Job Name: -- /337544t

PROCEEDINGS OF THE THIRTY-FOURTH ANNUAL MEETING OF THE

# BERKELEY LINGUISTICS SOCIETY

February 8-10, 2008

**GENERAL SESSION**

**and**

**PARASESSION on INFORMATION STRUCTURE**

Edited by

Sarah Berson, Alex Bratkievich, Daniel Bruhn, Amy Campbell,
Ramon Escamilla, Allegra Giovine, Lindsey Newbold, Marilola Perez,
Marta Piqueras-Brunet, Russell Rhomieux

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

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

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

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

All rights reserved.

ISSN 0363-2946

LCCN 76-640143

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

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# TABLE OF CONTENTS

List of presenters not included in this volume.....i

Foreword.....iii

**GENERAL SESSION**

Phonosemantic Evidence for the Mimetic Stratum in the Japanese Lexicon …….1
KIMI AKITA

A Semantic Analysis of the Wason Selection Task .....13
JEANNE APTEKMAN

Palatalization as Overlap of Articulatory Gestures: Crosslinguistic Evidence.....25
NICOLETA BATEMAN

On Shallow and Deep Minimality…….37
LEV BLUMENFELD

*GIVE* Verb-Object Constructions in French: from Grammar to Idioms……49
MYRIAM BOUVERET

Phonetics vs. Phonology in Loanword Adaptation: Revisiting the Role of the Bilingual.....61
CHARLES B. CHANG

Flexibility and Rigidity: Multiplicatives, Frequency, and Quantification Adverbs.....73
ANIKO CSIRMAZ

Environment Prototypicality in Syntactic Alternation……...85
GABRIEL DOYLE and ROGER LEVY

Structural Case and the Typology of Possessive Constructions……97
MAIA DUGUINE

Total Identity in Co-occurrence Restrictions……..……109
GILLIAN GALLAGHER

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Backwards Ellipsis is Right Node Raising……..121
SEUNGWAN HA

Perceptual Errors or Deliberate Avoidance?
Types of English /r/-Dissimilation……...…133
NANCY HALL

The Morphology-Phonology Connection……145
SHARON INKELAS

Reflexives and the Shift between First and Second Person: The Case of
Japanese……..…… 163
OSAMU ISHIYAMA

Event Integration Patterns in Sidaama (Sidamo)……175
KAZUHIRO KAWACHI

Modification within a Noun Phrase in Sidaama (Sidamo)……..…187
KAZUHIRO KAWACHI and ABEBAYEHU AEMERO
TEKLESELASSIE

A Cognitive Approach to the Acquisition of Passives in Korean……..199
MEESOOK KIM

Perceptual Similarity in Korean Vowel Epenthesis……209
SEUNG KYUNG KIM

Relations between the Conative and *Out-at* Constructions:
An Extended Semantic Map Approach……221
YONG-TAEK KIM

Supplemental Relative Clauses and Syntactic Generality……...233
RUSSELL LEE-GOLDMAN

Focus on Embedded Adverbials……..245
RAINER LUDWIG, FABIENNE SALFNER, and MATHIAS
SCHENNER

Acoustic Correlates of Prosodic Prominence for Naïve Listeners of American
English…….257
YOONSOOK MO

Sluicing in Bahasa Indonesia, P-Stranding, and Interface Repair……...269
YOSUKE SATO

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The Japanese Contrastive *Wa*: A Mirror Image of EVEN…….....281
OSAMU SAWADA

A Typological Approach to the Split Scope Readings of Negative Indefinites..293
MICHELLE ST-AMOUR

Using Social Information in Language Processing……..305
LAURA STAUM CASASANTO

Production and Perception of Pitch Accent in Japanese……..317
YUKIKO SUGIYAMA

The Relative Importance of Rhythm and Intonation for the Perception of New Zealand English Dialects…….329
ANITA SZAKAY

Nibbling is Not Many Bitings in Italian and French: A Morphosemantic Analysis of Event-Internal Plurality……...341
LUCIA M. TOVENA and ALAIN KIHM

The Agent-Obfuscating Function of *Mono* 'Things' in Japanese Discourse……353
NINA AZUMI YOSHIDA

Two Patterns of Reduplication in Washo……365
ALAN C. L. YU

**PARASESSION: INFORMATION STRUCTURE**

Prosody, Accessibility, and Sentential Negation in Brazilian Portuguese…...…379
MEGHAN E. ARMSTRONG and SCOTT A. SCHWENTER

Encoding Information Structure via Object Agreement in Spanish Interactions…….....391
VALERIA A. BELLORO

What's New (and What's Given) in the Theory of Focus?.....403
DANIEL BÜRING

The Syntax-Pragmatics Interplay in Yaqui..……425
LILIÁN GUERRERO

The Sentence-Internal Topic and Focus in Chinese……437
YU-YIN HSU

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Presentation: From Comment to Topic……449
STEFAN HUBER

Information Structure and Discourse Function of Amalgam *Wh*-Clefts…….461
CHRISTIAN KOOPS and SEBASTIAN ROSS-HAGEBAUM

Specification under Discussion……473
LINE MIKKELSEN

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

**List of presenters not included in this volume**

The following authors also presented papers in the General Session or Parasession, but their work does not appear in this volume: Sungeun Cho, Barbara Citko, Elizabeth Coppock, Shannon Finch, Andrew Garrett, Nicholas Gaylord, Maria Polinsky, Craige Roberts, Malavika Shetty, Cynthia Levart Zocca.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

**Foreword**

We are pleased to present the proceedings of the BLS 34 General Session and Parasession on Information Structure, held at the University of California, Berkeley, in February 2008. We would like to thank the contributors to this volume and all those who attended and participated in the conference. We would also like to thank the following organizations for their generous financial support:

The Doreen B. Townsend Center for the Humanities
Linguistics Department, UC Berkeley
Graduate Assembly, UC Berkeley
Division of Social Sciences, UC Berkeley

Sarah Berson, Daniel Bruhn, Amy Campbell, Ramon Escamilla, Allegra Giovine, Lindsey Newbold, Marilola Perez, Marta Piqueras-Brunet, Russell Rhomieux

Volume editors



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# GENERAL SESSION

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# Phonosemantic Evidence for the Mimetic Stratum in the Japanese Lexicon[1]

KIMI AKITA
*Kobe University*

## 0. Introduction

This paper pursues phonosemantic evidence for the existence of the mimetic (or sound-symbolic, ideophonic) category in Japanese, especially with respect to lexical stratification. Specifically, I will discuss experimentally whether there is some difference in sound-symbolic phenomena between mimetic and nonmimetic words, or between the Mimetic stratum and other strata, in particular the Native stratum.

The organization of this paper is as follows. In Section 1, I will introduce two major standpoints toward the vocabulary stratification issue—one gives an independent status to mimetics and the other does not—in Japanese linguistics. In Section 2, citing the experimental consideration in Akita (2008), I will present a morphophonological definition of the mimetic category. Based on the idea, in Section 3, I will discuss on an experimental ground whether there is some difference in sound-symbolic effects between morphophonologically mimetic and nonmimetic words. Finally, in Section 4, I will conclude in favor of the viewpoint that posits a special (phono)semantic status for mimetics that it can be the case that sound symbolism works more effectively in mimetics than nonmimetics.

## 1. Three vs. Four Lexical Strata in Japanese

### 1.1. Lexical Stratification in Etymology and Phonology

In lexicological, etymological, and phonological studies, there have been two major hypotheses concerning lexical stratification of Japanese (for other hypotheses see Itô and Mester 1999; Tateishi 2003; Kurisu 2006). One is the three strata hypothesis, which is mainly taken in etymological descriptions (see Tokieda et al.

[1] This paper represents part of the author's research supported by Grant-in-Aid for JSPS Fellows (#19·536). I am grateful to the BLS 34 audience for their insightful comments and criticisms. My greatest acknowledgment goes to Hajime Takeyasu, who provided generous support and advice in statistical analyses. I also thank Yo Matsumoto, Natsuko Tsujimura, and Benjamin Bergen, all of whom gave me lots of constructive comments. Remaining errors and shortcomings are of course my own.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

1955:355; Miyajima 1977). The three strata are the Native (or Yamato) stratum, the Sino-Japanese stratum, and the Foreign (or Loanword) stratum. This hypothesis reflects where a word comes from: Japanese original, Chinese, or English (or other languages including French, German, and Portuguese).

The other hypothesis posits the fourth lexical stratum. Concretely, it separates the Mimetic stratum out of the (etymologically) Native stratum. This idea is the mainstream in current Japanese phonology (see McCawley 1968; Itô and Mester 1995; Fukazawa et al. 1998). The reason for positing the fourth stratum is phonological differences between mimetics and nonmimetics. For example, Itô and Mester (1995) argue for this latter hypothesis based on the unique constraint violation pattern of mimetics cited below. Mimetics are sole candidates for the membership of the phonological group which allows a single [p] (e.g. ***p****a^tipati*, ***p****oro^ri*) but does not allow a voiceless obstruent following a nasal within a morpheme (e.g. **ko**N**k**a**^ri*, **pi**N**t**a**^ri*) and a voiced geminate cluster (e.g. **ko**Q**g**a**^ri*, *??he**Q**n**a**hena*) (see also Kurisu 2006; Akashi 2007).[2]

(1) Phonological uniqueness of mimetics:

| | [p] | NT | DD |
|---|---|---|---|
| Native | * | * | * |
| Sino-Japanese | * | √ | * |
| Mimetic | √ | * | * |
| Foreign | √ | √ | √ |

(adapted from Itô and Mester 1995:820)

My question regarding this issue is quite simple and naïve: is there any (phono)semantic basis for the separate status of the Mimetic stratum? This question is a natural one in light of the general assumption that mimetics are semantically peculiar (see Hamano 1998 among others).

### 1.2. Lexical Stratification in Phonosemantics

Phonosemantics is a (psycho)linguistic field that investigates the motivated or iconic properties of systematic correspondences found between sound and meaning of words within and sometimes across languages (Hinton et al. 1994; Magnus 1999). Some phonosemantic studies, such as Kawahara et al. (2005, 2008) and Shinohara et al. (2007), have pointed out the existence of sound-symbolic phenomena in *nonmimetic* words in favor of the three strata hypothesis (i.e. without distinction between the Native and the Mimetic strata; see also Makino 2007).[3] In

[2] Abbreviations and symbols used in this paper are as follows: C = consonant; N = moraic nasal; Q = the first half of a geminate cluster; V = vowel; ^ = accent nucleus, pitch fall (specified only for mimetics)

[3] Given that the traditional three- and four-strata hypotheses are purely based on lexicology, etymology, or phonology, it might be inappropriate to discuss a semantic issue in the same framework. In this respect, "the Mimetic stratum" here should be replaced with "the mimetic category."



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

fact, this cross-stratal characteristic is why sound symbolism is sound symbolism—more explicitly, why "sound symbolism" is deliberately distinguished from "sound-symbolic words" (i.e. mimetics) (Tamori and Schourup 1999).

If phonosemantic properties are not specific to mimetics, where does the sense of semantic peculiarity of mimetics come from? A possible moderate solution to this apparently contradictory situation is the following:

(2) A hypothesis on the phonosemantic status of mimetics:
The mimetic category is the *best* locus of sound symbolism.

In preparation for an experimental examination of this hypothesis, I will establish a formal definition of mimetics in the next section.

## 2. Morphophonological Definition of Mimetics

This section, based on the findings in Akita (2008), gives a clear definition to Japanese mimetics in terms of their morphophonology. The declaration of the definition will offer a basis of the discussion in Section 3, where what is mimetic plays an essential part.

Despite the fact that mimetics sound "unambiguously mimetic" to native Japanese speakers (Hamano 1998:219; Tamori and Schourup 1999:6), definition of mimetics has been one of the biggest puzzles in mimetic studies (for similar puzzles in other languages see Abelin 1999; Wiltshire 1999; Newman 2001). Hamano (1998:6-7) discusses this difficulty from four aspects. First, the semantic idiosyncrasy of mimetics (i.e. their ability to imitate nonlinguistic sounds or manners by means of linguistic sounds) without a firm criterion is too unreliable to use in an objective definition. Second, indeed, some morphological processes, such as reduplication (e.g. *metya**metya***, *to^ko**toko***) and emphatic consonant insertion (e.g. *bi**Q**ku^ri*, *ko**N**ga^ri*), frequently take place in mimetics. However, these are neither a necessary nor sufficient condition for mimetics. For example, neither morphological property is present in mimetics like *hura^ri* and *gunyaQ^*. Moreover, these properties are shared with not a few nonmimetic words like reduplicated nouns like *hito**bito*** 'people' (< *hito* 'person') and intensified expressions like *Su{**Q**/**N**}gee!* 'Grrreat!' (< *sugoi* 'great'). Third, we can observe some crosscategorial traffic into and out of the mimetic category (e.g. *simi^zimi* < *simu* 'soak' (a nonmodern verb); *noNbi^ri* < *nobu* 'get long' (a nonmodern verb); *awate-huta-meku* 'be flustered' < *huta* (a nonmodern mimetic root)). Hence, a historical/etymological definition does not necessarily work well. Finally, there is a phonological and grammatical phenomenon only observable in mimetics: [p]-initial adverbs that take the quotative particle *-to* are mimetic (e.g. *po^tapota-to*, *pita^ri-to*; cf. [p]-initial loanword adverbs like *pawahuru-{ni/*to}* 'powerfully' and *parareru-{ni/*to}* 'in parallel'). This statement is true but far from defining the entire mimetic category.

In what follows, I will introduce an experimental study that shows that a set of morphophonological templates successfully define the category.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 2.1. Morphophonological Templates for Mimetics

In the challenging situation stated above, Akita (2008) proposes that satisfying one of the limited number of morphophonological templates (or constructions) is the crucial condition for a canonical member of the mimetic category in Japanese. This proposal stems from the fact that almost all mimetics can be classified into one of the fifteen formal classes listed below:

(3) Morphophonological templates for Japanese mimetics:
   a. For CV-roots:
      CVQ^, CV(^)N(^), CViQ^, CV(^)V(^), CV^V-CVV, CVV-CVV, CV^N-CVN, CVN-CVN, CV^i-CVi
   b. For CVCV-roots:[4]
      CVCVQ^, CVCV(^)N(^), CVCV^ri, CVCCV^ri, CV^CV-CVCV, CVCV-CVCV

As Hamano (1998) discusses in detail, Japanese mimetics can be basically reduced to one- or two-mora roots. For example, *suQ^* and *pyo^NpyoN* can be analyzed as based on the one-mora (CV) roots *su* and *pyo*, respectively. Likewise, *poQka^ri* and *meromero* can be reduced to the two-mora (CVCV) roots *poka* and *mero*, respectively. Seen differently, one- and two-mora mimetic roots enter one of the nine and six morphophonological templates in (3), respectively. For example, *suQ^* fills the template CVQ^, *pyo^NpyoN* fills CV^N-CVN, *poQka^ri* fills CVCCV^ri, and *meromero* fills CVCV-CVCV. As an illustration of the wide coverage of the templates, Akita (2008) shows how many mimetics registered in Kakehi et al. (1996) (with some supplementation, 1,652 in total), one of the largest Japanese mimetic dictionaries, fill the templates.

| | | |
|---|---|---|
| (4) | a. Mimetics satisfying a template: | 1627 (98%) |
| | Reduplicative templates (e.g. *bu^ubuu*, *do^kidoki*): | 785 (48%) |
| | *-Q^*-ending templates (e.g. *saQ^*, *dokiQ^*): | 269 (16%) |
| | *-(^)N(^)*-ending templates (e.g. *poN^*, *doki^N*): | 122 (7%) |
| | CVCV^ri (e.g. *huwa^ri*, *doki^ri*): | 146 (9%) |
| | CVCCV^ri (e.g. *geNna^ri*, *doQki^ri*): | 133 (8%) |
| | Derivatives (e.g. *kururiN^*, *paQpaQ^*): | 117 (7%) |
| | Fossilized templates (e.g. *haQ^si*, *huQku^ra*):[5] | 55 (3%) |
| | b. Mimetics satisfying no template (e.g. *hihii^N*, *ogya^a*): | 25 (2%) |

Akita's (2008) templatic approach is critically different from previous ones in two points. First, it emphasizes *accentuation* (i.e. presence/absence and position

[4] Throughout this paper, in naming templates, I will omit the numbers indicating the positions of consonants and vowels. Note that C1 and C2 are basically different in Japanese mimetics (Hamano 1998).

[5] "Fossilized templates" include templates that were once productive (e.g. CV^CCV, CVCCV^ra) (Yamaguchi 2002:34-5, 39). Now mimetics filling these templates give some old-fashioned tones.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

of "^") in setting up the mimetic templates (cf. Lu 2006). Second, it uses the fifteen templates as a *set* which as a whole participates in the definition of mimetics.

### 2.2. Morphophonological Templates and Mimeticity

Akita (2008) submits an experimental piece of evidence for the validity of the templatic definition of Japanese mimetics. The experiment measures the "mimeticity" of four types of nonsense words (i.e. sequences of phonemes that do not exist as a word in the vocabulary of Japanese). 100 stimulus words in total were created under two parameters: namely, whether to fill one of the templates for two-mora mimetic roots in (3b) and whether to possess one of the three segmental properties below that Tamori and Schourup (1999) claim are unique to mimetics.

(5) Segmental features "unique to mimetics":
   a. Free from sequential voicing in reduplication (e.g. **ko^ro**g**oro*; cf. *hito**b**ito* 'people')
   b. Free from nasalization of C1 /g/ of a reduplicant (e.g. **ga^ya**ŋ**aya*; cf. *kami**ŋ**ami* 'gods')
   c. High frequency of initial [p] (about one-sixth of all; e.g. ***p**ariN^*, ***p**i^kupiku*, ***p**oQku^ri*)

(adapted from Tamori and Schourup 1999:210-1)

Thirty native Japanese speakers were asked to rate the mimeticity of each audiorecorded word presented twice at random via a headphone in a quiet room. Ratings were made on a seven-graded scale: from "1" (does not sound mimetic at all) to "7" (sounds very mimetic) with "4" as moderate.

Results were consistent with the templatic definition hypothesis. Mean scores (recalculated between 0 and 1) for the four types of words are given in (6) with some stimulus samples.

(6) Results of the mimeticity experiment (Akita 2008):

| | Templatic/segmental factor | Stimulus samples | Mean scores |
|---|---|---|---|
| a. | √/√ | *pu^sipusi, paruN^* | .65 |
| b. | √/* | *hemo^ri, se^mozemo* | .57 |
| c. | */√ | *pa^muto, pekiro^iwa* | .10 |
| d. | */* | *me^toa, ponusame* | .15 |

A two-way repeated measures analysis of variance revealed that the main effects of both templatic and segmental factors were significant (templatic factor: $F$ (1, 2998) = 94.14, $p < .001$; segmental factor: $F$ (1, 2998) = 7.33, $p < .01$). However, the effect sizes of these factors showed a remarkable contrast. As the partial eta squares (from 0 to 1) indicate, more than the half of the results were determined by the templatic condition (templatic factor: $\eta p^2 = .66$; segmental



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

factor: $\eta p^2$ = .003). This consequence offers strong support to the idea that the membership of the mimetic category in Japanese is guaranteed by the aforementioned set of morphophonological templates. In the following section, I will use the template satisfaction discussed here as a criterion of mimetics.

## 3. Morphophonological Templates and Sound-Symbolic Effects

In order to examine the hypothesis put forward in (2) above (i.e. "the mimetic category is the best locus of sound symbolism"), I conducted an experiment that compared sound-symbolic effects in mimetics with those in nonmimetics. I limited my concern to what is called magnitude symbolism (or size sound symbolism) of vowels and consonants, which has been most widely discussed in the sound symbolism studies since Sapir (1929). For example, numerous experiments have been done to show that words starting with a voiced consonant (e.g. ***b**eep*) tend to represent bigger referents than those starting with a voiceless consonant (e.g. ***p**eep*). Likewise, words with a low/broad vowel (e.g. *m**a**l*) are said to represent larger referents than those with a high/narrow vowel (e.g. *m**i**l*) in many languages (to mention a few, Johnson 1967; Ultan 1978; Diffloth 1994).

### 3.1. Method

I asked twenty native Japanese speakers (11 females, 9 males; from 19 to 55 years old, 29.25 on average) to rate how large the imagined referents (e.g. a desk) of thirty-six nonsense words seemed. The rating scale was from "1" (small) to "4" (large). Twelve audiorecorded triads of CVCV-based words were created with C1 /g, z, b; k, s, p/, V1 /a/ or /i/, and CV2 /no/. As listed in (7), all possible combinations of C1 and C2 were put in a nonmimetic template (i.e. CV^CV) and two mimetic templates identified in Section 2 (i.e. CV^CV-CVCV and CVCV^ri).[6] These male vocal stimuli were recorded on Audacity, an audioeditor-recorder, and presented twice per word at random on Windows Media Player or Apple QuickTime Player. Every test trial followed ten practice questions.

(7) A list of stimuli:

| C1 | | | V1 | Mimetic template *CV^CV | √CV^CV-CVCV | √CVCV^ri |
|---|---|---|---|---|---|---|
| Velar plosive | voiced | /g/ | /a/ | ga^no | ga^no-gano | gano^ri |
| | | | /i/ | gi^no | gi^no-gino | gino^ri |
| | voiceless | /k/ | /a/ | ka^no | ka^no-kano | kano^ri |
| | | | /i/ | ki^no | ki^no-kino | kino^ri |
| Alveolar fricative | voiced | /z/ | /a/ | za^no | za^no-zano | zano^ri |
| | | | /i/ | zi^no | zi^no-zino | zino^ri |
| | voiceless | /s/ | /a/ | sa^no | sa^no-sano | sano^ri |
| | | | /i/ | si^no | si^no-sino | sino^ri |

[6] I used *two* mimetic morphophonological templates in case magnitude-symbolic effects are ascribed to a particular mimetic template, not mimetic templates in general (see also footnote 8).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

| | | | | | | |
|---|---|---|---|---|---|---|
| Bilabial plosive | voiced | /b/ | /a/ | ba^no | ba^no-bano | bano^ri |
| | | | /i/ | bi^no | bi^no-bino | bino^ri |
| | voiceless | /p/ | /a/ | pa^no | pa^no-pano | pano^ri |
| | | | /i/ | pi^no | pi^no-pino | pino^ri |

### 3.2. Prediction

A specific prediction within Hypothesis (2) is as follows. If magnitude symbolism is more effective—i.e. the largeness effects of voiced Cs and /a/ and the smallness effects of voiceless Cs and /i/ are promoted—in mimetics, then the difference in magnitude symbolism between a voiced C and a voiceless C or between /a/ and /i/ will be greater in morphophonologically mimetic (i.e. CV^CV-CVCV, CVCV^ri) words than in morphophonologically nonmimetic (i.e. CV^CV) words.

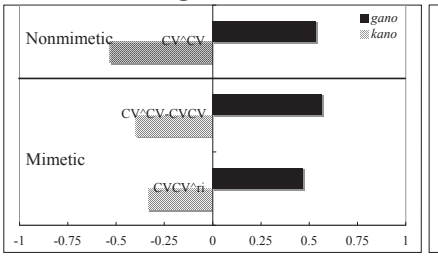
### 3.3. Results

Results of the experiment partially supported the hypothesis. First of all, in accordance with the previous findings, nonmimetic as well as mimetic words instantiated magnitude symbolism. A three-way analysis of variance showed the significance of the main effects of all the three factors (voicedness of C1: $F$ (11, 708) = 457.18, $p < .001$; /a/ vs. /i/ of V1: $F$ (11, 708) = 37.50, $p < .001$; mimetic vs. nonmimetic: $F$ (11, 708) = 4.70, $p < .01$). Intriguingly, the effect size of the voicedness factor was overwhelmingly greater than those of the other two factors (voicedness: $\eta p^2 = .39$; /a/ vs. /i/: $\eta p^2 = .05$; mimetic vs. nonmimetic: $\eta p^2 = .01$).

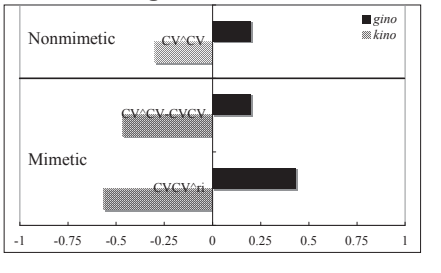
What is directly concerned with the present discussion is the mimeticity factor. Subjects' ratings were recalculated in order that "large" and "small" judgments have positive and negative numbers, respectively (from "-1" to "+1" with "0" as moderate). The graphs in (8) give a mean score for each stimulus, comparing each two roots constituting a minimal pair with respect to the voicedness of their first consonants. In each graph, the first pair of bars indicates mean scores for nonmimetic stimuli (i.e. CV^CV), and the second and third pairs of bars indicate those for mimetic stimuli (i.e. CV^CV-CVCV and CVCV^ri, respectively).

