter and Otanes (1972), Gil (1982, chapter 6), Himmelmann (1991), and Shkarban (1992), note that various syntactic categories are less readily differentiated in Tagalog than in other languages. The present claim, first put forward in Gil (1992), is more far-reaching, in that it expressly denies the viability of such categories altogether. In more common parlance, what is being argued here is that Tagalog does not distinguish between syntactic categories such as noun, verb, adjective, preposition, and sentence, nor does it distinguish between lexical and phrasal categories.

6The claim that Tagalog has but a single open syntactic category is a non-existence claim, namely that there is no substantial set of syntactic rules and principles
converging on a subset of words and word strings that is significantly smaller than the set of all words and word strings in Tagalog. Claims of non-existence are risky propositions: one has to look everywhere to be absolutely certain that what one seeks does not exist. I have not had occasion to look everywhere; however, I have looked in what I consider to be some of the more likely places, and found no evidence whatsoever for distinguishing between two or more open syntactic categories in Tagalog. The claim that Tagalog has a single open syntactic category, S0, is accordingly put forth as an interim conclusion, to be supported or perhaps modified by future investigation.

7In the morpheme-by-morpheme glosses, the following abbreviations are used: AT "actor topic"; DIR "direct (case)"; DT "direction topic"; EXCL "exclamation"; IT "instrumental topic"; LIG "ligature"; LT "locative topic"; OBL "oblique"; PERS "personal"; PFV "perfective"; PT "patient topic"; STAT "stative"; TOP "topic".

8While some scholars have characterized ang as a subject or nominative-case marker, other scholars argue that it is more appropriately analyzed as a topic marker (as is arbitrarily assumed in the morpheme-by-morpheme glosses); see Manaster-Ramer (1991) for an extensive survey of the positions on this issue.

9Traditionally, descriptions of Tagalog have assumed that sentences such as (8d), with an E-verb in predicate position and an E-noun as its argument, constitute the unmarked instantiations of template (8), whereas sentences such as (8b), with an E-noun in predicate position and an E-verb as its argument are more highly marked, with a "nominal" predicate and a "verbal" argument having undergone "zero-nominalization". However, such descriptions would seem to be the result of viewing the data through Anglocentric eyes; Tagalog itself offers no evidence that I am aware of for such analyses.

10The form of the ligature is determined morphophonemically: a suffix -ng if the preceding word ends in a vowel, -n, or -ng; a free form na otherwise.

11In some cases, one of these interpretations is more readily available than the other; these factors need not detain us here.

12As suggested in (9) above, the examples in (11) - (14) may allow an additional interpretation, in which the E-noun is the modifier of the E-determiner, E-adjective, E-prepositional-phrase and E-relative-clause.

13See, for example, De Guzman (1976, 1979), Cena (1977), and Gil (1984).

14See, for example, Schachter (1976, 1977), and Gil (1984). Other scholars, though, argue that Tagalog does have subjects and objects, identifying these with either pragmatic roles such as topic and non-topic, or thematic roles such as agent and patient. However, under any analysis, Tagalog grammatical relations are quite different from those in other, more familiar languages.

15See Schachter and Otanes (1972:183-193,411-435) for detailed discussion.

16However, a subset of the clitics, the person forms, may also occur in S0 positions: these words enjoy dual category membership, in S0 and S0/S0.

17In addition, Tagalog possesses a number of other "function words", including ang, -n/na and ng illustrated in (8) - (10). However, in Gil (1990), phonological evidence is provided suggesting that these items are more appropriately considered as affixes, rather than independent words. Hence, in accordance with criterion (4a), they are not eligible for syntactic category membership.

18Interestingly, bawat would appear to be the only Tagalog quantifier that does not have the distributional properties of an S0.
19 Apparently, this construction is available for only some speakers of Tagalog; others judge it to be ungrammatical. However, all speakers who accept sentences such as (22) judge them to be ambiguous in the way described below.

20 In the pictorial representations of Interpretations A and B, distinct men are identified by their hats, while distinct suitcases are indexed by Macpaint patterns.

References


LANGUAGES WITHOUT DETERMINER QUANTIFICATION*

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This paper will focus on the syntax of quantification in Straits Salish, a Native American language of the Northwest Coast area. Straits Salish has no determiner quantifiers, no determiners that can be glossed all, each, most, every, many, few, etc.; number words cannot function as determiners, and the feature of definiteness/indefiniteness is not marked in the Determiner system. The language thus provides data that is of particular interest for the study of the morphological and syntactic devices used across languages for the expression of quantificational notions, and the implications of these findings for universal grammar. Quantification is expressed in two ways in Straits Salish syntax: in a small closed class of adverbs, and in certain open class lexical items. The goal of this paper is to identify the grammatical feature of Straits Salish and other languages that is responsible for the exclusion of Determiner quantification.

Determiners are constituents of Noun Phrases, which are generally understood to be maximal projections with a zero-level noun as lexical head. A persistent problem in the analysis of the Salish languages has been the question of whether there is a contrast between noun vs. verb at the lexical level in these languages. What I am going to argue here is that while there are word roots in Straits Salish that arguably may be termed 'nominal' and 'verbal' at the morphological level, this distinction does not have the expected consequences for the X-bar component of the grammar and the syntax; the syntactic behavior of all open class words is the same. It will be useful to call this syntactically defined class the predicate. All predicates have the same distribution in the syntax: they occur with a subject clitic to form a finite clause. A clause may occur with a Demonstrative to form a Determiner Phrase, an adjoined subordinate structure. These nominalized clauses differ from NPs generally in being excluded from argument positions, since they are adjuncts, adjoined subordinate structures. Thus, for Straits Salish we may say that every open class item is the lexical head of its own clause, whether a finite "main" clause or an adjoined subordinate clause. In sum:

1) There are no lexical classes whose maximal projections are NP or VP.

There are three subordinate clause types: Propositional, Subjunctive, and Relative clauses. The adjoined Relative clauses are of the "headless" or "internally headed" variety commonly seen in Native America (see Hale, 1973; Jelinek 1987).
Aside from the open class of predicates to which all inflectable words belong, the Straits Salish lexicon includes only a few closed class items:

2) Closed class elements

a. Second position Inflectional Clitics (the Subject; Tense, Modality, and Mood)
b. Determiner/Demonstrative pronouns (third person);
c. Sentence particles (modals, discourse markers);
d. Adverbs (largely quantificational);
e. Conjunctions
f. The Preposition

All closed class items are particles/clitics, with the single exception of adverbs, which constitute a closed class of words with a special syntax, to be described shortly. The list of closed classes is small, and each class contains relatively few members, when compared to languages with more familiar lexical inventories. For example, Straits Salish has a single preposition, which marks adjuncts oblique. For most Salish languages, the closed class elements can be easily listed on a single page. In the next section, I will focus on the Clitics and Demonstratives, since they are crucial to the noun/verb question; then I will return to the quantificational system and its implications.

1. Sentences: the Predicate and INFL. A major typological feature of the Salish languages is the presence of a "Second Position" clitic sequence in finite or "main" clauses, where various Inflectional categories such as Tense, Modality, Mood, and the Subject appear. This string is encliticized to a morphological word, which is the domain of a primary stress; the clitics are unstressed. Clitics are identified here with the equal sign.

3) a. cey=lə'=sən
   work=PAST=1sNOM

b. si'em=sə=sxʷ
   noble=FUTURE=2sNOM

c. tɕikʷəs=yəxʷ=t
   tired-EVID-1pNOM

I worked.

You will be noble/a chief.

Evidently, we are tired.

Any predicate may appear in this clause initial position. I assume a Pollock (1989) style raising analysis on which the predicate word is raised to adjoin the clitic string (see Jelinek, 1993). The clitic string is composed of the following elements:
4) The sentence operators

a. **Tense clitics**
   
   =sə’ Future
   
   =lə’ Past

b. **Modal clitics**
   
   =yəq Optative
   
   =yəxʷ Evidential
   
   =c’ə’ Probability
   
   =q Conditional

c. **Mood**
   
   =’ə Interrogative

5) The Subject pronouns

a. **Nominative case**
   
   =sən ‘I’
   
   =sxʷ ‘you’
   
   =t ‘we’
   
   =sxʷhə ə ‘you pl.’

b. **Absolutive case**
   
   NULL third person

There is an ‘ergative split’ in the language, whereby first and second person arguments are Nominative/Accusative, and third person arguments are Ergative/Absolutive. The Ergative is overt, and the Absolutive (Intransitive subject and Transitive patient) is phonologically null. As a result, an intransitive predicate appearing without a first or second person Nominative subject clitic is unambiguously interpreted as a finite sentence, with a **definite** third person Absolutive subject. This means that roots may never occur independently; the least than can be said is a clause.

6) a. čey=ə’
   
   b. si’em=ə’
   
   c. ə’=kʷəs=ə’

   He/she/it/they work.
   
   He (etc.) is a chief.
   
   He (etc.) is tired.

**Internal structure of the predicate.** Predicates contain a root plus any internal arguments. It is on the basis of internal arguments that the root classes ‘noun’ and ‘verb’ could be argued for. Transitive predicates include one of the set of transitivizing suffixes (TR) and an object suffix. Unlike the clitics, these object suffixes are phonologically integrated into the predicate word, and may receive the main word stress.

7) kʷənɨɡ-t-ənas=sən
   
   help-TR-1/2sACC=1sNOM

   I helped you.

(A sentence with no overt Tense marking is often given a Past reading.) The set of object suffixes is:
8) a. Accusative
   -ŋəs 1sg or 2sg
   -ŋəč 1pl

   b. Absolutive
   Null 3 person

   If no first or second person object is overtly marked after a Transitivizer, a third person Absolutive object is again the default interpretation, as in (9a). The third person Ergative (transitive agent) is -s, as in (9b).

9) a. kʷənin-t-θ=la'=sən
   help-TR-3A=PST=1sNOM
   I helped him/her/it/them.

   b. kʷənin-t-s=la'=θ
   help-TR-3ERG=PST=3A
   He helped him.

   The Ergative is morphologically an internal argument; it is a suffix (adjoined with a hyphen). Unlike a Nominative subject clitic, it precedes the Tense, Modality and Mood clitics. A predicate with an Ergative internal argument has an Absolutive external argument.¹

   So far we have seen Accusative, Absolutive, and Ergative internal arguments. The fourth type of internal argument is the Possessive. If the Straits Salish root describes something that can be characterized grammatically as possessed, for example material objects, relations, feelings or experiences, a Possessive pronoun may be affixed. However, since all internal arguments are incorporated into the predicate word, the ‘external’ syntax of predicates with Possessive arguments does not differ from that of other predicates: they occur with the clitic string to produce a sentence that has the property of finiteness.

10) a. na-ŋənə=sxʷ
    1sPOSS-child=2sNOM
    You are my child.

   b. na-men=la=θ
    1sPOSS-father=PAST=3ABS
    It is my late father.

   Ex. (11, 12) illustrate ‘psych’ predicates with a Possessive pronoun marking the Experiencer, while the subject is a second position clitic.

11) na-šk’i’=sxʷ
    1sPOSS-value=2sNOM
    You are my dear/valued. (I like you.)
    [cf. s-šk’i’=θ  It is dear/valuable.]

12) na=słəl=θ
    kʷ ye’-ən
    1sPOSS=intent=3ABS DET go-1sSBD
    It is my intention to go.
Ex. (12) shows an adjoined Hypothetical clause, with Hypothetical subject marking; the subject clitics listed in (5) occur only in main clauses.

While transitive predicates may be sorted into subclasses with respect to their internal arguments, it is not at all clear that simple intransitive predicates can be usefully classified other than on semantic grounds. This problem was initially pointed out by Kuipers (1968). In sum, whatever the morphological or semantic features of the predicate may be, whatever internal argument structure it may have, its external syntax is the same: it combines directly with the clitic string in finite clauses.

Serial Predicates. These constructions contain more than one predicate word, forming a complex predicate. Compare Ex. (13, 14) with (15), containing a serial predicate.

13) 'əy=sx\textsuperscript{w} 
    good=2sNOM
    You’re good.

14) sway'qə'=sx\textsuperscript{w} 
    male=2sNOM
    You’re a man.

15) 'əy=lə'=sx\textsuperscript{w} 
    swəy'qə'
    good=PAST=2sNOM  male
    You were a good man.

The second position clitic sequence follows the first word of the complex predicate in (15); it cannot appear after the second.\textsuperscript{2}

16) * 'əy  swəy'qə'=lə'=sx\textsuperscript{w} 
    good  male =PAST=2sNOM

It is the initial predicate of the complex that undergoes raising, since raising is limited to a phonological word (Travis 1984). The second (unraised) predicate may be transitive, with an internal argument:

17) ən'ę=lə'=sən  len-\textsuperscript{t}ənəs 
    come=PAST=1sNOM  see-TR-2sACC
    I came to see you.

Evidence that the serial predicates form a constituent is provided by the fact that the lexical Passive takes scope over the entire complex.

18) ən'ę=lə'=sx\textsuperscript{w}  len-t-ŋ
    come=PAST=2sNOM  see-TR-PASS
    You were visited (‘come-to-see’d’).
In sum, predicates that appear in serial constructions describe qualities, material objects, or actions.

If Straits Salish had a copular verb, the syntactic behavior of some predicates would clearly be distinct from others: we would see "predicate nouns" and "predicate adjectives" occurring with an overt copula in at least some Tense/Aspect or person contexts. If we assume a copula that is phonologically NULL across all paradigms, a feature of INFL perhaps, then we have no way to constrain its distribution across predicate types. The generalization is:

19) All and only open class words are predicates.

So far we have seen only main clauses, composed of predicates containing internal arguments and occurring with subject clitics. These arguments are exclusively pronominal. Now let us consider the derivation and syntax of Determiner Phrases.

2. Determiner Phrases. We noted that in addition to main clauses, Straits Salish has various adjoined subordinate clause types: Propositional, Hypothetical, and Relative clauses. None of these clause types contains subject clitics or Mood markers, which are confined to main clauses.

Relative clauses are of the "headless" variety, comparable to a "free" relative. They are derived from any predicate by a Demonstrative/Determiner which functions as an iota operator in binding one of the arguments of the relativized predicate, producing a referring expression. Compare the following:

20) a. leŋ-t-oŋas=sxʷ
   see-TR-1/2sACC=2sNOM
   You saw me.

b. cə leŋ-t-əxʷ
   DET see-TR-2SUBORD
   the (one that) you saw

c. cə leŋ-t-oŋəs
   DET see-TR-1/2ACC
   the (one that) saw you/me

Relatives based on intransitives are Subject-headed:
21) a. ca ḋey
    b. ca si'em
    c. ca +čikʷəs
    d. ca ḋeənə
    e. ca na-men=lo'
    the (one who) works
    the (one who is) noble, a chief
    the (one who is) tired
    the (one who is) a child
    the (one who is) my late father

In sum, relatives may be derived from any main clause type. A relative clause can be derived from a Passive (22a), or from a ‘psych’ predicate, with a Possessive experiencer, as in (22b).

22) a. ca leŋ-t-ŋ
    b. ca na-səx'i
    the one who was seen
    the (one who) is dear to me/
    the one I like

Determiner Phrases can not appear as predicates, cannot occur with the clitic string. The constructions in (21, 22) cannot be interpreted as sentences with null absolutive subjects. I interpret this as evidence against a possible NULL copula as an Inflectional head.

23) a. *ca si'em=sxʷ
    b. *ca na-səx'í=t
    [you are the chief]
    [he is the one I like]

The set of Determiner/Demonstratives in Lummi (Straits Salish):

24) General                   Female
    ti'ə                  si'ə                proximate and visible
    ca                  sə                neutral
    kʷə                  kʷə                distal or out of sight
    kʷtsə (kʷca)       kʷsə                remote

Straits Salish Determiner Phrases differ from NPs generally in two respects: a) their lexical head can be any member of the open class of predicates, and b) they are adjoined subordinate clauses in A-bar positions, comparable to topics.

25) swəy'qə'=t  ca leŋ-t-ən
    man=3ABS  DET see-TR-1sSBD
    He is a man, the one I saw. (The one I saw is a man.)

26) leŋ-t-ə=sən        ca swəy'qə'
    see-TR-3ABS=1sNOM DET man
    I saw him, the one who is a man. (I saw the/a man.)
In the following example, the Determiner Phrase follows the predicate of the subordinate Propositional clause, yet it is coindexed with the third person subject in both clauses.

27) q'aq'ena=t=θ 'a=t ỹ=at-η-s cə 'əs'eləxʷ
   slow=3ABS CONJ SBD-walk-MIDDLE-3POSS DET old man
   He is slow when he walks, the old man.
   (*He is slow when the old man walks.)

I take this as evidence that the Determiner Phrase in (27) is an adjunct in an A-bar position. Baker (1992) argues that nominals in Mohawk are adjuncts, on the basis of the absence of expected subject/object asymmetries. Adjuncts in Salish are set off with an "afterthought" intonation contour; the typical sentence has one at most. Transitive sentences with two adjoined nominals are marginal, and it has been claimed by some Salishanists that they probably represent English language contact (Kinkade 1983). Where a transitive with two nominals is elicited, their order is not significant.

28) ?? kʷənɨ̞-t-s=θ sə ʃtəniy' cə swəy'qa'
    help-TR-3ERG=3ABS DET female DET male
    The woman helped the man.
    Or: The man helped the woman.

When two adjuncts are present, the preferred construction is the Passive, where one adjunct is Oblique. Order of the direct and oblique adjuncts is free.

29) kʷənɨ̞-t-η=θ 'ə sə ʃtəniy' cə swəy'qa'
    help-TR-PASS=3ABS PREP DET female DET male
    The man was helped by the woman.

The oblique marker 'ə occurs before any adjunct not coindexed with a direct argument of the predicate. This includes various directional and locative expressions as well as the optional passive 'by' phrases. The preposition cannot take a pronominal object suffix; these suffixes only occur internal to open class predicates. Oblique Determiner Phrases, like direct Determiner Phrases, cannot serve as predicates.

30) a. čey=sən 'ə cə 'elən
    work=1sNOM P DET house
    I work at, in the house.

b. *'ə cə 'elən=sən
    P DET house=1sNOM
    [I am at, in the house]

Ex. (30b) is ungrammatical because it contains no predicate except the one bound by a Determiner. We may conclude that the semantic feature of
finiteness is a property of all lexical predicates, unless this property is bound by a Determiner.

**Hypothetical clauses.** Hypothetical clauses provide important additional evidence on the uniform syntax of predicates. Whatever their semantic or morphological features, all predicates share the same syntax in subordinate clauses, just as they do in main clauses. In Hypotheticals, third person subjects are overt.

31) a. čte-t-ŋ=sən  
    kʷə swi’qoa-t-əs  
    ask-TR-PASS=1sNOM   DET young man-3SBD  
    I was asked if he was a young man.

b. čte-t-ŋ=sən  
    kʷə t’əm’-t-əs  
    DET hit-TR-3ABS-3SBD  
    I was asked if he hit him.

c. čte-t-ŋ=sən  
    kʷə nə-s-χ’i’-əs  
    DET IsPOSS-SBD-value-3SBD  
    I was asked if it’s what I like. (‘psych’ pred.)

The uniformity of subject marking across predicate type in subordinate clauses is important evidence that it is not just the presence of the main clause Inflectional clitic sequence that produces the uniformity of syntax for all the predicate subclasses.

Plurality of states, events or entities can be marked optionally in the predicate via reduplication and other internal processes. This occurs in all clause types, as well as in Determiner Phrases.

32) a. s+teniy’=ə  
    s+ən-teniy’=ə  
    She is a woman.  
    They are women.

b. sə s+teniy’  
    sə s+ən-teniy’  
    the (one who is a) woman  
    the (ones who are) women

33) a. nəq-ŋ=ə  
    nəq-nəq-ŋ=ə  
    He is diving.  
    He is diving repeatedly.

b. cə nəq-ŋ  
    cə nəq-nəq-ŋ  
    the (one who) dives  
    the (one who) dives repeatedly,  
    or the (ones who) dive (repeatedly)
Tense is marked in both main and subordinate clauses.

34) a. cə swəy’qə=la’  
    DET man=PAST  
    the late (deceased) man

   b. cə qəy=sə’  
    DET work=FUTURE  
    the one who will work

Proper names require Determiners and take affixes.

35) a. tečəl=ə’  
    cə Tim  
    arrive=3ABS DET Tim  
    Tim arrived.

   b. xʷi’elqən=ə’  
    cə Kennedy  
    return=3ABS DET Kennedy  
    Kennedy came back.

c. qə-te-η=ən  
    kw  s-Lena-s  
    ask-TR-PASS=1sNOM DET SBD-Lena-3SBD  
    I was asked if it was Lena.

In sum: all predicates, whatever their lexical features or internal argument structure, have the same "external" syntax.

3. Quantification in Straits Salish. Bach, Kratzer and Partee (1987) identify a typological contrast across languages in the distribution of elements marking Determiner vs. Adverbial Quantification. The Straits Salish Determiner system consists only of demonstrative pronouns that mark contrasts in relative distance, gender, visibility, and the like; however, they do not mark the following quantificational features:

36) a. Definite vs. indefinite  
    b. Singular vs. plural  
    c. Count vs. mass  
    d. Cardinality expressions (numbers, many, few,..)  
    e. Strong quantifiers (each, every, most, all...)

The default interpretation of Determiner Phrases is definite; indefinite interpretations are permitted in some contexts, to be reviewed below.

Straits Salish has unselective adverbial quantification, as identified by Lewis (1975), and some sentence particles and clitics that express modal notions. Work in progress on quantification in natural language suggests that while all languages have A-Quantification, only some languages have D-Quantification.

The adverbial quantifiers. Salish has a small closed class of second-order predicates, the unselective adverbial quantifiers. The most common of these
is perhaps *məkʷ, which can be glossed 'all, completely'.

37) məkʷ=ɪ 'əw' ye' ALL-1pNOM LINK go We all went.

38) məkʷ=sxʷ 'əw' ə-t-Ø ALL-2sNOM LINK eat-TR-3ABS You ate them all.
Or: You ate it all up (completely).

In (37), the adverbial has scope over the subject; in (38), over the predicate, either the event or the internal argument. Adverbial quantifiers only occur linked to another predicate, over which they have scope, by the LINK particle 'əw'. As with serial predicates, the first word of the resulting complex predicate raises to adjoin the clitic string. The Adverbial cannot be the single predicate in a clause.

39) *məkʷ=ɪ ALL=1plNOM [we are all]

Ex. (40) could be used in speaking of a bunch of flowers that all a) have the same color, or b) are not parti-colored. The adverbial quantifier may have scope over either the predicate ('how much' -- the extent or degree of saturation of the color) or over the subject ('how many').

40) məkʷ=Ø 'əw' p'əq ca sp'eqəŋ all=3ABS LINK white DET sprout They are all/completely white, the flowers.

Another example of an unselective adverbial quantifier is provided by əe' 'again, also'. In the two glosses given for Ex. (43), the adverbial takes scope over either the subject or the predicate.

41) əe'-sən 'əw' ye' again/also-1sgNOM LINK go.
I'll go again/I also will go. [additionally]

In addition to məkʷ and əe', the following adverbial quantifiers have been recorded in Straits Salish.

42) a. yas always b. ən'an very/too much
c. əəlel almost d. xʷəw'e never; not yet

Additional example sentences:
43) a. yas-sən 'əw' ye' always-1sgNOM LINK go
    I always go.

b. 'ən'an=θ 'əw' əy ə cə s'iən very LINK=3ABS good DET food
    The food is very good.

"Strong" vs. "Weak" Quantifiers. Milsark (1977) distinguishes between two
types of quantifiers: the strong quantifiers include items like all, each, most
and every, while the weak quantifiers include cardinality expressions such as
numerals, and words like many and few. This major division within the domain
of quantifiers has a number of syntactic reflexes across languages. For
example, strong quantifiers cannot occur in existential contexts, while weak
quantifiers can:

44) a. *There are all (each, most) men in the boat.
    b. There are many (few, seven) men in the boat.

The examples in (44) show that in English, both strong and weak quantifiers
appear in D-Quantification, but the strong quantifiers are excluded from
existential contexts. In Salish, the contrast between strong and weak
quantifiers is marked in the syntax as follows:

45) a. Strong quantifiers are adverbials.
    b. Weak quantifiers are predicates.

In Ex. (37, 38) above we saw strong quantifiers as unselective adverbials,
connected to a main predicate via a LINK particle. Weak quantifiers are
‘main’ predicates, serving as the single predicate in a clause.

46) ən'=θ cə s'eenax'
    big/many=3ABS DET fish
    They are many, the fish.

Existential Constructions. There are affirmative and negative existential
predicates. The affirmative existential is also a locative predicate, as is
commonly seen across languages.

47) a. ni'=θ cə s'eenəx'
    exist=3ABS DET fish
    There’s (the) fish.

b. ni'=ə=la'=θ
    exist=Q=PAST=3ABS
    Were there any?

48) 'əwənə=ya=x'=θ cə s'eenəx'
    not:exist=EVID=3ABS DET fish
    Apparently there’s no fish.
Existential contexts exclude strong quantifiers.

49) ni'=$\emptyset$ cə $\eta\text{ən}$' s'ətənəŋ'
   exist=3ABS DET big/many berry.
   There are [the] many berries. (Weak Quantifier)

50) * ni'=$\emptyset$ cə mək'w s'ətənəŋ'
   exist=3ABS DET all berry
   [* There are [the] all berries] (Strong Quantifier)

Evidence from Hypothetical and Propositional clauses. In these subordinate clauses, cardinality and existential predicates, like all other predicates, show overt subject marking.

51) čte-t-ŋ=sən
   k'wə $\eta\text{ən}$'-əs
   ask-TR-PASS=1sNOM DET many-3SBD
   I was asked if there were many.

52) čte-t-ŋ=sən
   k'wə ni'-əs
   DET exist-3SBD
   I was asked if there were any.

53) čte-t-ŋ=sən
   k'wə 'əwənə-əs
   DET not:exist-3SBD
   I was asked if there weren't any.

In (54), the negative existential quantifier appears in an adjoined Propositional subordinate clause, where it is inflected for second person Possessor subject.

54) 'əsk'wəy=$\emptyset$ k'wə stəŋ-+ k'wə 'ən-s'-əwənə
   IMPOSS=3ABS DET do:what-1pl DET-2sPOSS-SBD-NEG:exist
   It's impossible, that we do something, [if] you don't exist. (We can't do anything without you.)

Type-shifting in predicates (Partee 1987). There are a few open class predicates that may also be used as Adverbial quantifiers, with the LINK particle.

55) a. si'it=$\emptyset$
   true=3ABS
   It's true.

55) b. si'it=sən 'əw' $\text{čik}$'wəs
   true=1sNOM LINK tired
   I'm really tired.

Other predicates that may be type-shifted in this fashion are $\eta\text{ən}'$ 'big', $\text{čeyn}$
'straight', and *hay* 'finish'.

56) a. *hay=∅*
    finish=3ABS
    It’s finished.

b. *hay=sən ʔəw† ṝ-telə*
    finish=1sgNOM LK REL-money
    1. I have all the money.
    2. Only I have money.

**Negation.** Type-shifting appears also with Negation. The Negative predicate *ʔəw†* can appear either as an Adverbial (Ex. 57), or as a simple intransitive (Ex. 58, in a main clause serial predicate).

57) *ʔəw†=sən s-ʔəw†-ye’*
    NEG-1sNOM IRREALIS-LINK-go
    I’m not going/I refuse to go.

58) *ʔəw†=sxʷ qʷʔəqʷəl ʔə† iʔən-axʷ*
    NEG=2sNOM speak CONJ eat-2sSBD
    You don’t talk while you eat.

**Lowering.** The universal quantifier can be transitivized, as can most (if not all) other Straits Salish predicates. When transitivized, it is necessarily no longer an Adverbial, and has the meaning ‘take completely’.

59) *makʷ-t-ə=yəq=sxʷ*
    all-TR-3ABS=OPT=2sNOM
    Wish you would take them all/finish them off.

This transitive predicate may appear in a Determiner Phrase.

60) *ca makʷ-t-ə-axʷ*
    DET all-TR-3ABS-2sSBD
    the (ones) you took all (of)/’totalled’

**Wh-words.** Wh-words across languages share a number of properties with quantifiers. In Salish, Wh-words, like cardinality expressions, are predicates. Wh-words occur with the clitic string.

61) a. *wet=sxʷ*
    who=2sNOM
    Who are you?

b. *wet=∅  ca swi’qoa†*
    who=3ABS DET young man
    Who is he, the young man?

Like all other predicates, Wh-words have overt third person subjects in Hypothetical clauses.
63) ƛə-t-ʔ=sən      kʷə stəʔ-əs  
    ask-TRANS-PASS=lsgNOM   DET what-3SBD  
    I was asked what it was.

64) ƛə-t-ʔ=sən  kʷə wet-əs  
    DET who-3SBD  
    I was asked who it was.