(8) Mean scores for magnitude symbolism of C1 (voiced vs. voiceless):

a. ***g****ano* vs. ***k****ano*



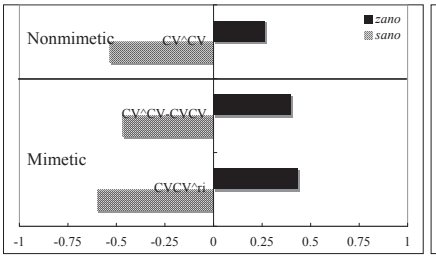

b. ***g****ino* vs. ***k****ino*



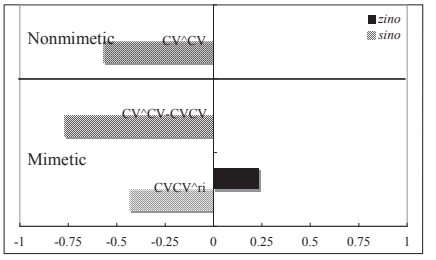



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

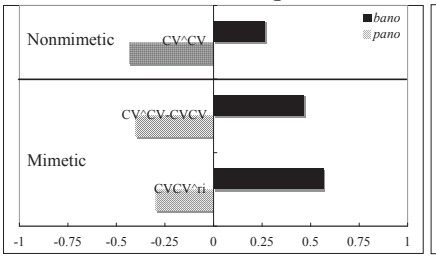
c. *zano* vs. *sano*



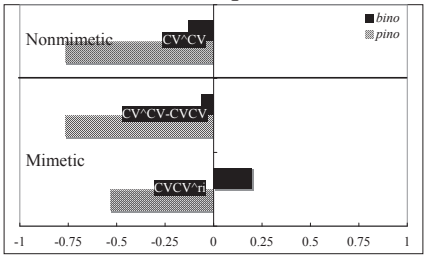

d. *zino* vs. *sino*




e. ***b**ano* vs. ***p**ano*



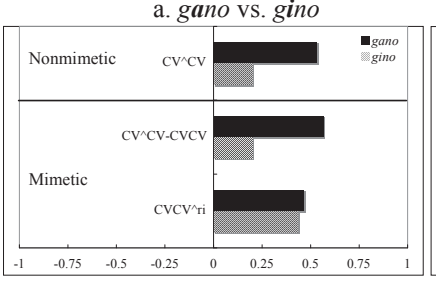

f. ***b**ino* vs. ***p**ino*



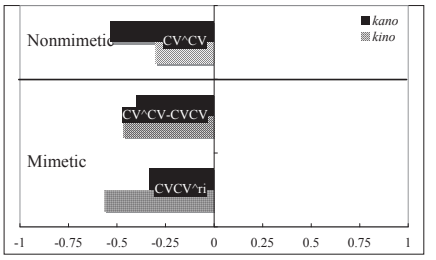

The graphs in (9) compare each two roots constituting a minimal pair with respect to their first vowels (i.e. /a/ and /i/).

(9) Mean scores for magnitude symbolism of V1 (/a/ vs. /i/):

a. *g**a**no* vs. *g**i**no*

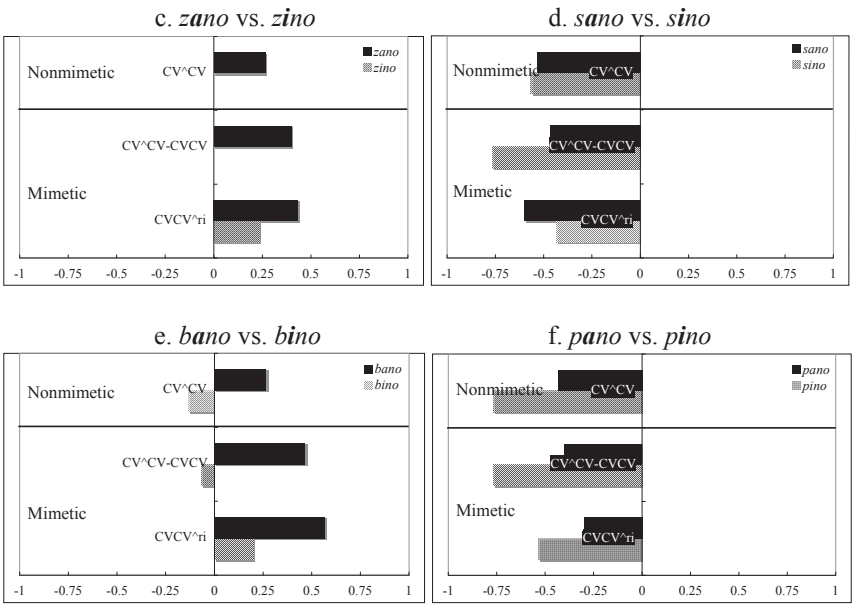



b. *k**a**no* vs. *k**i**no*






In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.




### 3.4. Analysis and Discussion

For examination of the prediction set in Section 3.2, differences between the scores for nonmimetic stimuli and those for mimetic stimuli—namely, between CV^CV and CV^CV-CVCV stimuli and between CV^CV and CVCV^ri stimuli—were calculated. Statistical comparisons were drawn between nonmimetic CV^CV and mimetic CV^CV-CVCV scores and between nonmimetic CV^CV and mimetic CVCV^ri scores. Post-hoc tests (one-tailed Wilcoxon signed-rank tests) for the Friedman test revealed that most mimetic-nonmimetic pairs form no significant contrast in their magnitude-symbolic effects.[7] However, in two cases, mimetics produced significantly greater magnitude-symbolic effects than nonmimetics ((8b) *gi^no*-minus-*ki^no* < *gino^ri*-minus-*kino^ri*: $Z$ (19) = -2.58, $p$ < .007 = adjusted significance level; (9b) *ka^no*-minus-*ki^no* < *kano^ri*-minus-*kino^ri*: $Z$ (19) = -2.13, $p$ < .03). Moreover, approaching significance was obtained for two cases ((8b) *gi^no*-minus-*ki^no* < *gi^nogino*-minus-*ki^nokino*: $Z$ (19) = -1.51, $p$ < .07; (9d) *sa^no*-minus-*si^no* < *sa^nosano*-minus-*si^nosino*: $Z$ (19) = -1.80, $p$ < .07). What is crucial for the current context is the fact that there was *only one* case in which nonmimetic words surpass mimetic words in their magnitude-symbolic effects—although merely with approaching significance ((9d) *sa^no*-minus-*si^no* > *sano^ri*-minus-*sino^ri*: $Z$ (19) = -1.51, $p$ < .07). This set of

[7] The Friedman and the Wilcoxon tests, nonparametric alternatives to repeated measures ANOVA and the paired Student's *t*-test, respectively, were used because the current experiment employed an ordinal scale (see Section 3.1), which is unfit for the parametric tests (Pett 1997).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



results suggest, even if they do not guarantee, that magnitude symbolism of consonants and vowels is more effective in mimetic words, although it can work in nonmimetic ones as well.[8] Note, however, that the inequality in magnitude-symbolic effects observed between the two mimetic templates used in the present experiment suggests the need for consideration of other mimetic templates.[9]

## 4. Conclusion

In this paper, I have claimed that sound-symbolic effects work more effectively in morphophonologically mimetic words than in morphophonologically nonmimetic ones with magnitude symbolism of consonants and vowels as examples. At the moment, we have more positive than negative evidence for the hypothesis. Larger-scale follow-up experiments are expected to clarify the phonosemantically as well as morphophonologically definable status of the Mimetic stratum of Japanese. This clarification will substantiate the alleged existence of the semantic peculiarity that native Japanese speakers' intuitions find for the word class at issue.

There are some specific improvements to be made in future research. First, since the present study employed a mere four-graded scale for rating, it will be useful for clearer discrimination among stimulus words to adopt a scale that allows finer-grained evaluations. Second, we need to extend our observation to other semantic scales than magnitude—softness, roundness, loudness, for example. Finally, we have to examine the sound-symbolic properties of words with various segmental combinations. Investigations in this line will surely contribute to the identification of the fundamental characteristics of sound symbolism and mimetics.

## References

Abelin, Åsa. 1999. *Studies in Sound Symbolism.* Gothenburg Monographs in Linguistics 17. Göteborg: Göteborg University.

Akashi, Kaori. 2007. Variation of Emphatic Mora Augmentation in Japanese Mimetics. *Phonological Studies* 10:3-10.

Akita, Kimi. 2008. Onsyootyoogo-no "hantyuuka-mondai"-e-no hitotu-no kotae: Tamori & Schourup (1999)-e-no ripurai [Defining the mimetic category in the

[8] An experiment using existent words as stimuli might give still milder results, for sound-symbolic interpretation tends to be strong in nonwords (Bentley and Varon 1933; Brown 1958; Westbury 2005).

[9] The results for the reduplicative template were more consistent with my prediction than those for the suffixed template. This seems to stem from the templatic magnitude symbolism of the reduplicative construction. As Sharon Inkelas pointed out at the conference, reduplication generally enhances the spatial, temporal, or more abstract size of referent entities, properties, and eventualities, as in Japanese *ieie* 'houses' (< *ie* '(a) house') and *akaaka* 'bright red' (< *aka* 'red'). Furthermore, we have to consider the possibility that the template CVCV^ri carries the segmental sound symbolism of /r/ and /i/ as well as a templatic sound symbolism.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Japanese lexicon: A reply to Tamori and Schourup (1999)]. *Proceedings of the Eighth Annual Meeting of the Japanese Cognitive Linguistics Society*.

Bentley, Madison, and Edith J. Varon. 1933. An Accessory Study of "Phonetic Symbolism." *American Journal of Psychology* 45(1):76-86.

Brown, Roger. 1958. *Words and Things.* New York: The Free Press.

Diffloth, Gérard. 1994. /i:/ Big, /a/: Small. In L. Hinton, J. Nichols, and J. J. Ohala, eds., *Sound Symbolism*, 107-114. Cambridge: Cambridge University Press.

Fukazawa, Haruka, Mafuyu Kitahara, and Mitsuhiko Ota. 1998. Lexical Stratification and Ranking Invariance in Constraint-Based Grammars. *CLS* 34: *The Panels*, 47-62. Chicago Linguistic Society.

Hamano, Shoko. 1998. *The Sound-Symbolic System of Japanese.* Stanford, CA: Center for the Study of Language and Information.

Itô, Junko, and R. Armin Mester. 1995. Japanese Phonology. In J. A. Goldsmith, ed., *The Handbook of Phonological Theory*, 817-838. Oxford: Blackwell.

Itô, Junko, and R. Armin Mester. 1999. The Phonological Lexicon. In N. Tsujimura, ed., *The Handbook of Japanese Linguistics*, 62-100. Oxford: Blackwell.

Johnson, Ronald C. 1967. Magnitude Symbolism of English Words. *Journal of Verbal Learning and Verbal Behavior* 6(4):508-511.

Lu, Chiarung. 2006. Giongo/gitaigo-no hiyuteki-kakutyoo-no syosoo: Nintigengogaku-to ruikeiron-no kanten-kara [Aspects of figurative extensions of mimetics: From Cognitive Linguistic and typological perspectives]. Ph.D. diss., Kyoto University.

Kakehi, Hisao, Ikuhiro Tamori, and Lawrence Schourup. 1996. *Dictionary of Iconic Expressions in Japanese.* Berlin/New York: Mouton de Gruyter.

Kawahara, Shigeto, Kazuko Shinohara, Akira Nakayama, Shinsuke Oshida, Ikuyo Kaneko, Miko Odate, and Yoshihiro Matsunaka. 2005. Nihongo-no on'in-sosei-ga kanki-suru imeezi-ni tuite-no zikken-kenkyuu [An experimental study on images evoked by phonological features in Japanese]. *Papers from the 22nd Annual Meeting of Japanese Cognitive Science Society*.

Kawahara, Shigeto, Kazuko Shinohara, and Yumi Uchimoto. 2008. A Positional Effect in Sound Symbolism: An Experimental Study. *Proceedings of the Eighth Annual Meeting of the Japanese Cognitive Linguistics Association*.

Kurisu, Kazutaka. 2006. Theoretical Implications of Mimetic Voicing in Japanese. In T. J. Vance and K. Jones, eds., *Japanese/Korean Linguistics* 14, 51-62. Stanford, CA: Center for the Study of Language and Information.

McCawley, James D. 1968. *The Phonological of a Grammar of Japanese.* The Hague: Mouton.

Magnus, Margaret. 1999. *The Gods of the Word: Archetypes in the Consonants.* Truman State University Press.

Makino, Seiichi. 2007. An Argument for Non-arbitrary Relationship between Sound and Meaning in Japanese Grammar. In Y. Ikegami, V. Eschbach-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Szabo, and A. Wlodarczyk, eds., *Japanese Linguistics: European Chapter*, 239-250. Tokyo: Kurosio.

Miyajima, Tatsuo. 1977. Goi-no taikei [The lexical system]. In S. Oono et al., eds., *Nihongo* 9: *Goi-to imi* [Japanese 9: Lexicon and semantics], 1-41. Tokyo: Iwanami.

Newman, Paul. 2001. Are Ideophones Really as Weird and Extra-systematic as Linguists Make Them Out to Be? In F. K. E. Voeltz and Ch. Kilian-Hatz, eds., *Ideophones*, 251-258. Amsterdam/Philadelphia: John Benjamins.

Pett, Marjorie A. 1997. *Nonparametric Statistics for Health Care Research: Statistics for Small Samples and Unusual Distributions*. Thousand Oaks/London/New Delhi: SAGE.

Sapir, Edward. 1929. A Study in Phonetic Symbolism. *Journal of Experimental Psychology* 12(3):225-239.

Shinohara, Kazuko, Shigeto Kawahara, Akira Nakayama, and Yoshihiro Matsunaka. 2007. Onsyootyoo-to sintaisei [Sound symbolism and embodiment]. *Kotoba-to ningen: Journal of Human Linguistics Circle* 6:1-12.

Tamori, Ikuhiro, and Lawrence Schourup. 1999. *Onomatope: Keitai-to imi* [Onomatopoeia: Form and meaning]. Tokyo: Kurosio.

Tateishi, Koichi. 2003. Are Borrowed Morphemes Always Foreign? In T. Honma, M. Okazaki, T. Tabata, and S. Tanaka, eds., *A New Century of Phonology and Phonological Theory: A Festschrift for Professor Shosuke Haraguchi on the Occasion of His Sixtieth Birthday*, 258-267. Tokyo: Kaitakusha.

Tokieda, Motoki et al., eds. 1955. *Kokugogaku ziten* [A dictionary of Japanese linguistics]. Tokyo: Tokyodo.

Ultan, Russell. 1978. Size-Sound Symbolism. In J. Greenberg, ed., *Universals of Human Language, Volume 2: Phonology*, 525-568. Stanford, CA: Stanford University Press.

Westbury, Chris. 2005. Implicit Sound Symbolism in Lexical Access: Evidence from an Interference Task. *Brain and Language* 93(1):10-19.

Wiltshire, Caroline R. 1999. Expressives in Tamil: Evidence for a Word Class. In R. Singh, ed., *The Yearbook of South Asian Languages and Linguistics*, 119-137. New Delhi/Thousand Oaks/London: SAGE.

Yamaguchi, Nakami. 2002. *Inu-wa* biyo-*to naiteita: Nihongo-wa giongo/gitaigo-ga omosiroi* [Dogs were crying *biyo*: It is mimetics that are interesting in Japanese]. Tokyo: Kobunsha.

Kimi Akita
Department of Linguistics
Graduate School of Humanities and Social Sciences
Kobe University
1-1 Rokko-dai-cho, Nada-ku, Kobe-shi
Hyogo 657-0016 Japan

akitambo@gmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# A Semantic Analysis of the Wason Selection Task

JEANNE APTEKMAN
*Lattice UMR 8094 (ENS, Centre National de la Recherche Scientifique)*

## 0. Introduction: Logic, Natural Language and the Psychology of Reasoning

In introduction, we would like to focus on the distinction between three different levels: a logical relation, a (logical) formalization of this relation, and the way natural language expresses this relation. By analyzing the relations between these three levels, we would like to present the aims and the complexity of the psychology of reasoning's program.

### 0.1. Logical Implication, Material Conditional and *SI*-Clauses

Let us look at the following example:

(1) *Paris est la capitale de la France et Berlin la capitale de l'Allemagne,*
Paris is the capital of France and Berlin is the capital of Germany

From this sentence, everybody agrees to conclude with:

(2) *Donc, Paris est la capitale de la France*. (Ou *Donc Berlin est la capitale de l'Allemagne*).
Then, Paris is the capital of France (*Or* Berlin is the capital of Germany)

In the same way, everybody agrees to accept as logically true the following conditional statement:

(3) *Si Paris est la capitale de la France et Berlin la capitale de l'Allemagne,*
*Alors Paris est la capitale de la France.*
If Paris is the capital of France and Berlin is the capital of Germany,
Then Paris is the capital of France.

Everybody seems to agree to say that (3) has to be understood as a true statement.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



What allows us to recognize (3) as true does not depend on a specific formalization, nor on a definite logic. It is not necessary to be a trained logician to accept as true this statement. Both the naïve subject and the great mathematician would admit that we have a relation of logical entailment at work.

Moreover, we can see that this relation does not rely on what is specifically expressed in this example. We consider (2) as a logical consequence of (1) because of their logical form. Then, by keeping the same form in both the premise and the apodosis, we must get the same logical consequence relationship between them. So from any *A and B* statement, we can (or must) infer *A* or *B*.

So from a relationship between two particular statements, we got to a relationship between two forms, and what justifies that anybody accepts (3) as true is its very form.

Then, what logic does is trying to express this consequence relation by determining which forms activate it. It is not about constructing this relation, but about characterizing it in using the form of the statements that activate it. For doing it, Classical Logic develops a connector called material conditional.

The logical approach is a vericonditional one, which means that it is interested in truth conditions. Material conditional is then defined by its truth table, which is the following:

| P | Q | P ⊃ Q |
|---|---|---|
| V | V | V |
| V | F | F |
| F | V | V |
| F | F | V |

This truth table is grounded on the idea that the truth of the premise has to be transmitted to the apodosis, so when P is true, Q has to be true as well, and the only case in which the conditional statement is considered to be false is then the one in which P is true and Q is not.

But, this truth table was built for material conditional, not for SI-clauses and IF-clauses.

So we have three different things:

- A logical relation of necessary entailment (logical implication)
- A formalization of this relation (material conditional)
- Natural language IF-Clauses

We think that the main epistemological problem that psychology of reasoning has to solve is confusion between these three levels.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



### 0.2. Psychology of Reasoning

There are two different aims for psychology of reasoning. The first one is to specify the relation between logic and reasoning by testing subjects' reasoning abilities. The second one, which is strongly related to the first one, is to examine the hypothesis of a mental logic[1] that would be internal to the brain. The hypothesis of a Mental Logic claims that logic is no longer thought as a formalisation or as a characterization of external laws. On the contrary, these laws are supposed to be first and subjects are tested to check if their reasoning is really congruent with the formalization proposed by logic.

The weak one tries to determine whether or not ordinary conditionals in *si…, alors* or in *if…, then* correspond to material conditionals, which is to determine whether or not the way subjects understand expressions associated with logical implication (*si… alors* clauses) correspond to its characterization in terms of material conditionals.

On the contrary, the strong version tries to determine whether or not the subjects *right* in their understanding.

We consider that the second approach is irrelevant, since material conditionals and rules associated with them are not primitive: they have been built in order to express logical implication, but the ambiguity between these two different versions seems to be an impediment in the analysis that have been proposed to the results.

## 1. Wason Selection Task (WST), 1966.

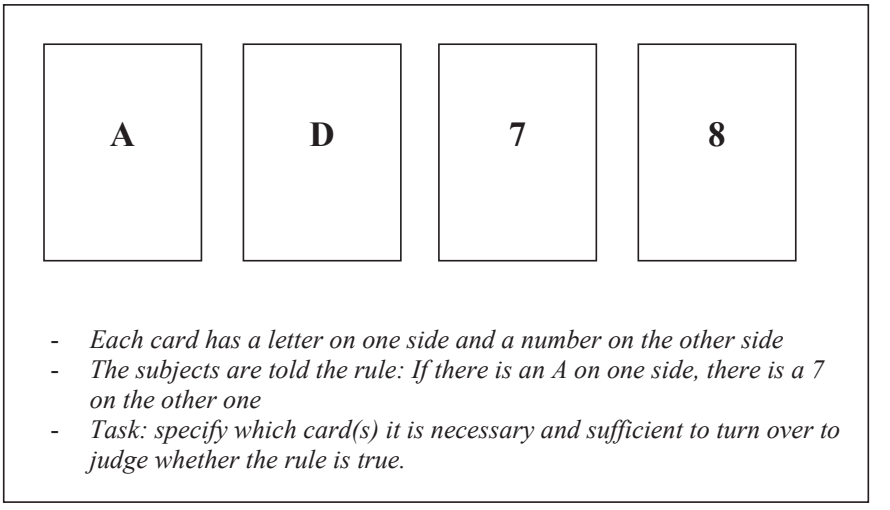
### 1.1. Presentation of the Task

In its paradigmatic version, the Wason Selection task consists in presenting four cards to the subjects. Each card is known to have a letter on one side and a number on the other side. Two of these cards are presented to the subjects with the letter side up, and two with the number side up. The subjects can read the following inscriptions on the four cards: A, D, 7, and 8. They are told that the rule is: If there is an A on one side, there is a 7 on the other one and they are asked to determine which card(s) it is necessary and sufficient to turn over to judge whether the rule is true.

[1] See Braine, P. and O'Brien, D. 1998



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.




The expected answers are the A-card and the 8-card, since if there were an A on the other side of the 8-card, it would falsify the rule. But, if most subjects decide to pick up the A-card (*P card*), 90% of them fail to choose the 8-card (*Not-Q card*). Actually, more people choose to pick-up the 7-card (*Q card*)

The WST became famous because of these so-called *bad results*, and the question that arose was to understand why the subjects fail.

In order to answer this question, other versions have been proposed that were more familiar versions (Cosmides and Tooby 1992) or deontic versions (Griggs and Cox 1982).

But there are two different ways of understanding these results that corresponds to the two versions of the psychology of reasoning program for conditionals.

Then first way of understanding these results, which corresponds to the strong version of the program, would be to refute any logical ability to the subjects. It seems however unsatisfactory, since subjects do manifest logical abilities in everyday life, even if they are "logically naïve." Moreover, as we said, the material conditional has been built on the basis of what was recognized as true by everyone: thus the implication relation is a relation that subjects are able to perceive.

The second way is by postulating a gap between what the experimenter wants to test and what is actually tested. That would correspond to the weak version. If we agree to this understanding, as we do, we now have to determine what is actually tested in this task.

The first answer to this question is given by Sperber, Cara and Girotto (1995), and their relevance explanation of the tasks and its results.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 1.2. A Pragmatic Analysis of the Wason Selection Task

Sperber, Cara and Girotto (1999) propose a pragmatic analysis of the Wason selection task using relevance principles. This analysis is grounded on five hypotheses:

- Subjects understand the task as one of selecting potentially relevant evidence for evaluating the truth of the rule.
- Subjects envisage evaluating the rule in the only possible way, that is, indirectly, through its observationally testable consequences.
- Inferring some of the consequences of any statement is done spontaneously, as part of the process of comprehension, in order to arrive at *relevant-as-expected* interpretation.
- Subjects trust their intuitions, that is the output of their spontaneous inferential abilities; they take the directly testable consequences that they have inferred to be the consequences through which the rule should be tested.
- Subjects select the cards the observation of which may directly test these spontaneously derived consequences (Sperber, Cara and Girotto 1999)

By applying these principles, it seems natural to pick the A-card, and possibly the 7-card. Using their hypothesis, Sperber, Cara and Girotto set up easy experiments that respect the general rules of the Wason selection task and that are answered successfully by the subjects. So what Sperber *et al.* tell us is that this task is not testing the subjects' abilities to understand and apply conditional statements, *at least as they are understood by classical logic.*

However, the rule in the Wason Selection Task is formulated as a conditional statement (*If P then Q / Si P, alors Q*), which is generally understood as corresponding to material implication. We are going to examine what it could teach us about the meaning of IF.

### 1.3. What do the WST's Results Tell Us about the Meaning of *If*?

We have seen that the task does not test the ability of understanding and applying conditionals. The subjects do not understand this task as a reasoning task, and depend on their intuitions to solve he problem, while experimenters would like subjects to rebuild the truth table of material implication. But this aim depends on the assumption that material implication and its "translation" in natural language (*If…then / Si…alors* statements) do coincide, which does not seem to be the case. The Wason selection task tests the subjects' understanding of *If…then / Si…alors* statements, and shows us that this understanding differs from the one associated with material conditional.

Thus, *subjects are not wrong, and their answer help us specify the meaning of If /Si*. That is the reason why we would like to introduce now our semantic analysis of the Wason selection task.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 2. A Semantic Analysis of the Wason Selection Task

We believe that the results can be explained in a very simple way: Subjects do what they are told to do. They understand the rule as an *If* (or *Si*)-clause, rather than as a material conditional. We base this interpretation on a study of *SI*-clauses in French, which allows us to classify them into four classes of uses.

In order to introduce our semantic analysis of these results, we will now briefly present this classification[2].

### 2.1. A Study of *SI*-Clauses

The classification we propose is made up with four classes of uses:

- The enunciative uses
- The hypothetical uses
- The concessive uses
- The comparative uses

The idea pertaining to this study is that the *SI*-clauses work as space constructors (Dancygier and Sweetser 2005), and we characterize the space set up by *SI* as a transitory frame for the apodosis. In using this understanding of the *SI*-clauses, we can show how we can reinterpret the subjects' answers to the selection task as a proper understanding of the instructional meaning of *SI*, as well as a proper understanding of the instructional meaning of *IF*.

### 2.2. Enunciative Uses: Discourse Conventions

The enunciative uses work as discourse conventions set up in the protasis that make the enunciation of the apodosis possible. This possibility is an enunciative possibility: the protasis can provide either acceptability conditions for the apodosis (metalinguistic uses) or relevancy conditions (speech act uses).

**Metalinguistic comment on what is said:**

The first category of enunciative uses is the metalinguistic comments, which can concern:

- A single term in the apodosis, as in the following examples:

(4) Faut-il signaler encore un pneu non pas increvable, mais qui se rit – **SI l'on peut dire** – de la crevaison ? (H. Tinard, L'Automobile)

(5) I consider this work, **if you permit me**, to be rather good.

- The whole apodosis:

(6) Il manquait de conscience et, **SI l'on excepte** son amitié pour Robert, il n'avait pas de fidélité. (Georges Bataille, *l'abbé C*).

[2] for more details, see Aptekman 2008



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(7) Such, unfortunately, is the case, **if we except** perhaps the admirable list of editions due to the great Panizzi (NY Times book review)

- A language convention

(8) *SI les transports publics sont la vie d'une ville, Vancouver est dans le coma.*
(9) *If public transit is the lifeblood of a dynamic city, Vancouver is in a coma (cited in Dancygier & Sweetser 2005)*

**Speech act conditionals:**

(10) SI tu as soif, il y a de la bière dans le frigo
(11) If you're thirsty, there is beer in the fridge

### 2.3. Hypothetic Uses

We distinguish these enunciative uses from the hypothetic ones that involve cases in which the protasis *activates* (*déclenche*) the apodosis in a *factual* or in an *inferential* way. In the first case, we will talk about hypothetico-prospective uses, and in the second one, we would say that the uses are inferential.

**Hypothetico-prospective uses**

We call 'hypothetico-prospective' the uses that involve a notion of prediction, by presenting the protasis as *potential*.

(12) **Si** je gagne au loto, j'achèterai une voiture / **Si** je gagnais au loto, j'achèterais une voiture
(13) **If** I win the lottery, I'll buy a car / **If** I won the lottery, I'd buy a car

**Hypothetico-deductive conditionals and explicative uses: *inferential* uses**

We also consider as hypothetic some uses that are not prospective, but in which the protasis still activate the apodosis, even if it is not in a factual way.

We consider as hypothetico-deductive uses the uses that express a prediction that is neither temporal nor predictive (14), and the uses that are usually considered as explicative[3] or epistemic[4] ones (15 and 16).

(14) Ecoute, Antoine, tu diras tout ce que tu veux, moi je sors pas de là : SI tu obliques, tu vas pas tout droit*!* (Alain Robbe-Grillet, *Les Gommes*, 1952)
(15) If you turn right, you don't go straight
(16) S'il est riche, **c'est qu'**il a dû magouiller pas mal

[3] Cf. De Vogüe 1986.
[4] Cf. Dancygier et Sweetser 2005.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(17) **If** he was running, he must have been guilty (Internet)
(18) **If** ever there was a good Yankee, he must have been Irish (Internet)

### 2.4. Concessive Uses: Non Efficient Cause and Limit Condition

The third class of uses we distinguish gathers concessive uses. In such uses, what is expressed in the protasis allows what is expressed in the apodosis *despite an implicit entailment (thwarted)* that would assert *If P, not Q*.

In these uses the protasis sets up a frame in which the apodosis unexpectedly holds.

(19) Je n'ai le droit de le dire à personne, **même SI** au fond tout le monde s'en fout…
(20) **SI** Jake et Chuckie sont les personnages centraux du roman, ce serait faire injure à Mac Liam Wilson d'oublier la palette d'individus tous plus extravagants les uns que les autres. (Book review on the Internet)
(21) Toutefois, l'union - fruits, **SI** elle est en constantes relations avec le conseil supérieur de la conserve, a une gestion absolument indépendante.
(L'industrie des conserves en France, 1950)
(22) Even **if** something is not true, if it's repeated loudly and publicly enough, people tend to start believing the lie. (Internet website)

### 2.5. Comparative Uses: Comparison Scale (specific to French)

The last class we would like to introduce gathers the comparative uses that introduce a comparison between the protasis and the apodosis.

In these uses, the *SI* seems to connect the protasis and the apodosis without placing them in an inferential relation. So these uses are very different from the concessive ones since they d not refer to an implicit (thwarted) entailment. On the contrary, they put the two propositions in parallel, on a common scale.

In English, it could be translated by *while*:

(23) SI Jean est adorable, Lucie est insupportable
~ While Jean was charming, Lucie was impossible

(24) Je ne nie point que **SI** vingt métiers font la misère, vingt aventures font la solitude.
(Hervé Bazin, La Mort du petit cheval)

## 3. Conclusion: *SI* Introduces a *Transitory Frame* for the Apodosis and Subjects Understand IF-Clauses in the WST

In all these uses, we can consider SI as providing a frame for the apodosis, and this frame must be understood as transitory. This frame is built in the protasis in order to interpret the apodosis.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Based on this hypothesis it is easy to reinterpret the WST's results: they appear to show that subjects d understand *If/Si-clauses*. Actually, almost all subjects pick up the A card, that is the frame *P card*. By doing this, they set up a frame that corresponds to the one set up by the apodosis. Then a large part of them chooses to turn over the 7 card, which is the apodosis *Q card.* They consider the apodosis within the protasis frame. So by choosing the *P-card* and the *Q card*, subjects do exactly what SI-clauses tell us to do: they use P as a frame, and they consider what happens in this frame.

In this understanding, the 8-card (*Not-Q card*) is out of the protasis frame, and subjects have no reason to choose it. *If/Si-clauses* semantics does not allow subjects to pick up the Not-Q card.

**References**

Aptekman, J. 2008. Locutions En Si Et Marqueurs Dans La Protase: Indice Cotextuels et Compositionnalité. *Corela* 6(1). http://corela.edel.univ-poitiers.fr/index.php?id=224.

Caron, J. 1992. *Précis de Psycholinguistique*. Paris: Presses Universitaires du France.

Comrie, B. 1986. Conditionals: A Typology. In E. C. Traugott, A. Ter Meulen, J. Snitzer Reilly, and C. A. Ferguson, *On Conditionals*, 77–99. Cambridge: Cambridge University Press.

Cornulier, B. 1985. *Effets de Sens*, Paris, Seuil.

Cosmides, L. 1989. The Logic Of Social Exchange: Has Natural Selection Shaped How Humans Reason? Studies with the Wason Selection Task. *Cognition* 31, 187-276.

Culioli, A. 1990. *Pour Une Linguistique de L'énonciation. Opérations Et Représentations,* Tome 1. Paris: Ophrys.

Culioli, A. 1999. *Pour Une Linguistique de L'énonciation. Formalisation Et Opérations de Repérage,* Tome 2. Paris: Ophrys.

Culioli, A. 1999. *Pour Une Linguistique de L'énonciation. Domaine Notionnel,* Tome 3. Paris: Ophrys.

Dancygier, B. 1988. *Conditionals and Concessives, Papers and Studies in Cognitive Linguistics* 24, 123-32.

Dancygier, B. 1993. Interpreting Conditionals: Time, Knowledge and Causation. *Journal Of Pragmatics* 19, 403-34.

Dancygier, B. 1998. *Conditionals and Prediction: Time, Knowledge and Causation in Conditional Constructions.* Cambridge Studies in Linguistics, 87. New York: Cambridge University Press.

Dancygier, B. and E. Sweetser. 2005. *Mental Spaces in Grammar: Conditional Constructions.* Cambridge Studies in Linguistics, 108. New York: Cambridge University Press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Degand, L. and H. Pander Maat. 2003. A Contrastive Study of Dutch and French Causal Connectives on the Speaker Involvement Scale. In A. Verhagen and J. Van de Weijer, eds., *Usage-based Approaches to Dutch: Lexicon, Grammar, Discourse*. Utrecht: LOT, 175-199.

Degand, L. and H. Pander Maat. 1999. Scaling Causal Relations in Terms of Speaker Involvement. In *Levels of Representation in Discourse*, *Working Notes of the International Workshop on Text Representation*, 45-54. Edinburgh University.

Fauconnier G., and M. Turner. 1996. Blending as a Central Process Of Grammar. In A. Goldberg, ed., *Conceptual Structure, Discourse, and Language*, Stanford, CLSI.

Fauconnier, G. and E. Sweetser, eds., 1996. *Space, Worlds and Grammar*. Chicago: University Press Of Chicago.

Filippi, C. 1998. La Relation de Concession: Etude Contrastive de *Though* En Anglais Et de *Bien Que*, *Même Si* Et *Encore Que* En Français. *Linguistique Contrastive Et Traduction* 4. Paris: Ophrys.

Grice, H. P. 1957. Meaning. In *Philosophical Review* 66, 77–88.

Grice, H. P. 1975. Logic and Conversation. In P. Cole and J.L. Morgan, eds., *Syntax and Semantics 3: Speech Acts.* Vol. 3, 41-58. New York: Academic Press.

Griggs, R. A., and J. R. Cox. 1982. The Elusive Thematics Material Effect in Wason's Selection Task. *British Journal Of Psychology* 73, 407-420.

Lakoff, G. 1987. *Women, Fire, and Dangerous Things: What Categories Reveal About the Mind*. Chicago: University of Chicago Press.

Langacker, R. W. 1987. *Foundations of Cognitive Grammar: Theoretical Prerequisites.* Stanford: Stanford University Press.

Sperber, D., F. Cara, and V. Girotto. 1995. Relevance Theory Explains the Selection Task. In *Cognition*, 57: 31-95.

Sperber, D. and D. Wilson. 1989. *La Pertinence : Communication et Cognition.* Paris: Les Editions de Minuit.

Sweetser, E. 1996a. Reasoning, Mappings and Meta-Metaphorical Conditionals. In M. Shibatani and S. Thompson, eds., *Grammatical Constructions: Their Form and Meaning*. Oxford: Oxford University Press.

Sweetser, E. 1996b. Mental Spaces and the Grammar Of Conditional Constructions. In G. Fauconnier, G. and E. Sweetser, eds. *Space, Worlds and Grammar*. Chicago: University Press of Chicago.

Sweetser, E. 1997. Role and Individual Readings Of Change Predicates. In J. Nuyts and E. Pederson, eds., *Language and Conceptualization*. Oxford: Oxford University Press.

Talmy, L. 2000. *Toward A Cognitive Semantics*. Cambridge: Cambridge University Press.

Talmy, L. 2005. The Fundamental System of Spatial Schemas in Language. In D. B. Hampe and J. E. Grady, eds., *From Perception To Meaning: Image Schemas in Cognitive Linguistics*, 198-234. Berlin: Mouton de Gruyter.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Victorri, B., and C. Fuchs. 1996. *La Polysémie--Construction Dynamique Du Sens,* Hermès.

Walliser, B., D. Zwirn, and H. Zwirn. 2005. Abductive Logics in A Belief Revision Framework. *Journal of Logic, Language, and Information.*

Wason, P. C. 1966. Reasoning. In B. M. Foss, ed. *New Horizons in Psychology*. Harmondsworth: Penguin.

Jean Aptekman
Lattice (UMR 8094)
1, rue Maurice Arnoux
92120 Montrouge
France

jeanne.aptekman@gmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Palatalization as Overlap of Articulatory Gestures: Crosslinguistic Evidence

NICOLETA BATEMAN
*California State University, San Marcos*

## 0. Introduction

This paper addresses an asymmetry in the behavior of labial consonants with respect to two types of palatalization, *full* and *secondary*. *Full palatalization* involves consonants being articulated within the palatal region of the vocal tract when adjacent to a palatal vocoid such as *i, e, j*, as in (1). *Secondary palatalization* involves consonants acquiring a secondary palatal articulation in the same context, as in (2):

(1) Full palatalization:

| | | | |
|---|---|---|---|
| [kɨfɛ̲t] | 'open!' | (masc. sg. Imperative) | (Amharic, Ethiopia) |
| [kɨfɛ̲ʧi] | 'open!' | (fem. sg. Imperative) | |

(2) Secondary palatalization:

| | | | |
|---|---|---|---|
| /jamati/ | [jamaṯ̲ʲi] | 'a person' | (Waṯjarri, Australia) |

Palatalization has been reported to affect consonants at the three major places of articulation, labial, coronal, and dorsal, in asymmetrical ways. For example Bhat (1978), whose crosslinguistic survey presents 120 instances of various types of palatalization, finds that secondary palatalization is common for consonants at all three places of articulation, while what I call full palatalization is common for coronal and dorsal consonants, but rare for labial consonants. He reports only five languages with labial full palatalization: the Moldavian dialect of Romanian (Romance, Romania), Tswana (Southern Bantu, Botswana), Lumaasaba (Narrow Bantu, Uganda), Fula (Niger Congo, Cameroon), and Chontal (Hokan, Mexico). This suggests that labials are more resistant than coronals and dorsals to full palatalization, or shifting to coronal articulations. In addressing the issue of labial to coronal shifts, particularly those in Southern Bantu, Ohala (1978) proposes a perceptual explanation: labials followed by a palatal glide can be directly perceived as coronals.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Two questions arise as a result of Bhat's (1978) generalizations about the prevalence of full and secondary palatalization and Ohala's (1978) perceptual explanation of labial to coronal shifts. First, why is there an asymmetry between full and secondary palatalization for labial consonants? And second, if labial full palatalization is perceptually motivated, why is it so rare?

Answers to both of these questions are informed by a new crosslinguistic study of palatalization (Bateman 2007a). For this study I surveyed 117 languages from 86 genera (language subfamilies, such as Germanic or Romance, Dryer 1989), geographically and areally balanced. Of these, 58 show some type of palatalization, and 59 do not. Tables (3) and (4) below summarize the number of languages/dialects where full and secondary palatalization is found, grouped according to major place of articulation.

(3) Full palatalization

| POA affected in a given language | Only Labial | Only Coronal | Only Dorsal | Coronal + Dorsal | Labial + Dorsal | Labial + Coronal | Labial, Coronal, Dorsal |
|---|---|---|---|---|---|---|---|
| Total | 0 | 27 | 9 | 12 | 0 | 0 | 2 |

Table (3) shows that coronal and dorsal consonants can undergo independent or co-occurring full palatalization in a language, while labial full palatalization always co-occurs with full palatalization of both coronal and dorsal consonants. There are only two languages in this sample where labials fully palatalize, the Moldavian dialect of Romanian, and Tswana, and there is no language where labials alone or labials and either coronals or dorsals show full palatalization.

(4) Secondary palatalization

| POA affected in a given language | Only Labial | Only Coronal | Only Dorsal | Coronal + Dorsal | Labial + Dorsal[1] | Labial + Coronal[1] | Labial, Coronal, Dorsal |
|---|---|---|---|---|---|---|---|
| Total | 0 | 7 | 9 | 3 | 2 | 4 | 10 |

Table (4) shows that, as with full palatalization, coronal and dorsal consonants can undergo independent or co-occurring secondary palatalization in a given language. The greatest difference involves labial consonants, as there are many more cases of secondary palatalization of labials (16 total). Nevertheless, even secondary palatalization of labials must co-occur with the palatalization of coronal and dorsal consonants, as noted by the asterisk in the third- and second-

[1] All of these cases have full palatalization of the third place of articulation



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



to-last columns of table (4), which indicates that in those languages where labials and either coronals or dorsals show secondary palatalization, the third place of articulation shows full palatalization. For example, in Zoque only labials and dorsals undergo secondary palatalization, while coronals undergo full palatalization.

The generalizations presented above reveal a striking pattern that positions labials against all other consonants. This suggests that the underlying issue relating full and secondary palatalization to the labial, coronal, and dorsal places of articulation must reside in some major difference between labial and non-labial sounds.

In the following sections I argue that palatalization is primarily an articulatory process, formally expressed as temporal overlap of articulatory gestures of the tongue and the lips (in the sense of Browman and Goldstein 1986, *inter alia*), thus capturing a major distinction between labials and non-labials: the former are articulated with the lips, while the latter are not. I show that this articulatory proposal makes the correct predictions regarding full and secondary palatalization for all consonants, and also explains the rarity of full labial palatalization. In particular, the model predicts that consonants at all three places of articulation should undergo secondary palatalization, and that only coronals and dorsals, but not labials, should undergo full palatalization. This prediction is reconciled with the attested cases of labial full palatalization via a diachronic explanation: for both Moldavian Romanian and Tswana there is historical evidence which demonstrates that labial consonants themselves did not undergo a change. Rather, a palatal glide that followed the labials progressively hardened to the palatal sound we see synchronically, followed by the deletion of the labial.

## 1. Current Proposal

I propose that the general patterns of palatalization as well as the particular patterns of labial palatalization are best explained by referring to the oral articulators *lips* and *tongue* and their interaction during speech production. The formal model is couched in Articulatory Phonology (AP; Browman and Goldstein 1986, Byrd 1996, Kochetov 1998, Gafos 2002), a framework that provides a straightforward explanation for phonological processes such as palatalization. In brief, full palatalization results from a high degree of temporal overlap of tongue-tongue gestures, while secondary palatalization results from a minimal degree of temporal overlap of tongue-tongue or lips-tongue gestures.

### 1.1. Background on Articulatory Phonology

In Articulatory Phonology the gesture is the main unit of phonological contrast. A gesture is specified in terms of an *articulator* (the *lips,* the *tongue tip*—TT, and the *tongue body*—TB), a *constriction location* (CL), which is roughly equivalent to place of articulation, and a *constriction degree* (CD), roughly equivalent to manner of articulation. In (5) I provide examples of gestural specifications for [t], [i], [tʲ], a palatalization target, trigger, and outcome, respectively:



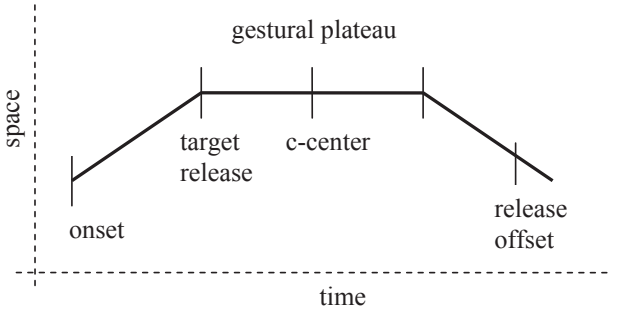
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(5) [t] gesture: TTCL [alveolar], TTCD [closed]
[i] gesture: TBCL [palatal], TBCD [narrow]
[tʃ] gesture: TBCL [alveo-palatal], TBCD [closed-critical]

In addition, gestures have a duration. As speech unfolds in real time consonant and vowel gestures must coordinate with one another, and as a result they can overlap in time. This type of gestural coordination, expressed as temporal overlap, explains phonological processes.

A gesture can be represented as in (6), using articulatory landmarks such as the *onset*, *target, c-center* (closure phase), and *release* phases of the gesture, shown horizontally on a temporal axis (Gafos 2002).

(6) Gestural landmarks (adapted from Gafos 2002)



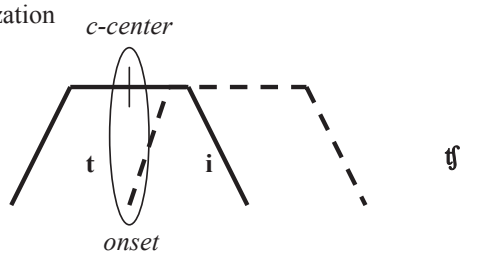

### 1.2. An Articulatory Model of Palatalization

Full and secondary palatalization can be profitably viewed as the outcome of gestural coordination resulting from temporal overlap (see also Kochetov 1998, Davidson 2003). As shown in (7), I propose that in full palatalization the onset phase of the vocalic gesture (dotted line) is synchronized with the c-center phase of the consonantal gesture (solid line), representing a high degree of temporal overlap. The c-center is a general landmark, the key idea being that the onset of the vocoid gesture is synchronized with some point during the closure phase of the consonantal gesture, which is within the c-center landmark phase. This is compatible with Byrd's (1996) phase window model, where variability in temporal coordination of gestures is attributed to windows in the confines of which other gestures can "begin". This temporal overlap pattern results in undershoot of the consonantal target, as the gesture of the consonant blends with that of the following vocoid.



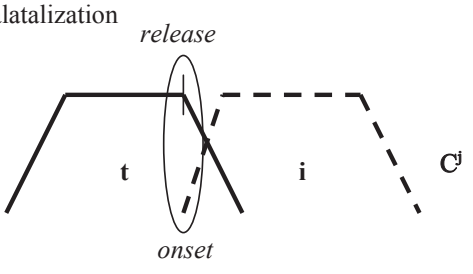
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(7) Full palatalization




On the other hand, in secondary palatalization the onset phase of the vocalic gesture (dotted line) is synchronized with the release phase of the consonantal gesture (solid line), as in (8). This represents a minimal degree of temporal overlap, where the consonant is fully articulated and also has a secondary tongue body palatal articulation.

(8) Secondary palatalization




While the representations in (7) and (8) illustrate the general pattern of gestural overlap proposed for full and secondary palatalization, they alone do not explain the particular patterns of palatalization observed. For example, one might expect any consonant to show full palatalization provided that the consonantal and vocalic gestures are synchronized as in (7), leaving the rarity of labial full palatalization unmotivated.

I propose that both the general palatalization patterns and the particular behavior of the labials can be explained by referencing the *oral articulators* involved in consonantal (target) gestures and vocalic (trigger) gestures, and gestural coordination. As already mentioned, the major articulators in AP are the lips, the tongue-tip and the tongue-body. However, typological evidence regarding palatalization provides support for positing a separate *tongue* articulator, which subsumes tongue-tip and tongue-body as sub-articulators. Browman and Goldstein (1989) also explored the notion of a Tongue node for similar purposes. Thus, labial consonantal targets are articulated with the lips, while coronal and dorsal consonantal targets are articulated with the tongue. The vocalic palatalization triggers, such as *i*, *e*, *j*, are all articulated with the tongue; therefore, coronals, dorsals, and palatalization triggers share the same major articulator, the tongue, separating them from the labials which alone use the lips. I argue that the distinct behavior of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



labials with respect to both full and secondary palatalization resides in this very difference in target and trigger articulators, and I propose that which articulators are involved in gestural coordination will affect the potential degree of temporal overlap and therefore the type of palatalization outcome.

If adjacent gestures use the same articulator, the tongue, there is great pressure for them to perturb each other, and as a result they can overlap to different degrees. A minimal degree of temporal overlap, as that occurring when the onset phase of the vocoid gesture is synchronized with the release phase of the consonantal gesture, results in secondary palatalization:

(9) Minimal temporal overlap (V-onset, C-release)
t + i → $t^j$
k + i → $k^j$

A greater degree of overlap, as that occurring when the onset phase of the vocoid gesture is synchronized with some point in the c-center (closure) phase of the consonantal gesture, results in full palatalization:

(10) Greater temporal overlap (V-onset, C-center)
t + i → ʧi
k + i → ʧi

On the other hand adjacent gestures using different articulators, the lips and the tongue, are under no pressure to perturb each other, as each articulator can move independently of the other. For this very reason lips and tongue gestures *can* overlap in time, as one can have simultaneous lip closure and tongue movement. I argue that a minimal degree of temporal overlap of lips and tongue gestures can result in a secondarily palatalized labial, but that any greater degrees of temporal overlap of such gestures will result in *no* palatalization at all.

(11) Minimal temporal overlap (V-onset, C-release)
p + i → $p^j$

Greater temporal overlap (V-onset, C-center)
p + i → pi

This model predicts that labial consonants can only undergo secondary palatalization, but not full palatalization. First, given the independence of the target and trigger articulators, there is no articulatory impetus for labials to fully palatalize and shift to tongue-articulations. In other words, there is no pressure for lips and tongue gestures to "blend" and create a new sound. And second, if the lips-tongue gestures showed no overlap, c-center overlap, or full overlap, the consonantal outcome would still be a labial, not a coronal palatal consonant as we might expect from full palatalization.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

For example, in palatalization the lips would be performing the task of lip closure for [p], while the tongue would be performing the task of achieving a palatalization trigger, such as [i]. It follows that if a lips gesture and the following tongue gesture were fully overlapped, the lips gesture would completely obscure that of the tongue, as the lips are physically in front of the tongue. Thus, full overlap of [p] and [i] gestures would result in a [p]. Further, I argue that a great, but not complete, degree of temporal overlap, as associated with full palatalization, would result in a labial followed by the vocoid: [p] + [i] → [pi]. With V-onset ~ C-center synchronization, upon the release of the consonant the vocoid gesture is already in motion, and it simply continues after the release of the consonantal gesture in the same way as when the vocoid gesture followed the lips gesture, with no overlap; thus, only the actual vocoid surfaces after the consonantal gesture.

To summarize, I propose that full palatalization results from great overlap of tongue-tongue gestures only, thereby predicting that coronals and dorsals, but not labials, should show full palatalization. Great overlap is defined as the synchronization of the vocoid gesture onset phase with the c-center phase of the consonantal gesture. Furthermore, I propose that secondary palatalization results from minimal overlap of lips-tongue or tongue-tongue gestures, thereby predicting that coronals, dorsals, and also labials should show secondary palatalization. Minimal overlap is defined as the synchronization of the vocoid gesture onset phase with the release phase of the consonantal gesture.