65) ƛə-t-ʔ=sən  kʷə ʔəxin-əs  
    DET where-3SBD  
    I was asked where it/he was.

In Straits Salish, Wh-predicates do not occupy argument positions, and there is no Wh-movement in the syntax. Wh-words are predicates that take external arguments.

Definites and Generics. Bittner and Hale, in press, show that Warlpiri nominals are open in interpretation as to definiteness. Salish Determiner Phrase may be open to both definite and generic readings.

66) ʔəwə=θ  s-əw’  t’iləm  cə  sʔəenəxʷ  
    NEG=3ABS IRR-LINK  sing   DET fish  
    The fish didn’t sing.  
    OR: Fish don’t sing.  (Definite)  
    (Generic)

Across languages, generics are often plural or mass nouns, but plurality is optionally marked in Salish, count/mass is not marked, and temporal reference can be left open. When the sentence is given a generic reading, the generic operator binds a variable in both the main clause and Determiner Phrase. When the DET P has a definite reading, there is coindexing between pronouns across the clauses.

Indefinites. A number of syntactic devices are employed in Straits Salish to provide indefinite readings. In Possessive ("have") sentences we see an incorporated Relational prefix that derives a possessive sentence from a predicate. Consider the following contrast:

67) a. s+eniy’=sxʷ  
    female=2sNOM  
    You are a woman  

   b. ƛ-s+eniy’=sxʷ  
    REL-female=2sNOM  
    You have a wife/woman.

Indefinite arguments also may be required in intensional contexts, in Desideratives, for example.
68) snəxʷəɬ'-ełən̓=sən
canoe-DESIDERATIVE-1sNOM
I want a canoe/to make a canoe.

There is another predicate that is used to express a desire for some definite entity, ‘to want something that you can see’.

69) sitən-θ=sən  cə snəxʷəɬ
desire-3ABS=1sNOM DET canoe
I want (covet) the canoe.

The principal means for expressing indefiniteness is with the simple intransitive ‘main’ predicate.

70) si’em’=θ  cə na-men
noble=3ABS  DET 1sPOS-sfather
My father is noble/a chief.

4. Concluding remarks. A summary on Salish syntax:

71) a. All open class words (i.e., neither particles nor adverbs) are predicates.
   b. The ‘external’ syntax of all Predicates, whatever their internal
      structure and lexical features, is identical in all clause types.
   c. Determiner Phrases are adjuncts that permit both definite and
      indefinite interpretations.

A summary on quantification in Straits Salish:

72) a. Straits Salish lacks Determiner quantification. Determiners are
      exclusively demonstrative pronouns.
   b. The Weak quantifiers (the cardinality expressions) are ‘main’
      predicates, as are Wh-words and existential expressions.
   c. The Strong quantifiers are unselective Adverbials. There is some type-
      shifting between first and second order predicates.

I attribute the absence of D-Quantification in Straits Salish to the fact that
Determiner Phrases are in A-bar positions in these languages. While
Adverbial quantification is unselective, Determiner quantification is not; the
function of Determiner Quantification is to fix the scope of the quantifier to
an NP in a particular argument position. In a tripartite quantificational
structure of the kind developed by Kamp (1981), Heim (1982), a noun may
form the restrictor clause of a quantifier.
73) \[ \text{All}_x \text{ fish}(x) \text{ swim}(x) \]
\[ Q \text{ Restrictor Nuclear scope} \]

Where there are no lexical items in argument positions, determiner quantification is necessarily excluded. Straits Salish has the typological feature

74) [+ Pronominal Arguments]

In languages with this feature, only incorporated pronouns occupy argument positions. These pronouns are exclusively definite and presuppositional. When an adjoined DET P receives an indefinite interpretation, it is linked via predication to an Absolutive pronoun in the main clause. On a definite reading, a DET P is topic-like in function. Since Determiner Phrases are in A-bar positions, they cannot include D-Quantifiers, whose function is to fix the scope of the quantifier to a particular argument position. Across languages, we do not see D-quantifiers in NPs in topic or ‘afterthought’ positions.

75) * Every/no fish, it swam.
    * They swam, most/few fish.

It has been argued for other languages that nominals are confined to A-bar positions: Navajo (Jelinek, 1984, 1988; Willie 1990, 1991; Faltz, in press); Warlpiri (Jelinek 1984); Mohawk (Baker 1992, in press), and Asurini do Trocara (Vieira, in press). These languages also lack Determiner Quantification. Except for Asurini, they have not been claimed to lack a noun/verb contrast. It is the fact that nominals are adjuncts in these languages that excludes Determiner Quantification; it also provides for, but does not require, the kind of predicate syntax we see in Straits Salish.

NOTES

*Some parts of the material presented here are included in a larger study of quantification in Straits Salish, to appear in a volume titled Quantification in Natural Languages, edited by Emmon Bach, Eloise Jelinek, Angelika Kratzer, and Barbara Partee (in press). I am grateful to the late Al Charles and Victor Underwood, and to Lena Daniels and Agatha McCluskey, for instructing me in Salish. I thank Richard Demers for introducing me to Salish, and for endless hours of fruitful discussion of these questions. I thank the following for their comments: Mark Baker, Andrew Barss, Maria Bittner, Molly Diesing, Donna Gerdts, Ken Hale, Ed Keenan, Dale Kinkade, Aert Kuipers, Tim Montler, Marcia Damaso Vieira, and Mary Willie. I am especially grateful to Emmon Bach, Angelika Kratzer, and Barbara Partee, for their generous help. None of these is responsible for my errors.
The ergative split and person hierarchy in Straits Salish prevents the third person Ergative from appearing with the first or second person Accusative. Ergative and Accusative are both internal arguments, and thus cannot cooccur.

Emmon Bach (p.c.) points out that this distribution of external vs. internal arguments was first documented for the Northwest area by Boas (1947) in his Kwakiutl Grammar, p. 283.

Gerdts (1988) shows that the quantifier mak'w in Halkomelem has absolutive scope. In Straits Salish it may have scope also over a subject, on a collective reading (Jelinek in press).

REFERENCES


Bittner, Maria and Ken Hale. Remarks on Definiteness in Warlpiri. In Bach et al, in press.

Faltz, Aryeh. Towards a Typology of Natural Logic. In Bach et al, in press.


Vieira, Marcia Damaso. The Expression of Quantificational Notions in Asurini do Tromara. In Bach et al., in press.


Universals in the Semantics of the Diminutive

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1 Introduction

The diminutive construction is one of the most universally-attested in language, so it's not surprising that a number of observers have noted such universals about it as its common realization by nasals (Jakobson & Waugh 1979), by reduplication (Moravcsik 1978), and especially by the use of higher tonality (Jespersen 1922; Sapir 1915/1949; Ultan 1978; Ohala 1984; Nichols 1971). Similarly, linguists have frequently observed that universal statements could be made about semantic aspects of the diminutive. Haas (1972:148), for example, noted that

the diminutive also usually carries with it a number of affective connotations which range from endearment to tenderness through mild belittlement or deprecation to outright derogation and insult.

Recently, following the lead of Sapir (1915/1949) on Nootka, a number of quite detailed studies have appeared on the semantics of the diminutive in particular languages, including Ojibwa (Rhodes 1990), Ewe (Heine et al. 1991), and Cantonese (Jurafsky 1988). It is my hope in this paper to extend Haas' characterization and make some universal statements concerning the semantics of diminutives, drawing on these studies and further data from a number of languages which vary typologically as well as genetically.

I draw three conclusions as a results of the study. First, I argue that there is much more in common among diminutives cross-linguistically than the commonly cited affectionate and pejorative senses, and sketch a universal radial category for the diminutive construction which includes the concepts of resemblance, imitation, gender, partitives, approximation, and hedging. Second, I examine the metaphorical extensions that the diminutive exhibits from its source domain of size or childhood to its various target domains, and argue that they are compatible with universal statements about the unidirectionality of semantic change in grammaticalization made by Traugott (1988), Sweetser (1990), Heine et al. (1991), and others. Finally, I introduce the concept of an abstract radial category, an extension to the theory of radial categories in which the elements of the category may be realized by distinct lexical items or constructions.
2 Semantic Categories and Grammaticalization

Many recent studies of semantic change in grammaticalization have relied on the radial category model of semantics of Lakoff (1987), which extends the classic model of categories by giving them complex internal structure. This structured polysemy model allows us to draw a middle ground between the abstractionist approach to representing semantics, in which a class of concepts is represented by some single abstraction which characterizes the whole class, and the homonymy approach, in which a class of concepts is represented as semantically atomic and unrelated. A radial category consists of a central prototype together with less-central conceptual extensions, represented by a network of nodes and links. Nodes represent prototypes of senses, while links represent metaphorical extensions, image-schematic transfer, or transfers to different domains. Interpreted as a historical object (for example by Heine et al. (1991), Nikiforidou (1991), Pederson (1991)), the radial category represents the process of grammaticalization, where the central sense represents a historically and semantically prior sense, and extensions represents historical expansions of the category by specific extensions to this core sense.

Parallel to this work in semantic category theory has been a tradition of studying the unidirectionality of semantic change in grammaticalization. A number of scholars have explained the tendency of meanings to become more abstract, i.e., more removed from the domain of the physical world, and more subjective or evaluative. For example, Traugott (1989) proposes three tendencies in semantic change, in which meanings shift from the external to the internal (evaluative or perceptual) domain, from the external or internal to the textual or metalinguistic domain, and in general toward greater subjectification. Sweetser (1990) shows that semantic changes in modals and certain verbs proceed in a metaphorical shift in domain from the real-world to the epistemic and speech-act domains, and described the types of metaphors which accompany this process. Heine et al. (1991) also propose a metaphorical interpretation of change, and argue that meaning shift proceeds along the path PERSON ⇒ OBJECT ⇒ SPACE ⇒ TIME ⇒ PROCESS ⇒ QUALITY.

The radial category for the semantics of the diminutive construction I give below is consistent with many of these versions of unidirectionality. We will see metaphorical extensions from the central physical domain of size to the domains of gender, social power, and conceptual centrality, exhibiting meaning shifts from the physical world to the social domain, and from the physical world to the conceptual or category domain.

Figure 1 shows the proposed universal structure for the semantics of the diminutive. Again, nodes represent senses, and links represent metaphorical extensions or domain transfers. Claiming that this structure is universal means, as Pederson (1991) has discussed, that the category in any individual language will be structured by subsets of this universal category, although we would in addition expect extensions to the universal category in specific languages. Jurafsky (1988), for example, shows a number of very specific extensions to the diminutive in Cantonese, such as
the concept *food*.

Figure 1: Proposed Universal Structure for the Semantics of the Diminutive

### 3 Core Senses - Child, Affection, Small

What is the historically prior and semantically central sense of the diminutive construction? Heine *et al.* (1991) show that for Ewe the earliest and central sense is the meaning *child*. Jurafsky (1988) shows that for Cantonese it is the meaning *son*; this is also true in each of the other dialects of Chinese, even in clearly non-cognate cases. Similar child-based central senses exist in the Bantu and Muskogean families. But in other languages and families, including Lakhota, Ojibwa, and throughout Indo-European, there is no historical evidence that the diminutive arose from a morpheme meaning “child”. Yet it is still quite plausible that the diminutive affix in these languages has a historically prior sense “child”. For example the pragmatic use of the diminutive to mark that a discourse participant or verbal argument is a child argues for a child-centered category; this usage is very common in North America (Munro (1988) gives examples from the Siouan, Muskogean, and Yuman families), as well as in Greek (Sifianou 1992) and Polish (Wierzbicka 1984).

For these reasons I propose that in fact the sense *child* is the historically and semantically prior sense of the diminutive, but that most of the extensions of the category follow the early extension to the sense *small*. Figure 1 shows the sense *child* as the root node in the partial ordering which defines the category; this use of diminutives to mark children or offspring seems universal. Besides the pragmatic
uses of the diminutive noted above, many languages lexically mark the young of animals with the diminutive:

<table>
<thead>
<tr>
<th>Offspring</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>duck</td>
<td>duckling</td>
</tr>
<tr>
<td>Ewe</td>
<td>koklô</td>
<td>koklô-vi</td>
</tr>
<tr>
<td>Ojibwa</td>
<td>mkwa</td>
<td>mkoons</td>
</tr>
<tr>
<td>Halkomelem</td>
<td>tâlîqâsèl</td>
<td>tâlîlîqâsèl</td>
</tr>
</tbody>
</table>

The use of the diminutive to mark affection or hypocorism, presumably an early extension of the use to mark children, has been extensively discussed in the literature. This sense is very common with both names and kinship terms, as the table below shows. We also see this affectionate sense on common nouns.

<table>
<thead>
<tr>
<th>Affection</th>
<th>Names</th>
<th>Kinship Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Marty</td>
<td>Cantonese</td>
</tr>
<tr>
<td>Ojibwa</td>
<td>mBiliins</td>
<td>Russian</td>
</tr>
<tr>
<td>Cantonese</td>
<td>wong₂</td>
<td>Halkomelem</td>
</tr>
<tr>
<td>Mid. Breton</td>
<td>Alanic</td>
<td></td>
</tr>
</tbody>
</table>

The remainder of the senses of the diminutive are based on an extension from the sense child to the sense small. Obviously this sense of the diminutive is very common; the table below presents a few examples.

<table>
<thead>
<tr>
<th>Small</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ojibwa</td>
<td>mkizin 'shoe'</td>
<td>mkiznens</td>
</tr>
<tr>
<td>Yiddish</td>
<td>di mil 'the mill'</td>
<td>dos milxîl</td>
</tr>
<tr>
<td>Ewe</td>
<td>kpé 'stone'</td>
<td>kpé-vî</td>
</tr>
</tbody>
</table>

4 Gender and Contempt

The unimportance/contempt and female gender senses of the diminutive are quite interrelated in many languages. The contempt sense is linked to the central sense small by a metaphor from the source domain size to the target domain of social importance or power, which might be characterized as follows:

POWER AND IMPORTANCE IS SIZE
The **Weakness** table below shows some more literal examples of this metaphor, in which the diminutive represents weakness in the physical world.

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewe</td>
<td><em>do</em></td>
<td><em>do-ví</em></td>
</tr>
<tr>
<td>Yiddish</td>
<td><em>der vint</em></td>
<td><em>dos vintl</em></td>
</tr>
<tr>
<td></td>
<td>‘disease’</td>
<td>‘minor suffering, cold’</td>
</tr>
<tr>
<td></td>
<td>‘the wind’</td>
<td>‘the breeze’</td>
</tr>
</tbody>
</table>

The **Contempt** table lists examples where this sense of “small” or “weak” has extended from the physical to the social world. Note the common use of the diminutive to mark foreigners and marginalized women, viewing them as socially weaker or of smaller status.

<table>
<thead>
<tr>
<th>Contempt</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td><em>star</em></td>
<td><em>starlet</em></td>
</tr>
<tr>
<td>Cantonese</td>
<td><em>nui</em></td>
<td><em>sau</em></td>
</tr>
<tr>
<td></td>
<td>‘woman’</td>
<td><em>nui</em></td>
</tr>
<tr>
<td></td>
<td>‘woman’</td>
<td><em>mo</em></td>
</tr>
<tr>
<td></td>
<td>‘woman’</td>
<td><em>sek</em></td>
</tr>
<tr>
<td>Nez Perce</td>
<td><em>wiki</em></td>
<td><em>wiki</em></td>
</tr>
<tr>
<td></td>
<td>*‘Coeur d’Alene’</td>
<td>*‘Coeur d’Alene (der)’</td>
</tr>
<tr>
<td>Fuzhou</td>
<td><em>huang</em></td>
<td><em>limey</em></td>
</tr>
<tr>
<td>Oktober</td>
<td><em>gner</em></td>
<td>*‘foreigner’</td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Besides the power metaphor, the *contempt* sense exhibits a metaphor which reappears in most of the other extensions, particularly in the gender, imitation, and approximation senses. This is the metaphor which links the diminutive with marginality or marginalization.

**Category Centrality is size (or Marginal is Small)**

Through this metaphor relating category centrality to size, the diminutive marks marginal or less-central members of various categories. Thus foreigners are viewed as marginal members of the category of people, and dance hostesses as marginal members of the category of women. Stating the metaphor at the domain of the category and not just marginality makes a more general prediction that the augmentative might be used conversely to mark category centrality or exactness.

In addition to the use of the diminutive to mark marginalized women, many languages draw an even tighter relation between the diminutive and *female gender*, exhibiting the metaphor

**Gender is Size**

This **Gender is Size** metaphor would be quite closely linked with the **Power is Size** and **Category Centrality is Size** metaphors in cultures which mark women as marginal members of society or as socially or physically weak. In addition to the Cantonese data discussed above, a number of languages,
which seem to be mostly Indo-European and Semitic, (Fodor (1959) also notes some
related examples from Afro-Asiatic) employ the same morpheme for diminutives
and as a feminine marker. We can distinguish these from what might be called
“switch-gender” – that is, cases of the sort common diachronically in Romance
or which exist in Hottentot, where a change of lexical gender is used to mark an
exceptional or unusually large or small object. Unlike those symmetrical cases, in the
examples here it is solely the feminine that patterns with the diminutive.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Feminine</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>major majorette</td>
<td>diner dinette</td>
</tr>
<tr>
<td>Hebrew</td>
<td>axyan ‘nephew’ axyanit ‘niece’</td>
<td>mapa ‘tablecloth’ mapit ‘napkin’</td>
</tr>
<tr>
<td>Hindi</td>
<td></td>
<td>ghantā ‘bell’ ghantī ‘small bell’</td>
</tr>
</tbody>
</table>

Zubin (p.c.) has pointed out examples like those in the Gender II table, where
there is an asymmetry in the vocabulary for young people, in which the word for
“girl” incorporates a diminutive form (as the English does, from the Germanic “-l”
diminutive), but the word for “boy” does not.

<table>
<thead>
<tr>
<th>Gender II</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>Junge ‘boy’</td>
<td>Mädchen ‘girl’</td>
</tr>
<tr>
<td>Cantonese</td>
<td>dzai2 ‘son’</td>
<td>nui2 ‘daughter’</td>
</tr>
<tr>
<td>English</td>
<td>boy</td>
<td>girl</td>
</tr>
</tbody>
</table>

5 Partitives

A number of languages use the diminutive to denote something like a salient part
of a whole. Following Rhodes (1990), I call these partitive diminutives. Common
uses of the partitive diminutive include body-part partitives, derivation of count
from mass nouns, and derivation of verbal sub-events. The body-part partitive is
used to derive smaller body-parts from enclosing body-parts (the last example is
from Heine et al. (1991)).

<table>
<thead>
<tr>
<th>Body-Part</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ojibwa</td>
<td>zid ‘foot’</td>
<td>zidens ‘toe’</td>
</tr>
<tr>
<td>Ewe</td>
<td>afō ‘foot, leg’</td>
<td>afō-ví ‘toe’</td>
</tr>
<tr>
<td>Baule</td>
<td>sa ‘hand’</td>
<td>sa-mma ‘finger’</td>
</tr>
</tbody>
</table>

A number of languages extend the partitive diminutive to derive something like
count nouns from mass nouns – here the salient part is a delineated part of a larger
amount. The table below shows a number of such cases; in some cases, such as
Cantonese, the language does not grammaticalize the count/mass distinction, but
the diminutive may still be used to form nouns which are delineated parts of the
mass quantity expressed by the base nouns.

<table>
<thead>
<tr>
<th>MASS</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yiddish</td>
<td>der zam dl</td>
<td>dos zem dl</td>
</tr>
<tr>
<td>Ojibwa</td>
<td>goon</td>
<td>goon ens</td>
</tr>
<tr>
<td>Ewe</td>
<td>suk li</td>
<td>suk li vi</td>
</tr>
<tr>
<td>Cantonese</td>
<td>tong 4</td>
<td>tong 2</td>
</tr>
</tbody>
</table>

Finally, a number of languages use a diminutive form on the partitive marker itself, as shown below. Each of these forms is used to denote subamounts of mass nouns, and subevents of durative verbs.

| Lev. Arabic | šwayye     | ‘a little (bit of)’ |
| Mandarin    | yi dianr   | ‘a little (bit of)’ |
| English     | a little   |                   |

6  Resemblance, Imitation, and Approximation

This section discusses a chain of senses of the diminutive construction which extend the core sense to the concept *resemblance* and from that to the concept *imitation*. In the *resemblance* sense the diminutive marks an object which *resembles* the source object in its form or function, but is smaller. Rhodes (1990) has called these *classificatory* diminutives, because the diminutive object is a small object which is classified in the same ontological hierarchy as the larger object. The table below gives some examples.

<table>
<thead>
<tr>
<th>RESEMBLANCE</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cantonese</td>
<td>toi₄</td>
<td>toi₂</td>
</tr>
<tr>
<td>Ojibwa</td>
<td>waagsgonecghan</td>
<td>waagsgonecghans</td>
</tr>
<tr>
<td>Hebrew</td>
<td>mapa</td>
<td>mapit</td>
</tr>
<tr>
<td>Hebrew</td>
<td>pax</td>
<td>paxit</td>
</tr>
<tr>
<td>Nez Perce</td>
<td>źini-t</td>
<td>źiti-t</td>
</tr>
<tr>
<td>French</td>
<td>ciboule</td>
<td>ciboulette</td>
</tr>
<tr>
<td>Ewe</td>
<td>hče</td>
<td>hče-vi</td>
</tr>
</tbody>
</table>

Note that these are not just cases where a language marks two objects as being identical expect for variation in size. In each case, the language distinguishes between a smaller version of an object, marked with an adjective meaning ‘small’, and the diminutive, which marks a separate concept; I give below a clear example.
of this from Heine et al.'s (1991) analysis of Ewe.

<table>
<thead>
<tr>
<th>Bare Form</th>
<th>Diminutive</th>
<th>English Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>heč</em></td>
<td><em>heč-vi</em></td>
<td>'knife'</td>
</tr>
<tr>
<td></td>
<td><em>heč sue</em></td>
<td>'shorter-than-average knife'</td>
</tr>
</tbody>
</table>

Sense 8, imitation, maintains the notion of resemblance from sense 7, but the category differs in two ways. First, the nouns in this category are viewed as imitations or copies of natural objects, often body parts. The verbs, similarly, mark an imitation or pretense of an action (The verbal examples are from from Moravcsik (1978)). Second, recall that the resemblance sense, while emphasizing formal or functional resemblance, still required that the target object be smaller than the source object. In this new imitation sense, the diminutive form does not necessarily mark a smaller object. The diminutivized forms may in fact denote larger objects, as is the case with the Mandarin and Spanish examples below.

<table>
<thead>
<tr>
<th>Imitation</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dom. Spanish</td>
<td>boca 'mouth'</td>
<td>boquete 'hole'</td>
</tr>
<tr>
<td>Dom. Spanish</td>
<td>caballo 'horse'</td>
<td>caballete 'trestle'</td>
</tr>
<tr>
<td>Mandarin</td>
<td>zhu 'pearl'</td>
<td>fo zhur 'monk’s beads'</td>
</tr>
<tr>
<td>Russian</td>
<td>noga 'leg'</td>
<td>nožka 'chair leg'</td>
</tr>
<tr>
<td>English</td>
<td>leather</td>
<td>leatherette</td>
</tr>
<tr>
<td>Hebrew</td>
<td>yad 'hand'</td>
<td>yadit 'handle'</td>
</tr>
<tr>
<td>Pacoh</td>
<td>biq 'sleep'</td>
<td>tāq qâmbiq biq 'pretend to sleep'</td>
</tr>
<tr>
<td>Sundanese</td>
<td>wani 'to dare'</td>
<td>wawanian 'pretend to be brave'</td>
</tr>
</tbody>
</table>

Note that by this sense of the diminutive, we have completely left the original source domain, size. This chain SMALL ⇒ RESEMBLANCE ⇒ Imitation shows a clear example of the shift in domain from the real-world to the domain of categories. An imitation marks an object which is a very non-central member of a category, applying the MARGINALITY IS SMALL metaphor discussed earlier.

The ninth sense of the diminutive is the use to mark approximation. Here the diminutive marks cases where some predicate is weakened, or less applicable to its arguments. Once again the concept small is extended from the real-world domain of size to the linguistic domain of “strength of predication”. By using an approximation we are saying that the concept is weaker or less applicable to some argument. In extending smallness or weakness in the world to smallness or weakness of predicates, the concept has even lost the aspect of real-world formal resemblance that characterizes the resemblance and imitation senses. Once again, because an approximate concept is a marginal one, we see the MARGINALITY IS SMALL metaphor.

One use of the diminutive for approximation marks lexical items whose meaning
is "approximation". I give a few examples from Cantonese:

Cantonese jo2 gan2 ‘more or less’ dai6 koi2 ‘about, approximately’

In a very common use of the diminutive, adjectives or verbs are marked with the diminutive to indicate an approximation or weakening of verbal force. Note in the last case here, the English diminutive "-ish" applies both to a weakening of adjectival force as well as to numerical approximation. Some of these languages associate some pejorative meaning with these approximatives – note English diminutive "childish", with pejorative overtones, versus "childlike". These evaluative senses of the diminutive tend to occur here and there among the other senses.

<table>
<thead>
<tr>
<th>APPROXIMATION</th>
<th>Unmarked Form</th>
<th>Diminutive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cantonese</td>
<td>hong4 ‘red’</td>
<td>hong4 hong2 ‘reddish’</td>
</tr>
<tr>
<td>Mid. Breton</td>
<td>moel ‘bald’</td>
<td>moelic ‘rather bald’</td>
</tr>
<tr>
<td>Dom. Spanish</td>
<td>cansado ‘tired’</td>
<td>cansadillo ‘rather tired’</td>
</tr>
<tr>
<td>English</td>
<td>red</td>
<td>reddish</td>
</tr>
<tr>
<td>Halkomelem</td>
<td>sxwāxwθ ‘be insane’</td>
<td>sxwixwāxwθ ‘be a little crazy’</td>
</tr>
<tr>
<td>English</td>
<td>three</td>
<td>threēish</td>
</tr>
</tbody>
</table>

7 Hedges

The use of the diminutive to indicate a pragmatic hedge, softening or weakening the illocutionary force of the utterance, occurs in Japanese (Matsumoto 1985), Tzeltal (Brown & Levinson 1978), Cantonese (Jurafsky 1988), and Greek (Sifianou 1992). In these cases, the diminutive is used in asking for permission, for softening a command or a refusal, or merely to mark friendly or close relations among interlocutors. Brown & Levinson (1978:177) note that in a number of languages, including Tamil and Malagasy, this use of diminutives for politeness is even more grammaticalized, and the word for ‘a little’ functions generally like English please.

Cantonese mam4 mam2 hai4
slow slow-dim. walk
Take care, walk safely [weaken an imperative]

Tzeltal: ya niwan ʃba kaʔy ʔala kurso ta hobel
I’m maybe going to take a little course in San Cristóbal [asking permission]

Japanese: Chotto shizuuka ni shite kudasai.
Please chotto be quiet. [weaken an imperative]

Greek: ðoste mu psaraki tote.
give me fish-dim. then
Could you give me some fish then? [establish friendly context]

Where the approximation sense was a semantic hedge, this category functions
as a pragmatic hedge. Retracing the semantic chain from the core sense, from *small* to *approximation* to *hedging*, shows a semantic shift proceeding from the real-world domain (*x is small*) to the linguistic or textual domain (*weaken the locutionary force of the predicate p*) to the discourse domain (*weaken the illocutionary force of p(x)*). This transition from the real-world to the speech-act domain mirrors the shift in verbal semantics studied by Sweetser (1990) and Traugott (1991).

8 Distributed Radial Categories

In studying the directionality of change in the reflexive construction, Croft et al. (1987) and Pederson (1991) note that as the category decays, the most central sense is often lost first, and a new construction arises to take over this sense. We can see a parallel example for the diminutive in modern Cantonese, where as the diminutive tone extended its semantics into the domains of food, gender, kinship, and society, it lost its original core diminutive sense. A new diminutive affix arose which currently only covers the central senses of the category. The result of this sort of process is a state of the language in which multiple diminutive morphemes co-exist, spanning different portions of the conceptual network.

This process complicates our original proposal that the core sense of a radial category model both the semantically and historically prior sense of a morpheme or construction. In order to describe the case where two morphemes both cover the same network, Pederson (1991) proposes that they be modeled with separate radial categories. But what of cases in which the radial category for the diminutive is spanned by a large collection of morphemes, each of which covers only a small portion of the network, but which taken together span the entire category?

![Diagram of diminutive category covering distinct morphemes](image)

Figure 2: The diminutive category covering distinct morphemes
The current state of the diminutive in English (see Figure 2) may be an example of such a situation, in which distinct morphemes ("-let", "-y") cover different parts of the category. The kind of category Figure 2 shows for the English diminutives is not the traditional radial semantic category (Brugman 1981) realized by a single lexeme or construction. This new object, which we might call an abstract radial category, acts as an abstract "diminutive" concept in the grammatical competence of the speaker; it links together distinct affixes unrelated by form. Future work will focus on further details of these categories.