By adopting an articulatory approach and referencing the oral articulators and their interaction during speech production, the analysis proposed here explains the general patterns of palatalization emerging from the crosslinguistic study. Specifically, first it provides a straightforward explanation for why coronals and dorsals can undergo both full and secondary palatalization: as coronals and dorsals use the same articulator as the palatalization triggers, the tongue, the degree of gestural temporal overlap will determine the type of palatalization that will result. Second, the analysis also explains why labial consonants undergo secondary palatalization fairly commonly: minimal temporal overlap of lips-tongue gestures can lead to secondarily palatalized labials, where the labial consonant is articulated fully and only has a secondary palatal articulation superimposed on it, but there are no labial to coronal shifts.

In addition, however, the analysis also predicts that labials should *not* undergo full palatalization, a prediction that must be reconciled with the two attested cases of apparent labial full palatalization, Moldavian Romanian and Tswana. In the following section I present a brief account of full "labial palatalization" in these two languages and show that labial consonants did not actually undergo palatalization themselves. The synchronic labial ~ palatal alternations are reflexes of diachronic developments, and historical evidence thus verifies the prediction of the articulatory model of palatalization.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 2. Labial "Full Palatalization"

### 2.1. Moldavian Romanian

In both Standard Romanian and in the Moldavian dialect, all consonants are affected by an underlying /i/ suffix, such as the plural or the 2nd singular of the indicative. Labial consonants show productive secondary palatalization, dorsals show full palatalization, and coronals either fully palatalize or assibilate. Some examples are given in (12) for plural nouns in Moldavian.

| (12) | *Singular* | *Plural* | |
|---|---|---|---|
| t→ ts | soldat | soldats | 'soldier' |
| k→ ʃʲ | rak | raʃʲ | 'lobster' |
| p→ pʲ | episkop | episkopʲ | 'bishop' |
| b→ bʲ | krab | krabʲ | 'type of fish' |
| m→ mʲ | pom | pomʲ | 'tree' |
| v→ vʲ | elev | elevʲ | 'student' |
| f→ fʲ | ʃəf | ʃəfʲ | 'boss' |

In addition, the Moldavian dialect appears to exhibit full palatalization of labials, in that the labial consonants shift to a palatal or secondarily palatalized non-labial consonant, as shown in (13) for definite plural nouns.

| (13) | *Sg. def.* | *Pl. def.* | |
|---|---|---|---|
| p→ kʲ | stropu | strokʲi | 'drop (of liquid)' |
| b→ gʲ | ʃerbu | ʃergʲi | 'deer-buck' |
| v→ ʒ | bolnavu | bolnaʒi | 'sick (person, masc.)' |
| f→ ʃ | kartofu | kartoʃi | 'potato' |
| m→ nʲ | psalmu | psalnʲi | 'psalm' |

This type of alternation is synchronically productive only via analogy, as labial "full palatalization" is a widely recognized feature of this dialect among Romanian speakers. Two native speakers of Moldavian who were presented with nonce verb forms ending in labial consonants said they would be pronounced with labials in the Moldavian dialect, for example the nonce infinitive [uriba] would be [urigʲ] in the 2nd singular indicative, before the suffix /i/ (Bateman 2007b).

On the surface, alternations such as those in (13) above seem to indicate a productive synchronic process whereby the entire series of labial consonants shifts in a single step to palatal or secondarily palatalized non-labial consonants, contrary to the articulatory prediction outlined in the previous section. However, historical evidence demonstrates that this is not the case. These alternations are the result of a series of sound changes that affected a palatal glide which followed the labial, rather than the labial itself (Ionescu 1969, Avram 1977). The only way that labials were themselves affected was deletion from a labial-palatal cluster.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Historical evidence suggests the following progression of sound changes for Moldavian. First, a palatal glide appeared after a labial consonant. The source of this glide is different depending on context, for example it was already present in forms such as [vjer] 'boar', and it was provided by secondary palatalization in plural forms such as [lupʲ] 'wolves' (Avram 1977, Bateman 2007a). The palatal glide progressively hardened to the palatal or palatalized consonant we see today, assimilating the voicing, continuancy, and nasality features from the labial consonant. Glide hardening produced a labial-palatal(ized) cluster, and finally, the labial consonant deleted from the cluster, leaving only the palatal or palatalized consonant we see today. The labial palatalization steps are summarized in (14) via an example of the "palatalization" of [v] in 'boar':

(14) vjer → vʝer → vʒer → ʒer 'boar'

This analysis of labial "full palatalization" is supported by the existence of forms at intermediate stages, with labial-palatal(ized) consonant clusters, in other dialects of Romanian and also in the Moldavian dialect itself, as in (15):

(15)

| | *Other dialects* | *Moldavian* | |
|---|---|---|---|
| p→ kʲ | kopc̲il | kopkʲil | 'child' |
| | lupc̲i | lupkʲi | 'the wolves' |
| | pkiʃjor | kʲiʃjor | 'leg' |
| m→ nʲ | mnʲel | nʲel | 'lamb' |
| f→ ʃ | fc̲er | ʒer | 'iron' |
| b→ gʲ | albj̲ina | algʲina | 'the bee' |

In addition, parallel developments in other Romance languages further support this account. For example, Latin labials have palatal reflexes in Modern French (Ohala 1978, Nyrop 1914):

(16)

| *Latin* | *Modern French* | | |
|---|---|---|---|
| rŭbĕus | rouge | [ʁuʒ] | 'red' |
| răbĭes | rage | [ʁaʒ] | 'rabid' |
| căvĕa | cage | [kaʒ] | 'cave' |
| sapiam | sache | [saʃ] | 'that s/he know' |

As in Moldavian, the path of sound change from labial to palatal in French also involved glide hardening and labial deletion (Nyrop 1914, Pope 1961):

(17) pj → pʧ → ʧ → ʃ
bj → bʤ → ʤ → ʒ



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

To summarize, diachronic evidence supports the prediction of the articulatory account that labial consonants should not undergo full palatalization. As I show in the next section, this is further supported by similar historical developments in Tswana, a language genetically unrelated to Romanian.

### 2.2. Tswana

Labial consonants also appear to undergo full palatalization in a single step in Tswana passives, causatives, and diminutives. Some examples of diminutive forms with the suffix *–ana* are provided below. Forms with a coronal and a dorsal consonant are given for comparison, to show that they also undergo full palatalization (Cole 1955; Sound System of Setswana 1999; tones are omitted):

| | | | | | |
|---|---|---|---|---|---|
| (18) | t → ʧ | lobat̲i-ana | → | lobat̲ʃana | ‘small board/plank’ |
| | ŋ → ɲ | moɛŋ̲-ana | → | moɛn̲ana | ‘little stranger’ |
| | p → ʧʷ | tlʰap̲i-ana | → | tlʰat̲ʃʷa:na | ‘small fish’ |
| | b → ʤʷ | muχub̲i-ana | → | muχuʤʷa:na | ‘small pond’ |
| | ɸ → ʧʰʷ | muraɸ̲i-ana | → | muraʧʰʷa:na | ‘small nation’ |

As with Romanian, these changes did not occur in a single step but rather via intermediary stages of glide hardening and labial deletion. I propose that in the diminutive the final stem vowel first became a glide. This glide progressively hardened, assuming voicing from the labial consonant, while labialization resulted from lip rounding that persisted throughout the production of the labial-palatal cluster (Ohala 1978 also mentions persistent lip rounding). Finally, the labial consonant deleted, leaving only the palatal consonant which is seen today. An example is given below for [tshit̲ʃʷana] ‘small piece of iron’ (tones omitted):

(19) tshipi + ana → tshipjana → tshipʃana → tsiptʃʷana → [tshitʃʷana]

Evidence of glide hardening comes from Cole (1955), who provides alternative forms in Tswana dialects with labial-palatal clusters, as summarized in (20).

(20)

| | Passive forms in Tswana dialects | | | Diminutive forms in Tswana dialects | | |
|---|---|---|---|---|---|---|
| p | ʧʷ | pʃʷ | psʷ | ʧʷ | pʃʷ | pʃ |
| b | ʤʷ | bʤʷ | | ʤʷ, ʤ | bʤʷ | bʤ |
| pʰ | ʧʰʷ | pʃʰʷ | | ʧʰʷ | pʃʰʷ | pʃʰ |
| ɸ | ʃʷ | ɸʃʷ | | ʃʷ | | |

Prior analyses of labial palatalization in Tswana include misperception (Ohala 1978) and mutation (LaCharité 1993). Ohala (1978) proposes that a labial followed by a palatal glide can be directly perceived as a palatal, with no need for intermediate stages. However, the presence of forms at intermediate stages



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



suggests otherwise. Furthermore, an analysis based on misperception does not explain why such cases are so rare. LaCharité (1993) proposes an analysis whereby the causative is a floating feature [+strident] that is sometimes associated with the final stem consonant to produce palatalization. This approach suggests that palatalization is the realization of morphology, and furthermore the association of the floating feature with final stem consonants seems arbitrary (Bateman 2007a).

In this section I showed that the apparent direct change from labial to palatal or palatalized consonant in Moldavian and Tswana is in fact the synchronic reflex of a series of diachronic sound changes that did not involve the labial consonant except in the final stage when it was deleted. The diachronic evidence presented above supports the articulatory analysis of palatalization and reconciles the prediction that labials should not undergo full palatalization with the apparent attested cases in the crosslinguistic study.

## 3. Conclusion

In this paper I proposed an articulatory account of palatalization, whereby full and secondary palatalization are viewed as resulting from different degrees of temporal overlap of articulatory gestures of the palatalization consonantal targets and vocoid triggers. Viewed as the result of articulatory overlap, the general patterns of full and secondary palatalization that emerged from the crosslinguistic study can be explained straightforwardly. First, coronal, dorsal, and labial consonants are all predicted to show secondary palatalization, as this results from a minimal degree of temporal overlap of tongue-tongue or lips-tongue gestures. Second, only coronal and dorsal consonants are expected to undergo full palatalization, as this arises from greater degrees of temporal overlap of tongue-tongue gestures, thus predicting that labial consonants should not undergo full palatalization. I showed how this prediction is reconciled with the apparent attested cases of labial full palatalization by appealing to historical evidence that indicates that the labial consonants themselves did not change, but rather a following palatal glide did.

The articulatory account thus provides clear answers to both questions addressed in the paper. First, the asymmetry between full and secondary palatalization for labial consonants results from which articulators are used (lips or tongue), and the degree of temporal overlap that occurs. And second, the rarity of labial full palatalization results from the fact that labials do not fully palatalize at all. Thus, the articulatory account is superior to a perceptual one because it not only makes the right predictions regarding the crosslinguistic palatalization patterns, but also provides an explanation for them.

## References

Avram, Andrei. 1977. Preliminaries to a Classification of Daco-Romanian Dialects Based on Labial Palatalization. *Studii si Cercetari Lingvistice* 3, 217-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



288, Bucharest.
Bateman, Nicoleta. 2007a. A Crosslinguistic Investigation of Palatalization. Ph.D. diss., University of California, San Diego.
Bateman, Nicoleta. 2007b. Palatalization in Moldavian Verbs: Centrality of the Infinitive Base. LSRL 37, Pittsburgh, PA. March 17, 2007.
Bhat, D.N.S. 1978. A General Study of Palatalization. In Greenberg, ed., *Universals of Human Language*, 47-92.
Browman, Catherine P. and Louis Goldstein. 1986. Towards an Articulatory Phonology. *Phonology Yearbook* 3, 219-252.
Browman, Catherine P. and Louis Goldstein. 1989. Articulatory Gestures as Phonological Units. *Phonology* 6, 201-251.
Byrd, Dani. 1996. A Phase Window Framework for Articulatory Timing. *Phonology* 13(2), 139-169.
Cole, Desmond T. 1955. An Introduction to Tswana Grammar. Longman.
Davidson, Lisa. 2003. Articulatory and Perceptual Influences on the Production of Non-Native Clusters. In *Proceedings of the 15th International Congress of Phonetic Sciences*. Barcelona, Spain, August 3-9.
Dryer, Matthew S. 1989. Large Linguistic Areas and Language Sampling. *Studies in Language* 13-2, 257-292.
Gafos, Adamantios I. 2002. A Grammar of Gestural Coordination. *Natural Language and Linguistic Theory* 20 (2), 269-337.
Ionescu, Liliana. 1969. Palatalizarea labialelor în graiurile din Moldova. In *Fonetica şi Dialectologie* VI, 49-57.
Kochetov, Alexei. 1998. Labial Palatalization: A Gestural Account of Phonetic Implementation. *The Canadian Linguistics Association Annual Proceedings*, 38-50.
LaCharité, Darlene. 1993. On the Need for Negative Constraints and Repair: Consonant Mutation in Setswana. In Carole Paradis and Darlene LaCharité, eds., *The Canadian Journal of Linguistics*.
Nyrop, K.R. 1914. Grammaire Historique de la Langue Française. Copenhague.
Ohala, John J. 1978. Southern Bantu vs. the World: The Case of Palatalization of Labials. *BLS* 370-386.
Pope, Mildred K. 1961. From Latin to Modern French with Especial Consideration of Anglo-Norman. Phonology and Morphology. Manchester University Press.
The Sound System of Setswana. 1999. Department of African Languages and Literature, University of Botswana.

Department of Liberal Studies
California State University, San Marcos
333 S. Twin Oaks Valley Road
San Marcos, CA 92096

nbateman@csusm.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# On Shallow and Deep Minimality[1]

LEV BLUMENFELD
*Carleton University*

## 0. Introduction

### 0.1. Minimality and stress

Word minimality effects were one of the central discoveries of prosodic phonology (McCarthy and Prince 1986). Under the standard view, whether rule-based or couched in Optimality Theory, restrictions on the minimal size of words arise as a result of the interplay between two factors: first, in order to be pronounceable, phonological material must be parsed into prosodic categories such as stress feet, and, second, there can be constraints on the minimal size of those prosodic constituents. Together, these two factors produce the effect of a limitation on the minimal size of words which is connected with the prosodic phonology of the language. I will refer to the view that minimality and prosody are connected as the PROSODIC MINIMALITY HYPOTHESIS.

The standard theory was subject to vigorous criticism by Garrett (1999), whose typological research has shown that the relationship between the two factors is not as clean as might be expected. Garrett identifies several problematic types of word minima; a full discussion of his arguments goes beyond the scope of this brief paper. I will focus on two types of situations: languages where stress-based weight criteria do not match with the minimality-based weight criteria, and languages with a word minimum but an unbounded stress system.

The majority of languages with weight criteria mismatches between stress and minimality, as identified by Garrett, as well as by Gordon (1999), involve languages where codas are not moraic for the purposes of stress. If such a languages imposes a bimoraic word minimum, one expects to find CVV(C) words but no CVC or CV words. In fact, more often than not, minimality makes a different cut between heavy and light syllables, disallowing CV and ruling CVC in. I will discuss these cases in the next section. A smaller number of languages require monosyllables to contain BOTH a long vowel and a coda, even though having just

[1] I am grateful to audiences at BLS and at the University of Ottawa for comments, and to Barry Alpher for discussing Pama-Nyungan phonology with me. All errors are my own.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



one would be sufficient to satisfy the word minimum; I will come back to these cases in Section 4.

The second group of problematic languages identified by Garrett have restrictions that appear to be similar to word minima, but the stress system requires unbounded feet. One such case will be the subject of Section 2.

### 0.2. CVC: light for stress, heavy for word minimum

Languages where CVC counts as light for the purposes of stress but heavy for the purposes of minimality are numerous, according to Garrett's and Gordon's surveys.[2] This mismatch is systematic, because there are no languages I am aware of with the opposite pattern, where CVC counts as light for minimality but heavy for stress.[3]

Such cases can in fact be brought into line with the prosodic minimality hypothesis with a simple assumption that the moraicity of codas arises as a result of constraint interaction (Morén 1999). In languages with a weight mismatch between stress and minimality, codas are non-moraic except in monosyllables, where assigning a mora to the coda would rescue subminimal inputs. Following Morén, I will refer to this idea as moraic COERCION.

Consider the following facts from Djaru, a Pama-Nyungan language (Tsunoda 1981). Djaru shows a weight mismatch: CVC counts as light for stress, but is heavy for the purposes of minimality because CVC words are attested.[4] Under my proposal, the final consonants of these and only these CVC words are moraic, and it turns out that there is direct evidence for this proposition. Djaru has a bimoraic word minimum, as shown by lengthening of underlying CV stems: the catalyst morpheme /ŋa/ surfaces as [ŋa:] (Tsunoda 1981:46). Crucially, this lengthening does not apply to underlying CVCs, which surface with short vowels. This suggests that the C at the end of these preverbs is moraic.

In addition, the moraicity of the consonant in monosyllables has an effect on the ergative allomorphy. As in many other Pama-Nyungan languages, the Djaru ergative case marker is sensitive to the mora count of its base (for a survey, see

[2] Several cases listed by Garrett are in fact more complex, because not only are CVC monosyllables allowed while codas are in general non-moraic, but CVV words are unexpectedly excluded, in absence of any general restriction on word-final long vowels. Languages of this type include Huasteco Mayan (Larsen and Pike 1949), Luiseño (Kroeber and Grace 1960), and possibly Wintu (Pitkin 1984), where CVV words are rare. These languages appear to reverse the CVV ⟩⟩ CVC ⟩⟩ CV weight hierarchy, allowing CVC but prohibiting CVV. I believe that these cases are best attributed to a root minimum similar to what I suggest for Guugu Yimidhirr below rater than to a word minimum, but there is no space here to address this fully.

[3] Cebuano (Shryock 1993), which is listed by Gordon as having CVV minimality but moraic codas, in fact has disyllabic minimality which is subverted by a later optional rule of intervocalic *l*-deletion. In the native vocabulary, all of the CVV surface words derive from CV*l*V inputs; loan words have CVVC minimality, similar to the Australian cases discussed below in Section 4.

[4] The CVC words in Djaru are the so-called 'preverbs'. While in other Australian languages such preverbs may not always be phonologically independent, Tsunoda's description makes it clear that in Djaru CVC preverbs can form phonological words of their own.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Paster 2006a,b). The relevant allomorphs are -(*ŋ*)*gu*, which attaches to bimoraic stems, and -*lu*, which attaches to stems containing more than two moras (Tsunoda 1981:54-55). (The difference between -*ŋgu* and -*gu* has to do with the presence or absence of a nasal coda in the word; this is an OCP effect unrelated to the mora-counting allomorphy). The following examples illustrate: (1)a and (1)b show the contrast between a disyllabic and a trisyllabic stem with short vowels; (1)c shows that the allomorph -*lu*, which goes on trisyllabic nouns, is also attached to nouns containing a long vowel. This shows that the allomorphy is sensitive to mora count rather than syllable count. Finally, the word in (1)d has the structure CVC.CV, and takes the allomorph that attaches to stems of two moras; this shows that codas do not contribute weight.

| | | | |
|---|---|---|---|
| (1) | a. | ŋaba-ŋgu | 'water' |
| | b. | maŋari-lu | 'vegetable food' |
| | c. | ga:ja-lu | 'bush tomato' |
| | | da:di-lu | 'daddy' |
| | d. | jambi-gu | 'big' |

CVC preverbs can take nominal morphology, and the ergative allomorphy corroborates my proposal that the final consonants of CVC are moraic. The ergative forms of two preverbs are shown in (2).

| | | | | |
|---|---|---|---|---|
| (2) | a. | jud-gu-lu<br>jud-ŋu-lu | b. | dyad-ŋu-lu |

The forms are irregular in two ways: first, the morpheme -*gu* or -*ŋu* is attached to the CVC stem, which does not occur in any other ergative forms.[5] Tsunoda suggests that this augment serves to build the stem up to the canonical disyllabic length; the choice between -*gu* and -*ŋu* is unclear. However, the resulting disyllabic, bimoraic CVC.CV stem should receive the -*ŋgu* allomorph according to the normal generalizations, in the same way as the CVC.CV stem in (1)d is treated as bimoraic. Instead, the allomorph -*lu*, reserved for trimoraic stems, is attached.

Together with the failure of vowel lengthening in underlying CVC, the ergative allomorphy shows that the final consonant of the monosyllable is coerced to be moraic under pressure of minimality. Thus there is in fact no weight mismatch between stress and minimality.

However, not all apparent violations of the prosodic minimality hypothesis can be explained in this manner. I will argue in the remainder of this paper that in addition to prosodic factors, restrictions on the size of roots can also yield apparent minimality effects which may counteract, or be independent from, the prosody.

[5] There is another allomorph of the ergative, -*gulu*, but it attaches to stems ending in *b*, *g*, or *ŋ* (Tsunoda 1981:55).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 1. Shallow minimality: Latin

Let me start by illustrating a classic example of prosodic minimality, which comes from Latin (Mester 1994). It is an especially clean case of the phenomenon: the prosodic minimum is exactly the same size as the minimal foot, established uncontroversially on independent grounds; the minimum is inviolable, and applies to all content and function words; and the minimum is clearly word- rather than root-based.

Based on the evidence from stress and meter, CVV and CVC are heavy; CV is light. The words in (3) below illustrate common examples of monosyllables satisfying the minimum, all of which have either a coda or a long vowel, or both.

(3)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| nunc | 'now' | sōl | 'sun' | mel | 'honey' | dē | 'of' |
| sunt | 'be.3PL' | vīs | 'force' | vir | 'man' | vī | 'force.ABL' |

Latin also has two ways of repairing subminimal inputs. The verb root /da/, when it surfaces without an affix in the imperative, undergoes vowel lengthening to satisfy the minimum (4)a. On the other hand, the three CV function words are enclitics (4)b, forming a prosodic word with their host.

(4) a. Lengthening

| ROOT | IMPER | INFIN |
|---|---|---|
| /da-/ | dā | da-re |

b. Cliticization

-que 'and'
-ne 'not'
-ve 'or'

The minimum applies to function words as well as lexical words. Prepositions, conjunctions, particles, and the copula all obey the bimoraic minimum.

The stress foot of Latin is the moraic trochee: a bimoraic foot. This is an uncontroversial fact established on the basis of stress, allomorphy, and meter (Mester 1994). This means that the minimal word is identical in size to the minimal foot: Latin offers a canonical example of prosodic word minimality.

It is important to stress that the Latin requirement applies to words but not to roots. There is one verb root /da/ 'give' which consists of a light syllable; when unaffixed, it surfaces with a long vowel as shown above. The root of the verb *me-ā-re* 'wander' has the same CV shape (though, due to its membership in a different morphological category, it never surfaces without the theme vowel *-ā*, and the lengthening à la (4)a never gets a chance to apply). The roots of the verbs *n-ā-re* 'swim' and *fl-ē-re* 'weep' can plausibly be analyzed as consisting of only consonants, as can the root of the adverb *cl-am* 'secretly'. There is at least one word, *ex-∅-t-a* 'entrails', which seems synchronically not to have any root at all, being composed of the prefix *ex-* 'out of' and the past participle suffix *-t*.[6] Despite

[6] This word comes from **ex-sec-t-a* 'cut out'; the root disappeared as a result of somewhat irregular phonological reduction.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

the small size of these roots, all of the WORDS derived from them have at least two moras.

To summarize: the Latin word minimum is identical to the minimal foot of the language, applies to words, both content and function, and does not apply to underlying roots. In other words, Latin offers a well-behaved example of a language with a word minimum grounded in the prosodic system of the language. I will refer to such languages as having a SHALLOW minimality effect.

## 2. Deep minimality: Russian

While Latin supplied a canonical example of shallow minimality, Russian will serve as our reference example for a different, non-prosodic type. I will show in this section that Russian has a minimum that applies to roots of content words rather than surface words, and is not prosodic in the sense that it has nothing to do with the stress system of the language.

At first glance Russian words appears to have a CCV minimality requirement, because monosyllabic content words that end in vowels must have a complex onset. The following sets of examples provide a nearly exhaustive list of such words in several morphological categories: feminine and neuter nominatives (5), genitives (6), and 1st singulars of verbs (7).