9 Lexical Diminutives

Section 7 discussed diminutives in Tzeltal and Japanese which are lexical rather than morphological. These forms, and others like the English construction 'little' or 'a little', exhibit much of the semantics of the morphological diminutive forms, but often co-exist with them in the grammatical system of a language. It may be useful to view these lexemes as an example of diminutive grammaticalization in progress. Figure 3 gives an example from English, showing the universal radial category from Figure 1 with the relevant subtree spanned by the semantics of 'little'. Note in particular the distinction between 'little', which can occur in any of these senses, and 'small', which can occur only in the central sense.

"you little so--and--so"

"my little friend"

"my little ones"

"little finger"

"a little tired"

"the little woman"

"a little water"

"rest a little"

Figure 3: The periphrastic diminutive little

10 Conclusions and Future Work

We have always known that there were universals in the semantics of the diminutive, in particular with regard to children, affection, and contempt. I have argued here first that the diminutive as a construction has a surprising amount of semantic coherence crosslinguistically, and that besides affection and contempt we can often expect to
see partitives, resemblance, gender, approximation, and hedging expressed by the diminutive, and that we can capture these relations with a radial category model.

Second, I have shown that the diminutive, in grammaticalizing a clearly real-world property, size, into a marker of approximation and hedging, as well as transferring into the social and evaluative domains, is compatible with modern theories of unidirectionality in semantic change. Finally, I have suggested, albeit only briefly, that the theory of radial categories might be extended with abstract radial categories which are not linked to a unique lexeme or construction. I hope in future work to address a number of the shortcomings of this study, in particular examining a larger set of languages, and looking at augmentatives, non-stative verbs, and the use of the diminutive to mark food, which is common in Cantonese, Russian, Polish, and Greek.

11 Acknowledgements

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References


Negation, Indefinites, and the Jespersen Cycle
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University of California, Santa Cruz

Introduction*
My goal in this paper is to bring together current theories of the abstract syntax of negation and the semantics of indefinite arguments to elucidate what is called 'Jespersen's cycle' in the diachronic development of the expression of negation. The classic statement of the cycle comes at the start of Jespersen 1917 (p. 4):

The history of negative expressions in various languages makes us witness the following curious fluctuation: the original negative adverb is first weakened, then found insufficient and therefore strengthened, generally through some additional word, and this in its turn may be felt as the negative proper and may then in course of time be subject to the same development as the original word.

Jespersen illustrates two full cycles from Romance with the examples in (1).

1.a ne dico
1.b non (=ne+oenum) dico
1.c jeo ne di
1.d je ne dis pas
1.e Je dis pas

In Latin, we begin in (a) with the particle *ne* preceding the finite verb. In the first cycle, *ne* is strengthened by the indefinite *oenum* ("a thing") which becomes the new particle *non* in (b). The second cycle begins with the weakening of *non to ne* in Old French (c), which is in turn 'strengthened' by a particle derived from an indefinite in the Modern Standard French (d). Weakening *ne* to the point of silence gives the colloquial (e). The previously redundant particle has assumed the ability to express the negation.

The Head and Argument cycles
As presented by Jespersen, it is a cycle with three main stages. The examples concern the development of negation particles positioned with respect to the head of the clause, i.e. the finite verb. But there is a parallel pattern in the development of negative argument expressions. Modern Romance languages offer us numerous cases of argument phrases which are (affirmatively) indefinite in form but which express negation. In addition to the French personne and rien, the Catalan sentence in (2) shows that a word which historically must have meant 'a thing' but now means 'nothing':

2. Res l'espanta

Nothing scares him

The development of negation-expressing argument phrases from regular indefinite arguments has the following stages: first the argument is a regular indefinite
argument, then it becomes a co-occurring 'supporter' of the clausal negation, and finally it becomes an independent expressor of negation. We could call these the 'one thing', 'anything', 'nothing' stages of the Jespersen argument cycle, represented by (3).

3.a She didn't say one thing
   .b She didn't say anything
   .c She said nothing.

The examples in (3) are intended to represent semantic stages followed by single items like personne and res, whose meanings seem to change without change in form.

However to see the argument cycle as involving only these three stages is to overlook an intermediate stage between the second and last stages. There are two differences between (3b) and (3c): the absence of negation on the head of the clause and the ability of the object argument to express negation. In standard English, negation cannot be marked on the head of the clause when it is expressed in the object argument. While it is conceivable that the development of sentences like (3c) might make these two changes simultaneously, the evidence of the Romance languages and non-standard dialects of English shows an intervening stage. The argument cycle is better represented by (4), in which there are four stages.

4.a She didn't say one thing
   .b She didn't say anything
   .c She didn't say nothing
   .d She said nothing.

The stage (4c) is 'negative concord', where a single semantic negation is indicated by both the head of the clause and the argument expression. A stage involving negative concord is a necessary step in the development of argument expressions which are able to express negation independently. It is therefore not surprising to find that the Catalan sentence in (2) has a concordant correspondent (5):

5. Res no l'espanta Nothing scares him

If arguments follow a four-stage cycle, we should reconsider the stages represented in (1) for the head particle cycle. The end of the argument cycle is one in which concord is no longer possible and the argument expressor is the sole indication of negation. With this in mind, we see that Colloquial French will not have reached the end the cycle until it is no longer possible to double pas with ne. Consequently the full head particle cycle is represented by (6):

6.a ne
   .b *(ne)...pas
   .c (ne)...pas
   .d (*ne) ... pas

What the two cycles have in common can be expressed as (7):
7.a  Head expression of negation  
.b  Head supported by strenghtener  
.c  Strenghtener able to express negation and be concordant  
.d  Former strenghtener now independent expressor of negation

The two cycles are logically independent but the principal source for the strenghteners in the head cycle are strenghteners from the argument cycle. Horn 1989 (p. 452) notes a menu of items like a crumb, a fig, a garlic, and a leek and their monetary counterparts (sous, red cents, plugged nickels, and thin dimes) as well as atomic units in various domains (like the inch that you don’t budge) frequently do service as argument cycle strenghteners and can become conventionalized negative polarity items. Minimum value items can also switch cycles to become invariant strenghteners for head negation, as did the step (passum) of early French which gives modern pas. All of these are apparently indefinites: phrases which might be considered existential quantificational or referential terms.² And so it is to an examination of the theory of indefinites that I now turn.

Theory of Indefinite Arguments

In an influential line of work starting with Lewis 1975 and continuing through Heim 1982, Partee, 1991, and Deising 1992 among many others, an approach to the logical structure of quantification and the role of indefinite arguments in it has been developed which has the makes the following general assumptions.

Quantificational structures

Quantification is a relation between a restriction or domain and a claim about the domain, the scope of the quantification. The mapping between this tripartite logical structure and the syntactic structures which express it can be direct or obscure. The most direct relation is nominal quantification, where the operator is expressed by a determiner whose complement is the restriction and whose position in the clause indicates the target of binding in its scope. Less direct are cases of adverbial and modal quantification, in which the restriction is drawn from adjunct clauses or particular parts of the clause containing the adverb or modal. On this view, there is a common abstract logical structure to the sentences in (8), despite the fact that the universal quantificational operator is expressed by a determiner in (a), an adverb in (b), and no visible formative in (c).

8.a  Every violinist carries an extra bow.  
.b  A violinist always carries an extra bow.  
.c  If a violinist is careful, she carries an extra bow.

Binding of Indefinites

The common logical structure of these cases explains the varying quantificational force of indefinites like a violinist with adverbial quantification. (8b) claims that taking instances of violinists as our domain, all of them will carry an extra bow. With a different adverb in (9), the indefinite serves the same function, but the quantificational force is different: only a majority are claimed to carry an extra bow.
9. A violinist usually carries an extra bow.

The so-called Kamp/Heim theory of indefinites (Heim 1982, Kamp 1981) analyzes indefinites as restricted free variables with no inherent quantificational force. Indefinites inherit their quantificational force by relating to the quantificational operators in the sentence in a predictable way. Indefinites in the restriction of a quantifier act as if they were bound to the quantifier, while indefinites which fall in the scope of quantifications are existentially closed within that scope. (The latter assumption accords with the tradition of considering them to be existential quantifier phrases.)

In the view of logical structure which emerges from these assumptions, phrases in a variety of syntactic categories license a tripartite quantificational structure during interpretation. Indefinites are phrases whose descriptive content expresses only the restriction on a variable. The combination of verbs with their arguments does not generally create a quantificational structure. Indefinite arguments create parameterized meanings whose parameters are grounded when it becomes the restriction of a quantificational operator. In the sentences in (8), the indefinite an extra bow falls in a quantificational scope and so is existentially closed in that scope.

If we assume, in a natural extension of Fodor and Sag 1982 that indefinites may be systematically ambiguous between a referential and a free-variable construal, then the classic baby logic ambiguity of (10) is an ambiguity between a referential and a free variable construal of the indefinite a dog.

10. every student petted a dog.

The reading on which the choice of dog covaries with the choice of student is the natural outcome of the assumption that the indefinites in the scope of a quantificational domain will be anchored within it. The other reading results from construal of the indefinite as referring to a (discourse novel) dog.

Quantifier operators may either directly bind the variables represented by indefinites or simply trigger their existential closure. In either case, an indefinite is not free outside of the minimal quantificational structure in which it falls. I will say in either case that the operator roofs the indefinite. In (8), the indefinites a violinist and an extra bow are both roofed by the universal operators.

Since the argument expressions in the Jespersen cycle are indefinites, I will assume that the kind of analysis sketched here is appropriate for them. I will also assume that negation is logically an operator structure. We are accustomed to speaking of the scope of negation; for a brief discussion of the restriction of negation, see Kratzer 1989. As a consequence, we will view a negated clause as a domain in which indefinites are roofed by the negation operator. Parallel to (10), the ambiguity of (11) is due to the referential/free variable ambiguity of the indefinite argument expression.

11. She didn’t talk to a student.
The reading on which it entails that she talked to no students results from the roofing of the indefinite by negation.

**The Head Cycle and Inflectional Projections**

The prime locus of the expression of negation is the head of the clause. Because of the essentially subject-predicate structure of at least some propositions, the view of negation as a mode of predication advocated by Horn 1989 is an attractive one and will be assumed here.

This assumption makes the association of head negation particles with the finite verb reasonable under the assumption that these elements are part of the inflectional system which is represented by the functional category (family) I in current transformational grammar. In recent work on the syntax of negation within this framework, following from the analyses in Pollock 1989, free-standing negative particles and bound negative morphology is analyzed as a functional formative which projects a phrase in which the scope of the negation serves as the complement to the functional head. Depending upon the morphological facts of the language, bound morphemes will be gathered into words by the action of head movement between the verb and the components of the inflectional functional formatives.

I cannot survey these analyses in any detail here, but I will observe that two detailed analyses of languages in these terms have proposed conditions which require negation and tense to be in close association in surface structures. Laka 1990 assumes a universal constraint which requires that the tense projection c-command the negation projection in s-structure and proposes that languages may differ from each other in the underlying relation between tense and negation. Zanuttini 1991 assumes that there are two universal underlying positions for negation within the inflectional projections, either above or below the tense projection. She proposes analyses for a range of Romance languages which differ in whether they allow negative concord, correlating some of the differences with whether the negation projection c-commands the tense head in s-structure.

The results of both of these theories are congenial to the semantic assumption that clausal negation as a mode of predication is licensed by the morphological indication of negation in the head of a clause. The syntactic assumptions of these theories make major features of Jespersen’s Head Cycle fall out, if we assume that the principal negation is in the higher position, above tense, and the creation of the supporting negation is reanalysis of an argument expression as a functional projection below the tense. The fact that both of these positions are part of the complex head projection of the clause make the fact that either one or both together are able to license the quantificational logical structure which is the expression of the negation.

Henceforth I will assume that a clause is interpreted as negated by predication denial in the sense of Horn 1989 iff its head, the complex Infl, is licensed to contain the abstract formative [neg], and that the most obvious way of doing that is putting a negation particle into the Infl complex. With that as background, we can examine in detail the stages of the argument cycle.
The Roofing of Indefinite Arguments

The Kamp/Heim analysis of indefinites provides a basis for the interpretation of a variety of so-called weak quantifier terms, not just traditional indefinites like a dog. While most can be given both referential and bound variable construals, some indefinites lack the referential option. As a consequence, they will always be roofed by some quantificational operator in the clause and appear to be subject to a licensing condition, as they would not be well-formed in clauses which cannot be analyzed as containing some quantificational operator.

Among the candidates for analysis as nonreferential indefinites are wh-phrases in English, which always have some roofing operator. Ladusaw 1992 argues that argument negative polarity items like any and ever should also be analyzed as nonreferential indefinites. Classes of nonreferential indefinites differ according to range of operators which license them. Following Ladusaw 1979 and Keenan and Faltz 1985, I will assume that the nonreferential indefinites that we call negative polarity items must be roofed by an operator which is polarity reversing in the sense defined in (12), a category which includes clausal negation.

12. A function $f$ is polarity reversing iff $\forall p, q[p \leq q \rightarrow f(q) \leq f(p)]$.

With regular indefinites, we can observe that for phrases with a good deal of descriptive content like that in (13b), a referential construal is preferred; while those with minimal descriptive content as in (13a) tend to be construed as nonreferential.

13.a She didn’t talk to a student.
13.b She didn’t talk to a student of mine who lives next door.

I assume that this follows from the pragmatics of utterance interpretation and not from grammatical theory, but indefinites with minimal descriptive content can be grammaticalized as nonreferential. In addition, given the polarity reversing property of negation, nonreferential indefinites which describe minimal units for a domain will have the effect of widening the restriction of the operator (in the sense of Kadmon and Landman (to appear)) and therefore will strengthen the assertion of the sentence, as described in Fauconnier 1975. Consequently, indefinites with little descriptive content which describe minimal elements are ripe for reinterpretation as negative polarity items. And as we noted above, this is the class of items which are prime inputs to the Jespersen’s argument cycle.

Returning to the cycle in (4), the move from stage (a) to stage (b), the ‘strengthening’ of the negation, is the development of a nonreferential negative polarity indefinite. On the view laid out here, nothing changes in the semantic interpretation of an indefinite when it takes on this status. The grammaticalization of nonreferentiality will entail that the item must have a license in the clause. Additionally, its licenses must be restricted somehow to the polarity reversing operators in whose scope it can consistently function as a strengthenener.
So the first move in the cycle produces a negative polarity argument and the theory of indefinites allows us to see that it is not a change in denotation.

**Developing Negative Concord**

The next move in the cycle continues by a fallacious move of ‘cum hoc ergo propter hoc,’ in which the negative polarity item becomes a potential expressor of negation. But I think it must actually involve two steps, the first of which is the development of a negative concord system.

The argument cycle in (4) is illustrated with English phrases in which the argument expression has incorporated a morphological feature of negation. But recall the facts of French *personne* and Catalan *res* and we can see that morphological change is not a necessary condition for the next move. What is needed in order to show that the next move has occurred is evidence that the argument expression alone is sufficient to express negation.

It seems to be a general property of most negative polarity items that in addition to being logically roofed by their licenses, they must be c-commanded by them in surface structure. It is this assumption that is responsible for the ungrammaticality of (14):

14. *Any of them didn’t talk to her.*

As a consequence, the first indication that an argument expression is losing its conventional polarity item status is its ability to appear in positions structurally superior to its erstwhile license. As a consequence, from the day that (5) became a well-formed sentence in Catalan, for example, it was clear that *res* was losing its status as a normal polarity item. At the point at which (2) became grammatical, it was clear that it had acquired the ability to be an independent license of the expression of negation. That is, it had succeeded in moving from meaning ‘anything’ to ‘nothing’.

What does it mean to have come to mean ‘nothing’ (in the relevant sense)? One might think that it had come to express a negative existential quantifier; that is, one might think that it had come to express the generalized quantifier in (15):

15. $\lambda P \ [ \text{PERSON} \wedge P = \emptyset]$

But if that is what happens at the next stage, we are confronted with a profound chaos in the speech community. For if these phrases actually change their denotations to (15), then sentences like (4c) come to mean the exact opposite of what they meant before the change. This is the semantic double negation effect. To change the denotation of these expressions will make them independent expressors of negation. And yet in order to explain the meaning of examples like (5), we would seem to need to assume that these argument phrases have the denotation in (15). The key to this dilemma is to note that Catalan, Italian, Spanish, and presumably all the other languages which are in this stage of
development are negative concord languages and to assume that the next stage in
the cycle is the development of a negative concord system.

In Ladusaw 1992 I argue in more detail that the best analysis of negative concord
languages is to assume that the denotations of the argument terms in a clause
showing negative concord are precisely the same as the negative polarity items:
they are nonreferential indefinites roofed by the clausal negation. This
assumption however raises the issue of how negation actually gets expressed in a
clause like (5). I believe it gets expressed configurationally rather than be
inherited directly from the denotation of any of the visible formatives of the
clause. One way, but not the only way, of making sense of this idea is to assume
that in the interpretation of the such a clause, the negation is expressed by the
inflectional head of the clause. What we need an answer for is how the
inflectional head of the clause can express negation when there is no
morphological indication of negation on it.

The answer I propose is that at this stage of the language, the head of a clause can
be considered negated if either it is marked with negative morphology or
governed by a phrase which is marked with the ability to license the expression of
negation. The distinction is a fine one, but I think a necessary one. In a sentence
like (5) or its Italian analogue (16), the head of the clause is interpreted as
negative because the argument expression *nessuno* carries a morphosyntactic
feature which licenses the occurrence of an abstract negation in the inflectional
complex.

16. *Nessuno* ha visto Mario. Nobody has seen Mario.

As a consequence of this analysis, the fact that these languages are strictly
negative concord follows automatically. The only other support that I can
currently adduce for this position is that, under the assumption that licensing
relations generally require c-command in surface structure, it also explains the
pattern of grammaticality in (17)-(18), which is pervasive in negative concord
languages. These argument terms are able to licensed the expression of negation
only if they c-command the head of the clause in surface structure.

17.a Mario *non* ha visto *nessuno*. Mario has seen none.
    .b *Mario ha visto *nessuno*.
18.a Non ha telefonato *nessuno*. Nobody telephoned.
    .b *Ha telefono* *nessuno*. Nobody telephoned.

So we now have the basis for a story about the development from (b) to (c) in the
Jespersen Cycle: The negative polarity item does not change its denotation, but
rather trades surface structure licensing conditions with the head of the clause. No
longer required to be c-commanded by negation in s-structure, they are free to
occur in positions superior to the head of the clause. In this position, they are in a
position to themselves act as licenses for the expression of negation from the
inflectional complex. Nothing in the semantics has changed yet; the only changes
have been in the structure-sensitive licensing requirements on these elements.5
We are now in a position to complete the description of the argument cycle. The property of licensing the expression of the negative quantificational structure through the clause head can be reinterpreted as the property of directly expressing the structure. As a consequence, each of the items which previously could license clausal negation in the absence of head marking are now interpreted as independent expressers of negation. This causes the change from a negative concord language into a double negation language. The apparent change in denotation from nonreferential indefinite denotation to negative quantifier is only apparent. The generalized quantifier denotation in (15) is precisely what one would expect of a negation operator structure whose restriction simply is the indefinite which has served as the denotation all along.

Conclusion

The argument in this paper has been an involved one and I have not been able to bring to bear in the space available all the evidence that I would have liked. However I hope to have made clear the attractiveness of the theory of indefinites as a way of capturing the generalizations about the relation between head and argument negation, negative polarity items, negative concord, and negative quantifiers which have been associated with the term ‘Jespersen’s cycle’ for many years.

In brief summary, I have argued that we should recognize two cycles: a head cycle and an argument cycle. They are logically separate but practically related by the recruitment of negative polarity items as supports for head of clause negative particles. The theory of indefinites gives us a way of describing the progress of the argument cycle without assuming at any stage that the denotation of the arguments has changed. Rather the cycle is a result of the ebb and flow of grammaticalized licensing conditions on indefinites and the head markers of negation which produce negative concord languages as a crucial stage in the cycle.

Footnotes

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1Picallo, p. 93. She says that with some of the nonnegative phrases, the doubling with no is obligatory even in subject position, but that (2) is ok, though it prefers to be doubled. Importantly, it is ambiguous between this reading and one on which it means ‘the smallest thing scares him’, in which case this would be an example of the development of a ps/fc-any item.

2I do not believe that there is anything logically necessary in the connection between the two cycles and would be glad of examples of head strengtheners which are not derivative of argument expressions.

3This makes it sensible that there are many languages in which the ‘negative polarity items’ are wh words.

4I believe that this two step grammaticalization is responsible for the differences among languages in whether their any word can also have a free-choice reading and whether the wh words also function as free-choice or polarity items.
If an item can gain the ability to license the expression of negation, then it can presumably lose it as well. This is what happens to *ne* when it loses the ability to be an independent expressor of negation.

References


Universals of Construal
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If we ask in what ways and to what extent semantic structure might be
universal, the answer will clearly depend on our position concerning the nature of
linguistic meaning. The most basic decision in this regard is whether to view
meaning as first and foremost a psychological phenomenon, or whether to seek its
locus elsewhere. I have always maintained that meaning is primarily a matter of
conceptualization, in the broadest sense of that term (i.e. any kind of mental
experience). While this may seem obvious, it is worth recalling that well known
semantics textbooks of fairly recent vintage either fail to even acknowledge the
conceptualist view of meaning (e.g. Cruse 1986) or else denounce it as being not
only misguided but beyond the pale of scientific inquiry (e.g. Kempson 1977: 2.2-
3; Palmer 1981: 2.2). Nevertheless, conceptualist semantics has gained a measure
of respectability in recent years and is becoming sufficiently widespread among
theorists of diverse outlooks that it threatens to establish itself as the default
assumption.

Equating meaning with conceptualization does not, of course, either resolve
the issue of universality or render self-evident the optimal way of characterizing
semantic structure. The decision to allow active, conceptualizing minds into the
loop of meaning and semantic description affords a plausible basis for predicting
either extreme diversity or strong universal tendencies. On the one hand, it frees
linguistic meaning from the control of objective circumstances, so that it can float
untethered wherever the whims and vagaries of human imagination might carry it.
On the other hand, it might be argued that conceptualization is so highly constrained
by the commonalities inherent in both our biological endowment and the world
around us that a substantial degree of universality should be expected. Adherence
to conceptualist semantics is likewise compatible with widely divergent views about
the specific nature of semantic structure and how to describe it. For instance, the
umbrella is broad enough to shelter what might loosely be called an ‘imagistic’
approach emphasizing metaphor and image schemas (e.g. Lakoff 1987; Johnson
1987; Sweetser 1990; Talmy 1983), as well as multiple theories—themselves quite
different—which posit semantic representations comprising syntactically structured
strings of discrete elements drawn from a fixed vocabulary (cf. Jackendoff 1983,

While I greatly appreciate the descriptive insight of these latter accounts, it
seems to me rather unlikely that the concatenation of discrete elements directly
reflects the format assumed by conceptual structure in actual cognitive processing.
One reason to be dubious is that a concatenative format offers no intrinsic basis for
anticipating (and no obviously natural means of capturing) the critical role of
construal in conceptualization and linguistic semantics. The term construal is
used in opposition to content (though I would not claim that the two are sharply
distinct). Expressions which evoke essentially the same conceptual content can
nonetheless be semantically distinct because they construe that content in alternate
ways—with respect to the perspective adopted, for example, or the relative
prominence of various substructures. In numerous publications (e.g. 1986b,
1987a, 1988, 1990, to appear) I have documented certain ‘aspects’ or ‘dimensions’
of construal which are needed for an explicit account of semantic and grammatical
phenomena. These aspects of construal would appear to be strong candidates for
the status of language universals. After a brief survey, I will speculate on the
source of their universality. We will then consider how these same factors contribute to linguistic diversity.

If only for expository purposes, I generally arrange the dimensions of construal under five broad headings: specificity, scope, prominence, background, and perspective. By specificity I simply mean the degree of precision and detail with which a situation is characterized. We have the conceptual and linguistic resources to portray a situation in however much rich, fine-grained detail we care to provide, or conversely, to abstract away from specifics and present it at any level of schematicity. For example, the sentences in (1) could all be used to describe the same event; each elaborates (or instantiates) the more schematic expression that follows it.

(1) The tall, surly waiter viciously kicked an elderly woman’s yelping poodle. > The waiter kicked a woman’s dog. > The man struck a canine. > Someone did something. > Something happened.

Exhibiting the same kind of relationship are series of expressions such as poodle > dog > canine > mammal > animal > creature > thing, generally discussed under the rubric of hyponymy or taxonomic hierarchies.

As the basis for its meaning, an expression evokes a set of cognitive domains, which range from basic domains (irreducible dimensions of human experience, such as space, time, pitch, and color) through concepts and conceptual assemblies of indefinite complexity (thus including frames (Fillmore 1982) and ICMs (Lakoff 1987)). The domains an expression evokes provide its conceptual content. One aspect of how an expression construes that content consists in selecting certain portions of each domain as being relevant to its value. Those portions of active domains that a particular expression selects and exploits as the basis for its meaning will be referred to as its scope. Since there are limits on the amount of conceptual content we can actively entertain at any one time, scope is always bounded in some fashion (though any specific line of demarcation might well be arbitrary). For instance, a word like poodle requires a spatial scope of sufficient expanse to support the conception of the referent’s shape, but it need not encompass the entire universe. Likewise, the verb kick evokes a temporal scope that is long enough for the designated event to run its course, yet considerably less than all eternity. The conception of a network of kinship relations serves as one cognitive domain for terms like mother, grandson, aunt, and cousin, and such a network extends indefinitely far in any direction. However, only a limited portion of a kinship network is directly relevant for the characterization of any one term: for mother, a parent-child configuration; for aunt, a larger assembly including a parent’s sibling; and so on.

Scope represents an important descriptive construct needed for the explicit characterization of many linguistic phenomena (Langacker to appear). For example, it has a pivotal role in the ‘nested-locative’ construction:

(2) I left your book outside, in the back yard, beside the pool, on the yellow chair, under the towel.

The characteristic feature of this construction is that the successive locative expressions confine the object being located (in this case the book) to smaller and smaller areas, each nested within the one previously established. More technically,
the search domain of one locative—the region to which it confines the object in question (Hawkins 1984)—constitutes the spatial scope of immediate relevance for interpreting the next locative in the sequence: the full locative relationship it designates is manifested within the immediate scope thus defined. I have also argued (1987b) that scope is critical to describing the count/mass distinction for nouns, as well as the precisely analogous perfective/imperfective (or active/static) contrast for verbs. A necessary feature of a count noun is that the boundary of the designated entity fall within its scope in the relevant domain (typically space). Similarly, a perfective verb designates a bounded process whose endpoints are included in its temporal scope, whereas such bounding is not intrinsic to the characterization of an imperfective. I have further analyzed the progressive construction as having an imperfectivizing function by virtue of imposing, on the bounded process designated by a perfective verb, a restricted immediate temporal scope which excludes its endpoints. These aspecual notions are sketched in Figure 1.

(a) Perfective
(b) Imperfective
(c) Progressive

![Figure 1](image)

An element can be prominent (or salient) with respect to others in numerous ways. A prototype is salient within its category, and a basic level category within a taxonomic hierarchy (Rosch 1978). There are multiple kinds of discourse prominence. Linguistic evidence suggests the greater intrinsic prominence of entities that are concrete rather than abstract, human vs. non-human, visible vs. non-visible, etc. For anaphoric purposes, an element mentioned explicitly is more salient than one introduced only sublexically; hence the contrast in (3), with them understood in both examples as referring to the parents (cf. Postal 1969):

(3)(a) The child that lost its parents misses them badly.
(b) *The orphan misses them badly.

The various sorts of prominence have to be carefully distinguished, as they differ in both their cognitive motivation and their linguistic function.

We will focus here on two other kinds of prominence that are central to grammar. The first is what I call profiling. Within the conceptual base subsumed by its (immediate) scope, every expression profiles—i.e. designates—some substructure. The conception of an eye, for example, serves as the base for words like iris, pupil, and cornea, which profile different subparts. The base for orphan is a scenario involving mating, birth, nurturance, death, and survival, and its profile is the survivor. An expression’s profile is its referent—not its referent in the world, but within the conceptualization it evokes. To say that an element is mentioned explicitly is thus equivalent to saying that it is profiled at some level of
organization, as the parents are in (3)(a) but not in (3)(b). Two expressions may evoke essentially the same conceptual content yet contrast semantically because they profile different facets of it (e.g. iris vs. pupil). In regard to its role in grammar, I will only mention that profiling determines an expression's grammatical class. For example, both complain and complainer evoke the same essential content: that of a person engaging in a certain activity. The former is a verb and the latter a noun because, from this common base, they respectively select for profiling the activity and the actor.