(5) CC-V nom.sg. (the V is a nominative marker)

| | | | |
|---|---|---|---|
| mg-a | 'mist' | tlʲ-a | 'aphid' |
| xn-a | 'henna' | mgl-a | 'darkness' |
| tʲm-a | 'darkness' | dn-o | 'bottom' |
| mzd-a | 'bribe' | frʲ-a | 'pretentious person (pejor.)' |
| zl-o | 'evil' | čm-o | 'person (pejor.)' |

(6) CC-V gen.sg. of CVC words (the V is a genitive marker)

| | | | | | |
|---|---|---|---|---|---|
| vš-i | 'louse' | lʲd-a | 'ice' | ps-a | 'dog' |
| šv-a | 'seam' | dnʲ-a | 'day' | lʲn-a | 'flax' |
| rv-a | 'moat' | lb-a | 'forehead' | mx-a | 'moss' |
| rt-a | 'mouth' | lʲv-a | 'lion' | pnʲ-a | 'stump' |

(7) CC-V 1sg of CVC or CV verb stems (the V is a 1SG marker)

| | | | | | |
|---|---|---|---|---|---|
| bj-u | 'beat' | žm-u | 'press' | lʲn-u | 'cling' |
| tk-u | 'weave' | vj-u | 'plait' | žr-u | 'gobble' |
| lj-u | 'pour' | tr-u | 'rub' | šj-u | 'sew' |
| gn-u | 'bend' | zlʲ-u | 'anger' | mn-u | 'crumple' |
| šlʲ-u | 'send' | žd-u | 'wait' | lg-u | 'lie' |
| pr-u | 'trudge' | ss-u | 'piss' | rž-u | 'neigh' |

All of the monosyllables in these categories have complex onsets: there are no CV words of this kind. There seems to be a minimality requirement at play.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

That the requirement for complex onsets applies only to vowel-final monosyllables is shown by the following examples. Monosyllables that end in consonants may have a simple onset or no onset at all (8)a, and the same is true of polysyllables that end in vowels (8)b. Together with (5)-(7), these data show that the complex onset requirement only applies to words that are in some sense too small.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (8) | a. | sad | 'garden' | par | 'steam' | šum | 'noise' |
| | | um | 'mind' | už | 'grass snake' | il | 'silt' |
| | b. | kara | 'punishment' | dura | 'fool (fem.)' | | |
| | | era | 'era' | igo | 'yoke' | | |

The diachronic source of this peculiar restriction is clear. Many words with complex onsets like those in (5)-(7) reflect Old Russian CVCV words, where the first was a *yer* – one of the two short vowels, *ĭ* and *ŭ*, which deleted if there was a non-yer vowel in the following syllable. Because Old Russian had a CVC minimum, the smallest word after *yer* deletion would have been CCV.

But there is more to this minimality restriction than its history. If it reflects an earlier CVC minimality that applied before *yer* syncope in Common Slavic, one might expect modern Russian to have a CVC minimality applying synchronically at a level prior to *yer* deletion. Yet this is not the case: while most of the words in (5)-(6) contain a synchronic *yer*, not all do. At least *xna*, *tlʲa*, *frʲa*, and *čmo* unambiguously do not, as there are no alternants where the vowel shows up, and the same is true of some of the verbs in (7). This shows that the restriction has something to do with the complexity of the onset rather than with quantity of segmental material prior to *yer* deletion.

What is more, the minimality requirement is synchronically active. There are in fact vowel-final monosyllabic borrowings and neologisms with a simple onset, but they are NEVER INFLECTED, i.e. they are indeclinable. The following shows several examples of indeclinable CV nouns.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (9) | li | 'league' | | po | 'Po (river)' | ra | 'Ra' |
| | go | 'go (game)' | | pa | 'pas (step)' | | |
| | do, re, mi, fa, lʲa, si | | (names of musical notes) | | | | |

Borrowings such as *pa* or *po*, even though they might inflect like feminine and neuter nouns whose citation (nominative) forms end in *-a* and *-o*, cannot do so. Being indeclinable means that the final vowel of these CV words is part of the root rather than the nominative suffix, while in all of the inflectable words in (5)-(7), the final vowel is a marker of the nominative, genitive, or 1SG. In other words, in a noun whose citation form has the shape CV, the vowel must be part of the root, but in nouns of the shape CCV or CVCV, the vowel may be the nominative suffix. Verbs behave somewhat differently: some of the verb stems in (7) do end in a high vowel and are thus underlyingly CV. This vowel becomes a glide when followed by a vowel in the affix: /bi + u/ → *bju* 'hit'.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

To sum up what we know so far: CV words may exist, but only if their vowel is part of the stem; if the final vowel of a monosyllable is part of the affix, the word must have a complex onset. This generalization appears to be due to a minimality requirement, because it is the size of the root that matters for the morphological properties of the noun. But it cannot be word minimality, because CV words are allowed (9).

In fact, the Russian data that were presented above can be understood in terms of a single minimality constraint, as long as this constraint is understood to apply to roots rather than words. The constraint requires each root to contain at least two SEGMENTS (consonants or vowels).

The following illustrates how this minimality restriction accounts for the generalizations presented thus far. Roots consisting of either a single V or a single C are predited not to exist, and are unattested (10)a. Among roots consisting of two segments, the following are attested : CC roots (10)b, VC roots (10)c, and CV roots (10)d, which behave differently depending on whether they are nominal or verbal. The only type predicted to exist but unattested are VV roots (10)e, but these are absent due to an independent hiatus restriction.

| | | | | |
|---|---|---|---|---|
| (10) | a. | V roots: | | *impossible* |
| | | C roots: | | *impossible* |
| | b. | CC roots: | | /tl$^{j}$/ ‘aphid’, /xn/ ‘henna’ |
| | c. | VC roots: | | /ad/ ‘hell’, /il/ ‘silt’ |
| | d. | CV roots: | Ns: | /pa/ ‘step’, /po/ ‘Po’ (indeclinable because vowel-final) |
| | | | Vs: | /bi/ ‘beat’, /li/ ‘pour’ (inflected with glide formation) |
| | e. | VV roots: | *impossible* due to an independent hiatus restriction | |

The biliteral minimality only applies to content (lexical) words but not to function words. There are several prepositions, conjunctions, and particles that consist of a single segment, consonant or vowel, shown below.

| | | | | | | |
|---|---|---|---|---|---|---|
| (11) | a | ‘but’ | u | ‘by’ | s | ‘with’ |
| | b | CONDITIONAL | k | ‘to’ | o | ‘about’ |
| | i | ‘and’ | v | ‘in’ | | |

Finally and most importantly, the Russian minimality requirement is not related to the prosodic system of the language. The Russian stress system is based on unbounded feet (e.g. Halle and Idsardi 1995). There is no evidence of any kind for binary feet: no rhythmic secondary stress and no alternating vowel reduction. Thus, Russian is not expected to have any minimality requirement at all, given the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



structure of its stress system. This gives further support to my argument that the constraint applies to roots rather than words.[7]

Let us summarize the key properties that distinguish Latin and Russian minimality. There are three. First, the level at which the minimality applies: the Latin requirement refers to the amount of material in words, while the Russian requirement counts the segments in the roots. Second, its scope: in Latin but not in Russian function words must respect minimality. And third, the relationship to prosody: in Latin but not in Russian the minimal word is related to (and identical with) the minimal foot independently motivated for the language.

In contrast to the Latin-type shallow minimality, I will refer to the constraints on the minimal size of roots as DEEP minimality.[8]

## 3. Typological predictions

The previous sections illustrated unambiguous examples of shallow and deep minimality. The two types have different motivations and different properties. While shallow minimality is grounded in the prosodic structure of the language, the motivation behind deep minimality is less clear, and here I will only speculate on what might give rise to limits on the minimum number of segments in roots of content words. Restrictions on roots were entertained by Gordon, as an example of "maximization of total material in a morpheme" (1999:264 and ff.), and were conjectured to be one of the motivations behind the minimality effects. Gordon, however, submits that such a view is "untenable in its strongest form", because if languages routinely maximize simply the amount of segmental material in a morpheme, ONSETS are expected to play an important part in minimality requirements, just as codas do.[9] As I have argued above, however, onsets DO in fact play a role in minimality in Russian, and perhaps our failure to notice this effect is due to the independent restrictions that languages may place on onsets in addition to minima. For example, the Pama-Nyungan data that are discussed below as having deep minimality have an independent obligatory onset requirement, obscuring the effect of minimality on onsets.

I will not devote more space to speculative discussion on the motivation behind root minimality, limiting myself to the empirical observation that it exists as part of the grammar of at least some languages.[10] My focus here is to harness this observation to make clearer the relationship between the typology of stress systems and minimality, arguing that some apparent mismatches between stress and minima are due to the independent action of constraints on the size of roots.

[7] A further argument that Russian minimality is not prosodic is that other Slavic languages with very different prosodic systems show similar minimality requirements. E.g. Czech, which has a binary stress system, also has a CCV-like word minimum (Kučera 1961, Gordon 1999).

[8] Hargus and Beavert (2006) offer a different case of CCV-like minimality, arguing that it applies to words and counts consonants. I cannot address these data here due to space limitations.

[9] See also Golston (1991) for a different view of minimal size restrictions on morphemes.

[10] I also leave open the question of how restrictions on roots – i.e. on inputs – are to be implemented in an output-oriented theory such as OT. This question is tangential to my main argument.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Less is known about possible root minima than about the possible word minima. The example used above shows a segment-counting minimum: Russian requires roots to contain two segments. Some Pama-Nyungan languages require roots to contain three segments (see below). Other Australian languages have disyllabic or bimoraic root minima. As I have argued for Russian above, and as I will show for Pama-Nyungan languages below, allowing for a minimal restriction on roots brings an apparent counterexample to the prosodic minimality hypothesis into line. A natural question arises whether ANY language that appears ill-behaved from the point of view of this hypothesis can be swept under the rug of root minimality, and what would constitute a counterexample to my proposal.

The two minima are distinguishable from each other based on their properties and function in the grammar. Shallow minimality applies to words and is prosodically natural. Characteristic of shallow minima are cases where special phonological or morphological augmentation processes bring subminimal roots up to the required surface minimum. Vowel lengthening in monosyllables in Latin and Djaru is an example of such phonological augmentation. There can also be minimality-driven blocking of a deletion rule. E.g. in Djapu final vowel deletion applies only in words longer than two syllables (Morphy 1983:29-30). A similar effect is observed in Lardil (Hale 1973). Strategies that aim to satisfy a shallow minimum can also be morphological: in some Australian languages where the minimum is disyllabic but verb roots can consist of just one CV syllable, allomorphy can ensure that verbs derived from these roots never surface with fewer than two syllables. Djapu (Morphy 1983), Nyawaygi (Dixon 1983), Uradhi (Crowley 1983), and Wajarri (Douglas 1981), are examples of such languages.

On the other hand, if a language's minimum is due to a restriction on roots (a deep minimum), then there should not be any such augmentation effects, because morphological affiliation of segments is non-negotiable, and increasing the amount of material in surface words does nothing to increase the size of the underlying root.

A language can be unambiguously diagnosed as having a shallow minimality restriction, if it has the kind of minimality-driven augmentation of subminimal inputs. My proposal makes the following typological prediction: if a language has shallow minimality, then the word minimum ought to have the connection with the prosodic system of the language as predicted by the standard prosodic minimality hypothesis (modulo complications such as coercion). The equivalent converse prediction is that if a minimum demonstrably has nothing to do with the prosodic system of the language (as in Russian), it must be due to a restriction on the size of roots rather than words, and should behave accordingly: there should not be any augmentation processes, for example.

A counterexample to the theory proposed here would be a language with a minimality requirement that unambiguously applies to words, but does not appear to be rooted in the prosodic system of the language.

Finally, there is a caveat to be added. It might be tempting to suggest that shallow minimality should always be surface-true – because, after all, it applies to



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

words – while deep minimality need not necessarily be satisfied on the surface. There are several counterexamples to this proposition. Anguthimri (Crowley 1981) has a bimoraic word minimum, and a Latin-like lengthening process that ensures that /CV/ inputs surface with long vowels (12)a. There is also schwa-insertion that applies before word-initial voiced fricatives and [r]. This rule applies AFTER minimality-driven lengthening (12)b. The fact that the minimum is evaluated at a level of representation other than the surface form does not make it any less of a shallow, or prosodic, word minimum. The minimality-driven lengthening is simply counterbled by a later process.

| | | | | |
|---|---|---|---|---|
| (12) | a. | /pwi/ | fwi: | 'seed' |
| | | /wa/ | wa: | 'grey hair' |
| | | /tu/ | tu: | 'west' |
| | b. | /ra/ | əra: | 'stomach' |

## 4. Intersection of deep and shallow minimality

In the languages discussed so far, the minimum was either shallow or deep. In this section I argue that an apparent set of counterexamples to the prosodic minimality hypothesis from several Pama-Nyungan languages is due to the combined effects of the two kinds of minimality.

Most Pama-Nyungan languages have either disyllabic or bimoraic minimality (e.g. Dixon 2002). Strict disyllabic minima tend occur in languages where final stress is impossible (Garrett 1999; see also Kager 1995), but the details of the distribution of disyllabic vs. bimoraic minima are complex and go beyond the scope of this paper.

What interests us here are cases where the minimum is neither disyllabic nor bimoraic. A number of languages have the following restriction: monosyllables are only allowed if they contain BOTH a long vowel and a coda, a restriction I will refer to as a SUPERMINIMUM. For example, Guugu Yimidhirr (Haviland 1979) and Gumbayngirr (Eades 1979) both have this restriction. In Yimidhirr, the following monosyllables occur: *bu:r* 'nest', *mi:l* 'eye', and *ḍu:l* 'guts', but there are no CVV ones in the lexical vocabulary.

Crucially, neither Yimidhirr nor Gumbaynggir has moraic codas, nor a prohibition against word-final vowels. Thus the CVVC minimum cannot be explained as a case of either coercion or ordinary phonotactics, and presents a genuine counterexample to the prosodic minimality hypothesis. One interpretation of these facts is that these languages have BOTH a shallow and a deep minimality requirement at the same time: the shallow requirement is bimoraic and ensures that the word contains two moras at surface, while the deep requirement requires noun roots to contain at least THREE segments.[11] Thus a CVV word would violate the deep minimum, a CVC word the shallow minimum, and CV word would violate both. Only CVVC has both two moras and three segments.

[11] Assuming, uncontroversially, that a long vowel counts as a single segment.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



If languages like Guugu Yimidhirr are treated as having BOTH shallow and deep minimality at the same time, they do not present a counterexample to the prosodic minimality hypothesis.

## 5. Conclusion

The prosodic minimality hypothesis imposes expectations on the relationship between minimality and stress which do not always correspond to the observed typology. Some of the mismatches between stress and minimality can be analyzed as due to moraic coercion. Other cases are due to restrictions on roots, which are independent of the prosodic system of the language. A theory that allows both shallow (word) and deep (root) minimality has a better match with the typology.

## References

Crowley, Terry. 1981. The Mpakwithi Dialect of Anguthimri. In R.M.W. Dixon and Barry Blake, eds., 147-194.

Crowley, Terry. 1983. Uradhi. In R.M.W. Dixon and Barry Blake, eds., 307-428.

Dixon, R. M. W. 1983. Nyawaygi. In R.M.W. Dixon and Barry Blake, eds., 431-525.

Dixon, R. M. W. 2002. *Australian Languages: Their Nature and Development*. Cambridge: Cambridge University Press.

Dixon, R. M. W. and Barry Blake, eds. 1979. *Handbook of Australian Languages, Volume I*. Amsterdam: John Benjamins.

Dixon, R. M. W. and Barry Blake, eds. 1981. *Handbook of Australian Languages, Volume II*. Amsterdam: John Benjamins.

Dixon, R. M. W. and Barry Blake, eds. 1983. *Handbook of Australian Languages, Volume III*. Amsterdam: John Benjamins.

Douglas, Wilfrid H. 1981. Watjarri. In R.M.W. Dixon and Barry Blake, eds., 197-272.

Eades, Diana. 1979. Gumbaynggir. In R.M.W. Dixon and Barry Blake, eds., 245-361.

Garrett, Edward. 1999. Minimal Words Aren't Minimal Feet. In Matthew K. Gordon, ed., *Papers in Phonology 2: UCLA Working Papers in Linguistics, Vol.1*., 68-105. Los Angeles: University of California, Los Angeles, Department of Linguistics.

Golston, Chris. 1991. Minimal Word, Minimal Affix. *North East Linguistic Society 21*:95-109.

Gordon, Matthew. 1999. Syllable Weight: Phonetics, Phonology, and Typology. Ph.D. diss., University of California, Los Angeles.

Hale, Kenneth. 1973. Deep-surface Canonical Disparities in Relation to Analysis and Change: An Australian Example. In Thomas A. Sebeok, ed., *Current Trends in Linguistics. Volume 11: Diachronic, Areal, and Typological Linguistics*, 401-458. The Hague: Mouton.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Halle, Morris and William Idsardi. 1995. General Properties of Stress and Metrical Structure. In John A. Goldsmith, ed., *The Handbook of Phonological Theory*, 403-444. Oxford: Blackwell.

Hargus, Sharon, and Virginia Beavert. 2006. Word-initial Clusters and Minimality in Yakima Sahaptin. *Phonology* 23:21-58.

Haviland, John. 1979. Guugu Yimidhirr. In R.M.W. Dixon and Barry Blake, eds., 27-180.

Hayes, Bruce P.. 1995. *Metrical Stress Theory: Principles and Case Studies*. Chicago: University of Chicago Press.

Kager, René. 1995. Consequences of Catalexis. In Harry van der Hulst and Jeroen van de Weijer, eds., *Leiden in Last: HIL Phonology Papers I*, 269-298. The Hague: Holland Institute of Generative Linguistics.

Kroeber, A.L. and Goerge William Grace. 1960. *The Sparkman Grammar of Luiseño*. Berkeley: University of California Press.

Kučera, Henry. 1961. *The Phonology of Czech*. The Hague: Mouton.

Larsen, Raymond S. and Eunice Victoria Pike. 1949. Huasteco Intonations and Phonemes. *Language* 25(3):268-277.

McCarthy, John J. and Alan Prince. 1986. Prosodic Morphology. Ms., University of Massachusetts at Amherst.

Mester, R. Armin. 1994. The Quantitative Trochee in Latin. *Natural Language and Linguistic Theory* 12:1-61.

Morén, Bruce T. 1999. Distinctiveness, Coercion, and Sonority. Ph.D. diss., University of Maryland at College Park.

Morphy, Frances. 1983. Djapu, a Yolngu Dialect. In R.M.W. Dixon and Barry Blake, eds., 1-188.

Paster, Mary. 2006a. Pama-Nyungan Ergative Allomorphy: Historical Reconstruction and Theoretical Consequences. Presentation, Annual Meeting of the Linguistic Society of America.

Paster, Mary. 2006b. Phonological Conditions on Affixation. Ph.D. diss., University of California, Berkeley.

Pitkin, Harvey. 1984. *Wintu Grammar*. Berkeley: University of California Press.

Shryock, Aaron. 1993. A Metrical Analysis of Stress in Cebuano. *Lingua* 91:103-148.

Tsunoda, Tasaku. 1981. *The Djaru Language of Kimberley, Western Australia*. Canberra: The Australian National University.

School of Linguistics and Applied Language Studies
Carleton University
1125 Colonel By Dr.
Ottawa ON K1S 5B6
Canada

lev_blumenfeld@carleton.ca



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# *GIVE* Verb-Object Constructions in French: from Grammar to Idioms

MYRIAM BOUVERET
*University of Rouen-University of California, Berkeley*[1]

## 1. Introduction

This paper presents a corpus-based study of French verb-object constructions headed by *donner* 'give'.[2] Using the Explanatory and Combinatorial Lexicology (ECL) framework part of Meaning Text Theory (Mel'čuk 1997), I combine it with a Construction Grammar model (Kay and Fillmore 1999). I follow Construction Grammar in regarding grammatical constructions and idioms as having equal status as **constructs**. If constructs are form-meaning mappings then their description will involve both semantic and formal generalizations. The first section analyzes constructions collected from the corpus. The second section discusses the degrees of grammaticalization and idiomaticity of *donner* verb-object constructions. The particular case of *X DONNER Y + INFINITIVE* ('X give Y to be V-ed') is studied in the third section, where I further examine the notions of **construction**, **construct** and **cognitive salience**. This construction is particularly interesting in its fully compositional relationship to non-literal and highly idiomatic subconstructions.

## 2. *GIVE* Verb-Object Constructions in the Frantext Corpus

### 2.1. Frequencies

The *donner* transitive construction is widely polysemous, meaning 'give' (V+concrete things or any other *X CAUSE Z TO RECEIVE Y* construction), 'make' (V+communication nouns), 'organize' (V+event nouns), 'show' (V+leading situation), 'serve' (V+food nouns). Corpus results are summarized in Table 1:[3]

---

[1] This paper was written while the author was a visiting scholar at the Department of Linguistics, University of California, Berkeley. Special thanks to Eve Sweetser for her many suggestions and to Charles J. Fillmore for his reading and comments on an earlier draft.

[2] Base textuelle *Frantext*, ATILF-CNRS, University of Nancy, France. Literature corpus. Period consulted 1980-2000.

[3] Although covering 20 years from 1980 to 2000, the corpus search does not provide all the transitive meanings of the verb.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

**Table 1: *DONNER* Transitive Constructions in Frantext Corpus 1980-2000**

| Meaning | Form |
|---|---|
| • 1. communicate (+ information nouns) | 1. *donner un conseil* 'give advice', (similarly *donner des informations, une explication, une raison, un renseignement, les consignes, des nouvelles, le nom, une adresse, donner un signe, donner le* (*signal de*) *départ*). |
| • 2. *donner un coup de* | 2. *donner un coup de balai* 'give a sweeping to', (similarly *donner un coup de main, un coup de téléphone, un coup de pied, un coup de coude*) . |
| • 3. make (+ communication nouns) | 3. *donner un cours* 'teach a class'. |
| • 4. give (+ concrete things) | 4. *donner un manteau aux pauvres* 'give a coat to the poor', (similarly *donner une arme*). |
| • 5. X causes Z to receive Y | 5. *donner un baiser*, (similarly *donner des responsabilités*, *des soins, du plaisir, en donner pour son argent*). |
| • 6. X causes Z to take (+care nouns named by Y) | 6. *donner le sein* 'breastfeed', (similarly *donner la becquée, le biberon, le bain* (semi-fixed expressions). |
| • 7. organize (+ event nouns) | 7. *donner une fête* 'throw a party'. |
| • 8. show (+ leading situation) | 8. *donner la bonne direction* 'to head somebody in the right direction', (similarly *donner le la, donner le ton*). |
| • 9. show (+ appearance) | 9. *donner l'illusion* 'give the illusion', (similarly *donner l'impression, donner l'image, donner l'air*). |
| • 10. serve (+ food nouns) | 10. *donner du thé* 'pour tea'. |
| • 11. give name | 11. *donner un nom* 'give name'. |
| • 12. provide a man with descendents by bearing children to him | 12. *donner un enfant* 'bear a child to someone', (similarly *donner une descendance*). |

Argument structure and the deep semantic nature of constructions vary and *donner* can express different event types including a simple or complex caused-motion construction (*donner un manteau aux pauvres* 'give a coat to the poor'), a resultative construction (*donner un nom* 'give a name'*, donner la chair de poule* 'give goose pimples'*, donner le vertige* 'make feel dizzy'*, donner un coup de pied* 'give a kick'*, donner un conseil* 'give advice', *donner l'assaut* 'to assault'), an activity construction (*donner une fête* 'throw a party', *donner un cours* 'teach a class'), and a causation construction (*donner sa voiture à réparer* 'give one's car for repair').

In the corpus, *donner* as a support verb is the most frequent construction (23%) where it collocates with: *nom* 'name', *instructions* 'instruction', *explication* 'explanation', *conseil* 'advice', *ordre* 'order', *baiser* 'kiss', *nouvelles* 'news', *conference* 'conference', *cours* 'class', etc… (similarly *donner un conseil* 'give advice'*, des informations* 'give informations'*, une explication* 'give an explanation'*, un renseignement* 'give an information'*, les consignes* 'give instructions' (1), *donner un coup de balai* 'give a sweeping to'*, un coup de main*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



'give a hand'*, un coup de téléphone* 'give a call'*, un coup de pied* 'give a kick'*, un coup de coude* 'give somebody a nudge' (2), *donner un cours* 'teach a class' (3), *donner un nom* 'give a name' (11) in Table 1). The second corpus (Word Sketch Engine Google corpus) shows 30% of *donner* as a support verb whereas the third corpus (*Le Monde* 2002) has 12 % of support verb constructions.

In comparison, the concrete meaning of *donner* has a very low frequency in the Frantext corpus (8%), although in a French dictionary (i.e. *Le Nouveau Petit Robert*) this sense is presented first in accordance with lexicographic microstructure rules. A search of two other corpora confirms this infrequency, showing 5% in *Le Monde* 2002[4] and 0% in Word Sketch Engine Google corpus.[5] These results are somehow counter-intuitive given the perception of the concrete meaning of the verb *donner* as being more central. A cognitive explanation of this centrality could be provided by language acquisition studies:

> Children tend to use verbs meaning *want*, *make/do*, *put*, *bring*, *take out* or *give* before other verbs are used. In a longitudinal study Ninio observes that SVO and VO patterns were initially produced with only one or at most a few verbs for a prolonged period. More and more verbs came to be used in an exponentially increasing fashion (…). On both Ninio's account and the present proposal, patterns are learned on the basis of generalizing over particular instances. (Goldberg 2006:78, citing Ninio 1999)

Not all of children's earliest verbs are highly transitive but Goldberg's hypothesis is then that "high frequency of particular verbs in particular constructions facilitates children's unconsciously establishing a correlation between the meaning of a particular verb in a constructional pattern and the pattern itself, giving rise to an association between meaning and form" (Goldberg 2006:79). She concludes with others that "frequency and order of acquisition play key roles in category formation in that training on prototypical instances frequently and/or early facilitates category learning" (Goldberg and Casenhiser 2006:199).

From a lexicographic point of view, the explanation for ranking the concrete meaning first can sometimes--but not always--be etymological. The concrete meaning of *donner* appears in French during the second half of the tenth century with objects referring to physical gifts (*Il lui donna une fort belle dot* 'He gave her a fine dowry') then later (1050) in the expression *donner l'aumône* 'give alms'. Historically, *donner* appeared first in 842 in *Les Serments de Strasbourg*, linked to mental attributes like power or strength (ATILF 2007), *donner le pouvoir* 'empower'.