There is both semantic and grammatical motivation for claiming that expressions can profile not only things but also relationships (each term being understood in an abstract, inclusive sense discussed in Langacker 1987b). Nominal expressions (including nouns, pronouns, determiners, and noun phrases) are those which profile things. Such classes as adjectives, adverbs, prepositions, and verbs (as well as higher-order structures like prepositional phrases and finite clauses) profile various kinds of relationships. Like nouns, relational expressions often have the same content yet exhibit a semantic (and also a grammatical) contrast attributable to the alternate profiles they impose on it. The verb crack and the stative-adjectival cracked evoke the same content, involving a change through time and a resultant final state; the difference is that the verb designates the entire temporally evolving relationship, while only the resultant state is profiled by the adjectival participle. A difference in profiling also figures in the contrast between a perfective verb (e.g. complain) and its progressive counterpart (be complaining). Whereas the verb profiles a full, bounded event, as in Figure 1(a), the progressive designates only the portion delimited by the immediate scope, as shown in 1(c).

However, profiling is not always sufficient to distinguish relational expressions that have the same content but different meanings. We can see this most clearly from pairs of opposing terms like above vs. below, in front of vs. in back of, and before vs. after. A situation which manifests one of these relationships also manifests its converse—if X is above Y, then it must also be the case that Y is below X. Moreover, the paired expressions have the same profile, there being no referential difference between the two relations. At the clausal level, I would argue that the same is true of an active and its corresponding passive (Iraq invaded Kuwait vs. Kuwait was invaded by Iraq). I think the contrasts can only be attributed to a kind of salience involving the relational participants. In virtually every profiled relationship, some entity stands out as the one the expression is concerned with locating, characterizing, or somehow assessing in relation to others. I refer to this entity as the relational trajector, and to another salient entity—with respect to which the trajector is located or evaluated—as a landmark. For instance, X is above Y takes Y as a landmark for purposes of locating the trajector, X, whereas Y is below X does the opposite. The two expressions would thus be felicitous in response to different questions (Where is X? vs. Where is Y?).

Like prominence, the term background subsumes a variety of distinguishable phenomena. What they seem to share is an ability to conceptualize two distinct structures in relation to one another, to entertain them simultaneously but asymmetrically, so that one is the object of immediate or primary interest. An obvious case is metaphor, in which the source domain provides a background used for construing the target domain (Lakoff and Johnson 1980; Lakoff and Turner 1989). In discourse, the current utterance is assessed against the background of those which have gone before; an example is focus, where unreduced stress signals the introduction of something new or noteworthy relative to what has already been established:
(4) A: What did the customer want?  
B: She wanted THAT NEW VEGETARIAN LIPSTICK.

Standard presupposition represents a kind of background, as do assumptions and expectations in general. I have analyzed negation as portraying a situation which lacks some entity against the background of a conception in which it is present (1991: 3.3.3; cf. Givón 1979: ch. 3). Under this rubric we can also cite the effect of how a complex expression is put together, i.e. its compositional path: expressions with the same composite semantic value may nevertheless have slightly different meanings reflecting the course of their assembly out of smaller components. Despite evoking the same conceived entity, for example, the descriptions triangle, three-sided polygon, and three-angled polygon are semantically non-equivalent because they portray it against the background of distinct compositional histories.

The last general heading, perspective, also encompasses numerous aspects of construal. The terms left and right exemplify two such factors, namely vantage point and orientation. Clearly, the meaning of a sentence like (5)(a) is not limited to the profiled relationship between the two overtly mentioned participants; its scope must also include an implicit observer in terms of which left and right are assessed.

(5)(a) Jack is to the right of Jill.  
(b) When Charles walked into the room, Jack was to the left of Jill.

Another aspect of perspective is mental transfer, in which the conceptualizer imagines (or at least takes into account) how the scene appears to some other observer. In (5)(b), for instance, the assessment that Jack is to the left rather than the right can be made relative to the vantage point and orientation of the speaker (the default observer), of Jill, of Charles, or even some other viewer apparent from the discourse context. An additional factor is the direction of mental scanning. It seems evident that the sentences in (6) have different meanings, and that the distinction hinges on the opposite directionality expressed by the prepositional phrases:

(6)(a) The scar extends from his ankle to his knee.  
(b) The scar extends from his knee to his ankle.

Objectively, these sentences describe the same situation, a static one where nothing actually moves. I attribute the semantic contrast to the alternate directions in which the conceptualizer, in building up his conception of the scene, traces a mental path along the scar’s extension.

Several other facets of perspective should be mentioned. I say that an entity is construed subjectively or objectively to the extent that it functions exclusively as the subject vs. the object of conception (Langacker 1985, 1986a, 1990). Maximal objectivity therefore attaches to an explicitly mentioned entity, e.g. the scar in (6), that is salient, well-delimited, and the specific focus of attention. Conversely, maximal subjectivity characterizes an implicit conceptualizer whose attention is directed elsewhere and who thus loses all self-awareness. In (6), for example, the conceptualizer receives a subjective construal despite the semantic import of the mental path he traces. We, as outside observers, can describe the
conceptualizer as scanning through the scene in one direction or the other, but he
certainly does not conceive of himself as doing so—from his own perspective only
the scar and leg are evident.

Sentence (7), taken from Talmy 1988, illustrates a distinct but related
phenomenon:

(7) *There is a house every now and then through the valley.*

A house does not flash in and out of existence, as suggested by the adverb *every
now and then*, nor does it move *through the valley*. The sentence is nonetheless
natural and readily understood. It is perfectly coherent relative to the special
circumstance in which the conceptualizer imagines what an observer sees when
moving through the valley, rather than describing what it looks like from a fixed
vantage point. From the perspective of a moving observer, whose field of view
comprises only a limited portion of the valley at any one instant, the sentence
correctly describes what is actually perceived: within the *immediate scope* defined
by the moving field of view, a house does indeed appear *every now and then*. This
example resembles the previous one in that the motion of an implicit, subjectively
construed conceptualizer figures crucially in its meaning. The difference is that the
expressions in (6) involve a single vantage point and describe a configuration fully
manifested in the field of view at a single moment—scanning occurs *within* the field
of view, which may itself be static.

A final aspect of perspective resides in our tendency to organize a conceived
situation in terms of a stable, inclusive *setting* within which smaller *participants*
occur and engage in relationships. Participants *interact* with one another—typically
in force-dynamic fashion (Talmy 1985a)—but merely *occupy* some portion of a
setting (a *location*). Though flexibly applied and often covert, the distinction
between participants on the one hand and settings/locations on the other has
extensive ramifications in grammar (Langacker 1987c, *to appear*). These notions
figure in the prototypical semantic values of certain grammatical constructs
pertaining to clause structure. As shown in (8), for instance, it is usual for
temporal and spatial settings to be coded by clause-external adverbs, locations by
clause-internal adverbs, and participants by subjects and direct objects.

(8) *This morning on the golf course, my ball hit a squirrel on the
thirteenth green.*

(9)(a) *The last few years have witnessed amazing political changes.*

(b) *Amazing political changes have been witnessed by the last few years.*

There are however departures from this canonical arrangement. In particular, it is
not unusual for the subject to be construed as a setting or location rather than a
participant. I propose that sentences like (9)(a) be analyzed in this fashion. The
ungrammaticality of (9)(b) then follows as a consequence of two independently
supported claims: that passivizability is a symptom of *transitivity*; and that
transitivity is based on the *interaction of participants* (cf. Rice 1987).

Though it is doubtless incomplete, the foregoing survey may at least
indicate the importance and ubiquity of construal. It does not reside in any specific
conceptual content, but rather in ways of structuring, packaging, and portraying
such content that are applicable to essentially any cognitive domain. I have tried to
indicate, if only very briefly, how each dimension of construal plays a role in
meaning and grammar. Let me now offer the conjecture that these varied aspects of construal all represent semantic universals. This position is not based on any systematic cross-linguistic survey; the most I can presently say is that the need to posit these factors has for the most part either been suggested or reinforced by attempts to describe otherwise problematic data in diverse languages.

In a way, of course, this claim of universality may be obvious and fairly uncontroversial. With few if any exceptions, it is hard to imagine the factors cited not being universally available. Could we imagine a language, for instance, that did not enable its speakers to portray situations at varying levels of specificity? Would we ever expect to find a language that did not employ metaphor? Or one where previous discourse was irrelevant, there was no perspective, and all elements were equal in prominence? The question, then, is not really whether such factors are universal, but rather why. Caution and ignorance prevent me from offering a comprehensive and definitive answer. I will however make some general comments and then examine one facet of the problem in some detail.

If it is granted that many aspects of construal are indeed robust language universals, we can rule out sheer coincidence as a viable explanation. We can likewise eliminate an imaginable position, combining innateness and a strong form of modularity, which I doubt that anyone would actually entertain. According to this straw-man account, aspects of construal are universal because they are innately specified as part of a language module; moreover, they are arbitrary in the sense of not being grounded in human experience, as well as being unrelated to other facets of cognition. This imagined view can safely be discarded because the relationship of construal to general experience and non-linguistic cognition is manifestly evident. The particular angle I will explore is the extensive parallelism between construal and visual perception.

Minimally, then, I assume that construal is universal in many respects because it is grounded in universal aspects of human experience and represents the linguistic manifestation of more general cognitive abilities. Beyond that the issues become more difficult to formulate, let alone adjudicate with any confidence, as they involve such classic conundrums as innateness vs. learning, the domain-specificity of inborn structures, and the privileged status of vision. Further complicating matters is the lack of any assurance that construal factors constitute a homogeneous class in regard to such questions, or that they are clearly distinguishable from other cognitive phenomena. Here I cannot address these issues in any serious way. I will however briefly indicate how I incline to think about them.

We are highly structured organisms who have evolved to cope with a particular structured environment. Our biological endowment enables, shapes, and constrains our experience (if we did not have eyes we could not see), but that endowment has itself been shaped by the environment it evolved in (if there were no light we would not have developed eyes). Our common biological make-up imposes a large measure of universality on human experience, providing its basic organizational features and confining it to a small field within the full space of experiences that appropriately designed creatures might conceivably undergo. It is only inside this narrow range that individual experience unfolds and learning occurs. Of course, to our own eyes this field of possibilities is immensely rich and infinitely variable. We are not aware of its limitations because we have no way of imagining alternatives. Moreover, we are unaware of the organizational features which determine it, for although they shape our experience, they do not constitute it.
I am therefore comfortable with the notion that aspects of construal might be universal because they stem from facets of our common biological make-up. Though they might be triggered or refined by experience, they are not actually learned or experientially acquired, but are rather part of the endowment which makes it possible for structured experience to emerge in the first place. (I would say the same about image schemas—cf. Johnson 1987; Lakoff 1987; Langacker 1993.) It is however important to recognize that a construal factor might be said to stem from our common biological make-up even if it is not specifically coded for genetically. For example, the fact that expressions have a restricted scope follows almost trivially from inherent limits on the representational capacity of a finite organism. Another possibility is for a certain aspect of construal to be derivative in nature. It might, for instance, constitute the projection at the conceptual level of a visual phenomenon whose specific biological determination resides at the level of perception.

Since the relation between meaning and visual perception is a topic that lends itself to misinterpretation as well as sweeping but unsubstantiated proposals, it is essential to make clear just what is and is not being claimed. For one thing, I have never said or believed that meaning reduces to visual imagery or that all conceptual structure is visuo-spatial in nature, nor should my frequent heuristic use of spatial diagrams be so interpreted. I do believe that space and vision are central if not pre-eminent in cognition, exerting a strong formative influence and serving as the basis for metaphorical projection to other domains. The extent to which such projection is constitutive of other domains (as opposed to merely providing a supplementary dimension of understanding) is, I think, yet to be determined. I am going to suggest that numerous properties of visual perception have general conceptual analogs reflected in construal. I take no position, however, on the issue of whether these properties have a visual origin (either phylogenetically or ontogenetically) or just a visual manifestation. Thus, while space and vision must be accorded some kind of primacy, the exact nature of that primacy remains an open question.

Certain basic constructs pertaining to visual perception are represented in Figure 2. Vision presupposes a viewer (V), the subject of perception. Vision has extensionality, which provides a way of dealing with the extensionality of our spatial surroundings. At any one time, of course, the visual field subtends only a limited portion of those surroundings. The full expanse of what a viewer can see at a given moment—primarily determined by the direction in which he is facing—can be called the maximal field of view (MF). This maximal field is organized into a dimly perceived periphery, where the viewer is located, and a center with greater perceptual acuity. I call this center the viewing frame (VF), since it comprises the area within which acuity renders focused observation possible. Alternatively, I invoke a theater metaphor and refer to it as the onstage region, i.e. the general locus of viewing attention. Somewhere within this region lies the specific focus (F) of viewing attention, also describable as the target or object of perception. A dashed arrow indicates the perceptual relationship between the viewer and the viewing target. Finally, the specific configuration assumed by these various elements constitutes a viewing arrangement.
V = viewer (subject of perception)
MF = maximal field of view
VF = viewing frame (onstage region)
F = focus of attention (object of perception)
 -> = perceptual relationship

Figure 2

All these constructs have direct analogs in general conception, and hence in those conceptual structures which function as the meanings of linguistic expressions. Corresponding to the viewer is the conceptualizer, who for linguistic purposes can primarily be identified with the speaker. Corresponding to the perceptual relationship is what I call the construal relationship, wherein the conceptualizer entertains a certain conceptualization and construes it in some particular fashion. Three semantic constructs that I have introduced and justified on linguistic grounds (cf. Figure 1(c)) can reasonably be regarded as the general conceptual analogs of the remaining elements in Figure 2: an expression’s overall scope (the full expanse of its content) is comparable to the maximal field of view; its immediate scope, to the viewing frame (onstage region); and its profile (conceptual referent), to the focus of viewing attention. We can further say that any specific configuration assumed by these various elements constitutes a conceptual arrangement.

Certain aspects of construal lend themselves very naturally to characterization as abstract conceptual counterparts of well-known visual phenomena. Consider trajectory/landmark alignment, the asymmetry in the prominence of relational participants responsible for the semantic contrast between an active and a passive, or between pairs of expressions like X is above Y vs. Y is below X. I see this as being directly analogous to figure/ground organization, known from studies of perception in gestalt psychology. The active/passive contrast and the above/below distinction are not implausibly analyzed as instances of figure/ground reversal. It is suggestive in this regard that the unmarked member of opposing pairs like above vs. below, in front of vs. in back of, and over vs. under is the one in which the trajector is more likely to be readily visible under normal circumstances. Such considerations have led me to hypothesize that a trajector is properly characterized as the primary figure in a profiled relationship, and a salient landmark as a secondary figure. Of course, figure must then be understood in a generalized sense, not in narrowly perceptual terms.

Profiling and trajectory/landmark alignment are two kinds of conceptual prominence that are especially important for grammar. I have suggested that they are properly described as the respective analogs of two kinds of perceptual prominence, namely focus of attention and figure/ground organization. While there are other sorts of conceptual and perceptual salience, it is not obvious to me whether they can or should be identified. I do not know, for instance, whether it would be accurate or merely fanciful to equate the prominence that comes with being explicitly mentioned (as opposed to being introduced sublexically)—recall the
examples in (3)) with the perceptual salience of an entity that has at some point been seen in isolation (not just as a subpart of a larger object).

Similar questions arise in regard to background. Inspired by the visual experience of seeing one object while others are visible behind it, linguists have spoken metaphorically of foreground vs. background with respect to multiple distinct phenomena. Here I am using background as a cover term for an even wider assortment. It is hard to know which of these phenomena are best considered direct conceptual analogs of the visual one, and which aspects of the latter should count most heavily in the comparison. Two basic aspects of the visual experience are the relative proximity of the foreground vis-à-vis the background, and the selective visual focus involved in seeing one object against the background of another. While they tend to correlate, these factors can be dissociated, since the objects we focus attention on are not always the nearest ones. Both factors are reflected at the conceptual level when we construe the current expression against the background of previous discourse: the current utterance has temporal immediacy to the speaker and addressee, whereas previous expressions lie at some remove; and the current expression is the focus of primary interest (the one we are now attending to). For certain other dimensions of construal subsumed under background, only the second factor has an obvious conceptual analog. It is not clear whether or in what sense we would want to say that the source and target domains of a metaphor lie at different 'distances' from the conceptualizer, yet the target domain is the focus of concern, the one we are trying to describe or understand. Similarly, in a complex expression it is the composite structure (the meaning of the whole) that is of primary interest in the sense of directly representing the situation to be encoded, whereas the compositional path (the meanings of its parts) is only subsidiary. For this reason complex expressions vary in their degree of analyzability (cf. Langacker 1987a: 12.1).

Other analogies between conception and vision seem more straightforward. A basic aspect of construal is our capacity to conceive and portray a situation at any level of specificity (or conversely, schematicity). This is directly comparable to the visual notion of granularity (or resolution). The degree of such acuity depends on distance: the closer we are to an object, the better we can see it, in the sense of detecting and resolving fine-grained details. Thus a series of progressively more specific terms like thing < animal < dog < poodle reflects the successive descriptions one might offer, based on visual evidence alone, in walking up to a distant object.

While acuity and viewing distance are inversely related, the latter shows a positive correlation with the size of the field of view. When the focus of visual attention is on a distant object, both the maximal field of view and the viewing frame (i.e. the general locus of attention) subtend large portions of the surrounding world. But if I look at something very close—e.g. the palm of my hand—my visual horizons shrink drastically and I see but a limited portion of my immediate environment. This correlation is mirrored in general conception. In contemplating events that occurred in the distant past, for instance, my thoughts tend to encompass a greater span of time than when I think about events occurring now or quite recently. I believe the correlation also has linguistic manifestations. The semantic constructs that I have equated with the maximal field of view, the viewing frame, and the focus of viewing attention are, respectively, an expression's overall scope, its immediate scope, and its profile. Their interaction with distance may have observable linguistic consequences.
Some examples emerged from Eugene Casad's work on Cora, a Uto-Aztec language of Mexico (see Casad and Langacker 1985). One such case involves locative expressions like (10)(a). They consist of a postpositional phrase, e.g. či'i-ta 'in [the] house', preceded by an adverbial particle comprising a deictic marker of distance (proximal, medial, or distal) as well as either u 'inside' or a 'outside'.

(10) (a) mú či'i-ta (MED-inside house-in) 'there inside the house'
    (b) ü čah-ta'a (DIST-inside town-in) 'off there in town'
    (c) *mū čah-ta'a (MED-inside town-in) 'there in town'
    (d) *iyu čah-ta'a (PROX-inside town-in) 'right here in town'
    (e) má čah-ta'a (MED-outside town-in) 'there in town'
    (f) iyya čah-ta'a (PROX-outside town-in) 'right here in town'

Although this pattern is basically regular and productive, certain combinations surprisingly turn out to be unacceptable. In particular, with u 'inside' and čah 'town' only the distal marking (zero) is permitted, as in (10)(b). The 'outside' marker a is required for medial and proximal distance, despite the fact that the postposition specifies an 'inside' relationship. We thus find expressions like (10)(e)-(f) in lieu of the expected (10)(c)-(d).

Why should things work this way? The apparent explanation hinges on the correlation between distance and scope. It is not unreasonable to suppose that the immediate scope for u is determined by the deictic element it fuses with. Thus, in accordance with whether the deictic specification is proximal, medial, or distal, the area subtended by the viewing frame it imposes can be quite small or indefinitely large. (Being an independent phrase, the postpositional locution has its own scope, which is not determined by the deictic element.) We can then explain the data in terms of an incompatibility between the immediate scope imposed by the adverbial particle and the massive size of a town (as compared to a house). From other examples, it appears that u is used only when a clear instance of an 'inside' relationship appears onstage within the viewing frame (otherwise a occurs by default). For such an instance to be discernible, the boundaries which delineate the 'inside' and 'outside' regions must themselves fall within this frame. The distribution observed in (10)(b)-(f) then results from the size of a town, whose boundaries can only be accommodated by the expansive viewing frame associated with a distal perspective.

The interaction of distance with scope and acuity has further linguistic ramifications. In vision, greater distance generally correlates with greater scope (i.e. a larger field of view) and lesser acuity. Lakoff has invoked the inverse correlation between distance and acuity as the experiential basis for the linguistic similarities between plurals and mass nouns: 'The relationship between multiplex entities and masses is a natural visual relationship. Imagine a large herd of cows up close—close enough to pick out the individual cows. Now imagine yourself moving back until you can no longer pick out the individual cows. What you perceive is a mass. There is a point at which you cease making out the individuals and start perceiving a mass. It is this perceptual experience upon which the relationship between multiplex entities and masses rests' (1987: 428). We might note, however, that a decrease in distance does not invariably enhance perception. As we approach an object, there is a point beyond which any further approximation actually makes it harder to observe—we are just too close to see it well. This happens, for example, when the defining boundaries of the object fall outside the
viewing frame and even the maximal field of view. Suppose you see a cow and decide to walk up to it and press your nose against its side. At this minimal distance you will no longer be able see the bovine contours—the familiar configuration of head, legs, body, tail, and udder—that normally allow you to perceive and recognize a cow from its shape. You may know that you are nuzzling a cow, but since its spatial boundaries overflow the limits of your field of view, all you actually see is a small expanse of cowhide.

I suggest that a conceptual analog of this visual phenomenon figures in the semantic value of the progressive construction. As shown in Figure 1, the progressive converts a perfective verb—defined as one that profiles a bounded process whose endpoints fall within its temporal scope—into a special kind of imperfective. It does so by imposing a restricted immediate scope (or temporal viewing frame) which excludes those endpoints. As the general locus of attention, an expression’s immediate scope has to contain its profile. Thus, whereas (11)(a) designates an entire bounded event of boot-polishing, its progressive counterpart (11)(b) profiles only that segment of the overall event subtended by the temporal viewing frame.

(11)(a) Jack polished his boots.
(b) Jack was polishing his boots.

Granted this analysis, two additional properties of progressives can be seen as grounded in the relationship among scope, distance, and acuity. First, the progressive conveys a sense of immediacy, one symptom of which is the enhanced likelihood of the speaker adopting the subject’s vantage point. For instance, (11)(b) lends itself more easily than (11)(a) to the continuation Tomorrow was the big dance, where tomorrow is reckoned from the vantage point of the subject, not the speaker. (This observation stems from a discussion with Aintzane Doiz-Bienzobas.) Immediacy is interpretable as the proximity associated with a viewing frame that subtends only a small portion of the relevant domain. Second, a progressive is imperfective, hence its profile is internally homogeneous, even though the designated process is segmented from a perfective describing a change through time. Here I would like to say that the exclusion of the distinctive endpoints from focused observation removes the basis for attributing the profiled segment any specific identity within the structured whole. It is thus construed as a homogeneous mass in much the same way that, in nuzzling a cow, we perceive an unidentified expanse of cowhide rather than any particular cow part.

This discussion of scope and distance has already led us into matters of perspective. Here the parallels between vision and conception seem fairly obvious. That the conceptual notion vantage point is considered analogous to the spatial viewpoint in vision will hardly come as a revelation. In fact, the possibility of distinguishing them is only made evident by the use of vantage points in non-visuospatial domains (e.g. the temporal vantage point invoked by tomorrow). We can likewise identify mental scanning with visual scanning, whereby we direct our gaze along a spatial path. The two may not be distinguishable in examples like (6), where the directed mental scanning follows the spatial extension of a visible entity (a scar). There are however non-spatial examples like those in (12), where the conceptualizer traces oppositely directed mental paths through an abstract domain:

(12)(a) As body size increases, there are fewer and fewer distinct species.
(b) As body size decreases, there are more and more distinct species.
Of course, it is not precluded that spatial metaphor and visual imagery play a role in such cases. The point is merely that mental scanning represents a generalized ability not specifically tied to actual visual scenes.

Also under the heading of perspective, an entity is said to be construed subjectively or objectively to the extent that it functions exclusively as the subject vs. the object of conception. In (11)(a), for example, Jack and the boots are construed with maximal objectivity, being placed 'onstage' as explicitly mentioned focal participants. By contrast, the speaker receives a highly subjective construal: despite being the primary conceptualizer whose temporal vantage point anchors the past-tense marking, the speaker remains 'offstage' and unmentioned (an implicit 'viewing' presence). It should be evident that the speaker's implicit role is quite analogous to that of the viewer in visual perception. In the typical viewing arrangement, sketched in Figure 2, V is offstage, at the extreme periphery of the visual field, and is neither focused nor perceived with any acuity. V serves primarily as the subject rather than the object of perception, just as the speaker is primarily the subject of conception. Moreover, just as V's offstage location is partially within the maximal field of view and determines the distance and appearance of the focused entity, so an implicit speaker figures peripherally in the overall scope of a finite clause and thus establishes a default-case spatio-temporal reference point.

Finally, the conceptual distinction drawn between settings and participants has an evident basis in visual perception. For the most part, the entities construed as participants are small, compact, and mobile. They move around and interact within a setting that—at least in relative terms—is large, stable, and inclusive. While this conceptual opposition is not limited to the visuo-spatial domain (note the temporal setting in (8)), we can plausibly relate it to what happens almost every time we open our eyes and look at something: within a large, inclusive spatial expanse, we focus attention on one of many objects that are small and compact by comparison. It is of course possible to view the scene in a different manner, for instance by looking at the entire room instead of any specific object it contains. This marked viewing perspective can be considered analogous to the conceptual inversion that results in sentences like (9)(a), where the subject designates the setting rather than a participant.

At this point a brief summary may be in order. I have argued that construal is as important as conceptual content to an account of semantic structure and semantic universals. Every lexical item, grammatical element, and grammatical construction imposes a particular construal on the specific or schematic conceptual content it evokes. Many if not all of the numerous dimensions of construal are strong candidates for the status of language universals. They appear to be grounded in universal aspects of human experience and to represent the linguistic manifestation of more general cognitive abilities, which in turn presumably stem—either directly or indirectly—from aspects of our common biological make-up. In particular, construal displays surprisingly many parallels with visual perception. This parallelism is of course subject to different interpretations. It may be that vision exerts a strong formative influence on general conception, including its manifestation in linguistic meanings. Alternatively, both construal and the analogous visual phenomena might be seen as instantiating basic cognitive abilities that are not specifically visual in origin. I suspect that each alternative has some degree of validity.
Assuming that construal is in fact universal, we must ask why languages vary so greatly in their semantic structure, even for describing similar situations. If speakers of every language have a common biological endowment entailing the same construal abilities, and live in a structured environment which ensures the essential commonality of fundamental human experience, what is the source of the semantic disparities that bedevil translation and lead bilinguals to say that their languages put them in different "mental worlds"? One response is to argue that the differences are exaggerated, that we are more cognizant of the relatively modest discrepancies than with the far more extensive likenesses, precisely because we take the latter for granted. From Her outside perspective, God might tell us that we operate within an exceedingly narrow band in the full spectrum of divinely imaginable conceptual possibilities. But since our own imagination is confined to that band, we are unduly impressed by the actually very minor variation it encompasses.

I do think that is an accurate assessment. Still, the differences catch our interest and from our own narrow perspective are often striking. A good proportion of them are clearly attributable to the immense variation observable in the detail of human experience, even granted its fundamental commonality. Speakers of different languages may well live in vastly divergent physical environments, deal with inventories of artifacts having relatively few members in common, and participate in cultural systems that seem foreign and mysterious to outsiders. Of course, that cannot be the whole story, since two languages often express precisely the same situation in very different ways. Recall, for example, Whorf’s comparison of English I cleaned it with a ramrod and the Shawnee equivalent, whose lexical elements he identified as meaning ‘dry space’, ‘interior of hole’, and ‘by motion of an instrument’ (1956: 208). Or compare the Cora expressions in (13) with their English translations:

(13)(a) u-ká-kun (inside-down-hollows) ‘There is a small, deep well there.’
(b) a-pá-kun (outside-in:middle-hollows) ‘There is a wide-mouthed well there.’

Whereas English uses the noun well, which saliently evokes the functional notion of providing a source of water, Cora employs the subjectless verb kun ‘(be) hollow/hollowness occur’, which does not specifically pertain to wells or water, and emphasizes spatial configuration by means of verbal prefixes. Thus ká- in (13)(a) reflects the downward extension of the hollowness, while u- indicates restrictiveness (of the opening), depth of penetration, and inaccessibility (of the interior) to view. By contrast (a contrast easily ignored in English), the pá- in (13)(b) highlights the well’s location in the middle of an extended area (the surface of the earth), while a- conveys expansiveness, shallowness of penetration, and accessibility to view (Casad and Langacker 1985).

In general terms, the source of the variation is reasonably apparent. It stems from the existence and the very nature of construal, which ensure that any given situation can be viewed in multiple if not infinitely many ways. Starting from the same basic conceptual content—e.g. the conception of a well with certain evident properties—we can form an endless variety of specific conceptions by making alternate choices in regard to the many dimensions of construal. We can opt to portray it in fine-grained detail or at any level of schematicity. We can render certain properties salient by coding them explicitly (as for spatial configuration in
(13)), leaving others unmentioned and hence less prominent. Any facet of the scene might be put in profile: the well, construed as a thing; the process of hollowness occurring; the activity of drawing water; the water itself; the depth of the shaft; and so on endlessly. There are countless possible ways of construing selected aspects of the scene metaphorically. It can further be viewed with any scope, from any perspective, and in relation to different assumptions, expectations, and discourse contexts. Thus, although these basic construal abilities are universal, applying them to any particular body of conceptual content presents indefinitely many options, each cognitively natural in its own way.

Of course, a speaker is not left entirely to his own devices in this regard. Particular ways of construing various kinds of situations become conventionalized in a speech community. As an inherent aspect of its meaning, every lexical and grammatical element imposes a certain construal on its own content or the content supplied by others, and in using such an element, we necessarily adopt its construal for immediate expressive purposes. Importantly, I do not claim that the influence of these conventional modes of construal is necessarily either strong or pervasive. I do not say, for example, that just because two languages construe a phenomenon differently, their speakers must conceptualize it differently. To me that makes no sense, for it presupposes that a given person or community is capable of conceptualizing a particular phenomenon in only one way, whereas the whole thrust of my discussion is precisely the opposite. To take just one example, speakers of English effortlessly shift back and forth between construing an argument metaphorically as a combat plane (She shot down my argument), as a building (My argument collapsed), and as a container for fluid (That argument doesn’t hold water) (cf. Lakoff and Johnson 1980). The most one can say with any confidence a priori is that the conventions of a language facilitate the adoption of certain construals as opposed to others for purposes of convenient linguistic encoding. I myself tend to think of their influence as being limited and fairly superficial, though hardly trivial or negligible.

There is a greater likelihood that modes of construal might prove psychologically significant when they constitute general patterns rather than the idiosyncrasies of individual forms. Patterns of construal at any level of abstraction and generality are capable of being established in linguistic convention with the potential to exert broad influence on how things are said and how they are conceptualized for that purpose. For instance, an examination of Cora data leaves little doubt that spatial location and configuration are more prominently and systematically specified than in English (cf. Casad 1982, 1984). Beyond their inclusion in countless conventional constructions, we might postulate for the language a highly schematicized expectation that such information will normally be expressed. A generalized expectation of this sort could be regarded as a linguistically embodied ‘cognitive style’ representing the coherence of numerous specific structural phenomena.

While investigation at this level of abstraction is difficult and raises serious methodological issues, I think it ought to be pursued for both its intrinsic linguistic interest and for what it might suggest concerning the relationship of language, cognition, and culture. Of existing work along these lines, one thinks immediately of Talmy’s typological research on motion expressions (1975, 1985b, 1991), which demonstrates that languages have particular ‘styles’ or preferred patterns for the packaging of information regarding such factors as path, causation, and manner of locomotion. I am also intrigued by Ikegami’s proposal (e.g. 1985, 1988, 1991), based on a variety of structural and textual phenomena, that Japanese contrasts with
English by placing lesser emphasis on agentivity, showing a lesser tendency toward individuation, and relying more heavily on context for crucial information. He further proposes that this cognitive style might be related to general characteristics of Japanese culture. At this stage, such ideas have to be considered speculative, but I for one would be surprised if they did not turn out to have some measure of validity. Language does not exist in a cultural vacuum, and it is time we began systematically exploring the existence, scope, and import of these higher-level correlations.

References

----- 1988. What we see when we see flying cranes: motion or transition. The Japan Foundation Newsletter 15.5/6.1-9.


To appear. Grammatical traces of some 'invisible' semantic constructs.


An Optimality-Theoretic Typology of Case and Grammatical Voice Systems*

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In this paper we explore the consequences of the hypothesis that Universal Grammar contains formal counterparts of extremely simple constraints like these: agents surface as subjects; low-prominence arguments do not surface as subjects or objects; low-'animacy' arguments surface as objects. Using Optimality Theory (Prince & Smolensky, 1991, 1993) to formally manage the necessary violations of such constraints as they come into mutual conflict, we show that such simple universal principles governing the mapping of semantic roles to surface morphosyntactic roles can provide formal explanation of empirical cross-linguistic typologies of case and grammatical voice systems.

Optimality Theory provides a general means for constructing particular grammars from universal constraints, and of generating theoretical typologies of possible languages from the same constraints; this is summarized in §1. In §2, we present the universal constraints that constitute our proposed theory of case and voice. In this paper, we take a grammatical voice to be a particular mapping of thematic roles to surface abstract cases. In §3, we show how the theory entails three possible intransitive case-marking systems: Nominative/Accusative, Ergative/Absolutive, and Active/Stative. In §4, we illustrate how the theory treats one example language from each of these three systems, including voice as well as intransitive case. In §5, we state a set of implicational universals entailed by the theory and use them to derive analytic typologies of case/voice systems. In §6, we briefly sketch some extensions.

1. Analytic Typology in Optimality Theory

In Optimality Theory, a grammar is taken to be a function mapping each linguistic input (e.g., an underlying phonological string) to its correct structural description, or 'parse', or 'output' (e.g., a prosodic parse: Prince & Smolensky 1993). Universal Grammar (UG) provides the universe of possible outputs available to all languages: the candidate set. UG also provides a set of well-formedness constraints on outputs. These constraints are, in general, highly conflicting: for many inputs, all possible outputs violate at least one constraint. A grammar is a means of ordering all possible outputs according to how well they satisfy the well-formedness constraints — i.e., how harmonic they are (the term 'Harmony' derives from Smolensky 1986). The most harmonic possible output for a given input — the optimal output — is the structural description which is declared well-formed by the grammar: it is the correct output for that input.

The difficult job of the grammar of a particular language, then, is to determine which possible structural description of an input is most harmonic, when all such possibilities may violate some universal well-formedness constraints. According to Optimality Theory, a grammar does this by ranking the universal constraints in a language-particular dominance hierarchy: the grammar declares that satisfying any given constraint is strictly more important than satisfying all lower-ranked constraints. For any input, the output $O$ assigned to that input by the grammar is more harmonic than any alternative structural description $A$ of the input, in the following sense: if there are any
constraints which $O$ violates more strongly than $A$, then there is another, higher-ranked, constraint which $A$ violates more strongly than $O$.

When a structural description violates a constraint $C$, we say that it incurs the mark $*C$. When one constraint $C_1$ dominates another $C_2$ in the dominance hierarchy of a language, we write $C_1 \gg C_2$; this means, in effect, that the mark $*C_1$ is a ‘worse violation’ than $*C_2$: it does more to lower the Harmony of a structure which incurs it. When one structural description $B$ is more harmonic than an alternative $W$ (when $W$ incurs a worse set of marks), we write $B \succ W$; in a sense made precise by Optimality Theory, $B$ is ‘less marked’ than $W$.

The general methodology we deploy runs as follows:

1. Analytic Typology in Optimality Theory.
   a. Hypothesize a universal set of possible structural descriptions.
   b. Hypothesize a universal set of well-formedness constraints governing such structures.
   c. Consider all possible rankings of the constraints into dominance hierarchies; these define the predicted set of possible language-particular grammars. ¹
   d. For each possible hierarchy, determine the well-formed structures of the corresponding language.

The central innovation to grammatical theory provided by Optimality Theory, which we exploit here to the fullest, is this: UG is characterized as a set of highly general constraints which are frequently violated by the licit forms in the language. The theory tightly controls constraint violation, ensuring that licit forms only violate a constraint when doing so is necessary to permit satisfaction of a more highly ranked constraint. Optimality Theory has enabled the formulation and formal analysis of a number of highly general universal constraints in phonology: see Prince & Smolensky (1993) and the two-dozen Optimality Theoretic papers cited therein, especially McCarthy & Prince (1993). To our knowledge, the present paper describes the first systematic application of Optimality Theory outside phonology and morphology.

2. A Minimal Theory of Abstract Case

2.1 Inputs. Here, an input to be assigned a structural description by a grammar is simply a clause or a predicate/argument complex. Each argument in the input is labelled with its thematic role; here we treat only agent and patient². In addition, each argument is labelled with an abstract ‘prominence’ level, high or low. The voice alternations we treat are driven by prominence demotions in the input: the abstract ‘passive’ we consider arises from an input consisting of a low-prominence agent and a high-prominence patient. We denote this input ‘aP’, using ‘{a,p}’ to denote low- and ‘{A,P}’ high-prominence agents and patients, respectively. Our abstract ‘antipassive’ arises from the input AP, with prominence-demoted patient. Simple transitives (active voice) derive from the input AP. Our two intransitive inputs are A and P, depending on whether the argument is a thematic agent or patient. (The predicate itself is not made explicit in the input.)

2.2 Outputs. The output assigned by a grammar to an input consists in the input argument themselves, together with a value for each argument of what we will call an
‘abstract case’. We take such cases to be realized by overt morphological case on the NPs in some languages, by word order in others, and by verbal cross-referencing in still others. We do not explicitly treat verbal morphology or auxiliaries which may be associated with certain voices.

For our initial work restricted to two thematic roles, we assume only three possible abstract cases: $C_1$, $C_2$, and $C_4$. As shown in §2.4, the theory entails that, in all languages, $C_1$ and $C_2$ are the abstract cases respectively assigned to the arguments $A$ and $P$ for the simple transitive input $AP$; therefore, in any given language, we take $C_1$ and $C_2$ to be realized through whatever surface means are used to designate the agents and patients in simple transitive sentences. In the simple account here, $C_4$ subsumes all lower cases, including dative or oblique overt case on NPs, as well as failure of an argument to appear on the surface at all.

We notate outputs by simply subscripting each thematic argument with the number of the case it is assigned; for example, the simple transitive input $AP$ is universally assigned the output $A_1P_2$ (as we show below in §2.4). We assume that the candidate set of possible outputs made available by UG excludes every structure in which two different arguments are assigned the same core case $C_1$ or $C_2$; thus, e.g., $A_1P_1$ and $A_2P_2$ are not possible outputs.\(^3\)

In all languages, intransitive arguments are taken to bear case $C_1$ or $C_2$ when they are realized on the surface like the agents or the patients, respectively, in simple transitive sentences. This will permit all languages to be treated using a common set of universal constraints governing the assignment of abstract case.

The traditional names associated with $C_1/C_2$ vary depending on the intransitive case assignment strategy of the language. ‘Nominative/accusative’ (Nom/Acc) are the names traditionally used when intransitive arguments are all marked like transitive agents: in our terms, when intransitive arguments are assigned $C_1$, regardless of whether they are thematic agents or patients. The traditional terms are ‘ergative/absolutive’ (Erg/Abs) when, in our terms, intransitive arguments are all assigned $C_2$. Finally, ‘active/stative’ (Act/Sta) is the traditional terminology when intransitive agents receive $C_1$ but intransitive patients receive $C_2$.

Our first result is a derivation of this typology of case marking systems for intransitive clauses: we show that nominative/accusative, ergative/absolutive, and active/stative systems arise from different dominance rankings of a single universal set of constraints. But first we must present these constraints.

2.3 The Universal Constraints. We propose the following set of constraints\(^4\):

(2) Universal Constraints Governing Abstract Case

a. $A\rightarrow C_1$: Agents receive abstract case $C_1$.
b. $P\rightarrow C_2$: Patients receive abstract case $C_2$.
c. $A\rightarrow C_2$: Agents do not receive abstract case $C_2$.
d. $P\rightarrow C_1$: Patients do not receive abstract case $C_1$.
e. $\alpha\rightarrow C_4$: Core arguments (agents and patients) do not receive abstract case $C_4$.
f. $\alpha\rightarrow C_2$: Some argument is case-marked $C_2$.
g. $X\rightarrow C_1$: High-prominence arguments receive abstract case $C_1$.
h. $x\rightarrow C_{12}$: Low-prominence arguments are not core case-marked ($C_1$ or $C_2$).
Most of these constraints arise from the natural assumption that the mappings between thematic roles and cases which are manifest in simple transitives satisfy the universal mapping constraints: agents receive $C_1$ and not $C_2$ or $C_4$ (a,c,e); patients receive $C_2$ and not $C_1$ or $C_4$ (b,d,e). Some argument is case-marked $C_2$ (f) (and another is marked $C_1$; a constraint to that effect is redundant with (g), since in all inputs considered here, at least one argument is of high prominence). The constraints sensitive to abstract prominence (f,g) reflect the fact that prominence-demotion as manifest in passive and antipassive voices is expressed through loss of core case by core arguments (g), and, in the case of passive, the opportunity for a high-prominence patient to be promoted to $C_1$ (f). These constraints formally capture aspects of the functional correlation between subjecthood and discourse prominence (e.g., Givón 1984, 1989).

It is important to note that these proposed constraints and the input/output representations they presume are neutral with respect to many syntactic assumptions. Our cases might be primitive elements in a syntactic theory (analogous to the 'MAP's of Gerds 1993, this volume, and references therein). On the other hand, while it is not made explicit in the minimalist notation we employ, constituent structure of considerable complexity is consistent with the theory we explore here; our abstract cases could be taken to encode structural properties, the constraints (2) forming a module of a theory containing other structure-related constraints; the constraints (2) would then presumably serve to license the structural elements or movement required in the optimal structure (e.g., as suggested in another syntactic domain by Grimshaw 1993).

2.4 Active Voice. The means used in a given language to mark the abstract cases $C_1$ and $C_2$ are determined by how that language marks the agents and patients in simple transitive sentences. This follows, we asserted, from the fact that our theory of abstract case entails that the input for such sentences, AP (high-prominence agent, high-prominence patient), is always assigned the output $A_1P_2$ (i.e., A receives $C_1$, P receives $C_2$), regardless of the way the language ranks the universal constraints (2) in its language-particular dominance hierarchy. We now demonstrate this.

The first step is to determine the set of possible outputs for the input AP: the candidate set provided by UG. This is: $\{A_1P_2, A_1P_4, A_2P_1, A_2P_4, A_4P_1, A_4P_2, A_4P_4\}$. (As stated in §2.2, assigning both A and P the same core case — $A_1P_1$ or $A_2P_2$ — is assumed to be prohibited by UG.) Now since there are two high-prominence arguments and at most one can receive $C_1$, every candidate must violate constraint (2,g) $X \rightarrow C_1$ — only $A_1P_1$ satisfies this constraint fully, and UG rules out this structure. The output $A_1P_2$ satisfies all the other constraints, however. All other candidate outputs violate additional constraints; e.g., $A_4P_2$ also violates $A \rightarrow C_1$ and $\alpha \vDash C_4$. Thus, no matter how a grammar ranks the universal constraints (2), $A_1P_2$ is the most harmonic candidate: it incurs only the mark $X \rightarrow C_1$, whereas all the alternatives incur this same mark and others as well. Therefore the theory entails that, in all languages, the structural description assigned to AP is $A_1P_2$.

3. Deducing the Typology of Intransitive Case Systems

Consider the two possible (high-prominence) intransitive inputs: A, corresponding to an intransitive predicate taking a thematic agent as argument, and P, for a patient-taking
predicate. The possible outputs for A are just \{A_1, A_2, A_4\}; for P, \{P_1, P_2, P_4\}. The constraints in (2) which bear on these alternatives are given in the following table:

(3) Intransitive Case Marking Typology

<table>
<thead>
<tr>
<th>Constraint</th>
<th>Input: P</th>
<th>Input: A</th>
</tr>
</thead>
<tbody>
<tr>
<td>P→C_2</td>
<td>⇒ choose C_2</td>
<td></td>
</tr>
<tr>
<td>P/=C_1</td>
<td>⇒ choose C_2</td>
<td></td>
</tr>
<tr>
<td>α→C_2</td>
<td>⇒ choose C_2</td>
<td>⇒ choose C_2</td>
</tr>
<tr>
<td>X→C_1</td>
<td>⇒ choose C_1</td>
<td>⇒ choose C_1</td>
</tr>
<tr>
<td>A→C_1</td>
<td></td>
<td>⇒ choose C_1</td>
</tr>
<tr>
<td>A/=C_2</td>
<td></td>
<td>⇒ choose C_1</td>
</tr>
</tbody>
</table>

RESULT: choose C_2 unless X→C_1 dominates P→C_2, P/=C_1 and α→C_2

choose C_1 unless α→C_2 dominates X→C_1, A→C_1 and A/=C_2

<table>
<thead>
<tr>
<th>A_1</th>
<th>A_2</th>
</tr>
</thead>
<tbody>
<tr>
<td>P_2</td>
<td>Active/Stative</td>
</tr>
<tr>
<td>P_1</td>
<td>Erg/Abs</td>
</tr>
<tr>
<td>Nom/Acc</td>
<td>IMPOSSIBLE</td>
</tr>
</tbody>
</table>

Consider first the input P, and two of the possible outputs, P_1 and P_2. As the table shows, three of the constraints will be satisfied if and only if P is assigned C_2, i.e., iff the output is P_2. The fourth constraint is satisfied only if the output is P_1. Which output is more harmonic? In Optimality Theory, we do not answer this by majority vote; rather, we consult the language’s dominance hierarchy. If the fourth constraint X→C_1 dominates the other three, it wins, and P_1 is the more harmonic; otherwise, it is P_2. According to the methodology of Analytic Typology (1), cross-linguistic variation is generated by all possible rankings of universal constraints, so the theory predicts that P will receive case C_1 in some languages (those which rank X→C_1 highest) and case C_2 in others. These two possibilities are indicated in the bottom two lines of the table (shaded).

We have ignored the remaining candidate, P_4. Regardless of how the constraints are ranked, this structure can never be more harmonic than P_2: the only mark incurred by P_2 is *X→C_1, and P_4 incurs this mark as well as the marks *P→C_2 and *α/=C_4. Thus P_1 and P_2 are the only two possible optimal structures.

The case of agentive intransitives is analogous: it is treated in the rightmost column of table (3). Again, there are two possibly optimal candidates, A_1 and A_2; the latter will be optimal only in languages which rank α→C_2 higher than the other three relevant constraints, all of which are violated by A_2.
Analytic typology (1) assuming the universal constraints (2) thus predicts the typology of intransitive case-marking systems given in the shaded lower-right portion of (3). Depending on its ranking of the universal constraints, a given language will fall into one of the three possible cells: the fourth cell, a language systematically assigning intransitive agents C₂ and patients C₁, is predicted impossible because it would require that X→C₁ ⇒ α→C₂ (for P₁) and, in the same dominance hierarchy, that α→C₂ ⇒ X→C₁ (for A₂). The three predicted systems correspond to the traditional active/stative (A₁,P₂), ergative/absolutive (A₂,P₂), and nominative/accusative (A₁,P₁) systems.

4. Treatment of Example Languages

The ranking of the universal constraints (2) by a language’s grammar determines the cases assigned to all the possible inputs considered here, not just the intransitive inputs considered in §3. We now illustrate the patterns of case assignment across several different inputs, for three different dominance hierarchies corresponding to three typological language families. Appendix A provides a summary by language of the actual case/voice systems we refer to in the paper; relevant references are marked in the bibliography.

4.1 A Nominative/Accusative Example. The following is an Optimality Theoretic constraint tableau for a typological family which includes English:

(4) Constraint Tableau for English-type Languages

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>X→C₁</th>
<th>x→C₁₂</th>
<th>α→C₂</th>
<th>A→C₁₂</th>
<th>A→C₁</th>
<th>P→C₁</th>
<th>P→C₂</th>
<th>α→C₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A₁</td>
<td></td>
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<td></td>
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<td>A₂</td>
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<td></td>
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<tr>
<td>P</td>
<td>P₁</td>
<td></td>
<td></td>
<td>*</td>
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<td></td>
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<tr>
<td></td>
<td>P₂</td>
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<td></td>
<td></td>
<td>*</td>
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<td></td>
</tr>
<tr>
<td>aP</td>
<td>a₁P₂</td>
<td>*</td>
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<td>*</td>
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<td>a₂P₁</td>
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<td>a₄P₁</td>
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<tr>
<td></td>
<td>a₄P₂</td>
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<td>*</td>
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<td></td>
</tr>
<tr>
<td>Ap</td>
<td>A₁P₂</td>
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<tr>
<td></td>
<td>A₄P₄</td>
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<tr>
<td></td>
<td>A₂P₄</td>
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</tr>
</tbody>
</table>

Across the top of (4) is a ranking of the universal constraints (2), with most dominant to the left. (Certain modifications of the ranking would not effect the results.) Comparing the dominance hierarchy against the shaded intransitive typology of (3), we see that the conditions are met for a nominative/accusative system: X→C₁ does dominate all three constraints P→C₂, P→C₁ and α→C₂, so P will be assigned C₁; on the other hand, α→C₂
does not dominate $X \rightarrow C_1$ so $A$ will also be assigned $C_1$. Both high-prominence intransitive arguments $A$ and $P$ must be assigned $C_1$ in order to satisfy the most dominant constraint, $X \rightarrow C_1$. The constraint tableau shows two candidate outputs for $P$ ($P_1$ and $P_2$), and shows the marks each receives. (When any constraint $C$ is violated by a candidate output, a ‘*’ is placed in the column for $C$; this indicates the mark $\text{*}C$). The most-dominant mark incurred by $P_2$, $\text{*}X \rightarrow C_1$, is a higher-ranked violation than that of $P_1$, $\text{'a'} \rightarrow C_2$, so $P_1$ is more harmonic than $P_2$; $P_1$ is the optimal candidate, and therefore the output (indicated by $\text{\textvar{p}}$). (The candidate $P_4$ is not shown in (4) because, as previously explained, it is universally less harmonic than $P_2$.) Similarly, for input $A$, the optimal candidate is $A_1$. This dominance hierarchy gives rise to a nominative/accusative intransitive system.

The remainder of the tableau (4) concerns the passive input $aP$ and the antipassive input $Ap$. The candidate outputs shown are all those which are not universally less harmonic than some competitor (cf. §5). For $aP$, the optimal candidate is $a_4P_1$: the highest-ranking mark incurred by this structure, $\text{'a'} \rightarrow C_2$, is a less serious violation than the highest-ranking marks of all its competitors. Since the output of $aP$ is $a_4P_1$, in this language, passive is realized with an agent demoted to $C_4$ [in English, either an OBL NP or one that does not surface] and a patient promoted to $C_1$ [NOM]. This configuration, the traditional passive, we dub ‘Passive$_1$', the subscript labelling the case of the high-prominence argument (P). The antipassive input $Ap$ produces output $A_1p_4$ — ‘Antipassive$_1$’ — in which the patient is demoted to $C_4$ [in English, realized through absence on the surface; e.g., John ate].

The dominance hierarchy shown in (4), therefore, yields a language with nominative/accusative intransitive case marking, and Passive$_1$ and Antipassive$_1$ voices. English is of course just one representative of this large typological class.

4.2 An Ergative/Absolutive Example. If the constraint $X \rightarrow C_1$ topping the preceding hierarchy (boxed column in (4)) is ranked a bit lower, and all other relative rankings remain unchanged, the typological class changes from one including English to one exemplified by Eskimo. As shown in (5) below, the intransitive case marking system is now ergative/absolutive: intransitive $A$ and $P$ both receive case $C_2$ [ABS]. The optimal parse of $aP$ is now $a_4P_2$ — ‘Passive$_2$’: the agent demotes to $C_4$ [in Eskimo, either an OBL or surface-absent NP] while the patient receives $C_2$ [ABS], like intransitive arguments. The output for $Ap$ is now $A_2p_4$ — ‘Antipassive$_2$’: the patient demotes to $C_4$ [OBL or surface-absent in Eskimo] and the agent receives $C_2$ [ABS]. This is the traditional antipassive structure.

4.3 An Active/Stative Example. If we modify the English-type ranking (4) by moving the pair of constraints $A \rightarrow C_1$, $P \rightarrow C_1$ (dashed columns in (4)) to the top of the hierarchy, we move to a typological class including Lakhota. Tableau (6) below shows that the intransitive case marking system is now active/stative, with $A_1$ and $P_2$ optimal. The output for $aP$ is now $a_1P_2$, the same case assignment as in active voice. That is, whether the agent is high- (AP) or low-prominence (aP) makes no difference: the optimal parse assigns $C_1$ to the agent in either case. This is a language without a passive voice: the top-ranked constraint $A \rightarrow C_1$ ensures that agents receive $C_1$, regardless of their level of prominence. There is, however, an antipassive voice: input $Ap$ produces output $A_1p_4$ — Antipassive$_1$ [$C_4 =$ surface-absence in Lakhota].
(5) Constraint Tableau for Eskimo-type Languages

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>$x\rightarrow C_{12}$</th>
<th>$\alpha\rightarrow C_2$</th>
<th>$X\rightarrow C_1$</th>
<th>$A\rightarrow C_2$</th>
<th>$P\rightarrow C_1$</th>
<th>$P\rightarrow C_2$</th>
<th>$\alpha\rightarrow C_4$</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
<td></td>
<td>$A_1$</td>
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<td>$aP$</td>
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<td>$a_4P_1$</td>
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</tbody>
</table>

(6) Constraint Tableau for Lakhota-type Languages

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
<th>$A\rightarrow C_1$</th>
<th>$P\rightarrow C_1$</th>
<th>$X\rightarrow C_1$</th>
<th>$x\rightarrow C_{12}$</th>
<th>$\alpha\rightarrow C_2$</th>
<th>$A\rightarrow C_2$</th>
<th>$P\rightarrow C_2$</th>
<th>$\alpha\rightarrow C_4$</th>
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<tbody>
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<tr>
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<tr>
<td></td>
<td>$a_1P_2$</td>
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<tr>
<td></td>
<td>$a_2P_1$</td>
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<tr>
<td></td>
<td>$a_4P_1$</td>
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<tr>
<td></td>
<td>$a_4P_2$</td>
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<td></td>
<td>$A_1p_2$</td>
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<tr>
<td></td>
<td>$A_1p_4$</td>
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<tr>
<td></td>
<td>$A_2p_4$</td>
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</table>
5. General Analysis

In §4 we saw three possible case/voice systems which may arise through appropriate ranking of the universal constraints (2). What are all the possible such case/voice systems?

5.1 A Typology of Passives. The possible structures which can in fact surface as outputs from the low-prominence agent input aP are these: \(a_4P_1 = '\text{Passive}_1'; \ a_4P_2 = '\text{Passive}_2'; \ a_2P_1 = '\text{Reversal}';\) and \(a_1P_2 = \text{No Passive}.\) Only these four can be optimal for some constraint ranking — these are the ‘possibly optimal’ structures. Examination of all other possible outputs (e.g., \(a_2P_4, a_4P_4, \text{etc.}\)) reveals that each such output W is universally less harmonic than some other, possibly optimal, alternative B: W incurs all the marks incurred by B, and some others as well, so \(B > W,\) universally (see Prince & Smolensky 1993 §9.1.1).

Of the four possibly optimal outputs for aP, two are surface-intransitive: in \(a_4P_1\) and \(a_2P_2,\) only P bears a core case (\(C_1\) or \(C_2\)). In \(a_2P_1,\) agent and patient reverse the cases they receive compared to active voice; this ‘Reversal’ form of passive is exhibited in, e.g., Navajo (e.g., Jelinek 1990). When \(a_1P_2\) is optimal, the language lacks a passive, as discussed above for the Lakhota class.\(^5\)

While there are four possibly optimal outputs for aP, only one is optimal for a given language (determined by its dominance hierarchy); in the simple form presented here, the present theory provides only one possible input for generating passive structures, and since each input generates only one output, multiple passive constructions in a single language cannot be treated. An extension to a richer input representation capable of distinguishing different inputs would allow for multiple passives within a single language.

For subsequent analysis it is important to identify the exact conditions on a dominance hierarchy which will ensure that a given passive structure is optimal. Here is one such constraint domination condition; others can be deduced for Passive\(_2\), Reversal, and No Passive.

(7) A language has Passive\(_1\) if and only if its constraint ranking obeys the following:
   a. either \(X \rightarrow C_1\) or \(x \rightarrow C_1\) dominates each of: \(\alpha \rightarrow C_4\) and \(A \rightarrow C_1;\) and
   b. either \(\alpha \rightarrow C_2\) or \(x \rightarrow C_1\) dominates each of: \(\alpha \rightarrow C_2\) and \(\alpha \rightarrow C_4;\) and
   c. \(X \rightarrow C_1\) dominates each of: \(\alpha \rightarrow C_2, P \rightarrow C_2,\) and \(P \rightarrow C_1.\)

It may be verified that the ‘English’ hierarchy above (4), but not the ‘Eskimo’ (5) or ‘Lakhota’ (6) hierarchy, satisfies this condition; Passive\(_1\) occurs only in the English case.