### 2.2. Light Verbs and Support Verbs

Support verb constructions are a specific type of verb-object construction that are distinguished both lexically and syntactically. In (1), a free construction with a

[4] *Le Migou* search engine, OLST, University of Montréal. Newspaper corpus.
[5] *Word Sketch Engine*, LEXCOM, Adam Kilgarriff, University of Brighton, UK. Google corpus.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

plain verb, the verb is the governor and the object *book* the dependent noun, whereas in (2), a support verb construction, it is the noun *kiss* that expresses an activity and that bears the arguments *Jenny* and *John*.

(1) John gave Theo a book.
(2) Jenny gave John a kiss.

The relationship of support verb constructions to their morphologically related equivalents is unpredictable (as in English *kiss*, *advice*, *information*). The French constructions *donner un conseil* 'give advice', *donner une information* 'give information', *donner une giffle* 'give a slap', and *donner une tape* 'give a kick' are regularly related to the semantically equivalent verbs *conseiller* 'advice', *informer* 'inform', *giffler* 'slap', *taper* 'kick'. But there is no verbal form for *donner un coup* 'give a kick', *donner une conférence* 'hold a conference', or *donner un cours* 'teach a class;' and *donner un baiser* 'give a kiss' only matches the meaning *baiser* in its old sense 'kiss,' which currently appears in certain fixed expressions. In all of these constructions, *donner* is a light verb as well as a support verb.

How is a support verb (Gross 1989, 2005, Gross and De Pontonx 2005) different from a light verb? The category of support verb, unlike that of light verb, includes verbs which add meaning to an expression, as in *envoyer un baiser* 'blow a kiss.' Therefore, the category of support verb is a broader set of verbs;[6] which includes both (3) and (4), even though (4) is not a light verb because it adds a causative meaning:

(3) L'enfant prend un bain. 'The child is having a bath.'
(4) Il donne le bain à l'enfant. 'He is bathing the child.'

Only the neutral *prendre* 'take' in *prendre un bain* 'take a bath' (3) or the neutral *donner* in *donner un coup* 'give a kick' is considered a light verb.

Light verbs are not just light from a semantic point of view but also from a cognitive point of view; giving salience to the frame of the noun as in sentence (2) or (3), whereas a plain verb gives salience to its own verbal frame as in (1) (Bouveret and Fillmore 2008). The same "deferral" of salience occurs with any verb named as a support verb regardless of its additional semantic content or the change in the argument perspective as in (4). We can thus observe that the SUPPORT VERB + NOUN **construct** gives **cognitive salience** to the direct object in the transitive construction where the verb stands as syntactically and lexically relevant. This does not imply that the verb is completely semantically empty though, as the choice of the lexical unit is still motivated by some semantic components, part of the polysemy of *donner* which can be minimally paraphrased by: 'X causing Z to have Y '. But the light verb does not inherit the plain concrete

[6] From our ECL framework point of view (cf. Mel'čuk 2005).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

meaning ('transmission of Y entity from X to Z entailing the possession of Y entity by Z for a certain period of time'), as in *Theo gave John a book.*

## 3. Idiomaticity and Grammaticality: Categories of Constructions and Degrees of Fixity

### 3.1. Constructions and the Idiosyncrasy in a Language

In a Construction Grammar, constructions are seen as a range of phenomena from fixed expressions to idioms and fully open-slot constructions. Constructions can be grouped into more or less constrained families: N P N, for example, as in *Construction after Construction* (Jackendoff 2008), or idiomatic questions as in *What's X doing Y* (Kay and Fillmore 1999). Using the ECL framework and a cline of fixity, I propose to distinguish the following four categories of *donner* transitive constructions in French:

(A) lexically open constructions (*Il donna un manteau au pauvre* 'He gave a coat to the poor person').
(B) support verb constructions (*Donne-moi ton avis* 'Give me your advice').
(C) semi-fixed idioms (*Le nouveau gouvernement donne le ton* 'The new government shows the way' (literally 'sets the musical pitch')).
(D) idioms (*Ce morceau lui donne du fil à retordre* 'This piece of music is giving him a hard time' (literally 'gives him rope to twist').

The partition between these categories is based on criteria described in Table 2 as follows:

Criterion 1: pronominalization
Criterion 2: predicate noun allowing verbalization
Criterion 3: article and number variation
Criterion 4: insertion test
Criterion 5: commutation test
Criterion 6: negation test
Criterion 7: zeugma test

**Table 2: Classification of *DONNER* Verb-Object Constructions**

| Examples of Constructions | criterion 1 | criterion 2 | criterion 3 | criterion 4 | criterion 5 | criterion 6 | criterion 7 | Category of construction |
|---|---|---|---|---|---|---|---|---|
| *X donne un manteau à Z* | YES | NO | YES | YES | YES | YES | YES | A: free construction |
| *X donne un conseil à Z* | YES | YES | YES | YES | NO : A<br>YES : B | YES | NO | B: support verb constructions |
| *X donne le ton* | YES | NO | NO | NO | NO | YES | NO | C : semi-fixed constuctions |
| *X donne du fil à retordre à Z* | NO | NO | NO | NO | NO | NO | NO | D: idioms |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Categories B and C are very close: they both characterize semi-fixed expressions, but B is limited to the support verb category. The necessity to set apart a category C is sustained by the fact that corpus results attest either to lexically-constrained semi-idioms (*donner le sein* 'to breastfeed', *donner la becquée* 'to feed', *donner le biberon* 'to give the bottle') or grammatically-construed expressions, for example, the case of 'X *donne Y à + predicate*', as seen in section 4. Idioms classified in D are ranked last in the corpus (*donner la chair de poule* 'give goosepimples', *donner du fil à retordre* 'give a hard time', *ne plus savoir où donner de la tête*, *en donner pour son argent* 'give someone their money's worth').

### 3.2. Support Verbs and *Lexical Functions*

Meaning structures in the Meaning-Text theory are classified as either pragmatic or semantic. Semantics-bearing units are divided into three types: semi, quasi, and full phrasemes, depending on the fixity of their relationship with form. We describe here the semi phraseme, that is to say, the **lexical functions** (LFs), and amongst those, the specific lexical functions encoding collocations of support verb constructions. "A lexical function is a function that associates with a specific lexical unit (L) which is the argument or 'keyword' of *f*, a set of synonymous lexical expressions, the value of *f*" (Mel'čuk 1998:32). There are about sixty simple standard LFs in addition to complex LFs and non-standard LFs or configurations. Lexical functions encode a set of syntagmatic and paradigmatic semantic relations between lexical units. Syntagmatic lexical functions are, amongst others, modifiers, support verbs, realization verbs, phasal verbs, causation meanings. Paradigmatic lexical functions map between lexical classes for example from events to instruments, results, or medium. Morphologically they often involve derivation, e.g.: *to depart, departure*. A lexical function takes into account meaning components of the definition. The LF **[Magn]** for example means 'magnitude of the entity' and is restricted to applying to gradable concepts. The contrast between *high fever* ('forte fièvre') and *heavy rain* ('forte pluie') in English shows that the same LF can be instantiated in different lexical items: *high fever (Eng.)= forte fièvre (Fr.)*; *heavy rain (Eng.)= forte pluie (Fr.)*.

A support verb LF is a lexical rule mapping the semantic level to the syntactic level. Support verbs LFs are **[Oper, Func, Labor].** Each verb is established in relation to the syntactic role of the lexical unit in the verbo-nominal construction, subject, object, indirect object, as these are linked to their deep syntactic actants I, II, and III. The function **[Oper]**, for example, is used for a support verb object construction, the LF links at the deep syntactic level a deep syntactic actant of L to L itself. Actant 1 is an agent, actant 2 is an object or theme, and actant 3 is a recipient or goal. **Oper** is indexed with the number of the actant which turns up as a subject in the resulting construction.

**Oper1** (order)=*give*
**Oper3** (aid)= *receive*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

**Oper13** (resentment)= *feel [ ~ about N]*
**Func0** (snow)= *fall*
**Func2** (blow)= *fall [upon N]*
**Labor12** (interrogation)= *submit [N to an interrogation]*

Support verb LFs also appear in complex LFs or configurations of LFs as in **MagnOper**(war)= *rage on*.

## 4. A Case Study of *X DONNER Y + Infinitive*

We will now study the particular case of a semi-fixed grammatical construction which has several occurrences in the corpus. It is not a frequent construction but the pattern is striking since it appears in completely fixed expressions, semi-fixed expressions or free constructions: *X DONNER Y + Infinitive* as in *donner du grain à moudre* 'give material for conversation'*, donner (matière) à penser* 'give someone something to think about', *donner une énigme à résoudre* 'give a riddle to solve'.

### 4.1. Evidence for Constructionality?

"A construction (e.g. the subject-auxiliary construction) is a set of conditions licensing a class of actual constructs of a language (e.g. the class of English inverted clauses (…)" (Kay and Fillmore 1999:3). A construct however does not have to be fully regular or predictable, but constructions can be grouped into a family by partial similarities. For Langacker (1991), a *construct* is a grounded conceptual entity. I examine here this notion of groundedness, looking at grammatical, semantic, cognitive, etymological/morphological evidence in a case study of the transitive construction *DONNER + Infinitive*.

In French, the construction *X DONNER Y à + Infinitive (à Z)* is trivalent but a two or three argument complementation is encountered:

- *Donner du fil à retordre* (loc. 1680), 'give a hard time', literally: 'give a rope to twist'
  *Mon cocker me donne du fil à retordre* (forum Feminin.com, September 19, 2007)
- *Donner du grain à moudre* 'give material for conversation', literally: 'give grain to grind'
  *L'assassinat de Bhutto donne du grain à moudre aux candidats US* (*Le Monde*, December 29, 2007)
- *Donner matière à penser* 'give someone something to think about'
  *Enfin, cette collection donne matière à interrogation portant sur la question de la ...*
  *Elles donnent matière à penser à partir des textes de philosophes ...* (EspaceTemps.net, 2004)
- *Donner des devoirs (à faire) /donner à faire des devoirs* 'give homework'
- *Donner ses chaussures à ressemeler* 'give one's shoes for re-heeling', *sa montre à réparer* 'one's watch for repair'
- *Donner une énigme à résoudre* 'give someone a riddle to solve'

Should we consider in this construction the infinitive clause as simply adding a compositional purpose meaning to the main clause? Semantic evidence of a more construed meaning is provided with the existence of a GIVING frame (a



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Donor transfers a Theme from a Donor to a Recipient) activated through the trivalence: X (agent) GIVE Y (theme) [*to* + V-*ed*] *to* Z (recipient/patient). This frame is present in several sentences when the object Y is effectively transferred from X to Z, the third argument being effectively present or not in the sentence as in *give one's car for repair*. In this frame, the infinitive clause refers to the Purpose.[7] The purpose, however, cannot be any purpose: *give one's car for repair* sounds perfectly normal but *#give one's car to destroy* sounds unusual. The purpose then in the sentence has to realize some event associated with the theme in a conventional frame, which can be paraphrased: X causes Z to perform W activity (literal or metaphoric), W activity being a realization of what has to be accomplished with object Y.

But the GIVING frame does not explain the whole meaning of the construction, a REQUEST frame seems dominant. Grammatical evidence for this can be found in the fact that the *à* complementation in this construction is either an infinitive or a predicative noun: *donner ses chaussures à ressemeler* 'give one's shoes to be re-soled', *donner sa voiture au lavage* 'give one's car to the car-wash', *donner sa voiture au contrôle technique* 'give one's car for checking'. In several sentences the notion of transfer is not activated, but the frame REQUEST[8] is activated: *le professeur donne des devoirs (à faire) aux élèves* 'The teacher is giving homework to the pupils'. In this frame a Speaker asks an Addressee for something, or to carry out some action. Synonyms activating the same frames are *ask, order, request,* i.e. the dominant frame in *X DONNER Y + Infinitive* is then a REQUEST one: X REQUEST Z to perform an activity W, W (activity) being a typical realization of Y (theme).

Deep semantic evidence of this meaning is provided with the semantic role of addressee assigned to the third argument in the construction with a REQUEST frame instead of - or in addition to - the role of recipient in a single GIVING frame. In the following sentence (5), for example, the argument structure is composed of an agent, a theme, a recipient-addressee and a purpose:

(5) Le professeur donne un livre à lire aux enfants.
'The teacher asks the children to read a book.'
(6) Les enfants se sont vus donner un livre à lire par le professeur.
'The children were given a book by the teacher.'
(7) Les enfants doivent lire le livre indiqué par le professeur.
'The children have to read the book indicated by the teacher.'
(8) Les enfants doivent lire le livre que le professeur a indiqué.
'The children have to read the book indicated by the teacher.'

[7] FrameNet, Frame Report created by infinity on Sat Jun 23 .20:15:16 PDT 2001, http://www.framenet.icsi.berkeley.edu

[8] FrameNet, Frame Report created by wooters on Wed Feb 07 16:12:03 PST 2001. http://www.framenet.icsi.berkeley.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Paraphrase (6) of the sentence highlights the addressee role of the third argument in the passive alternation. The modal auxiliary *doivent* in sentence (7) shows the existence of a secondary agent causally affected by the act of giving. Notice that there is a close parallel to (7), (8), which clearly uses a verb of information rather than one of giving. This informational frame is also evoked in a variation of the construction where the theme can only be postponed to the infinitive clause, e.g. *il nous a donné à entendre qu'il était mécontent* 'he let us know that he was not satisfied'.

In the more central *X DONNER Y (noun) à + Infinitive* construction, an infinitive clause or a predicative noun can be introduced with the preposition *à*. In the case of a noun, this argument is assigned the semantic role of a goal including the purpose. For example, *donner ses chaussures au cordonnier* 'give one's shoes to the cobbler' implies the purpose 'to repair', whereas *donner ses livres au cordonnier* 'give one's books to the cobbler' does not make it possible to imply a purpose so that the meaning of a GIVING frame is activated. This meaning is construed by the *verb + concrete object* construction; the third argument Y if present, is assigned a semantic role of recipient instead of the addressee role activated in the REQUEST frame.

Looking at Etymology provides traces of a REQUEST frame in French shared by the two verbs *donner* and *ordonner*. *Donner* as a concrete meaning emerges in *Les serments de Strasbourg* (842). *Ordonner* (1119) means first 'put in order' and *ordonner* 'give an order' appears in 1165. In 1200, a phonetic contamination is supposed between *ordonner* and *donner*, since the Latin form *ordinare* had evolved in **ordinner* but the proximity with the existing *donner* influenced the actual form *ordonner*. Verbal phrases with *donner* and *ordonner*, e.g. *donner à entendre* 1269, 'cause to listen', *donner l'ordre de payer* 1590 'order a payment', *ordonner un médicament* 1558 'give a prescription', show an overlapping of meaning between the two verbs particularly in the morphological derivation, *donner* and *ordonner* both sharing the capacity to express causation and order.

In conclusion, *X GIVE Y à + Infinitive* is not strictly a grammatical construction neither does the infinitive clause simply provide a compositional meaning of purpose. We have proved so far that this construction shows a specificity that can be called, following Jackendoff 2008, a 'syntactic nut'.

### 4.2. Causation in *DONNER*

According to Ruwet (1972), *donner* in French includes a causation meaning (see 9a, 9b). A decomposition into a complex event involving causation is proposed by Goldberg in a CAUSE MOTION type of event (see 9c, 9d):

(9) a. Stephane a donné le livre à Arthur. 'Stephane gave the book to Arthur.'
   b. 'Stephane a fait avoir le livre à Arthur' (Ruwet 1972:152).
   c. Sam gave his car to the church (Goldberg 1995, 2007).
   d. 'X CAUSE MOTION of Y from X to Z'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The causation in the *X DONNER Y à + Infinitive* construction exists as a continuity between a weak meaning of a factitive 'cause to' in (10) and a strong meaning of request in (12), and a weaker one would be possible as well in (11):

(10) Il nous donne à entendre que la situation est délicate. 'He let us know that we are facing a delicate situation'.
(11) Paul a donné son article à relire à Jean. 'Paul asked Jean to read his paper'.
(12) Ils sont partis en nous donnant la vaisselle à faire. 'They told us to do the dishes as they left'.

In conclusion, *X DONNE Y + Infinitive* is a factitive construction, where *donner* behaves like a factitive semi-auxiliary close to other French semi-auxiliaries *laisser à* + predicate, *faire* + predicate. This *donner* factitive construction either completely hides the central concrete GIVING meaning but activates a weak CAUSATION meaning or a strong REQUEST meaning or renders both events of 'transfer' and 'request' present at the same time. A third frame of INFORMATION can be present, attested in the main construction or in a less central variation of the construction with a Y clause. The meaning of the *X DONNER Y + Infinitive* construction is then the following: X (agent) CAUSE Z (recipient OR addressee) to receive Y (object OR information) and to do W (action), W being a typical realization of what can be accomplished with Y.

## 5. Conclusion

There are collocational, semantic, syntactic, and morphological regularities allowing the recognition of families of constructions even among highly lexicalized idioms such as *donner du fil à retordre* 'to give a hard time' which can be related to other expressions sharing the same pattern and meaning, that is to say, a construct. Although the notion of construction has been proved in literature to be usage-based, **cognitive salience** seems to be as important as frequency in a case study unrelated to language acquisition. We have established in the case of the *X DONNER Y + Infinitive* construction that the recognition of this construct is linked to a cognitive salience manifested in lexical, syntactic, semantic, pragmatic, cognitive clues allowing the recognition of the construction as a whole.

Where should we encode constructions in a lexicon? For idioms like *donner du fil à retordre* 'give a hard time', for example, neither the meaning implied by the construction itself nor the meaning of any of the lexical units helps us to understand correctly the meaning of this fixed idiom. It is necessary to create a lexical entry for a completely fixed idiom (category D in Table 2, section 3.1.). In the case of a semi-fixed construction such as *X DONNER Y + Infinitive* (category C in Table 2, section 3.1.), e.g. *donner sa voiture à réparer* 'give one's car for repair', a notation (+ causal relation) might be added to the construction encoded under *donner* verb entry linked to the appropriate frame(s). In the specific case of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



the semi-fixed constructions with support verbs (category B in Table 2, section 3.1.), e.g. *donner un conseil* 'give advice', the construction has to be described under the noun entry, linking the support verb to the noun as a direct object activating the appropriate frame.

This paper has illustrated the proximity between lexicon and grammar: it is the syntax-semantic interface that makes it possible to construe the meaning of the verb object construction, in particular with support verb constructions. Most of all, a construction is a cognitive entity expressing relations of cognitive salience: meaning has proved to be grounded in our case study, and the process of connecting pieces building the construction as a whole is essential.

**References**

Analyse et Traitement Informatique de la Langue Français. 2007. *Dictionnaire étymologique*, Centre National de Ressources Textuelles et Lexicales, Centre National de la Recherche Scientifique http://www.cnrtl.fr/etymologie/donner, accessed January 15, 2008.

Bouveret, Myriam, and Charles J. Fillmore. 2008. Verbo-nominal Constructions in FrameNet Matching Lexical Functions in MTT. *Proceedings of the XIIIth Euralex Congress*, Barcelona July 15-19, 2008, European Association of Lexicography.

Goldberg, Adele. 1995. *Constructions*. Chicago: The University of Chicago Press.

Goldberg, Adele. 2006. *Constructions at Work. The Nature of Generalization in Language*. Oxford: Oxford University Press.

Goldberg, Adele, and Devin Casenhiser. 2006. Learning Argument Structure Constructions. In E. Eve Clark and Barbara F. Kelly, eds., *Constructions in Acquisition*, 185-205. Stanford: Center for the Study of Language and Information.

Gross, Gaston. 1989. *Les constructions converses du français*. Genève-Paris: Librairie Droz.

Gross, Gaston. 2005. Introduction. *Linguisticae Investigationes* 27(2):167-169. Amsterdam: John Benjamins Company.

Jackendoff, Ray. 2008. Construction after Construction and its Theoretical Challenges. *Language* 84(1):8-28.

Kay, P. and Charles J. Fillmore. 1999. Grammatical Constructions and Linguistic Gneralizations: The *What's X Doing Y?* Construction. *Language* 75:1-34.

Koenig, Jean-Pierre. 1993. Linking Constructions vs. Linking Rules: Evidence from French. *Proceedings of the 19th Annual Meeting of the Berkeley Linguistics Society*, 217-231. Berkeley, CA: Berkeley Linguistics Society.

Langacker, W. Ronald. 1991. *Foundations of Cognitive Grammar*, V*ol. II: Descriptive Applications*. Stanford: Stanford University Press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Langer, Stefan. 2004. A Linguistic Test Battery for Delimiting Support Verb Constructions. *Linguisticae Investigationes* 27(2):171-184. Amsterdam, New York: John Benjamins Company.

Levin, Beth, and Malka Hovav Rappaport. 2005. *Argument Realization*. Cambridge: Cambridge University Press.

Mel'čuk, Igor. 1997. *Vers une linguistique Sens-Texte. Leçon inaugurale*. Paris: Collège de France.

Mel'čuk, Igor. 1998. Collocations and Lexical Functions. In A. Cowie, ed., *Phraseology: Theory, Analysis and Applications*, 23-53. Oxford: Clarendon Press.

Mel'čuk, Igor. 2005. Verbes supports sans peine. *Linguisticae Investigationes* 27(2):203-217. Amsterdam, New York: John Benjamins Company.

Ninio, Anat. 1999. Pathbreaking Verbs in Syntactic Development and the Question of the Prototypical Transitivity. *Journal of Child Language* 26:619-53.

Piñango, Maria Mercedes, Mack, Jennifer, and Ray Jackendoff. 2006. Semantic Combinatorial Processes in Argument Structure: Evidence from *Light* Verbs. *Proceedings of the 32nd Annual Meeting of the Berkeley Linguistics Society*. Berkeley, CA: Berkeley Linguistics Society.

Ruwet, Nicolas. 1972. *Théorie syntaxique et syntaxe du français*. Paris: Editions du Seuil.

Sag, Ivan A., Timothy Baldwin, Francis Bond, Ann Copestake, and Dan Flickinger. 2002. Multiword Expressions: A Pain in the Neck for NLP. In *Proceedings of the Third International Conference on Intelligent Text Processing and Computational Linguistics (CICLING 2002)*, 1-15. Mexico City, Mexico.

Sweetser, Eve. 1990. *From Etymology to Pragmatics*, *Metaphorical and Cultural Aspects of Semantic Structure.* Cambridge: Cambridge University Press.

Žolkovskij, A.K., and Igor Mel'čuk. 1967. A. O semantičeskom sinteze — Sur la synthèse sémantique . In *Problemy kibernetiki* 19:177-238. [Three translations of the paper exist: **a**. in Hungarian: *Dokumentació és nyelvészet*, Budapest, 1969, 61-176; **b**. In English: *Systems Theory Research*, N.Y., v. 19; **c.** In French: *T.A.Informations*, 1970, nº 2, 1-85.]. Librairie Klincksieck.

Myriam Bouveret
University of Rouen
Department of Linguistics
7 rue Thomas Becket
76180 Mont-Saint-Aignan, France

myriam.bouveret@univ-rouen.fr
bouveret@berkeley.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Phonetics vs. Phonology in Loanword Adaptation: Revisiting the Role of the Bilingual[1]

CHARLES B. CHANG
*University of California, Berkeley*

## 0. Introduction

In recent studies of loanword adaptation, two main sides have emerged. On the one hand, phonetic accounts emphasize the influence of low-level perceptual factors in the mapping of source language (L2) forms to receptor language (L1) forms. On the other hand, phonological accounts contend that foreign words are incorporated into a language on the basis of phonological similarity between L1 and L2 phonemic categories by bilinguals with access to the phonology of both L1 and L2. In this paper, evidence from Burmese is presented in favor of an intermediate model incorporating both language-independent phonetics and language-particular phonology.

The paper is organized as follows. Section 1 reviews some key studies in the ongoing debate regarding the relative influence of phonetics vs. phonology in loanword adaptation. Section 2 provides background on Burmese phonology, with special attention to phonological differences from English. Section 3 presents examples of phonological scansion and phonetic scansion in the adaptation of English loanwords in Burmese. Finally, Sections 4 and 5 discuss the results and summarize the conclusions.

## 1. Phonetics vs. Phonology in Loanword Adaptation

Researchers endorsing a "phonetic approximation" view of loanword adaptation basically posit that perceptual (and, thereby, acoustic) similarity is responsible for the way L2 forms are mapped onto L1 forms. Though some studies may imply otherwise, phonology is not irrelevant under this view. On the contrary, it is

[1]I am indebted to Larry Hyman, Mathias Jenny, Michael Kenstowicz, Darlene LaCharité, Javier Martín-González, Lynn Nichols, Donca Steriade, Bert Vaux, Ingyin Zaw, Jie Zhang, and audiences at SEALS XVII, BLS 34, and PLC 32 for comments, feedback, and data that have greatly improved this paper. This work was supported by a grant from the Harvard College Research Program, a Jacob K. Javits Fellowship, and a National Science Foundation Graduate Research Fellowship. Any remaining errors are mine.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



precisely the perceptual biases from the L1 phonological system that are generally thought to result in unfaithful perception of L2 forms. In a nutshell, under this view transformations occur in loanwords vis-à-vis the original L2 forms because borrowers are non-native speakers of the L2 who hear the L2 forms unreliably.