5.3 A Typology of Antipassives. For the input Ap there are only three possibly optimal structural descriptions: \(A_2P_4 = '\text{Antipassive}_2'; \ A_1P_4 = \text{Antipassive}_1;\) and \(A_1P_2 = \text{No Antipassive}.\) The same reasoning used with passives will show that the remaining structures are sub-optimal regardless of the constraint ranking. And again, for each of the three possibly optimal parses of Ap, it is possible to derive a constraint domination condition, analogous to (7), under which that Antipassive will be present in a language.

5.4 Implicational Universals of Case and Grammatical Voice Systems. By examining the various constraint domination conditions analogous to (7), it is possible to determine which combinations of passive and antipassive voices and intransitive case systems can simultaneously obtain in a single language (i.e., derive from a single constraint ranking).
The results can be stated as follows ['⇒' = 'implies'; '¬' = 'not']:

(8) **Theorem: Implicational Universals**

1. Reversal ⇒ ¬Antipassive\(_{1,2}\)
2. Passive\(_2\) ⇒ ¬Accusative
3. Antipassive\(_1\) ⇒ ¬Ergative
4. Antipassive\(_2\) ⇒ Passive\(_2\)
5. Antipassive\(_2\) ⇒ Ergative
6. Passive\(_1\) ⇒ ¬Active
7. Passive\(_1\) ⇒ ¬Ergative
8. Reversal ⇒ ¬Active

This set of implications is non-redundant (each one rules out a combined voice/case system not ruled out by the rest) and complete (every voice/case system not ruled out by these implications can in fact be realized through some ranking of the constraints (2)).

5.5 **Compound Typologies.** These implicational universals determine the typologies shown below under (10). Each shaded cell is an impossible combination, ruled out by the universal(s) labelled by the indicated number(s). We locate in the typology of (10) a number of languages from a survey of voice systems. The predictions of this extremely simple theory are borne out fairly well empirically: although one of the Dyirbal and one of the Mam passives fall into predicted-impossible (grey) cells, and examples have not yet been found for two systems predicted possible (empty white cells), the great majority of languages examined fall in the predicted-possible (white) cells and nearly all cells are exemplified.

6. Extensions

A number of fairly straightforward extensions of the theory, such as to other thematic and case roles, etc., are clearly needed. We mention two less obvious extensions here.

6.1 **Impersonal Constructions.** A dummy can be treated as a case-receiving element in the output which is not present in the input — analogous to epenthesis in phonology. Certain kinds of Impersonal Passives can then be analyzed, as, e.g., \(aP \rightarrow a_1P_2 = \text{Impersonal Passive}_{12}\), where \(a\) denotes a missing agent in the input, and \(a_1\) a dummy assigned \(C_1\). As in the Optimality Theoretic treatment of epenthesis, this would violate a constraint \text{Fill}, which says that surface structural positions must be filled by underlying material. Impersonal constructions would appear only in languages with \text{Fill} sufficiently low-ranked (Prince & Smolensky 1993:25).

6.2 **Split Ergativity and the Ergative/Accusative Asymmetry.** As indicated in (3), the constraint \(\alpha \rightarrow C_2\) is necessary for the existence of ergative languages, but not accusative ones. In fact, compared to accusative languages, pure ergative languages are relatively rare; they are most often split, typically with nominals high on an 'animacy' hierarchy exhibiting an accusative pattern and lower-animacy nominals exhibiting the ergative pattern. This suggests that a more accurate version of the constraint \(\alpha \rightarrow C_2\) might be:

(9) \([-\text{An}] \rightarrow C_2\): Some low-'animacy' argument should receive abstract case \(C_2\).
The ergativity we have seen resulting from $\alpha \rightarrow C_2$ (when sufficiently highly ranked) would then appear only with low-‘animacy’ arguments, providing an explanation of why for ergative, but not accusative, systems, splitting seems to be the unmarked case. Similar treatment may be possible for aspect- or tense-based splits.

(10) **The Combined Case/Voice Typology**

<table>
<thead>
<tr>
<th>Accusative</th>
<th>Antipassive$_1$</th>
<th>Antipassive$_2$</th>
<th>No Antipassive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive$_1$</td>
<td>Arabic English</td>
<td>4 5</td>
<td>Bambara</td>
</tr>
<tr>
<td></td>
<td>Saramaccan</td>
<td></td>
<td>Finnish</td>
</tr>
<tr>
<td>Passive$_2$</td>
<td>2 Dyirbal(1st/2nd)</td>
<td>2 5</td>
<td>2</td>
</tr>
<tr>
<td>Reversal</td>
<td>1</td>
<td>1 4 5</td>
<td>Navajo</td>
</tr>
<tr>
<td>No Passive</td>
<td>Ewe Mojave</td>
<td>4 5</td>
<td>Ute</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Ergative</th>
<th>Antipassive$_1$</th>
<th>Antipassive$_2$</th>
<th>No Antipassive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive$_1$</td>
<td>3 7</td>
<td>4 7 Mam</td>
<td>7</td>
</tr>
<tr>
<td>Passive$_2$</td>
<td>3</td>
<td>Dyirbal(3rd) Chamorro Eskimo Mam</td>
<td>Burushaski</td>
</tr>
<tr>
<td>Reversal</td>
<td>1 3</td>
<td>1 4</td>
<td></td>
</tr>
<tr>
<td>No Passive</td>
<td>3</td>
<td>4</td>
<td>Enga</td>
</tr>
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<table>
<thead>
<tr>
<th>Active</th>
<th>Antipassive$_1$</th>
<th>Antipassive$_2$</th>
<th>No Antipassive</th>
</tr>
</thead>
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<tr>
<td>Passive$_1$</td>
<td>6</td>
<td>4 5 6</td>
<td>6</td>
</tr>
<tr>
<td>Passive$_2$</td>
<td>Lezgian</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Reversal</td>
<td>1 8</td>
<td>1 4 5 8</td>
<td>8</td>
</tr>
<tr>
<td>No Passive</td>
<td>Lakhota</td>
<td>4 5</td>
<td>Choctaw</td>
</tr>
</tbody>
</table>
## Appendix A

<table>
<thead>
<tr>
<th>Language</th>
<th>Passive (V-morph)</th>
<th>Antipassive</th>
<th>Impersonal: aP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic  N Acc</td>
<td>1 (?in-) A:0 P:NOM</td>
<td>1 (-0) A:NOM P:0</td>
<td></td>
</tr>
<tr>
<td>Palestinian</td>
<td></td>
<td></td>
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<tr>
<td>Bambara N Acc</td>
<td>1 (-ra) A:0, OBL P:ACC</td>
<td>-</td>
<td></td>
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<tr>
<td>Mande</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burushaski N⁷ Erg</td>
<td>2 (-0/0/-) A:0/0, OBL P:ABS</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>S. Asian isolate</td>
<td></td>
<td></td>
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<tr>
<td>Chamorro N Erg</td>
<td>2 (-ma/-in) A:OBL P:ABS</td>
<td>2 (-man/-fan) A:ABS P:0, OBL</td>
<td></td>
</tr>
<tr>
<td>Austronesian</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choctaw V Act</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Muskogean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyirbal N Erg*</td>
<td>2 (-0) A:0 P:ABS</td>
<td>2 (-Jay) A:ABS P:0, OBL</td>
<td></td>
</tr>
<tr>
<td>Pama-(3rd)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Nyungan Acc*</td>
<td>2 (-0) A:0 P:ACC</td>
<td>1 (-Jay) A:NOM P:0, OBL</td>
<td></td>
</tr>
<tr>
<td>(1st, 2nd)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Enga N Erg*</td>
<td>-</td>
<td>-</td>
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<tr>
<td>New Guinea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English N Acc</td>
<td>1 (periph. be) A:0, OBL P:NOM</td>
<td>1 (-0) A:NOM P:0</td>
<td></td>
</tr>
<tr>
<td>Eskimo NV Erg</td>
<td>2 (-g)aau- A:0, OBL P:ABS</td>
<td>2 (-0/-i) A:ABS P:0, OBL</td>
<td></td>
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<tr>
<td>Greenland</td>
<td></td>
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<tr>
<td>Ewe N Acc</td>
<td>-</td>
<td>1 (-0) A:NOM P:0</td>
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<tr>
<td>Kwa</td>
<td></td>
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<tr>
<td>Finnish N Acc</td>
<td>1 (-t)AA n A:0, OBL P:NOM</td>
<td>-</td>
<td>12 (-t)AA n [a:NOM] P:ACC (pronoun only)</td>
</tr>
<tr>
<td>Lakhota V Act*</td>
<td>-</td>
<td>1 (wa-) A:ACT P:0</td>
<td>12 (-0) a:ACT P:STA</td>
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<tr>
<td>Siouan</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Lezgian N Act⁸</td>
<td>2 (-0) A:0 P:STA</td>
<td>1 (-0) A:ACT P:0</td>
<td></td>
</tr>
<tr>
<td>NE Caucasian</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Language</td>
<td>Passive (V-morph)</td>
<td>Antipassive</td>
<td>Impersonal: sP</td>
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<tr>
<td>Mam Mayan</td>
<td>2 (-eel; -j; -?n) A:0, OBL P:ABS</td>
<td></td>
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<tr>
<td></td>
<td>2 (-njiz) A:0, OBL P:ABS</td>
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<tr>
<td></td>
<td>1 (-njiz) A:0 P:ERG (general truths)</td>
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<tr>
<td>Mojave Yuman</td>
<td>1 (-0) A:NOM P:0</td>
<td></td>
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<tr>
<td>Navajo Athapaskan</td>
<td>Reversal (bi-) A:ACC P:Nom</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saramaccan Creole</td>
<td>1 (-0) A:0 P:ACC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ute Uto-Aztecan</td>
<td>1 (-0) A:NOM P:0</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 (-c) [a:NOM] P:ACC</td>
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Notes: ‘N’ = Case realized by morphology on noun and/or word order, ‘V’ = verbal cross-referencing; ‘Erg’ = ergative/absolutive, ‘Acc’ = nominative/accusative ‘Act’ = active/-stative; ‘Erg*’, ‘Acc*’, ‘Act*’ = split system; OBL includes DAT; ‘0’ = surface-absence; [a] = silent dummy.

Notes

* We are grateful to Colin Wilson for his contributions to the empirical research; to Judith Aissen, Emmon Bach, Donna Gerdts, Jane Grimshaw, Paul Kay, Paul Kiparsky, George Lakoff, Doris Payne, Alan Prince, Richard Rhodes and Ivan Sag for helpful discussions; to the BLS audience for useful feedback; and to NSF for financial support (DBS-9209265). We welcome comments to {legendre@rintintin, smolensky@cs}.colorado.edu.

1. In this paper, we assume that all rankings of the universal constraints are possible. In other applications, restrictions on possible rankings are also part of UG (Prince & Smolensky 1993, §8.1.2; McCarthy & Prince 1993, §7).

2. A natural extension would decompose the cover terms ‘agent’ and ‘patient’ into features, figuring in the universal constraints. This would facilitate extension to a fuller spectrum of thematic roles — case-marking of experiencers being of particular interest.

3. This principle is occasionally violated; one case in Lakhota was given a multistratal Optimality Theoretic analysis in Legendre & Rood 1992.
4. It is possible that this constraint set could be modified without affecting the results established below. However, as we will see, fully exploring the consequences of each alternative constraint set is a lengthy matter, and we have not undertaken extensive investigation of alternatives. Some of the more obvious simplifications of the account, however, are not empirically adequate.

5. ‘No Passive’ here means no personal passive. Impersonal passives are briefly considered in §6.1: they derive not from the personal passive input aP but rather from aP: the agent is absent from the input.

6. This dummy may be silent. In Appendix A, this has been indicated in the last column by [a] — in pro-drop languages offering independent evidence for a silent dummy.

7. We treat the noun-marking system of Burushaski; there is also a verbal cross-referencing system, which is not completely aligned with the noun-marking system.

8. Lezgian is described as ergative/absolutive in Mel'čuk 1988; his discussion, however, clearly shows what in our terms is an active/stative system.

References


Two Predicted Universals in the Semantics of Space

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University of California at Berkeley

1 Introduction

This paper presents two predicted linguistic universals concerning the semantic structuring of space. These posited universals are predicted by a neurally and psychologically inspired connectionist model of the acquisition of lexical semantics in a visually-grounded domain (Regier 1992). They are presented here by way of opening them to empirical falsification.

While the predictions are the central focus of this paper, there are two related issues which arise, and which are also discussed here.

The first of these is that the work presented here suggests by example that the construction of detailed computational models of the acquisition of lexical semantics may be a productive avenue for the pursuit of semantic inquiry generally. In particular, this work suggests that models of this sort can give rise to falsifiable predictions regarding semantic universals, based on what the model may say concerning the learnability of particular combinations of semantic features.

The second of these concerns the issue of learning in the absence of explicit negative evidence. The model presented here learns using a technique which relies on positive evidence only.

We proceed to examine first the predictions themselves, then the model of semantic acquisition which gives rise to them, including the means by which the model learns without explicit negative evidence. Finally, we provide an indication of just how it is that the model gives rise to the predictions.

2 The Predictions

The two predictions are the endpoint configuration prediction and the endpoint polysemy prediction. These are presented in turn below.
Figure 1: The Endpoint Configuration Prediction: Any language which has a lexeme denoting motion out of or motion through some configuration will also have a lexeme denoting either motion into that configuration or static location in it.

2.1 The Endpoint Configuration Prediction

The endpoint configuration prediction, illustrated in Figure 1, states that

Any language which has a lexeme denoting motion out of or motion through some configuration will also have a lexeme denoting either motion into that configuration or static location in it.

Consider, for example, the English lexeme *through*, shown in the upper left of Figure 1. Here we see a small square trajector\(^1\) moving through a circular landmark object. We can view the lexeme *through* as denoting motion through a configuration of inclusion, in that inclusion of the trajector within the landmark occurs in mid-event for *through*. This leads us to predict, by our posited universal, that English will have a lexeme denoting either motion

\(^1\)The *trajector* is an (often moving) object located relative to another object, known as the *landmark*.
into a configuration of inclusion (\textit{into}), or static location in the configuration of inclusion (\textit{in}).

Consider the lower example, from Russian. The fact that Russian has a lexeme \textit{iz-pod}, denoting motion out from underneath, i.e. motion of a trajector out from underneath a landmark, leads us to predict that Russian will also have a lexeme denoting either motion into the region under the landmark, or static location under the landmark. In fact Russian \textit{pod} can be used in either of these two senses.

2.2 The Endpoint Polysemy Prediction

The endpoint polysemy prediction, illustrated in Figure 2, states that

The use of a single lexeme to denote either static location in some configuration or motion into that configuration will be more likely to appear in a language than the use of a single lexeme to denote either static location in a configuration or motion \textit{out of} that configuration.

Thus, this prediction states that lexemes such as English or German \textit{in}, which can denote either static location inside or motion into the region inside, are more likely than are lexemes like the fictitious spatial term \textit{in/out-of}, which denotes either static location inside or motion out of the region inside.

Similarly, lexemes such as Russian \textit{pod}, meaning either location underneath or motion to the region underneath, are more likely than are lexemes like the fictitious Russian \textit{pod/iz-pod}, meaning either location underneath or motion out from underneath.

3 The Model

Having presented the predictions themselves, we now move on to the model that gives rise to them, beginning with a more precise specification of exactly what function it performs: the model learns to linguistically classify visually perceived events. It is given a set of movie-lexeme pairs, and learns to label the simple events and relations shown in the movies with the appropriate lexemes. For example, consider Figure 3. This figure is a representation of a movie of the sort the model is exposed to during training. Each movie, like this one, contains two objects, a \textit{landmark}, or object relative to which other objects are located, and a \textit{trajector}, an often moving object located relative to the landmark. In this figure we see a movie of five frames, with the frames overlaid one on top of another. Thus, the five circles are in reality a single circular trajector moving out from underneath a horizontally-extended
is more likely to appear than

in

or

in/out-of

is more likely to appear than

pod

or

pod/iz-pod

Figure 2: The Endpoint Polysemy Prediction: The use of a single lexeme to denote either static location in some configuration or motion into that configuration will be more likely to appear in a language than the use of a single lexeme to denote either static location in a configuration or motion out of that configuration.
rectangular landmark, in five steps. The final frame of the movie is indicated by a small dot inside the trajector. Note that the landmark, labeled “LM”, remains stationary throughout this movie.

This movie illustrates the Russian preposition *iz-pod*, meaning “out from underneath”, and was in fact labeled with that preposition as part of a Russian training set. After training, the model was able to label other movies showing motion out-from-underneath as *iz-pod*.

The model was not built specifically to lead to the predictions we are discussing here. Rather, it was built to address two overarching linguistic issues.

The first issue is that languages differ dramatically in the ways in which they structure space. The model is intended to be able to learn the spatial system of any language, and therefore to be able to shed light on universal human processes of semantic acquisition in the domain of space. It has so far learned spatial terms from Bengali, English, German, Mixtec, and Russian.

The second issue concerns learning language without the benefit of explicit negative evidence, as children appear to (Braine 1971; Bowerman 1983; Pinker 1989). The model presented here similarly learns without the benefit of explicit negative evidence. This is done through the use of *deliberately weakened implicit negative evidence*, a somewhat bulky name for what is in reality a very simple notion, and a notion which may be taken as a solution to the problem of no negative evidence generally. The beginning of the idea, in its specific implementation in this domain, is to take a positive instance of one
spatial term as an implicit negative instance of all others. This is the "principle of mutual exclusivity" (Markman 1987). For example, if a particular spatial relation is labeled _above_, we assume that that also means "not _below_", "not _inside_", and so on. Unfortunately, this heuristic also leads one to conclude that a positive instance of _above_ is a negative instance of _outside_, which it is not. In fact, every positive instance of _above_ is also a positive instance of _outside_, which means that the heuristic is fallible. However, we can salvage this fallible heuristic by deliberately weakening the evidence from implicit negatives. Intuitively speaking, this means taking the implicit negative evidence less seriously than explicit positive evidence. Using this simple approach, the model is able to learn without exploiting explicit negative evidence.

Figure 4 presents the model, configured to learn a set of English spatial terms in (a), and a set of Russian spatial terms in (b). Note that the model learns a _system_ of spatial terms in consort; this is critical if the mutual exclusivity heuristic is to be used in obtaining implicit negative evidence from positive evidence only.

The input to the model is a movie of the sort shown in Figure 3, and the model is trained so that when a movie portraying some event is shown, only those output nodes corresponding to lexemes which accurately describe the event are activated. For example, if the movie in Figure 3 were supplied to the model shown in Figure 4(b) after training, the _iz-pod_ output node would become activated, indicating that the model has classified the movie as a positive example of _iz-pod_.

---

**Figure 4: Model configurations for English and Russian**
The model learns to determine, for each language to which it is exposed, which spatial features—such as inclusion, contact, alignment with some axis, and the like—are semantically significant. It learns to linguistically classify visually perceived events by noting when in the event significant spatial features appear. A detailed specification of the model, including further explication of the technique of deliberately weakened implicit negative evidence, may be found in (Regier 1992).

4 Results

No claim is made that the current model is in fact capable of learning the spatial system of any language. However, the model can learn the spatial systems of a range of languages, some of which differ quite significantly from English in their structuring of space. It is thus a first step on the road toward a model which will be capable of fulfilling the original goal.

Consider for example Figure 5, which illustrates the model’s performance on the lexeme šini from Mixtec, an Otomanguean language spoken in the state of Oaxaca, Mexico. Brugman (1983) presents a semantic analysis of spatial terms in Mixtec, spelling out the manner in which spatial locations are referred to as metaphorical body-parts. Šini, which translates literally to “head” in English, can be thought of as indicating that the trajector is either above or
on top of a vertically extended landmark – in a position corresponding to the "head" of an erect biped. It may seem at first that learning this spatial system would require a good amount of world knowledge which the current model does not have access to, e.g. basic anatomy of bipeds. However, it seems to be the case that much if not all of the categorization is based on primitive, purely perceptual features of the landmark object in question, such as the orientation of its major axis, which the current model is able to extract directly from the image.

The figure illustrates the model’s performance, after it was trained to respond strongly to instances of Mixtec šíni, to instances of English above and on. Responses range from 0.0 if the input is considered an extremely poor example of šíni, to 1.0 if it is considered an excellent example. Since not all instances of above and on are considered good examples of šíni, this figure illustrates an example of cross-linguistic variation in spatial structuring, as well as the model’s ability to learn spatial systems which differ radically from that of English.²

Figure 6 illustrates the model’s ability to linguistically categorize events involving motion. The model was first trained³ to recognize a set of English spatial prepositions, including through, and was then exposed to the movies displayed here, each of which is a positive instance of through, and none of which had ever been presented to the model earlier. As indicated by the

---

2The other major goal of the project, learning without negative evidence, is in fact not illustrated by this example, as šíni was learned using explicit negative evidence. This was done since not enough was known about the language to construct a full contrast set. Once such a set has been constructed, the system will be trained on Mixtec spatial terms without the use of explicit negative evidence.

3Training in this example took place without explicit negative evidence.
numbers at the bottom of each movie, all are considered excellent examples of through by the model. Analogously, the model gave very low through ratings to poor examples of through.

These two examples are meant to demonstrate the model’s ability to learn linguistic spatial systems. The model was constructed to address the two linguistic issues mentioned earlier: cross-linguistic variation in spatial systems, and the issue of learning without negative evidence. The two linguistic predictions with which this paper is centrally concerned, the endpoint configuration prediction and the endpoint polysemy prediction, in fact resulted as unexpected byproducts of the model-building process.

5 Predictions from the Model

Now that the predictions and the model itself have been presented, we move on to indicate just how it is that the model gives rise to the two predictions.

Recall that the first prediction is the endpoint configuration prediction, and that its essence is that any language which has a lexeme denoting motion out of or motion through some configuration will also have a lexeme denoting either static location in that configuration or motion into it. Thus the existence of through in English implies the existence of a lexeme such as in or into.

This is predicted by the model because of a particular type of endpoint emphasis which the model exhibits: the model will learn to detect only those spatial features which occur at the end of some movie it has seen. And since the model is exposed to only positive instances of spatial terms from the language being learned, this means that it will only learn those spatial features which occur either at the endpoint of some named event or in a named static configuration.

Thus, if the model is learning a set of English prepositions and is not exposed to movies for lexemes denoting events (or relations) ending in inclusion, such as in or into, it will not be able to learn to detect the feature of inclusion, and will therefore not be able to learn through. This is so since its failure to detect inclusion will lead to a failure to be able to learn through, inclusion being critical to through. Thus, the existence of through in a language implies the existence of lexemes like in or into.

This characteristic of the model, the fact that it only learns to detect features which are present at the end of some training movie, was not built in deliberately, but rather resulted from the attempt to build as simple a model as possible. The prediction thus arises from a model that was arrived at not

\[4\] Recall that the model makes use of deliberately weakened implicit negative evidence, which is derived from positive examples only.

\[5\] Nor for that matter will it be able to learn any other lexeme the semantics of which involve inclusion.
by specifically trying to embody this phenomenon, but on the independent grounds of structural simplicity.

The endpoint polysemy prediction, on the other hand, is arrived at on somewhat more empirical grounds. Recall that this prediction states that we are more likely to find a polysemous lexeme denoting either location in a configuration or motion into that configuration — as in the case of English or German in — than we are to find one denoting either location in a configuration or motion out of that configuration. This prediction, like the first, results from a form of endpoint emphasis which the model embodies, but one which is most easily characterized in terms of empirically observed learning and generalization behavior, rather than in-principle learnability constraints. The observed behavior is as follows: when the model is trained on English in in only its static sense, it often generalizes to consider the motion-into sense a good example of in as well, despite never having seen a motion-into movie labeled in. However, the model will only rarely generalize from static in to motion-out-of, i.e. motion which began in and then moved out. It is based on this and other analogous observed behavior that the endpoint polysemy prediction is proposed.6

6 It is worth noting that there are examples of polysemous lexemes which can denote either location in a configuration or motion out of that configuration, e.g. Russian u, which can mean either "by/beside", or "from". The prediction, however, maintains only that these will be less common than polysemous lexemes with static location and motion-into senses, not that they will not exist. On the other hand, the first prediction, the endpoint configuration prediction, is a strict implicational universal; a single counterexample would falsify it.

6 Conclusions

This paper has presented two predicted universals concerning the linguistic categorization of space, and the model which led to them. The predictions are presented with the intention of opening them to empirical falsification.

In addition, this work illustrates a more general point: that the construction of detailed computational models of the acquisition of lexical semantics affords a fruitful approach to the study of semantics per se. Such models can give rise to falsifiable semantic predictions of the sort presented here, based either on arguments of learnability or on empirically observed generalization tendencies.

Finally, the work presented here also provides a simple solution to the problem of learning language in the absence of explicit negative evidence, through the use of deliberately weakened implicit negative evidence.
References


How "general" are general classifiers? 
with special reference to *ko* and *tsu* in Japanese

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SUNY at Buffalo

Two principal models form the background to the study of numeral classifier and other semantically motivated nominal classification (NC) systems: (a) a lexical model in which the inventory of categories is viewed as a list of lexical items derived from nouns, and preserving much of the rich and somewhat idiosyncratic meaning of these source items; and (b) a grammatical model in which this inventory, or at least some part of it, is viewed as a grammatical system in which the individual forms have highly abstract and relational meanings, and behave as a system of alternatives. The first model--characterized by a "lexical" particularism in which each form has its own particular history and is related only loosely and unsystematically to other neighboring choices in the language--can be traced to turn of the century lexicalists such as Gilliéron (1918), and is reflected in some current work of the grammaticalization movement (e.g. Bybee (1985)). The second model is characteristic of the Saussurean extremism of Roman Jacobson (e.g. 1936) and other Pragueans who saw, and continue to see grammar and lexicon as highly structured systems of choices in which "tout se tient." In the middle of these extremes falls the centrist linguistic doctrine that grammatical meanings form structured systems while lexical meanings do not. Numerical classifier and other semantically motivated NC inventories fall squarely in the middle between these poles, resulting in controversy over their lexical vs grammatical status. In support of the system analysis is the fact that NC inventories ranging from the noun classes of Dyirbal to the verb-stem classifiers of Navajo to the numeral classifiers of Mandarin to the gender classes of German seem to have "general" members, giving the inventory its systemic structure by picking up the semantic "residue" (Dixon, 1982) of nouns which are semantically incompatible with more specific categories, i.e. by playing the role of globally applicable alternative choice. But the terms "general" and "default" classifier have come to be used in the literature to cover a variety of semantically and pragmatically distinct situations.

*Figure 1a*: complement function - remainder category for entities outside the semantic domains of specific classifiers

*Figure 1b*: default function - substitutes for any specific classifier within pragmatically specialized contexts.

This paper will attempt to decompose the notion of "general" classifier into more precisely definable distributional patterns, and will briefly survey general classifiers in
several typologically diverse NC inventory types before turning to the results of experimental and survey research on the two categories ko and tsu in Japanese (Shimojo, 1993a,b), research that will pin down their semantic and pragmatic properties more precisely than has been done in the past.2

Under the "general classifier" rubric at least three theoretically and empirically distinct phenomena may be distinguished. In many cases these functions are exhibited by the same classifier category, although this is not necessarily the case. A classifier acting in COMPLEMENT FUNCTION (Fig 1a) is a remainder category for nouns and/or referents outside the semantic domains of the other classifiers in the inventory, or at least only in the semantic periphery of these other categories. A classifier in DEFAULT FUNCTION (Fig 1b) can be substituted for other classifiers under specialized pragmatic conditions in which the speaker abandons the available precision of a semantically specific classifier in favor of a semantically neutral, and hence globally available one. Here there is no issue of semantic complementation, since the default classifier is used even though the noun or referent fulfills the summary description (Smith & Medin) of a specific classifier.

Yet a third type is UNSPECIFIED REFERENT FUNCTION, in effect when the speaker has little or no information about a referent and builds a referring NP around a non-specific expression as in "there's something scary in that house." In addition to exploring the functions displayed by "general classifiers" we will raise the issue of whether the ko or tsu categories have core meaning,3 the presence of which is at least potentially in conflict with the general classifier functions outlined above.

Table 1: a survey of "general" classifier functions. "Form" = the general classifier category in question. In many cases the core semantics of the general category is problematic.