In an early study representative of the phonetic approximation view, Silverman (1992) advances a two-tiered model of adaptation in which the first level involves phonetic scansion of the L2 output. He assumes that "the input to loanword phonology is merely a superficial non-linguistic acoustic signal" (1992:289), which is parsed into segments on the first level and mapped onto phonemes of the native L1 on the basis of acoustic similarity. On the second level, L1 phonological constraints are imposed upon the input, and Universal Grammar principles may apply. A notable claim of this model is that phonological knowledge of L2 plays no role in adaptation. Evidence from loanwords in Cantonese suggests that Cantonese speakers are unable to access the source phonological representations of incoming loanwords; thus, the role of the bilingual in loanword adaptation is said to be minimal.

The strongest version of the phonetic approximation view is developed in a later series of papers by Peperkamp and her colleagues (cf. Peperkamp and Dupoux 2003, Vendelin and Peperkamp 2004, Peperkamp 2005), who argue that not just some, but **all** transformations in loanwords result from unfaithful L2 perception (and, thus, that these transformations are phonetic in nature). Drawing parallels between the loanword literature and the cross-linguistic speech perception literature, Peperkamp argues that "loanword adaptations are basically phonetic rather than phonological in nature, and originate in the process of phonetic decoding during speech perception" (2005:350), though she acknowledges that this hypothesis is "a strong one that might be overly simplistic" (2005:349).

In contrast, the "phonological approximation" view of loanword adaptation contends that L2-to-L1 mapping occurs on the basis of phonological distance, rather than phonetic distance between categories: a foreign L2 segment is replaced by the L1 segment that is the closest phonologically (in terms of features), which is not necessarily the segment that is the closest perceptually. The most recent proponents of this view are Paradis and LaCharité, who in series of papers (cf. Paradis and LaCharité 1997, 2008; LaCharité and Paradis 2005) argue that bilinguals, who have access to the phonology of L2, are the ones chiefly responsible for introducing borrowings into a language, and that since the bilingual borrower knows the underlying representation for an L2 form, it is this phonemic representation that constitutes the input to L1. This fact lies behind much of the otherwise inexplicable data they provide on segmental adaptation.

LaCharité and Paradis (2005) point out several cases of loanword adaptation where an L2 segment is replaced by the phonologically closest L1 segment instead of the phonetically closest one (independently identified in speech perception and language acquisition studies). For example, English voiced stops, typically realized in initial position with no voicing during closure and simply a short-lag voice onset time (VOT), are closer phonetically to Spanish voiceless stops



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(unaspirated with short-lag VOT) than to Spanish voiced stops (strongly prevoiced with negative VOT). Therefore, if English voiced stops in loanwords were adapted phonetically, one would expect them to be mapped to Spanish voiceless stops, but on the contrary, they are mapped to the voiced stops, the phonologically closest category. The adaptation of English rhotics in Japanese and the adaptation of the English high lax vowels /ɪ, ʊ/ in a number of languages (e.g. Mexican Spanish, Parisian French) show a similar pattern.

This evidence suggests that what gives rise to segmental adaptations are not relationships of phonetic similarity, but relationships of phonological similarity. The extremely low rate of deletion present in the loanword corpora examined by LaCharité and Paradis – much lower than one would predict if faulty L2 perception were responsible for the changes made in loanwords – further supports the idea that borrowers' L2 perception is, in fact, not faulty at all.

## 2. A Primer on Burmese Phonology

### 2.1. Consonant, Vowel, and Tone Inventories

The segment inventories of Burmese are given in (1) and (2), where strictly allophonic segments have been placed in parentheses.

(1) Burmese consonant inventory

| | LABIAL | DENTAL | ALVEOLAR | PALATAL | VELAR | GLOTTAL |
|---|---|---|---|---|---|---|
| PLOSIVE | p pʰ b | | t tʰ d | | k kʰ g | ʔ |
| AFFRICATE | | | | tʃ tʃʰ dʒ | | |
| FRICATIVE | | (t̪)θ (d̪)ð | s sʰ z | ʃ | | h |
| NASAL | m̥ m | | n̥ n | ɲ̊ ɲ | ŋ̊ ŋ | |
| LATERAL | | | l̥ l | | | |
| TAP/FLAP | | | (ɾ) | | | |
| APPROXIMANT | w̥ w | | | j | | |

(2) Burmese vowel inventory

| | | FRONT | CENTRAL | BACK |
|---|---|---|---|---|
| MONOPHTHONGS | HIGH | i ĩ | | u ũ |
| | MID | e | (ə) | ɔ |
| | LOW | | a ã | |
| DIPHTHONGS | | ei ẽĩ | ai ãĩ au ãũ | ou õũ |

Notable consonantal gaps in comparison to English are the lack of /f, v, ɹ, ʒ/. With respect to vowels, mid nasal vowels and /æ, ɔɪ/ do not occur. Other English vowels missing from Burmese, such as the lax vowels /ɪ, ɛ, ʊ/, have close correspondents in Burmese vowel allophones not included in (2).

Burmese is a tone language, where differences between tones have to do not only with pitch, but also duration, intensity, phonation, and vowel quality (Green 2005). By most accounts (e.g. Wheatley 1987, Green 2005), there are four distinct tones: low, high, creaky, and a "checked" or glottal tone with the general features of creaky tone followed by glottal stop (cf. 3). The tone on schwa is neutral.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(3) Burmese tone inventory

| TONE | TRANSCRIPTION | CHARACTERISTICS |
|---|---|---|
| low | à | medium duration, low intensity, low/rising pitch |
| high | á | long duration, high intensity, high/falling pitch, often breathy |
| creaky | a̰ | short duration, high intensity, high/falling pitch, creaky |
| glottal | aʔ | very short duration, high pitch, sharp glottal closure |

### 2.2. Syllable Structure and Phonotactics

The basic Burmese syllable structure is $C_1(C_2)V(V)(C_3)$, where $C_2$ is an approximant. The rhyme minimally contains a monophthongal nucleus, and may also contain a diphthong. An optional coda $C_3$ is limited to the glottal stop occurring with glottal tone. Several phonotactic restrictions apply to this basic structure. First, the glide /j/ only occurs after labials; clusters such as */tj, kj/ are ill-formed (Green 2005). Second, the diphthongs /ai, au/ only occur before coda glottal stop. Third, /ɔ/ does not occur with a glottal coda (Cornyn 1944), while lax vowel allophones [ɪ, ɛ, ʊ, ʌ] only occur with a glottal coda, or else nasalized (except [ɛ]). In addition, the configuration of a nasalized vowel followed by a coda glottal is disallowed (*ibid*.). Finally, a syllable with a schwa cannot stand on its own and is always bound to a following major syllable with a full vowel (*ibid*.).

## 3. Loanword Adaptation in Burmese: Phonological or Phonetic?

This study focuses on a corpus of 278 adaptations comprising 193 established loanwords and 46 non-words gathered from one main Burmese-English bilingual consultant, as well as 39 adaptations cited by Wheatley (1987), Win (1998), and Green (2005). Non-word adaptations were based upon aural input. Examples from Wheatley, Win, or Green are marked as 'Wh', 'Wi', or 'G', respectively.

### 3.1. Phonological Scansion of the Input

In contrast to the phonetic mapping of segments predicted by Silverman (1992), English input is scanned phonologically in Burmese loanword adaptation. This level of phonological scansion is apparent in the adaptation of English allophones corresponding to Burmese phonemes and the adaptation of English phonemes corresponding to Burmese allophones. For example, English allophonically aspirated [$p^h$] is consistently adapted with Burmese /p/ (cf. 4) rather than Burmese /$p^h$/, which is used instead to represent English [f] (cf. 5).

(4)
a. *penguin* > [**p**ɪ̃.gwɪ̃] b. *Poland* > [**p**òù.lɑ̃]
c. *plastic* > [**p**ə.laʔ.sə.tɪʔ] d. *police* > [**p**ə.leiʔ]
e. *Japan* > [dʒə.**p**ɑ̀] f. *computer* > [kə̀ṵ.**p**jù.tà]
g. *champagne* > [ʃà.**p**ɛ́ɪ̃] h. *ball pen* > [bɔ́.**p**ɪ̃]

(5)
a. *file* > [**p**$^h$àɪ̀] b. *four* > [**p**$^h$óú]
c. *film* > [**p**$^h$ə.lɪ̃] d. *feeling* > [**p**$^h$ì.lɪ̃]
e. *Finland* > [**p**$^h$ɪ̃.lɑ̀] f. *Philippines* > [**p**$^h$ì.lɪʔ.pɑ̀ɪ̀]
g. *phone* > [**p**$^h$óṹ] h. *coffee* > [kɔ.**p**$^h$i]



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In other words, the adaptation of English [$p^h$] occurs on the phonemic level, not on an allophonic level; thus, the phone [$p^h$], as an allophone of the phoneme /p/, is adapted as Burmese /p/. The adaptation of aspirated stops at other places of articulation is similar, with both alveolars and velars being adapted with the Burmese unaspirated series nearly all of the time (cf. 6).[2]

(6) Corpus figures for adaptations of aspirated stop allophones

| INPUT | *n* | UNASPIRATED | ASPIRATED | % UNASPIRATED |
|---|---|---|---|---|
| [$p^h$] | 21 | 21 | 0 | 100.0 % |
| [$t^h$] | 17 | 15 | 2 | 88.2 % |
| [$k^h$] | 36 | 34 | 2 | 94.4 % |

English [ɾ] is also adapted on the phonemic level. As an allophone of English /d/, [ɾ] is rendered as Burmese /d/ (cf. 7), which prevents English [ɾ] from falling together with a different segment that is adapted with Burmese [ɾ] – namely, English onset /ɹ/ (cf. 8). This mapping pattern, too, is quite consistent and is by far the dominant pattern in the corpus (cf. 9).[3]

(7) a. *powder* > [pàǔ.**d**à] b. *radio* > [jèì.**d**ì.jòù]
c. *soda* > [$s^h$òù.**d**à] d. *video* > [bì.**d**ì.jò]

(8) a. *rifle* > [**ɾ**àĭ.$p^h$è] b. *rubber* > [**ɾ**à.bà]
c. *steering* > [sə.tì.jà.**ɾ**àĭ] d. *director* > [dà.**ɾ**aiʔ.tà]
e. *Victoria* > [wi̱.tòù.**ɾ**i̱.ja̱] f. *cigarette* > [sí.kə.**ɾ**ɛʔ]
g. *brake* > [bə.**ɾ**eiʔ] h. *drum* > [də.**ɾ**à]

(9) Corpus figures for adaptations of flapped /d/

| INPUT | *n* | # [d] | # [ɾ] | % [d] |
|---|---|---|---|---|
| [ɾ] | 10 | 8 | 1 | 80.0 % |

In addition, English contrasts that constitute allophony in Burmese are faithfully adapted, not disregarded. In particular, the tense/lax vowel distinction is generally maintained in loanwords despite the fact that neither vowel tenseness nor length is phonemic in Burmese. Tense vowels are adapted as tense (cf. 10), while lax vowel quality is achieved through the use of glottal tone, whose concomitant glottal coda has the effect of laxing/centralizing the host vowel (cf. 11).

(10) a. *CD* > [sì.**d**ì] b. *university* > [jù.nì.bà.sì.tì]
c. *B.A.* > [bì.**ʔ**èì] d. *Coca-Cola* > [k**ò**ù.kà.k**ò**ù.là]

[2] Note that this is unlikely to be due to a salient difference in aspiration between Burmese and English. Unlike Mandarin aspirated plosives, which are aspirated on average about 40 ms more than English voiceless plosives (cf. Wu and Lin 1989, Lisker and Abramson 1964), Burmese aspirated plosives tend to be aspirated only about 10 ms more than English voiceless plosives.

[3] See Paradis and LaCharité (1997) and LaCharité and Paradis (2005) for arguments against assuming that this mapping arises from L2 orthographic cues.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(11)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a. | *Living* | > | [lɪʔ.bǐ] | b. | *City Mart* | > | [sɪʔ.tì.maʔ] |
| c. | *B.Sc.* | > | [bì.ʔɛʔ.sì] | d. | *Jessica* | > | [dʒɛʔ.sì.kà] |
| e. | *jacket* | > | [dʒɛʔ.kɛʔ] | f. | *Craddock* | > | [kə.ɾɛʔ.dauʔ][(Wi)] |
| g. | *bus + car* | > | [bʌʔ.sə.ká] | h. | *'vood'* ([ʊ]) | > | [bʊʔ] |

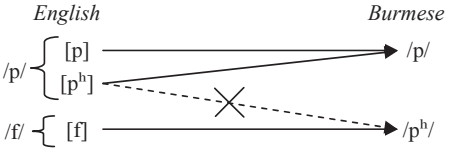
Though the pattern of adapting English lax vowels as Burmese lax vowels is not as robust as the non-preservation of allophonic aspiration, it is still the dominant pattern in the corpus. (12) shows that when only stressed input lax vowels are counted, Burmese clearly favors output lax vowels; if the counts are expanded to include all vowels, the results favor lax adaptations even more strongly.

(12) Corpus figures for adaptations of stressed lax vowel phonemes

| INPUT | *n* | LAX | TENSE | % LAX |
|---|---|---|---|---|
| $V_{[-tense]}$ | 135 | 90 | 45 | 66.7 % |
| [ɪ] | 63 | 41 | 22 | 65.1 % |
| [ɛ] | 32 | 22 | 10 | 68.8 % |
| [æ] | 23 | 17 | 6 | 73.9 % |
| [ʌ] | 15 | 8 | 7 | 53.3 % |
| [ʊ] | 2 | 2 | 0 | 100.0 % |

Thus, the non-adaptation of L2 allophonic details that are phonemic in L1 and the adaptation of L2 phonemic details that are only allophonic in L1 suggest that what the borrower of an L2 word attends to is information that is phonemic in L2. This strategy is shown in (13) for the case of the voiceless labials.

(13) Maintenance of source phonemic distinctions in adaptation




It was observed above that Burmese [ɾ] is used to adapt English onset /ɹ/ (cf. 8). In actuality, this is not the only segment that corresponds to /ɹ/ in loanword adaptations; Burmese [j] also occurs (cf. 14) and is in fact the prototypical substitution made for /ɹ/ in older loanwords and in the L2 speech of Burmese learners of English (cf. Win 1998). The corpus indicates, however, that [ɾ] now occurs more often than [j]. (15) shows that when only the most frequent variants of loanwords are counted, [ɾ] is slightly favored as the adaptation of /ɹ/; if the counts are expanded to include all variants, [ɾ] emerges as the clearly favored adaptation, as nearly all relevant loanwords occur with a [ɾ]-variant as a possible form.

(14)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a. | *radio* | > | [**j**èì.dì.jòù] | b. | *rum* | > | [**j**ã̀] |
| c. | *Russia* | > | [**j**ụ.ʃá] | d. | *crown* | > | [kə.**j**ã́ũ̃][(Wi)] |
| e. | *April* | > | [ʔèì.p**j**ì] | f. | *Andrew* | > | [ʔɪ̀ɪ̀.də.**j**ú] |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(15) Corpus figures for most frequent adaptations of onset /ɹ/

| INPUT | *n* | # [ɾ] | # [j] | % [ɾ] |
|---|---|---|---|---|
| [ɹ] | 37 | 20 | 17 | 54.1 % |

Thus, in this case of variation in adaptation as well there is movement towards a segmental mapping strategy that avoids phonological neutralization (here, between /ɹ/ and /j/), as schematized in (13). In newer /ɹ/-ful loans, the adaptation of /ɹ/ chosen is the one not already associated with an L2 segment – namely, [ɾ]. In this way, [ɾ] appears to have taken over as the prototypical adaptation of /ɹ/.

A final example of the influence of phonological knowledge is the adaptation of onset /nj/ clusters. An item like *New York*, adapted as [**nə.jú**.jauʔ] rather than *[**ɲ**ú.jauʔ], shows that borrowers correctly interpret /nj/ as a cluster, even though the palatal nasal /ɲ/ would arguably serve as the closest perceptual substitution.

### 3.2. Phonetic Scansion of the Input

Clearly, then, a level of phonological scansion must be involved in the adaptation of English loanwords in Burmese. However, some adaptations show that borrowers also pick up on phonetic details that are phonemic in neither English nor Burmese. For instance, the phonetically voiceless [ɻ̥] interval that occurs after voiceless aspirated plosives in English $_{\sigma}$[TR clusters appears to influence the percept of the preceding aspirated plosive such that it is often adapted as aspirated in only this environment (cf. 16a-c), in stark contrast to the otherwise general disregard for aspiration on voiceless stops seen above in (4).

(16) a. *Christ* > [**kʰ**ə.ɾɪʔ] b. *cream* > [**kʰ**ə.jɪ̀]
c. *truck + car* > [**tʰ**ə.ɾʌʔ.ká] d. *ice cream* > [ʔaiʔ.sə.**k**ə.jɪ́]

Note also the striking contrast between (16b) and (16d), both of which involve adaptations of the word *cream*. In (16b), /k/ is word-initial and aspirated, devoicing much of the following /ɹ/, and this leads to /k/ being adapted as aspirated. In (16d), however, /k/ is preceded by /s/, forming a cluster which is well-known in English for containing the unaspirated allophones of the voiceless plosives. Here the input likely contains reduced or no aspiration and, accordingly, reduced or no devoicing of /ɹ/; it follows that the plosive here is adapted as unaspirated per the usual pattern. Borrowers thus appear capable of distinguishing phonologically identical sequences on the basis of phonetic differences between them.

Another example of attention to subphonemic detail involves the adaptation of coda clusters comprising a nasal and obstruent. Given that coda nasals are normally adapted via vowel nasalization, the standard strategy of using glottal tone to adapt coda obstruents cannot be used here since nasal vowels are incompatible with coda glottals (cf. §2.2). The tone assigned to the nasal vowel must therefore be one of the other three tones. If the tone were assigned randomly, we would expect it to surface roughly 33% of the time as high, 33% of the time as low, and 33% of the time as creaky. What we find instead is that creaky tone is the most



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



frequent adaptation (e.g. 17), reflecting the laryngealization that occurs in this environment in anticipation of the final voiceless closure, which is often made simply at the glottis (cf. British English *but* [bʌʔ], American English *can't* [kʰɛ̃ʔ]). However, this pattern only occurs when the final obstruents are voiceless. When they are voiced, the tone assigned to the syllable is never creaky (cf. 18).

(17) a. *Sphinx* > [sə.pʰɪ̰̃] b. *count* > [kɑ̰̃ʊ̰̃]

(18) Corpus figures for tones assigned to syllables with complex codas

| INPUT | *n* | CREAKY | NON-CREAKY | % CREAKY |
|---|---|---|---|---|
| NC̥(C̥)]$_\sigma$ | 7 | 4 | 3 | 57.1 % |
| NC̬(C̬)]$_\sigma$ | 6 | 0 | 6 | 0.0 % |

Thus, borrowers do not treat all NC(C) clusters the same. Creaky tone assignment depends not only on whether there are coda obstruents, but also on whether laryngealization occurs. Borrowers clearly discriminate between syllable structures that are phonologically identical, but phonetically different, indicating once again that L2 scansion in loanword adaptation cannot be strictly phonological.

A final example of phonetic differentiation between phonologically identical structures is the adaptation of medial consonant clusters, which does not always follow the pattern appropriate for the input syllabification. On the one hand, medial onset clusters are resolved like initial onset clusters: the constituent consonants are preserved, through schwa epenthesis if necessary (e.g. 19a-b vs. 19c-d). A corpus investigation further shows that medial onset clusters are always resolved in this way (cf. 20).

(19) a. *Scott* > [**s**ə.**k**ɔ̰] b. *club* > [**k**ə.**l**ʌʔ]
c. *biscuit* > [bɪʔ.**s**ə.**k**ɪʔ] d. *cyclone* > [sʰɑ̀ɪ̀.**k**ə.**l**ɔ̃́ʊ̃́]$^{(G)}$

(20) Corpus figures for adaptations of medial onset clusters

| INPUT | *n* | # CC / Cə.C | # ʔ.C / ∅.C | % CC / Cə.C |
|---|---|---|---|---|
| …$CC… | 20 | 20 | 0 | 100.0 % |

On the other hand, medial heterosyllabic clusters are treated in one of two ways. They are either resolved like onset clusters (e.g. 21a-b) or like a sequence of coda and onset, with codas normally being either debuccalized or deleted (e.g. 21c-d).

(21) a. *Maz.da* > [mà.**z**ə.**d**à] b. *helicop.ter* > [hè.lì.kɔ̰.**p**ə.**t**à]$^{(Wh)}$
c. *Jet.son* > [dʒɛ**ʔ**.**s**ʰɪ̀] d. *Oc.tober* > [ʔau**ʔ**.**t**òù.bà]

This variation in adaptation strategy is not random, however. A pattern emerges from the corpus whereby some heterosyllabic clusters are generally adapted like onset clusters, while other heterosyllabic clusters are always resolved as coda-onset sequences, these latter cluster types being [t.s], [k.t], and [k.s]. (22) indicates that heterosyllabic clusters are resolved as onset clusters about one-third of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

the time in the corpus, but if the data are separated by cluster type, it turns out that [t.s]/[k.t]/[k.s] clusters are never resolved like onset clusters, while all other clusters are resolved like onset clusters nearly 80% of the time.

(22) Corpus figures for adaptations of medial heterosyllabic clusters

| INPUT | *n* | # CC / Cə.C | # ʔ.C / ∅.C | % CC / Cə.C |
|---|---|---|---|---|
| …C.C… | 19 | 7 | 12 | 36.8 % |
| [p.t] | 3 | 2 | 1 | |
| [p.s] | 2 | 1 | 1 | |
| [θ.l] | 1 | 1 | 0 | |
| **[t.s]** | **3** | **0** | **3** | |
| [t.l] | 1 | 1 | 0 | |
| [z.d] | 1 | 1 | 0 | |
| [z.ɹ] | 1 | 1 | 0 | |
| **[k.t]** | **5** | **0** | **5** | |
| **[k.s]** | **2** | **0** | **2** | |

Thus, once again phonologically identical syllable structures are treated differently on the basis of phonetic differences between them. In this case, coda [t] preceding [s] and coda [k] are debuccalized, while all other coda-onset sequences are adapted via epenthesis and resyllabification. As for why these particular codas should go to [ʔ] while other codas are preserved, the distinction is most likely one of relative perceptual salience (cf. Shinohara 2006). There are a couple of reasons why the [t] in [t.s] and the [k] in [k.t] and [k.s] would be less salient than the codas in the other clusters seen in (22). First, among English oral stops the velar stop is articulated the farthest back in the vocal tract, allowing obstruents at basically any other place of articulation to obscure its constriction when gestures overlap in real time; a velar release cannot be heard when it is "covered up" by a more forward alveolar closure, for instance. Second, the juxtaposition of these stops against perhaps the most perceptually salient segment of all, the high-frequency sibilant [s], is also likely to have the effect of obscuring or drawing attention away from release cues of the stop, especially when the release interval is overlapped with the beginning of the strident interval of [s]; this is especially so in the case of [t.s] since the two segments share the same place of articulation.

## 4. Discussion

To summarize, the adaptation of English loanwords in Burmese appears to involve both phonological and phonetic scansion of the L2 input. On the one hand, the faithful adaptation of distinctive L2 information that is non-distinctive in L1 and the abstraction away from non-distinctive L2 information that is distinctive in L1 suggest that L2 phonological knowledge is utilized in L2-to-L1 mapping. On the other hand, the impact on adaptations of phonetic details that are distinctive in neither L1 nor L2 suggests that phonetics is considered as well.

The phonological nature of aspects of English loanword adaptation in Burmese suggests that borrowers are indeed bilingual in Burmese and English to



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

some degree, but the question remains: how bilingual are they? Over a nearly 100-year period of British colonial rule, exposure to English would have been commonplace, and some sources suggest that in the recent past bilingualism was not uncommon, at least among the formally educated:

> In the past, Burma's educated class was nearly bilingual, but as a result of several decades of neglect of English language training, fewer younger people speak or understand English well…English and Burmese are widely spoken and used for official purposes…English fluency is not universal. (USDOS 1995)

> While the country was still under British colonial rule in the 1920s and 1930s, an upsurge in nationalistic sentiment led to the increasing use of Burmese instead of English in education and public life. However, by the 1980s there had been a shift back to the use of English. English is widely used as a teaching medium in schools and is the only language used at university level. (Baker and Jones 1998:379-380)

However, while English is still used by the government and educated people, it is no longer the primary language of instruction in higher education (Thein 2004), and consequently the extent of bilingualism seems to have declined significantly over the last 20-30 years:

> Burmese over the age of 40, particularly those over 65 years of age, are generally well-educated, but the lack of investment in education by the military regime and the repeated closing of Burmese universities over the past 18 years have taken a toll on the country's young. Most in the 15-39 year old demographic group lack technical skills and English proficiency. Many older educated Burmese studied English in mission schools during the British colonial and early independence period. The military nationalized schools in 1964 and discouraged the teaching of English in favor of Burmese. (USDOS 2007)

Given that English loanwords appear to have been borrowed into Burmese at different times, it is likely that the borrowers of these words were not uniform in their English proficiency. This potential variation in the borrowers' degree of bilingualism in English may underlie the mixed phonetic-and-phonological nature of the loanword adaptations examined in this study, or the mixed strategies might simply result from a lower level of bilingualism: speakers are somewhat proficient in English and apply an incomplete knowledge of English phonology to the adaptation of English loanwords. Note that this situation contrasts with the case of a language adapting either phonetically or phonologically depending on the L2 (e.g. French and German front rounded vowels in Japanese, cf. Dohlus 2005); it also contrasts with the case of a language adapting L2 borrowings phonologically at one point in time and phonetically at another point in time (e.g. Chinese borrowings in Japanese during a period of high vs. low bilingualism, cf. Heffernan 2007). The latter scenario in particular does not accurately characterize the Burmese facts, since it is not the case that some loanwords are adapted phonologically, while others are phonetically. Rather, the evidence suggests that attention is paid to phonology and phonetics at the same time, even in the same loan-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



words (e.g. *count* > [kaʊ̃], in which allophonic aspiration is disregarded, but allophonic laryngealization is adapted faithfully).