<table>
<thead>
<tr>
<th>Language</th>
<th>Characteristics of System</th>
<th>Form</th>
<th>Core Semantics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diari</td>
<td>2 gender classes marked on pn/det</td>
<td>nu</td>
<td>masc</td>
</tr>
<tr>
<td>Kala Lagau Ya</td>
<td>2 gender classes marked on pronoun</td>
<td>na</td>
<td>fem</td>
</tr>
<tr>
<td>Dyirbal</td>
<td>4 gender classes marked on loc. det</td>
<td>bala</td>
<td>inanimate</td>
</tr>
<tr>
<td>German</td>
<td>3 gender classes marked on pn/det</td>
<td>(none)4</td>
<td>—</td>
</tr>
<tr>
<td>Panare</td>
<td>about 21 genitive classifiers 5</td>
<td>iyu</td>
<td>alienable poss.</td>
</tr>
<tr>
<td>Navajo</td>
<td>about 14 predicate classifiers 6</td>
<td>si'a</td>
<td>3D</td>
</tr>
<tr>
<td>Yidiny</td>
<td>about 20 &quot;generic&quot; classifiers 7</td>
<td>wirra</td>
<td>hand-size instr obj</td>
</tr>
</tbody>
</table>

b. default function

<table>
<thead>
<tr>
<th>Language</th>
<th>Characteristics of System</th>
<th>Form</th>
<th>Core Semantics</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>unlimited lexical choices in individuating construction (a/the X of Y)</td>
<td>piece</td>
<td>shape-neutral concrete indiv.</td>
</tr>
<tr>
<td>Mandarin</td>
<td>100+ numeral classifiers, about 20 in frequent use</td>
<td>ge</td>
<td>human</td>
</tr>
<tr>
<td>Chichewa</td>
<td>7 paired sg-pl noun classes, marked throughout NP, pms, and in predicate</td>
<td>-a</td>
<td>human</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-zi</td>
<td>inanimate</td>
</tr>
</tbody>
</table>

c. unspecified referent function

<table>
<thead>
<tr>
<th>Language</th>
<th>Characteristics of System</th>
<th>Form</th>
<th>Core Semantics</th>
</tr>
</thead>
<tbody>
<tr>
<td>German</td>
<td>3 gender classes marked on pn/det</td>
<td>neuter</td>
<td>inanimate</td>
</tr>
<tr>
<td>Navajo</td>
<td>about 14 classes expressed by verb stem</td>
<td>sila</td>
<td>1D flex</td>
</tr>
<tr>
<td>Japanese</td>
<td>numeral classifiers</td>
<td>tsu</td>
<td>inanimate</td>
</tr>
</tbody>
</table>
Table 1 summarizes the properties of general classifiers in some typologically diverse languages. Diyari (Austin, 1981) and Kala Lagau Ya (Bani, 1987), both Australian languages, give a clear and simple picture of complement function. They each have a two-gender system; in Diyari one pronoun is restricted to females, and the other *nu* is used for males, non-sex specific animate terms, and inanimates; in other words, for all possible referents outside the *female* category. Kala Lagau Ya's system has the inverse structure: the pronoun *na* for all possible referents outside the *male* category. These pronouns, despite their complement function, still retain the core semantic properties *male* and *female* respectively, e.g. although *nu* can refer to a wide variety of entities, male beings are privileged exemplars in the category. Dyirbal (Dixon, 1982) is another Australian language with a semantically more complex gender system. The complement category *bala* has no overall coherent structure, unlike the other three categories in the system, which have semantically coherent radial structure (Lakoff, 1986). But *bala* does have privileged members, which are inanimate. German (Zubin & Köpcke, 1986), characteristic of the gender systems of Indo-European, has highly complex semantic structure in its gender categories, and within specific semantic domains any of the categories may have complement function. For example, the complement gender category in the *beverage* domain is *masculine*, within the *ship* domain is *feminine*, and within the *building* domain is *neuter*. But there is no one complement category at a more global level of conceptual structure.

Panare (Carlson & Payne, 1989) is a Cariban language with a well-developed set of genitive (possessed) classifiers for nouns which themselves cannot be inflected for possession. The classifiers divide the world up into 20 or more functional categories, most of which are quite specific (e.g. *ko* for weapons or *uyung* for artificial light sources). When referents not falling into these specific categories are possessed, they take the *complement* classifier *iyu*, which in addition is productive for novel referents, such as plastic toys.

Navajo (Young & Morgan, 1980), an Athapaskan language with verb-stem classifiers characteristic of this family, has two general categories: the (shape) category for 3D objects is also used for a variety of entities not admissible to other categories, i.e. serves complement function, and the 1D flexible category (see Table 1c)).

Coming closer to numeral classifier systems, Yidiny has a larger inventory of superordinate noun classifier categories, all of which have highly coherent semantic structure, with the exception of *wirra*, which has complex radial structure (Fig. 2)

---

**Figure 2: Radial semantic structure of the generic classifier category *wirra* in Yidiny**

```
                boomerang, shield
                clothes, saddle
                stick, stone shell

                (indiscernible) fruits
                (severed) body parts
                (vulgar for) female genitalia

                handful/amount
                of substance

                soil, sand, excretion
                liquid---blood, urine

                individuation (?)

                spirits of people, mythical spirits
                (indiscernible) insects, reptiles
                airplanes, cars
                sun, moon, wind, cloud

semantic extension
---
instance
```

*Figure 2: Radial semantic structure of the generic classifier category *wirra* in Yidiny*
inferable from Dixon's (1982) description, and near-global complement function (Fig. 3). Fig 3 shows that wirra is used just in case the semantic domain of one of the other categories is not applicable. For example, minya is used for edible animals, and wirra for all animals considered inedible. The radial structure in Figure 2 suggests, however, that handsized instrumental objects are privileged exemplars in the category.

Figure 3: Complement relations of wirra to other generic classifier categories

![Diagram showing complement relations of wirra to other classifiers]

**Default function** (Table 1b). The individuation construction in English (Fig 4) gives a clear illustration. Speakers can freely alternate between the shape-neutral general classifier “piece” and the shape-specific classifiers such as “sheet,” depending on the amount of information required at that point. Erbaugh’s (1986) peer-story data show that in spontaneous narrative production Mandarex speakers will substitute the general classifier ge for more specific classifiers even though they may insist on the specific ones in an elicitation task. Recent work by Ahrens (1993) shows that when Mandarin speakers’ attention is drawn to the issue of classifier choice by an elicitation task they more easily substitute ge for peripheral members than for central members of specific categories, with the same prototype effects that we will show for Japanese general classifiers below, i.e. ge does show some tendency toward complement function. Finally, Chichewa reveals (Corbett & Mtenje, 1987) default categories in the choice of verb agreement when nominals from different noun classes are conjoined. Human nouns take class-1 plural agreement, even if neither of the nouns is in class 1; and conjoined inanimates take class-6 plural agreement, even if neither noun is in class 6. The plurals of classes 1 and 6 thus serve as default categories for human and inanimate plurals when conjoining blocks the grammatical pairing of singular and plural noun classes.

**Unspecified referent function** (Table 1c) is clearly illustrated by the neuter gender category in German. Examples (1a,b) necessarily refer to entities which are at least implicitly lexicalized with nouns of masc- and fem-gender, respectively, e.g. a spoon (masc) and a fork (fem). But (1c) can refer either to a specifically neuter item (e.g. a
knife) or to any item, the properties of which the speaker is unsure of, e.g. something the addressee is concealing in his hand. This function is further evident in the use of neuter pronouns with "weather" and other "environment" predicates, and in the neutergender of non-taxonomic superordinate nouns such as Zeug 'stuff' and Ding 'thing' (Zubin & Köpcke, 1986).

In Navajo the predicate classifier for 1D flexible objects has a number of radial extensions, and is also used for objects whose properties are unknown. And in Japanese, the numeral classifier tsu, whose complement and default functions will be discussed in the next sections, is also used for objects of unknown properties.

**General Classifiers in Japanese.** Against this background picture of different functions for general classifiers the situation in Japanese is particularly instructive, since there are really two classifier inventories (exemplified in Table 2), one syntactically tied to a limited set of native Japanese numerals from one to ten, the other to a full set of Sino-Japanese numerals, each of which has a "general classifier." tsu with the native numerals, and ko with the Sino-Japanese ones, allowing a parallel study of the two. Table 3 summarizes the results of a simple listing task (cf. Rosch, 1973), in which 11 native speakers were asked to give 5 nouns they could use with each of the classifiers ko and tsu, without time constraint. With few exceptions, all nouns listed were either outside of specific classifier categories, or at most were peripheral members of these. This demonstrates the basic complement function of tsu and ko: they apply primarily to semantic territory outside the semantic domains of specific classifiers.

**Table 2: the two classifier sets**

<table>
<thead>
<tr>
<th>Specific Classifiers</th>
<th>classifiers co-occurring with:</th>
<th>Sino-J numerals (full set)</th>
</tr>
</thead>
<tbody>
<tr>
<td>tsu</td>
<td>tsu 'grain'</td>
<td>hon '1D'</td>
</tr>
<tr>
<td>kabu 'root veg'</td>
<td>ma8 '2D'</td>
<td></td>
</tr>
<tr>
<td>mune 'building'</td>
<td>ko '3D'</td>
<td></td>
</tr>
<tr>
<td>eda 'branch'</td>
<td>dai 'vehicle'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ki 'airplane'</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ken 'house'</td>
<td></td>
</tr>
</tbody>
</table>

**Table 3: Nouns given for tsu and ko in a free listing task. Full data is in Table 7.**

<table>
<thead>
<tr>
<th></th>
<th>Nouns Listed for Ko</th>
<th>Nouns Listed for Tsu</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central Members of Specific Classifier Categories</strong></td>
<td>isu (chair) - kyaku</td>
<td>sanrinsya (tricycle) - dai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>osara (dish) - mai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>naironbukuro (plastic bag) - mai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>hon (book) - satsu</td>
</tr>
<tr>
<td></td>
<td></td>
<td>isu (chair) - kyaku</td>
</tr>
<tr>
<td><strong>Peripheral Members of Specific Classifier Categories</strong></td>
<td>(none)</td>
<td>mado (window) - mai</td>
</tr>
<tr>
<td></td>
<td></td>
<td>kasettoteepu (cassette tape) - hon</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ronbun (thesis) - hon</td>
</tr>
<tr>
<td><strong>Not Members of Any specific Category</strong></td>
<td>everything else (22 nouns)</td>
<td>everything else (34 nouns)</td>
</tr>
</tbody>
</table>

A more precise measure of the complement status of tsu and ko is given by the results of a rating task with 102 native speakers, summarized in Table 4. They were given...
short generic sentences each containing a classifier construction with one of the general classifiers *ko* or *tsu*, as in (2)

2. mukoo-ni mikan-ga san-ko aru over:there-loc orange-nom 3-nom exist

*There are three oranges over there*

Speakers were asked to rate the acceptability of the sentence on a 5-point scale. *Tsu* and *ko* were paired with nouns which are members of specific classifier categories—these are listed across the top of the table. Nouns were chosen so that some would be central, others peripheral members of their respective classifier categories. The results show that *ko* and *tsu* are more acceptable with peripheral members of other categories than with central ones, as indicated by the positive values of the difference scores in the right-hand column. It is also crucial to note that this increase in acceptability occurred for each of the five specific classifier categories tested.

**Table 4.** Central and peripheral member nouns of specific classifier categories - *tsu* and *ko* are more acceptable with peripheral than with central members. Rating scale 1-5 (5=fully acceptable)

<table>
<thead>
<tr>
<th>specific classifier category to which noun belongs</th>
<th>hon</th>
<th>mai</th>
<th>dai</th>
<th>ken</th>
<th>ki</th>
<th>Overall Average</th>
<th>Diff. of Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>tsu</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>central</td>
<td>2.33</td>
<td>1.38</td>
<td>2.24</td>
<td>3.27</td>
<td>2.08</td>
<td>2.26</td>
<td>+1.06</td>
</tr>
<tr>
<td>peripheral</td>
<td>2.87</td>
<td>3.46</td>
<td>3.50</td>
<td>3.83</td>
<td>2.95</td>
<td>3.32</td>
<td></td>
</tr>
<tr>
<td><em>ko</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>central</td>
<td>1.60</td>
<td>1.24</td>
<td>1.69</td>
<td>1.62</td>
<td>1.59</td>
<td>1.55</td>
<td>+0.68</td>
</tr>
<tr>
<td>peripheral</td>
<td>1.68</td>
<td>2.31</td>
<td>2.84</td>
<td>2.21</td>
<td>2.13</td>
<td>2.23</td>
<td></td>
</tr>
</tbody>
</table>

These results suggest that the complement function of *ko* and *tsu* begins to exert itself as the graded structure of specific categories fades out at their peripheries. Note also that the difference score for *tsu* is greater than for *ko*, and that the absolute scores for *tsu* are over all about one rating point higher than for *ko*, suggesting that *tsu* fills this complement function more robustly than *ko* does.

The relatively low absolute scores for *tsu* and *ko* in this test might appear to be a problem, unless we keep in mind that we are dealing with their tendency to extend into the semantic territory of the specific classifiers. *Tsu* and *ko* are less unacceptable with the peripheral members of these categories. A pilot test in which some of these nouns were combined with other specific classifiers (e.g. *denwa 'telephone call'* with *mai*) yielded scores approaching 1.0, i.e. absolute unacceptability.

Further evidence for the complement function of *tsu* and *ko* is provided by distorting the form of everyday objects. Our reasoning is that stereotypic exemplars of such objects are an important component of semantic representations, and criterial for the applicability of classifiers When these objects are distorted in a way that makes them non-stereotypic for the noun, then speakers will tend to abandon the classifier with which the noun is associated, and turn to one of the general classifiers. Table 5 shows that as we spatially distorted several different objects in ways corresponding to the everyday use or variations of these objects, the 11 speakers we tested shifted from the relevant specific classifier to either *tsu* or *ko*, depending on which choice we gave them. The flat cutting board was distorted by making it thicker and thicker until it became more of a 3 dimensional cutting block. The flat napkin was crumpled so that it was no longer flat. The candle was changed into a candle stub, and the piece of chalk was made shorter and then into a stub. Note that all distortions used are actual-
Table 5: Distortions of mai (2D) and hon (1D) type objects. Subjects tended to use tsu or ko for the distortions.

<table>
<thead>
<tr>
<th>Lexical item</th>
<th>Percept shown to the subjects</th>
<th>no. of subjects choosing each classifier</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mai vs tsu</td>
<td>mai vs ko</td>
</tr>
<tr>
<td>cutting board</td>
<td>1. flat and thin</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>2. thicker</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>3. still thicker</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>4. still thicker</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>5. blocky</td>
<td>1</td>
</tr>
<tr>
<td>napkin</td>
<td>1. unfolded flat.</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2. crumpled</td>
<td>0</td>
</tr>
<tr>
<td>candle</td>
<td>1. full length</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2. stub</td>
<td>2</td>
</tr>
<tr>
<td>chalk</td>
<td>1. full length</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>2. shorter</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>3. stub</td>
<td>0</td>
</tr>
</tbody>
</table>

ly encountered in everyday life. All the percepts tested in this image test were distorted from 1- and 2-D objects into 3-D ones.

To further examine the role of dimensionality we have begun a study of distortion from 3 into 2 dimensions, as represented by examples (3) and (4). When the car and the can are undistorted, they take their usual classifier, dai and ko respectively. But when they have been squashed flat, at least some speakers prefer tsu. Note that they do not prefer mai, the classifier for flat objects, since this would clash with the semantic representation of the nouns car and can. Speakers tend not to shift to ko as a complement classifier in these cases because ko retains a core-semantic represen-

tation for 3D objects, to be discussed below.

undistorted objects

3a. kuruma-ga san-dai aru car-Sub 3-NC exist

'There are three cars.'

3b. pesyanko no kuruma-ga mit-tsu aru squashed-flat GEN car-Sub 3-NC exist

'There are three squashed-flat cars.'

distorted objects

4a. biiru-no kan-ga san-ko aru beer-Gen can-Sub 3-NC exist

'There are three beer cans.'

4b. pesyanko no biiru-no kan-ga mit-tsu aru squashed-flat GEN beer-Gen can-Sub 3-NC exist

'There are three squashed-flat beer cans.'

Default function of tsu and ko. The evidence provided so far suggests that tsu and ko complement the semantic categories of a range of specific classifiers. Further evidence also suggests that they have a tendency toward default function. First, in the free listing task summarized in table 3 five nouns were volunteered for tsu which are central members of specific classifier categories. Since the experimental task focuses the speaker's awareness on classifier choice, the results should be more conservative than spontaneous conversation. Indeed an ongoing observational study of spontaneous conversation (Shimojo, 1993c) shows that ko is also extended to nouns that are central members of specific classifier categories, as in (5).

5a. (sooseejii) ni-ko-zutsu hoshii? (sausage) 2-NC each want [specific cl. = hon]

'(Do we) want two (sausages) each?'

5b. watashi ee-va ni-ko mottekita I English-Japanese 2-NC brought [specific cl. = satsu]

'I brought 2 English-Japanese (dictionaries).'

Second, table 6 shows a shift away from specific classifiers and toward tsu and ko as more focus is placed on the numeral itself, a pragmatic substitution of a general for a specific classifier when attention is shifted away from the nature of the referent.
Table 6: default function - Tsu and ko are more acceptable when more focus is on the numeral. Numerals focussed with an adverb. Rating scale 1 - 5 (5=fully acceptable)

<table>
<thead>
<tr>
<th>Noun</th>
<th>Numeral+tsu</th>
<th>exactly +Numeral+tsu</th>
<th>Numeral+ko</th>
<th>exactly +Numeral+ko</th>
</tr>
</thead>
<tbody>
<tr>
<td>enpitsu (pencil)</td>
<td>2.43</td>
<td>3.30</td>
<td>1.56</td>
<td>1.95</td>
</tr>
<tr>
<td>manaita (cutting brd)</td>
<td>3.53</td>
<td>4.26</td>
<td>2.71</td>
<td>3.15</td>
</tr>
<tr>
<td>terebi (TV set)</td>
<td>3.39</td>
<td>4.00</td>
<td>2.67</td>
<td>2.90</td>
</tr>
<tr>
<td>biru (building)</td>
<td>3.84</td>
<td>4.70</td>
<td>2.35</td>
<td>3.40</td>
</tr>
<tr>
<td>roketto (rocket)</td>
<td>3.10</td>
<td>4.05</td>
<td>2.48</td>
<td>3.40</td>
</tr>
<tr>
<td>Overall Average</td>
<td><strong>3.26</strong></td>
<td><strong>4.06</strong></td>
<td><strong>2.35</strong></td>
<td><strong>2.96</strong></td>
</tr>
</tbody>
</table>

Internal structure of ko and tsu. One of the problematic issues surrounding general classifiers is whether they have core semantic structure. If a category accepts the "rejects" of all other categories in the system, then how can it itself have an internal structure? Our evidence suggests that tsu indeed seems not to have any core semantic representation,15 but that ko does, namely for 3D hand-sized manipulable solid objects, and that the core semantics retained by ko limits its exploitability in complement and default function. In other words we think that tsu is fully developed as a general classifier, while ko is on its way, with its core semantics stretched out of shape to be sure, but still not freely extendible to any (inanimate) noun regardless of its semantic properties. The most direct evidence (Table 7) comes from the Roschian free listing.

Table 7 Free listing task: Nouns listed for ko and tsu by 21 subjects. No. of subjects listing each noun precedes the noun.

<table>
<thead>
<tr>
<th>--Nouns Listed for ko --</th>
<th>--Nouns Listed for tsu--</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 keshigomu 'pencil eraser'</td>
<td>1 kutsu 'shoe'</td>
</tr>
<tr>
<td>5 ringo 'apple'</td>
<td>2 baketsu 'pail'</td>
</tr>
<tr>
<td>4 tamago 'egg'</td>
<td>2 suutsukeseus 'suitcase'</td>
</tr>
<tr>
<td>4 ishikoro 'small stone'</td>
<td>1 kassetoteepu 'cassette tape'</td>
</tr>
<tr>
<td>4 booru 'ball'</td>
<td>1 ohajiki 'marbles'</td>
</tr>
<tr>
<td>4 mikan 'orange'</td>
<td>1 ningyou 'doll'</td>
</tr>
<tr>
<td>4 koppu 'drinking glass'</td>
<td>1 ronbun 'thesis'</td>
</tr>
<tr>
<td>2 manjyu 'bean-jam bun'</td>
<td>1 sekai 'world'</td>
</tr>
<tr>
<td>2 kyandii 'candy'</td>
<td>1 syokugyou 'occupation'</td>
</tr>
<tr>
<td>2 jyagaimo 'baking potato'</td>
<td>1 hooho 'method'</td>
</tr>
<tr>
<td>2 tomato 'tomato'</td>
<td>1 uso 'lie'</td>
</tr>
<tr>
<td>2 denkyuu 'light bulb'</td>
<td>1 zenka 'criminal record'</td>
</tr>
<tr>
<td>1 saikoro 'dice'</td>
<td>1 yume 'dream'</td>
</tr>
<tr>
<td>1 isu 'chair'</td>
<td>1 yotee 'schedule'</td>
</tr>
<tr>
<td>1 syoottokeeki 'pc of cake'</td>
<td>1 koosu 'course of lectures'</td>
</tr>
<tr>
<td>1 omochi 'rice cake'*</td>
<td>1 yoyaku 'apointment'</td>
</tr>
<tr>
<td>1 roorupan 'bread roll'</td>
<td>1 machigai 'mistake'</td>
</tr>
<tr>
<td>1 tamanegi 'onion'</td>
<td>1 himitsu 'secret'</td>
</tr>
<tr>
<td>1 ningyou 'doll'</td>
<td>1 iken 'opininion'</td>
</tr>
<tr>
<td>1 hudebako 'pencil case'</td>
<td>1 hanashi 'story'</td>
</tr>
</tbody>
</table>
| 1 denchi 'dry battery' | 1
| 1 hashioki 'chopstick rest' | 1
| 1 tsukue 'desk' | 1

type-token Ratio = .43

---

type-token Ratio = .89
task which was summarized earlier in Table 3. Note that the nouns listed in Table 7 for ko are, with two exceptions, limited to solid hand-size manipulable 3D objects. Tsu, on the other hand, is spread out across a number of dimensions: concrete to abstract, small to very large, hollow or solid, 1-, 2-, or 3-dimensional; there doesn't seem to be any semantic focus at all.

Second, ko has a short list of 7 nouns listed four times or more, i.e. by 1/5 or more of the subjects, suggesting a cluster of prototypical exemplars in the semantic core of the category. The nouns listed for tsu come pretty close to having no concentration at all, suggesting the absence of privileged exemplars. This observation is quantified by the type-token ratio for tsu of .89, which is close to 1 and double the ratio for ko.

Third, in performing the task, subjects were able to list nouns for ko much more quickly than for tsu. When listing nouns for tsu, subjects needed more prompting to find 5 nouns, and several were unable to complete the task. These observations suggest that subjects were more likely to have privileged exemplars readily available for ko than for tsu.

Finally, while desk and chair are non-conforming exemplars for the summary description of ko, they are highly manipulable. In Japan students move their desks and chairs around every day so that they can clean the classroom. And there is a difference among chairs: easily moveable straight chairs are more readily classifiable with ko than are living-room easy chairs.

Corroborating evidence comes from a rating study of nouns, not in the domain of other specific classifiers (Table 8). Stereotypic exemplars that are hand-size at the top of the table get the highest ratings, button and thumbtack in the middle which are typically handled with the fingertips rather than the hand, and are flat in shape, get somewhat lower ratings. Desk and chest of drawers, which are clearly out of the hand-size range, get markedly lower ratings with ko. Now table 9 shows what happens when ko loses its grip: tsu becomes the preferred classifier for desk and chest at the bottom of the table. But note that ko may still be used.

### Table 8: Core Semantics of ko: Effect of object size on ratings (1-5)

<table>
<thead>
<tr>
<th>Noun</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td>mikan ‘orange’</td>
<td></td>
</tr>
<tr>
<td>saikoro ‘dice’</td>
<td></td>
</tr>
<tr>
<td>ishikoro ‘small stone’</td>
<td></td>
</tr>
<tr>
<td>suika ‘melon’</td>
<td>4.47</td>
</tr>
<tr>
<td>botan ‘button’</td>
<td>4.24</td>
</tr>
<tr>
<td>gabyoo ‘thumb tack’</td>
<td></td>
</tr>
<tr>
<td>tsukue ‘desk’</td>
<td>2.77</td>
</tr>
<tr>
<td>tansu ‘chest of drawers’</td>
<td></td>
</tr>
</tbody>
</table>

### Table 9: Core Semantics of ko: Forced Choice of Classifiers

<table>
<thead>
<tr>
<th>Noun</th>
<th>no of subjects (out of 11) choosing tsu and ko</th>
</tr>
</thead>
<tbody>
<tr>
<td>saikoro ‘dice’</td>
<td>ko (11) tsu (0)</td>
</tr>
<tr>
<td>ishikoro ‘small stone’</td>
<td>ko (10) tsu (1)</td>
</tr>
<tr>
<td>botan ‘button’</td>
<td>ko (9) tsu (2)</td>
</tr>
<tr>
<td>mikan ‘orange’</td>
<td>ko (8) tsu (3)</td>
</tr>
<tr>
<td>gabyoo ‘thumb tack’</td>
<td>ko (7) tsu (4)</td>
</tr>
<tr>
<td>suika ‘melon’</td>
<td>ko (6) tsu (5)</td>
</tr>
<tr>
<td>tsukue ‘desk’</td>
<td>tsu (7) ko (3) other (1)</td>
</tr>
<tr>
<td>tansu ‘chest of drawers’</td>
<td>tsu (5) ko (3) other (3)</td>
</tr>
</tbody>
</table>

Table 10, with further results from the deformation experiment discussed earlier, reinforces the same point. Subjects were shown four sizes of the same statue in
Table 10: Statue size variations

<table>
<thead>
<tr>
<th>statue size</th>
<th>No. of subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. handsize</td>
<td>tsu  4, ko 7</td>
</tr>
<tr>
<td>b. tablesize</td>
<td>tsu  8, ko 3</td>
</tr>
<tr>
<td>c. bodysize</td>
<td>tsu  8, ko 3</td>
</tr>
<tr>
<td>d. monumental</td>
<td>tsu 10, ko 1</td>
</tr>
</tbody>
</table>

appropriate context: a) held in the hand; b) on a coffee table; c) freestanding on the floor; and d) on the plaza outside a large public building. As the statue increased out of the hand-size range, subjects increasingly shifted from ko to tsu, suggesting that ko has a semantic core which restricts its applicability as a general classifier, while tsu does not.

A final piece of evidence suggesting that ko has core semantics restricting its applicability as a complement classifier, but that tsu does not, comes from the so-called φ-classifier construction, a syntactic context in which bare numerals are combined with nouns without an intervening classifier, as exemplified in number 6,

6a. manjyuu-o juugo-ko tabeta. 'I ate 15 bean-jam buns.'
bean-jam=bun-obi 15-CL ate

6b. sono heya-ni-wa isu-ga jyuunanna-ko/∅aru. There are 17 chairs in the room.'
the room-LOC-TOP chair-NOM 17-CL exist

6c. sono hon-ni-wa hanashi-ga jyuuni-∅ aru. 'There are 12 stories in the book.'
the book-LOC-TOP story-NOM 12-CL exist

and in table 11. Note that since the numerals are over 10, a Sino-Japanese classifier must be chosen, hence ko rather than tsu. In (6a) the classifier is obligatory, in (6b) it is optional, and in (6c) no classifier is acceptable. These differences are largely controlled by lexical selection, as depicted in table 11. Note the semantic grouping: column A contains nouns fitting the semantic core of ko; column B has nouns that lack one or more core semantic properties of ko: solidity in the case of bag and dish; hand-size and manipulability in the case of window, and apparently all properties in

Table 11: The φ-classifier construction. Tsu is excluded by the selection of a Sino-Japanese numeral. Nouns in (A) meet the summary description of ko; in (B) they meet only some parts, and in 'C' they don't at all.

<table>
<thead>
<tr>
<th>Sino-Japanese numeral 'over 10' occurs with...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A:</strong> Only With Ko</td>
</tr>
<tr>
<td>mezamashi 'alarm clock'</td>
</tr>
<tr>
<td>dokee</td>
</tr>
<tr>
<td>manjyuu 'bean-jam bun'</td>
</tr>
<tr>
<td>ishikoro 'small stone'</td>
</tr>
<tr>
<td>udedokee 'watch'</td>
</tr>
<tr>
<td>kasettoteepu 'cassette tape'</td>
</tr>
<tr>
<td>ohashiki 'marbles'</td>
</tr>
<tr>
<td>ningyoo 'doll'</td>
</tr>
<tr>
<td>kaban 'bag'</td>
</tr>
<tr>
<td>isu 'chair'</td>
</tr>
<tr>
<td>booru 'bowl'</td>
</tr>
<tr>
<td>wagon 'dinner cart'</td>
</tr>
<tr>
<td>hoshi 'star'</td>
</tr>
<tr>
<td>hangaa 'hanger'</td>
</tr>
<tr>
<td>tsukue 'desk'</td>
</tr>
<tr>
<td>hachiiue 'potted plant'</td>
</tr>
<tr>
<td>nabe 'sausage pan'</td>
</tr>
<tr>
<td>kutsu 'shoe'</td>
</tr>
<tr>
<td>baketsu 'pail'</td>
</tr>
<tr>
<td>suutsukeesu 'suitcase'</td>
</tr>
<tr>
<td>Koosu 'course'</td>
</tr>
<tr>
<td>machigai 'mistake'</td>
</tr>
<tr>
<td>honoo 'flame'</td>
</tr>
<tr>
<td>gakubuchi 'picture frame'</td>
</tr>
<tr>
<td>machi 'town'</td>
</tr>
<tr>
<td>kumo 'cloud'</td>
</tr>
<tr>
<td>ronbun 'thesis'</td>
</tr>
<tr>
<td>seki 'world'</td>
</tr>
<tr>
<td>syokugyo 'occupation'</td>
</tr>
<tr>
<td>hoohoo 'method'</td>
</tr>
<tr>
<td>uso 'lie'</td>
</tr>
<tr>
<td>zenka 'criminal record'</td>
</tr>
<tr>
<td>yume 'dream'</td>
</tr>
<tr>
<td>yotee 'schedule'</td>
</tr>
<tr>
<td>yoyaku 'appointment'</td>
</tr>
<tr>
<td>himitsu 'secret'</td>
</tr>
<tr>
<td>iken 'opinion'</td>
</tr>
<tr>
<td>hanashi 'story'</td>
</tr>
</tbody>
</table>


the case of the noun "mistake." Finally, column C has nouns that completely violate the semantic core of ko, with few exceptions. This distribution clearly shows the semantic restrictedness of ko, provided, of course, that we allow a semantic explanation for the existence of the ø-classifier construction. Note that if a native numeral and hence tsu is used in the sentences in (3), the classifier is always obligatory, i.e. there is no ø-classifier option. In fact, the nouns that we used in table 11 for illustrating the restriction on ko are precisely the nouns given by our subjects in the free listing task for tsu (Table 7)! So lexical selection in the ø-classifier construction once again suggests that the use of ko is restricted by a summary description, while the use of tsu is not.

Several conclusions follow (in varying degrees) from these studies of ko and tsu:
1. There is such a thing as a semantic system in the Saussurean sense, in which a sign may be chosen by speakers not only for its compatibility with the message being communicated, but also because it is the least incompatible. Tsu demonstrates this in a dramatic way, as does wirra from the Yidiny classifier system.
2. Numeral classification, as exemplified in Japanese, sits squarely on the semantic boundary between grammar and lexicon, the native numeral classifiers (with tsu) on one side, and the Sino-Japanese classifiers (with ko) on the other.
3. So-called "general" categories can be broken down into more precise semantic and pragmatic functions in a way that is theoretically insightful. We have been able to delineate three distinct functions: complement, default, and unspecified referent.
4. Complement function has a competitive relationship with internal semantic structure; hence a fully complementary category such as tsu has no summary description for purely systemic reasons. This competitive relationship can lead to intractable data. Only by sorting out the influences of core meaning and complement function are we able to make any sense out of the behavior of the classifier ko.
5. Classifiers may serve complement function at different levels of generality. Mandarin ge has no restriction: it complements (and defaults) across all semantic domains. Our work on Japanese suggests that tsu is absolutely limited to non-animate concepts, and ko to concrete inanimates, in agreement with Matsumoto (1993). In German, all three genders serve complement function within highly specific semantic domains.

Footnotes
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1. See Corbett (1991) for one attempt to distinguish semantically from formally motivated systems.
2. Downing (1984), in a ground-breaking study of the Japanese classifier system, says that ko and tsu are general classifiers for inanimates. Matsumoto (1993) says that tsu is "a classifier for inanimate entities in general," and that ko is "a classifier for concrete objects in general."...But neither of them explicitly differentiates distinct semantic/pragmatic functions associated with these classifiers.
3. Core meaning, roughly defined, is a semantic representation that captures the privileged exemplars in a category, but falls far short of the category's full extension, and thus cannot be considered a summary representation (Smith & Medin, 1981).
4. But all three genders serve complement function within specific semantic domains.
5. expressed by verb stem alternations, primarily of verbs of location and motion.
6. a closed class of generic nouns distinguished by their obligatory poss. marking.
7. a closed class of generic nouns occurring in N+N and in relative constructions, and used anaphorically.

8. Traditional analyses of German claim that neuter is the complement gender. Neuter does in fact serve unspecified referent function (see Table 1c).

9. E.g. minya classifies edible flesh, animals from which it is derived, and meat dishes.

10. The data for this section come from Shimojo (1993a,b).

11. Tsubu, kabu and mune tend, to varying degrees, to shift to the Sino-Japanese system with numbers over 4/5.

12. The exceptions (central members of other categories) are given in Table 3. Non-central membership in a classifier category can be determined by comparing (a) the judgement of native speakers that they can use that classifier with the noun with (b) the dictionary definition (Kindaichi et al., 1981) for the classifier, which lists typical members. Downing (1984) also provides information on graded membership of some classifier categories based on a Roschian listing task.

13. Specific nouns used were (central members in boldface):

hon: ya (arrow), enpitsu (pencil), ki (tree), hitto (bb hit), denwa (tel call) and terebi bangumi (TV program)

mai: kami (paper), manaita (cutting board), zabuton (cushion)

dai: kuruma (car), jitenysa (bicycle), rajo (radio), terebi (TV set), reezooko (refrigerator)

ken: ie (house), apaato (apt bldg), biru (building)

ki: hikooki (airplane), herikoputaa (helicopter), roketto (rocket)

14. The dai and ki categories are exceptions, since they share some members on the basis of their specific semantic overlap (Denny, 1979).

15. beyond a restriction to inanimates, as Matsumoto (1993) points out. He suggests that tsu is the general classifier for inanimates, hiki for animals, and ri/nin for humans.

16. Bean-jam bun' is a traditional food which is stuffed with sweetened bean paste. It is usually round and its diameter is about 2 inches. The size and shape of typical 'rice cake' is about the same as 'bean-jam bun'.

17. Tanihara et al (1990) say: 'concrete, small, solid, independent.'

References


Corbett, GG. 1991 Gender. Cambridge: Cambridge UP.


Identifying Anaphors

Edward L. Keenan, UCLA

Given a language L and an expression S of L, can we identify in terms of the structure of S, the possible locations of anaphors and their antecedents?

In a series of papers I have argued that we can, but only on a language by language basis. This is so even if, as here, we limit ourselves to simple anaphora -- one that (by definition) satisfies

i. the anaphor and antecedent are co-arguments, and
ii. the anaphor is a full NP reflexive anaphor.

(So we do not treat here of clitic or verbal affix anaphors, nor do we treat of reciprocals or other types of referential dependencies different from reflexives).

Thus I claim that even for simple anaphora there is no fixed identification procedure that works for all languages. Nominal morphology is a factor in some Ls (Korean); linear order is relevant in Samoan in a way in which it is not in Korean or English; C-command seems relevant in English in a way in which it is not in Korean or Samoan.

The purpose of this paper is to present another, less widely recognized, means of identifying simple anaphor-antecedent pairs, one I call verb dependent. Some languages which exhibit this pattern are Toba Batak (Sumatra), Malagasy (Madagascar), and Tagalog (Philippines). The pattern of simple anaphora in these Ls instantiates in the domain of anaphora a more general structure type they share, which I shall call verbal case marking. The defining trait of VCM languages is:

**VCM Languages**

The semantic role of a structurally identifiable argument of a predicate P varies with the choice of affix on P

These affixes will be called theta affixes. In general they do not vary with the noun class (person, number, gender) of the NP whose theta role they assign. (For a language independent definition of structurally identifiable see Keenan, 1993a).

The characteristic property of verb dependent anaphora is that the distribution of anaphors and their antecedents is conditioned by the presence of theta affixes. Other phenomena, such as extraction, are also conditioned by these affixes.
Moreover the morphological conditioning is independent of syntactic hierarchy, and in consequence the distribution of anaphors in these Ls may (and does) violate the sorts of C-command relations expected on the basis of English. We will provide an explicit compositional interpretation for such Ss, one in which the interpretation of the verbal morphology yields the correct anaphor-antecedent relations even though anaphors asymmetrically C-command their antecedents.

This paper is organized as follows: §1 reviews some of the variation in the expression of the anaphor-antecedent relation. §2 exemplifies verb dependent anaphora. §3 presents a compositional semantics for verb dependent anaphora.

§1 Anaphora Variation

In Korean (Keenan, 1993a; O'Grady, 1985; Park, 1986) we find that simple anaphors may more or less indifferently precede or follow their antecedents (1a,b) - (3a,b) preverbally if they are suffixed with -ul/-lul ("accusative") and their antecedents are suffixed with -i/-ka ("nominative"). What cannot happen is that anaphors are nominatively marked and their antecedents are accusatively marked, regardless of their relative order (4a,b).

(1) a. John-i caki-casin-ul pinanhayssta
   John-nom self- -acc criticized
   John criticized himself.

   b. caki-casin-ul John-i pinanhayssta
      self- -acc John-nom criticized
      John criticized himself

(2) a. Nwukwunka(-ka) caki-casin-ul pinanhayssta
    someone(-nom) self- -acc criticized
    Someone criticized himself

   b. Caki-casin-ul nwukwunka(-ka) pinanhayssta
      self- -acc someone(-nom) criticized
      Someone criticized himself

(3) a. Nwuka caki-casin-ul pinanhayss-ni
    Who self- -acc criticized-Q
    Who criticized himself?

   b. Caki-casin-ul nwuka pinanhayss-ni
      self- -acc who criticized-Q
      Who criticized himself?
(4) a. * Caki-casin-i John-ul pinanhaysta
    self- -nom John-acc criticized
    He-self criticized John

    b. * John-ul caki-casin-i pinanhaysta
    John-acc self- -nom criticized
    John criticized he-self

These data suggest that in the minimal contexts in which anaphora arises, learners of Korean must attend to the NP case marking on anaphors but may ignore the linear order (and presumably C-command) relations between anaphors and antecedents. To produce grammatical and intelligible results it suffices to mark anaphors accusative and assign the other NPs independently allowable cases. Overt case marking is also a factor in Bengali and Hindi (Dayal, 1993) and likely in other NCM (nominal case marking) languages. But, due to its absence, overt affixing of NPs is not a conditioning factor on the distribution of anaphors and antecedents in Ls like Mandarin or English.

By contrast in Samoan, arguments of transitive verbs are distinctly case marked and their relative order after the verb is quite free (in the ergative/absolutive case marking paradigm), (5a,b). But (Keenan, 1992; Chapin, 1970; Cook, 1991) anaphors must follow their antecedents regardless of case (5c-f).

(5) a. E vivi'i e le tama le teine
    asp praise erg the boy the girl
    The boy praises the girl

    b. E vivi'i le teine e le tama
    asp praise the girl erg the boy
    The boy praises the girl

    c. E vivi'i e le tama 'o ia lava
    asp praise erg the boy abs 3s self
    The boy praises himself

    d. E vivi'i le tama e ia lava
    asp praise the boy erg 3s self
    The boy praises himself

    e. *E vivi'i e ia lava le tama
    asp praise erg 3s self the boy
    He-self, praises the boy,
f. * E vivi'i 'o ia lava e le tama
    asp praise abs 3s self erg the boy
    The boy praises himself

Note also that (5d) is a case where the anaphor outranks its antecedent on the theta role hierarchy: AGENT > NON-AGENT. And this is so regardless of whether we regard e marked NPs as "subjects" in any deep sense; unequivocally such NPs are agents.

Samoan presents a second case marking paradigm in transitive Ss, usually it seems, with verbs that are not so clearly AGENT-PATIENT/THME taking. (6) is illustrative.

(6) E alofa le teine 'i lona tina
    asp love the girl loc her mother
    The girl loves her mother

Here the 'i marked ("locative") NP does not naturally preceed the unmarked NP.

However, a few verbs which take the case marking paradigm in (6) do take an AGENT argument, and it is the 'i marked one:

(7) a. Na lavea le teine 'i le tama
    past hurt the girl loc the boy
    The boy hurt the girl

b. Na lavea le tamaititi iate ia lava
    past hurt the child loc+3s self
    He-self hurt the child

c. * Na lavea 'o ia lava 'i le tama
    past hurt abs 3s self loc the boy
    The boy hurt himself

Again, in (7b) the anaphor follows its antecedent and outranks it on the theta role hierarchy. (7c) shows that this order may not be reversed.

§2. Verb Dependent Anaphora

Our first example of a VCM language with verb dependent anaphora is Toba Batak (Austronesian; Sumatra; Schachter, 1984). Transitive Ss in Toba are verb initial and may be distinguished according to the prefix on the verb. The major prefixes are mang- and di-, as illustrated in (8):
(8) a. Mang-ida si Ria si Torus  
   asp-see art Ria art Torus  
   Torus sees Ria  

   b. Di-ida si Torus si Ria  
   asp-see art Torus art Ria  
   Torus saw Ria

As main clauses, Ss built from *mang*- verbs are interpreted imperfectively (including generically). Ones built from *di*- verbs are interpreted perfectly. This distinction is overridden in subordinate contexts. Interchanging the NPs in (8a) changes the meaning to "Ria sees Torus". Similarly interchanging the NPs in (8b) reverses theta role assignment. In these Ss then the choice of verbal affix *mang*- / *di*- correlates with the theta role of a certain NP. In more detail:

Schachter (1984) argues that in all Ss of the form [pref+V NP$_1$ NP$_2$], the prefixed V and NP$_1$ form a constituent to the exclusion of NP$_2$. Partial summary evidence: Only NP$_2$ extracts (= relativizes, forms wh- questions by movement), NP$_1$ cannot be moved away from its verb. Various adverbial particles may separate the two NPs, but cannot separate V from NP$_1$. NP$_2$ undergoes discourse deletion, but NP$_1$ is largely immune to such processes. Predicate phrases, whether verbal, adjectival or formed with PPs, present an intonation peak on their penultimate syllable. And when V is transitive it is the penultimate syllable of [V + NP$_1$] which gets the peak. So this assignment treats predicates built from adjectives and intransitive verbs and transitive verb plus following NP identically.

The evidence for V + NP$_1$ constituency does not distinguish Ss built from *mang*- and *di*- verbs. So the audible constituent structure (which might be derived and contain empty nodes) of both types of S is given by:

(9)  \[[[\text{pref}+V + \text{NP}_1] + \text{NP}_2]\].

Thus in *mang*- Ss the external NP, NP2, is assigned the highest theta role in the theta grid of the verb (See Sugamoto, 1984), whereas the prefix *di*- assigns that theta role to the internal NP, NP$_1$. In this (minimal) way we see that Toba is a VCM language.

Now, in *mang*- Ss, (10a,b), only the external NP can antecede the reflexive, *dirina*, whereas in *di*- Ss only the internal NP functions as antecedent, (11a,b).

(10) a. Mang-ida dirina si Torus  
   -see self art Torus  
   Torus sees himself  

   b. *Mang-ida si Torus dirina  
   -see art Torus self  
   He-self sees Torus

(11) a. Di-ida si Torus dirina  
   -see art Torus self  
   Torus saw himself  

   b. *Di-ida dirina si Torus  
   -see self art Torus  
   He-self saw Torus
So in (11a) the anaphor asymmetrically C-commands its antecedent.

Observe that it is quite easy to describe the distribution of anaphors and antecedents in Toba in terms of its observable structure:

**Batak Anaphora Constraint (BAC)**

In simple Ss A may antecede B iff B forms a constituent with a *mang*- prefixed verb or A forms a constituent with a *di*- prefixed verb.

The BAC characterizes simple anaphora in terms of constituency and identity of theta affixes. If we only checked hierarchical structure we could not distinguish *mang*- from *di*- Ss as they are hierarchically identical. Of course the BAC as given is incomplete: more must be said concerning (i) ditransitive verbs and objects of prepositions, and (ii) a (very) few other verbal affixes, e.g. *ter*. But even so, *mang*- and *di*- Ss are the most widespread type of transitive S and the BAC gives the correct characterization for this core case. In this way we see that the distribution of anaphors and antecedents is not independent of verbal morphology.

Philippine languages (Tagalog, Cebuano, ... ) are a second, well known type of VCM language, ones which also present some surprising anaphora patterns. The number of theta role distinctions coded by theta affixes in Tagalog is much greater than in Toba Batak. Two common theta affixes are -*um*- and -*in*- , "actor focus" and "goal focus" respectively, as in (12a,b).

(12) a. s-um-ampal ng lelake ang babae

    AF-hit acc man woman
    The woman hit/slapped a man

b. s-in-ampal ng babae ang lelake

    GF-hit gen woman man
    The/a woman hit/slapped the man

Here it is the *ang* marked NP whose theta role varies with the choice of affix. And, comparable to Toba, only the NP whose theta role is identified on the verb can extract (Schachter, 1976).

We note that in (12a) the relative order of NPs (with their "case markers" *ng* and *ang*) varies quite freely postverbally. The *ng* NP here cannot be replaced by a definite NP such as a demonstrative or proper noun, and it has no pronominal forms. In (12b) by contrast there is a preference for the *ng* NP to follow the verb immediately (Schachter, 1976); moreover it may receive a definite interpretation,
can be replaced by demonstratives and proper nouns, and has pronominal forms - ones which independently function as possessors of N's. So Ss built from -in- forms present by far the widest range of NP arguments.

Tagalog presents an NP reflexive sarili niya "self" + 3gen', but its distribution in these simple transitive S types is surprising. Neither NP in (12a) can be replaced by it preserving grammaticality. In (12b) only the ang NP can be reflexive:

(13) a. sinampil ng babae ang sarili niya
hit gen woman self
The woman hit herself

b. * sinampil ng sarili niya ang babae

For this limited range of transitive S we may describe the distribution of simple reflexives by: Only ang NPs of -in- infixed verbs may be reflexive. The statement becomes somewhat more complex as a greater range of roots, theta affixes and case markers is considered. Still these examples show that the distribution of reflexives is not independent of the choice of theta affix.

Our last example of a VCM language is Malagasy. Like its cousins, Tagalog and Toba Batak, Malagasy builds verbs from roots and affixes. The two semantically most neutral theta affixes are i- and aN-, (14). They are active in the sense that the NP external to the major constituent break is assigned the highest ranking theta role in the theta grid of the verb. And, as with Tagalog and Toba, it is only this NP which relativizes, questions by movement, etc.

(14) a. [N+i+vidy akanjo hoan'ny tena+ny] ny vehivavy rehetra
pst+act+buy clothes for the self+theirs the woman all
All the women bought clothes for themselves

b. [M+aN+vono (mamono) tena hoan'ny zanaka] ny ray-aman-dreny
pres+act+kill self for the child the father-and-mother
Parents kill themselves for (their) children (generic)

c. [M+aN+petraka (mametraka) ny enta+ko ao anatin'ny vata] aho
pres+act+place the thing+my there in the trunk I
I am putting my things in the trunk

There are other active prefixes, most built by prefixing i- and aN- with semantically richer affixes having meanings like CAUSE and RECIPROCAL.
The natural "passive" (15) of (14c) is done by prefixing the root with a- rather than aN-. Typically the external NP in such Ss is assigned a THEME theta role (sometimes PATIENT). And in general in non-actives the "Agent Phrase" (the NP which receives the highest theta role in the theta grid of the verb) is bound to the verb in exactly the same, complicated, way in which possessors are bound to their noun heads and most objects of prepositions are bound to their preposition. Keenan (1933b) argues at length that these possessors form a syntactic constituent with their verbal head to the exclusion of other verbal complements.

(15) [[A+petra+ko] ao anatin'ny vata] ny enta+ko pass+put+my there in'the trunk the thing+my
My things are put by me in the trunk

Similarly suffixing the root with -ina assigns PATIENT (and sometimes THEME, depending on the verbal root) to the external NP, the Agent Phrase being presented as a possessor as expected.

(16) [[No+vidi+n'ny vehivavy rehetra] hoan'ny tena+ny] ny akanjo pst+buy+pass'the women all for'the self+their the clothes
Clothes were bought by each woman for herself

The most interesting non-active affix here is the "circumstantial" suffix -ana which combines with a root to which an active prefix has already been added. The external NP can now be interpreted with any theta role carried by an oblique NP in an active. Thus (17) is cognitively synonymous with (14b), but it is now the external NP which is assigned the benefactive role.

(17) [[Amonoa'n'ny ray-aman-dreny], tena,ny zanaka, act+kill+obl'the father-and-mother self the child
same as (14b) -- not literally translatable

Consider now the anaphora pattern exemplified in these Ss. That in (14a,b) is comparable to English, and, as in English, we may not interchange anaphor and antecedent preserving grammaticality. But the pattern in (16) and (17) is more surprising. The external NP, which clearly C-commands the anaphor, is not a possible antecedent. Only the genitive Agent Phrase is a possible antecedent and on no account which accepts the gross constituent structure illustrated (allowing invisible structure) will the Agent Phrase C-command the anaphor. Indeed the natural structure (Keenan, 1993b) is one in which the anaphor asymmetrically C-commands the Agent Phrase. In any event, the MAC below is descriptively adequate for simple anaphora in Malagasy.
Malagasy Anaphora Constraint (MAC)

A may antecede B iff B is accusative or an object of a preposition and A is the external argument of an active predicate or the genitive complement of a non-active one.

(Recall that active and non-active are defined partially in terms of theta affixes).

It may seem implausible that possessors should be able to bind outside their dominating NP, but this fact is compatible with many comparable ones in Malagasy. Thus, external NPs of active predicates, possessors of non-active ones and possessors of predicate nominals enjoy comparable control privileges:

(18) a. Mikasa ny hamaky io boky io ny mpianatra tsirairay
act+intend the fut+read that book that the student each
Each student intends to read that book

b. Kasain'ny mpianatra tsirairay ny hamaky io boky io
intend+pass the student each the fut+read that book that
same as (18a). NOT 'It was intended by each student that that book be
read (by someone)'

c. Adidi + n + i Doda + ny manaiky an'i Dada+ny
duty + gen + art Doda the pres+agree acc'art father+his
Doda's duty is to obey his father

§3. Little Batak

We present here a simple formal language designed to exhibit the sort of verb dependent anaphora we have illustrated above. Our purpose is to show that such a language can be directly interpreted as a function of its structure yielding the correct semantic results. Our purpose is to show that there is nothing logically necessary about antecedents C-commanding their anaphors and thus no semantic motivation for designing structures for the Ls studied in which such C-command relations hold. Crucially of course we will assign a syntactic and a semantic role to the verbal morphology. It is reasonable then that little Batak learners may simply interpret what they hear along the lines proposed here.

Syntax

Using English morphemes for the content words in Batak, we provide a context free grammar in which predicates "agree" in certain features with their arguments. Our rules will yield derivations summarized by trees like (19).
So there are "nominative NPs", NPn's, and "accusative NPs", NPa's. Proper nouns belong to both categories but the reflexive *self* (in real Batak, *dirina*) only has category NPa, accusative NP.

Similarly there are two kinds of one place predicate: P1n's, which combine with nominative NPs to form Ss, and P1a's which combine with accusative NPs to form Ss. Thus P1's and the NP's they combine with "agree" in "case features". Similarly there are two kinds of two place predicates: P2n's, which combine with nominative NPs to yield P1a's, the kind of P1 which wants an accusative NP to make an S. And there are P2a's, which combine with NPa's to form P1n's, the kind of P1 that wants a nominative NP to make an S.

With this agreement mechanism then each nuclear S will have just one nominative NP and one accusative NP.

Now both kinds of P2's are formed from a lexical class of category P2[root]. *mang-* combines with such roots to form P2a's, and *di-* combines with such roots to form P2n's. More formally, here are our rules:

1. S → P1a + NPn
   S → P1n + NPn

2. P1a → P2n + NPn
   P1n → P2a + NPa

3. P2a → mang+ P2[root]
   P2n → di- + P2[root]

4. P2[root] → see, etc.

5. NPn → john, bill

P1n → laughed

NPa → self, john, bill
Semantics

Given a non-empty universe $E$ of (possibly abstract) objects about which we think of ourselves as speaking, a subset of $E$ will be called a property over $E$. We write $P$ for the set of properties over $E$. And we write $R$ for the set of binary relations over $E$.

1. $P$'s will denote properties over $E$.

2. Proper nouns denote functions which map properties into \{true, false\} and binary relations to properties.

   Given an object $b \in E$, we will think of a proper noun like *bill* as denoting a function which maps a property $q$ to true just in case $b \in q$, and it maps a binary relation $R$ to the set of those objects which bear $R$ to $b$.

   More formally, proper nouns will denote elements of $\{I_b|b \in E\}$, where for each $b \in E$, each property $q$, and each binary relation $R$,

   $I_b(q) = \text{true} \text{ if and only if } b \in q \quad \text{and}$

   $I_b(R) = \{a|b \in aR\} \quad (\text{where } aR =_{df} \{y|aRy\})$

The elements of $\{I_b|b \in E\}$ are called individuals.

3. Now, in interpreting a sentence, an expression of category NPn will be interpreted as a function which maps properties to truth values. As the only NPn's are proper nouns we have already said what sorts of functions they can denote. In a particular situation (model) we just must say which individual each proper noun denotes.

   So in a model with universe $E = \{a, b, c, \ldots\}$ where john denotes $I_a$ and the P1n *laugh* is interpreted as a subset LAUGH of $E$, then the sentence *laughed john* will be interpreted as $I_a(\text{LAUGH})$, which is true iff $a \in \text{LAUGH}$. In general denotations of expressions in a given model are noted by the upper case expression.

4. Equally in interpreting a sentence an expression of category NPa will be interpreted by functions mapping binary relations to properties. Again we have already said what functions of this sort are denoted by proper nouns. The NPa *self* denotes that function SELF defined below:

   $\text{SELF} (R) = \{a|aRa\}$
5. Expressions of category P2[root] are interpreted by binary relations.

6. Now we come to the crux of the semantics, the denotation of mang- and di-.
Like self they are logical constants, we give their denotation explicitly.

mang- denotes that function MANG which maps each binary relation R to
a function which maps possible NPa denotations to properties, as follows:

\[ \text{MANG}(R)(G) = G(R) \]

Thus e.g. where bill denotes I_b, mang-see bill will denote MANG(SEE)(I_b), which
is just I_b(SEE), namely the set of objects which stand in the SEE relation to bill.
Similarly mang-see self denotes MANG(SEE)(SELF), which is SELF(SEE), the
set of x's such that (x,x) \in SEE. Thus observe the truth conditions of (20), in a
situation in which bill denotes I_b:

(20) \[ \text{Mang-see self bill} = \text{BILL(MANG(SEE)(SELF))} \]
\[ = \text{BILL(SELF(SEE))} \]
\[ = \text{true} \text{ iff } (b,b) \in \text{SEE} \]

Now consider di-. It combines with a relation denoting expression to yield
something which combines with an NPa to yield a truth value. Its semantic interpretation follows this syntax
directly. That is, di- will denote a function DI which maps binary relations R to
functions mapping each NPa denotation H to a function mapping each NPa
denotation G to a truth value, as follows:

\[ \text{DI}(R)(H)(G) = H(G(R)) \]

So e.g. DI(SEE)(JOHN)(BILL) = JOHN(BILL(SEE)). But notice that this is the
same truth value as JOHN(MANG(SEE)(BILL)) = JOHN(BILL(SEE)). In other
words the interpretation of (21a,b) are identical:

(21) a. Mang-see bill john \hspace{1cm} b. Di-see john bill

And finally course notice that the interpretation of (22) is given by:

(22) \[ \text{Di-see self bill} = \text{DI(SEE)(BILL)(SELF)} \]
\[ = \text{BILL(SELF(SEE))} \]

and this latter is just the interpretation of (20). That is, in Little Batak (22a,b)
have identical interpretations:
(22) a. Mang-see self bill       b. Di-see bill self

That is, *di-see bill self* "He-self saw bill" is true iff the object in the universe determined by *bill* stands in the SEE relation to himself. Thus the anaphor is correctly bound, and there is simply no logical problem in interpreting an expression in which an anaphor asymmetrically C-commands its antecedent. The key to doing that in this case was of course the assignment of a rich enough meaning to the particular morphemes *mang-* and *di-*.

Note the obvious here: English lacks the analogue of *mang-* and *di-. Its transitive verbs are, in these respects, less structured than in Batak, and in consequence the compositional interpretation of minimal transitive Ss in English and Batak is not point for point the same. Their syntax differs and so does their semantics, though both manage to say "John saw Bill" and "John was seen by Bill", but each in their own way.

**conclusion**  We have discussed one means languages may use to "code" the anaphor-antecedent (AA) relation. And we have touched upon others. But where does this leave us? Are there no language general properties concerning the AA relation?

This question is addressed in more detail in Keenan (1993a). We argue there that there is a very non-trivial general property. Namely, the AA relation is asymmetric in the sense that, informally, if A can antecedee B then B cannot antecedee A. More precisely (but see Keenan op cit for the notion "preserving structure"):

**Anaphor-Antecedent Asymmetry**

Anaphors and antecedents may not not be interchanged preserving meaning and structure

**References**


5. --- (1993b) "VP Nominative Languages: Malagasy (and other W. Malayo-Polynesian Languages). ms. UCLA


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