The present proposal is that the mixed adaptation situation in Burmese arises from an intermediate state of bilingualism in which borrowers have some, but not full knowledge of the phonology of L2, and therefore still attend to phonetic details of L2 while applying the phonological knowledge that they do have. Alternatively, it may be that the borrowers have full phonological knowledge of L2, but that they nonetheless maintain active phonetic awareness of L2. In this case, the input to loanword adaptation would be "enriched" in the way proposed by Kang (2008:114), who argues that "the phonological representation that the interlanguage mapping refers to should contain phonetic details that are considered non-contrastive in L1 and at the same time should somehow acknowledge the privileged status of contrastive features". In short, the fact that bilingual borrowers *can* adapt loanwords phonologically may not entail that they *will*.

## 5. Conclusion

Taken together, the findings in this study suggest that a model of loanword adaptation incorporating both phonetics and phonology is the most empirically sound. While loanword adaptations are indeed influenced by phonetic details of the input, bilinguals play a leading role in adaptation, allowing the phonology of L2 to have a profound effect on loanword adaptations in L1. However, the way in which loanwords are adapted is affected not only by the timing of bilingualism with respect to the timing of borrowing, but also by the degree of bilingualism among potential borrowers. In the case of Burmese, it appears that borrowers with an incomplete knowledge of the L2 phonology may be responsible for the mixed nature of English loanword adaptations, which show the influence of both phonological and phonetic considerations.

## References

Baker, Colin, and Sylvia Prys Jones. 1998. *Encyclopedia of Bilingualism and Bilingual Education*. Clevedon, UK: Multilingual Matters Ltd.

Dohlus, Katrin. 2005. Phonetics or Phonology: Asymmetries in Loanword Adaptations – French and German Mid Front Rounded Vowels in Japanese. *ZAS Papers in Linguistics* 42:117-135.

Green, Antony D. 2005. Word, Foot, and Syllable Structure in Burmese. In J. Watkins, ed., *Studies in Burmese Linguistics*, 1-25. Canberra, Australia: Pacific Linguistics.

Heffernan, Kevin. 2007. The Role of Phonemic Contrast in the Formation of Sino-Japanese. *Journal of East Asian Linguistics* 16(2):61-86.

Kang, Yoonjung. 2008. Interlanguage Segmental Mapping as Evidence for the Nature of Lexical Representation. *Language and Linguistics Compass* 2(1):103-118.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



LaCharité, Darlene, and Carole Paradis. 2005. Category Preservation and Proximity versus Phonetic Approximation in Loanword Adaptation. *Linguistic Inquiry* 36(2):223-258.

Lisker, Leigh, and Arthur Abramson. 1964. A Cross-Language Study of Voicing in Initial Stops: Acoustical Measurements. *Word* 20(3):384-422.

Paradis, Carole, and Darlene LaCharité. 1997. Preservation and Minimality in Loanword Adaptation. *Journal of Linguistics* 33(2):379-430.

Paradis, Carole, and Darlene LaCharité. 2008. Apparent Phonetic Approximation: English Loanwords in Old Quebec French. *Journal of Linguistics* 44(1):87-128.

Peperkamp, Sharon. 2005. A Psycholinguistic Theory of Loanword Adaptations. In M. Ettlinger et al., eds., *Proceedings of the 30th Annual Meeting of the Berkeley Linguistics Society*, 341-352.

Peperkamp, Sharon, and Emmanuel Dupoux. 2003. Reinterpreting Loanword Adaptations: The Role of Perception. In M. J. Solé et al., eds., *Proceedings of the 15th International Congress of Phonetic Sciences*, 367-370.

Shinohara, Shigeko. 2006. Perceptual Effects in Final Cluster Reduction Patterns. *Lingua* 116(7):1046-1078.

Silverman, Daniel. 1992. Multiple Scansions in Loanword Phonology: Evidence from Cantonese. *Phonology* 9(2):298-328.

Thein, Myat. 2004. *Economic Development of Myanmar*. Singapore: Institute of Southeast Asian Studies.

U.S. Department of State (USDOS). 1995. *Country Commercial Guide: Burma (Myanmar)*. Yangon, Myanmar: U.S. Embassy.

U.S. Department of State (USDOS). 2007. *2007 Investment Climate Statement – Burma*. Washington, DC: Bureau of Economic and Business Affairs.

Vendelin, Inga, and Sharon Peperkamp. 2004. Evidence for Phonetic Adaptation of Loanwords: An Experimental Study. In *Actes des Journées d'Etudes Linguistiques de l'Université de Nantes*, 129-131.

Wheatley, Julian K. 1987. Burmese. In B. Comrie, ed., *The World's Major Languages*, 834-854. New York: Oxford University Press.

Win, Than Than. 1998. Burmese-English Accent: Description, Causes, and Consequences. Ph.D. diss., Northern Illinois University.

Wu, Zongji, and Canmao Lin. 1989. Shi Yan Yu Yin Xue Gai Yao (实验语音学概要). Beijing: Higher Education Press.

Charles B. Chang
University of California, Berkeley
Department of Linguistics
1203 Dwinelle Hall
Berkeley, CA 94720-2650

cbchang@post.harvard.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# Flexibility and Rigidity: Multiplicatives, Frequency and Quantification Adverbs[1]

ANIKO CSIRMAZ
*University of Utah*

## 0. Introduction

There are a variety of adverbs which modify the description of repeatedly occurring situations. They can specify the number of occurrences or the frequency of such situations. The exact distinction among these adverbs – if it is acknowledged – is sometimes left vague, with the differences not explicitly specified (e.g. Cinque 1999, Ernst 2002).[2] In this paper I argue for a distinction among three classes of adverbs of counting: multiplicatives, frequency adverbs and adverbs of quantification. Building mostly on data from Hungarian, a highly discourse-configurational language, I note differences which follow from a simple, intuitive characterization of these adverbs. I also address the distribution of these adverbs, which is shown to follow from the view proposed here, and some additional properties of the adverbs.

A few terminological remarks are in order. In the following discussion, I use the term *situation* or *event*; loosely, these refer to some kind of eventuality, or subevents of complex eventualities (e.g. the event that is iterated). The term *situation description* or *event description* refers to the description of the appropriate event; properties such as countability can be defined for descriptions rather than for the situations themselves. As for the property of countability itself, I simply treat it as non-homogeneity.[3]

The paper is organized as follows. Section 1 presents the three classes of adverbs and discusses the properties distinguishing these. Section 2 considers the distribution of the adverbs. Sections 3 and 4 argue that it is possible to iterate ad-

[1] This paper builds on research on structural and semantic issues of adverbs in Hungarian, partially funded by OTKA TS 049873 (PI: Katalin É. Kiss). I thank K. É. Kiss, H. Bartos, A. Bene. B. Gyuris, C. Piñón, B. Surányi, B. Ürögdi, as well as the audiences at BLS 34 and PLC 32 for discussions and comments. All errors are my own.

[2] Other distinctions among the adverbs, including the property vague/ absolute or relative/ fixed (cf. Stump 1985), are ignored here.

[3] I assume that homogeneity should be defined as divisibility, but the discussion is also compatible with homogeneity defined as cumulativity.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

verbs of each type, and that not all adverbs can introduce a plurality of events. Section 5 notes some crosslinguistic extensions and concludes the paper.

## 1. Adverbs of Counting

Within **adverbs of counting**, there is a tripartite distinction among **multiplicatives**, frequency adverbs (**freq-adverbs**) and adverbs of quantification (**Q-adverbs**). This section offers a characterization and arguments supporting the distinction.

### 1.1. Multiplicatives

Multiplicative adverbs specify the number of occurrences of situations of the same type. In Hungarian, a language which displays surface scope in the preverbal domain (cf. Szabolcsi 1997, É. Kiss 2002, a.o.), multiplicatives take scope over the quantificational elements they precede.

(1) a. **Kétszer** [mindenki megkóstolta a pudingot]
twice everyone-NOM tasted the pudding-ACC
'Everyone tasted the pudding twice' (it happened twice that everyonetasted the pudding'

b. Mindenki **kétszer** [megkóstolta a pudingot]
everyone-NOM twice tasted the pudding-ACC
'Everyone tasted the pudding twice' (for every person, they tasted the pudding twice)

As shown below in section 2, multiplicatives have a flexible distribution. This follows from the unique restriction on the distribution, which requires multiplicatives to modify countable situation descriptions.

### 1.2. Freq-Adverbs and Q-Adverbs

The distinction between freq-adverbs and Q-adverbs is often left vague. Following partially van Geenhoven (2004, 2005) and Johansdottir (2005), I assume a strict division between the two types of adverbs.

Intuitively, freq-adverbs specify the frequency of multiple situations of the same type within a larger time interval (cf. Stump 1981, 1985). Q-adverbs, in contrast, quantify over situations (cf. de Swart 1993, 1996, a.o.).

It follows that freq-adverbs, but not Q-adverbs, require a time interval argument. This leads to a contrast in descriptions which hold outside of time (Lewis 1975, Johansdottir 2005). Consider (2). The possible values of a variable are independent of the time when the values are determined; no temporal argument for the situation is available. Accordingly, freq-adverbs (which require a time argument) are marked and Q-adverbs, with no such requirement, are fully acceptable.[4]

[4] The adverbs are separated by slashes (/). The grammaticality marking conveys that no matter which adverb is chosen, the example has the same grammaticality status.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(2) a. ??Az egyenletben ennek a változónak **sûrûn** / **ritkán**
the equation-in this-DAT the variable-DAT frequently rarely
/ **rendszeresen** negatív az értéke
regularly negative the value-POSS
'The value of this variable in the equation is frequently / rarely / regularly negative' (**freq-adverb**)

b. Az egyenletben ennek a változónak **gyakran** /
the equation-in this-DAT the variable-DAT often
**néha** / **általában** / **rendszeresen** negatív az értéke
seldom generally usually negative the value-POSS
'The value of this variable in the equation is often / seldom / generally / usually negative' (**Q-adverb**)

Unique situations also distinguish the two types of adverbs. With a unique situation, such as Feri eating a sandwich or a child being born, freq-adverb (but not Q-adverb) modification is marked:

(3) a. ??Feri **sûrûn** evett egy szendvicset
F-NOM frequently ate a sandwich-ACC
'Feri frequently ate a sandwich' (**freq-adverb**)

b. Feri **gyakran** evett egy szendvicset
F-NOM often ate a sandwich-ACC
'Feri often ate a sandwich' (**Q-adverb**)

(4) a. ??A kórházban **sûrûn** született egy csecsemô
the hospital-in frequently was born a baby-NOM
'A baby was frequently born in the hospital' (**freq-adverb**)

b. A kórházban **gyakran** született egy csecsemô
the hospital-in often was born a baby-NOM
'A baby was often born in the hospital' (**Q-adverb**)

The contrast is in line with the characterization given, with the additional stipulation that freq-adverbs must take scope over the default existential quantifier which binds the variable. Freq-adverbs specify the frequency of situations within a certain time interval; that non-uniqueness requirement follows from the impossibility of determining frequency for a single occurrence of a situation. Q-adverbs, in contrast, are quantificational; they specify that the event of Feri eating a sandwich or that of a child being born in the hospital occurred often. Because it is the (atomic) situation that is being quantified over, the uniqueness of a situation does not lead to ungrammaticality and the quantifier can bind a non-temporal variable.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The uniqueness requirement also predicts the following contrast. Recall that in preverbal positions, Hungarian has surface scope. The plural expression thus falls outside of the scope of the freq-adverb in (5a), and the freq-adverb modifies a unique situation, that of electing a specialist as chairperson. This is ruled out, given the non-uniqueness requirement imposed by freq-adverbs. The uniqueness condition is not relevant for Q-adverbs, and they are acceptable in this environment (5b).

(5) a. ??A frissen alapított vállalatoknál **sûrûn** / **rendszeresen**
the recently founded companies-at frequently regularly
egy szakembert választanak elnöknek
a specialist-ACC elect-3PL chairperson-DAT
'At recently established companies, it is frequently / regularly a specialist that is elected as chairperson' (**freq-adverb**)

b. A frissen alapított vállalatoknál **gyakran** / **rendszerint**
the recently founded companies-at often usually
egy szakembert választanak elnöknek
a specialist-ACC elect-3PL chairperson-DAT
'At recently established companies, it is often / usually a specialist that is elected as chairperson' (**Q-adverb**)

Unique situations also distinguish multiplicatives and Q-adverbs, where both adverbs are quantificational. Multiplicatives (whether absolute or vague) specify the cardinality of a situation, and similarly to freq-adverbs, they cannot modify unique situations (6a). Q-adverbs, as noted above, can modify such situations (6b).

(6) a. ??Feri **sokszor** meg-evett egy szendvicset
F-NOM many times PARTICLE ate a sandwich-ACC
'Feri ate a sandwich many times'

b. Feri **gyakran** meg-evett egy szendvicset
F-NOM often PARTICLE ate a sandwich-ACC
'Feri often ate a sandwich'

It is the requirement of a time interval argument and non-uniqueness of situations that distinguish freq-adverbs and Q-adverbs. Other diagnostics, suggested by van Geenhoven (2004, 2005), Johansdottir (2005), Cinque (1999) and others, fail to identify these two categories of adverbs. The problematic criteria include the following: functional uniqueness, homogeneity and time intervals affected.

(a) Functional uniqueness, which maintains that at most one adverb of each type may be present in a clause, cannot be maintained. The number of occurrences of these adverbs is not intrinsically restricted; constraints follow from parsing limitations and coercion effects (cf. section 3). (b) The two adverbs are assumed to have different effects on aspectual values. Freq-adverbs are said to affect ho-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



mogeneity, yielding unbounded, atelic aspect for the complex description. Q-adverbs are assumed not to change aspectual values in this way (cf. van Geenhoven 2004, 2005). Rather, both freq-adverbs and Q-adverbs can yield homogeneous, unbounded situation descriptions; the two adverb types are not different in this respect.[5] (c) Finally, the time intervals affected are also assumed to distinguish the two adverb classes. Specifically, van Geenhoven (2005) suggests that freq-adverbs operate on the event time, while Q-adverbs operate on the reference time interval. This distinction is dictated by functional uniqueness, which ultimately cannot be upheld, as noted above. The time intervals affected cannot be characterized in terms of iterativity and habituality either; both Q-adverbs and freq-adverbs allow habitual interpretation, which would require these adverbs to operate on some habitual time interval.

### 1.3. Morphological Differences

In addition to the criteria of non-uniqueness and modification of statements outside of time, morphology and non-temporal interpretation also provide a useful heuristic for distinguishing freq-adverbs and Q-adverbs.

In Hungarian, the realization of freq-adverbs can have non-temporal interpretation. Fixed freq-adverbs, for example, have a distributive suffix (*-ként* or *-ente/ -onta*) which allows non-temporal use as well.

(7) a. órán-**ként** 'hourly' (time) mérföldén-**ként** 'by mile' (spatial measure)
b. het-**ente** 'weekly' (time) darab-**onta** 'by piece'

Relative freq-adverbs in Hungarian appear with a general adverbial suffix *-n,* which derives adverbs from adjectives. These freq-adverbs have a non-temporal, usually a spatial homonym (8b).

(8) a. Feri **sûrûn** / **ritkán** sütött pizzát
F-NOM frequently rarely baked pizza-ACC
'Feri baked pizza frequently / rarely' (time)
b. Feri **sûrûn** / **ritkán** ültette a virágokat
F-NOM frequently rarely planted the flowers-ACC
'Feri planted the flowers densely / thinly' (space)

Q-adverbs fail to display such homonyms; no adverb or morphological component has a spatial parallel.[6] The non-temporal interpretation then identifies freq-

[5] The characterization in van Geenhoven (2004, 2005) appeals to the property of atelicity that arises after freq-adverb modification. In absence of a specific definition and view of atelicity, freq-adverbs and Q-adverbs can be treated on par. Both types of adverbs can yield homogeneous, unbounded situation descriptions, whether homogeneity is defined as cumulativity or divisibility.

[6] The lack of spatial use can be illustrated by the following example:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

adverbs unambiguously. In fact, spatial use is expected for these adverbs; the same adverb or suffix can specify frequency in either temporal or spatial domains.

## 2. Adverb Distribution

The distribution of multiplicatives can only be characterized in terms of the interpretation described above. Crucially, their distribution differs from that of other adjuncts and arguments in Hungarian, where the latter is determined by quantificational and referential properties of the expression.

### 2.1. Different Distribution Patterns

In general, topicalized, referential expressions appear at the left edge of the clause, followed by (distributive) quantifiers. The rightmost zone contains focused elements, negation and other, possibly non-referential expressions (cf. É. Kiss 2002).

| (9) | Topics | *Quantifiers / Q-adverbs* | **Focus / negation / freq-adverb [V XP*]** |
|---|---|---|---|
| | a pudingot | *mindenki* | **villával ette** |
| | the pudding-ACC | everyone-NOM | fork-with ate |
| | 'Everyone ate the pudding with a fork' | | |
| | a csokoládét | *sokan* | **nem szerették** |
| | the chocolate-ACC | many people-NOM | not liked |
| | 'Many people didn't like chocolate' | | |
| | Feri | *gyakran* | **villával ette a pudingot** |
| | F-NOM | often | fork-with ate the pudding-ACC |
| | 'Feri often ate pudding with a fork' | | |
| | A villát | *mindenki* | **sûrûn használta** |
| | the fork-ACC | everyone-NOM | frequently used |
| | 'Everyone used the fork frequently' | | |

Some adverbs of counting fail to pattern with other constituents in this respect. Let us consider those instances where the same quantificational component (such as the numeral *three*) can be identified in both adverbs of counting (the multiplicative *three times*) and other expressions (e.g. *three cakes*). The distribution of

(i) Feri *néha* / *gyakran* ültetett virágokat
F-NOM seldom often planted flowers-ACC
'Feri seldom / often planted flowers' / *'Feri planted flowers thinly / densely'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

multiplicatives and other constituents, even if they contain the same quantificational element, is distinct.

Multiplicatives can all appear in the three zones described above. They differ, among others, from other, indefinite expressions, which are restricted to topic and focus/ postverbal positions. Only multiplicatives, but not other indefinites can appear in the zone of quantifiers, freely ordered among quantifiers. Q-adverbs, in contrast, show parallelism with related quantificational expressions; all are located in the quantifier zone. No prediction is made for freq-adverbs; even though there exist spatial parallels with these adverbs, the distribution is not determined by the referential or quantificational properties noted above.

The distribution of adverbs of counting is illustrated in more detail below, and the distribution is motivated in the following subsection.

### 2.2. Adverbs of Counting

As the table in (9) indicates, the distribution of Q-adverbs and freq-adverbs is distinct. Only the former can precede quantificational expressions:[7]

(10) a. Feri **gyakran** / **néha** / **rendszerint** **mindenkit**$_{Q}$ meghívott
F-NOM often seldom usually everyone-ACC invited
'Feri often / seldom / usually invited everyone' (**Q-adverb**)
b. ??Feri **sûrûn** / **rendszeresen** **mindenkit**$_{Q}$ meghívott
F-NOM frequently regularly everyone-ACC invited
'Feri frequently / regularly invited everyone' (**freq-adverb**)

Freq-adverbs, unlike Q-adverbs, can follow negation:

(11) a. ?Feri ***nem***$_{NEG}$ **gyakran** / **néha** / **rendszerint** késett el
F-NOM not often seldom usually was late PART
'Feri was not often / seldom / usually late' (**Q-adverb**)
b. Feri ***nem***$_{NEG}$ **sûrûn** / **rendszeresen** késett el
F-NOM not frequently regularly was late PART
'Feri was not frequently / regularly late' (**freq-adverb**)

As noted above, multiplicatives are more flexible; they are freely ordered with freq-adverbs (12a) and quantificational elements, including Q-adverbs (12b).

(12) a. Feri (kétszer$_{M}$) **sûrûn**$_{F}$ (kétszer$_{M}$) csengetett
F-nom twice frequently twice rang
'Feri rang (twice) frequently (twice)'

[7] The subscript Q, F or M indicates the category of the adverb of counting. The subscripts Q and NEG, on constituents other than adverbs of counting, indicate position according to table (9).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. Feri (?kétszer$_M$) **gyakran**$_Q$ (kétszer$_M$) telefonált
F-nom twice often twice called
'Feri often called twice' / 'Twice, Feri called often' (e.g. on two trips)

### 2.3. Adverb Positions Derived

The distribution of adverbs of counting follows from the characterization offered above. **Q-adverbs** behave like quantifiers, as the former quantify over situation descriptions. The distribution of these two types of constituents is thus predicted to be parallel. **Multiplicatives** count the number of occurrences of (countable) situations. It is expected that multiplicatives can modify any appropriate description – an expectation that is borne out, as shown by the flexible ordering of these adverbs.

Finally, **freq-adverbs** specify the frequency of occurrence of (types of) situations within a certain time interval. Let us assume that freq-adverbs take a time interval argument, for which frequency is established. It follows then that freq-adverbs can only appear in a domain where time interval arguments can appear.

This domain is the zone which contains focus, negation, the verb and postverbal elements in Hungarian, boldfaced in the preceding examples. Here I offer only one argument for restricting time intervals to this zone, but additional supporting evidence is also available. Let us assume that time intervals are merged with (a projection) of the constituent that requires a time interval argument. Let us also assume that the **tense**, the ordering of speech time and reference time is structurally higher than all other time intervals, and that speech time is local to tense.

Speech time must then be lower than focus, given the following asymmetry. In neutral sentences, particles precede the verb. In a finite clause with focus, the particle will follow the verb (13a). In nonfinite clauses, however, the particle can appear on either side of the verb (13b). The contrast between finite and nonfinite focus constructions is naturally ascribed to the difference in the **tense** head, which is located below the focus position (cf. Brody 1990). Freq-adverbs are then restricted to a position below focus, to the domain where time intervals are available.

(13) a. Feri AZ ORVOSTÓL késett el / *el késett
F-NOM the doctor-from was late PART PART was late
'Feri was late FOR THE DOCTOR'S APPOINTMENT'

b. Fontos [Ferinek AZ ORVOSTÓL késnie el / el késnie]
important F-DAT the doctor-from be late PART PART be late
'It is important for Feri to be late FOR THE DOCTOR'S APPOINTMENT'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 3. Multiple Adverbs of the Same Type

It is worth emphasizing that there is no inherent restriction on iterating adverbs of counting. Contrary to van Geenhoven (2005), Johansdottir (2005), and others, functional uniqueness does not hold for these adverbs. Furthermore, the occurrence is also not restricted to two adverbs of each type (contra Cinque 1999).

Limitations on multiple adverbs do arise; but they are rather due to the necessity of coercion. All adverbs of counting modify descriptions that are countable, but modification by a freq- or a Q-adverb yields a complex non-countable description. It follows then that a (non-countable) situation description which contains a freq-adverb cannot be modified by another freq-adverb or a Q-adverb, since the latter require a countable description. The mismatch can be resolved, however, by coercion, which forces a countable interpretation for the non-countable description (cf. Moens and Steedman 1988, de Swart 1998, a.o.). The non-countable description in this case has a delimited interpretation; this can arise, for instance, by considering periods of being late frequently (which can occur rarely; cf. (14b)).

(14) a. Feri **négyszer**$_{M}$ **háromszor**$_{M}$ **kétszer**$_{M}$ csengetett
F-NOM four times three times twice rang
'Feri rang twice three times, on four occasions'

b. Feri **ritkán**$_{F}$ késett el (**rendszeresen**$_{F}$) **sûrûn**$_{F}$
F-NOM rarely was late PART regularly frequently
'It rarely happened that Feri was (regularly) frequently late'

c. Feri **néha**$_{Q}$ (**általában**$_{Q}$) **gyakran**$_{Q}$ csengetett
F-NOM seldom usually often rang
'Feri seldom rang (usually) often'

The markedness of multiple adverbs of the same type arises from the necessity of coercion operations and parsing limitations. The interpretation of the iterated adverbs is, however, entirely predictable; whenever multiple adverbs are present, they exhibit surface scope. This is expected, given that Hungarian has surface scope.

## 4. Freq-Adverbs and Multiple Situations

It follows from the proposed view of adverbs that freq-adverbs (and multiplicatives) do not yield multiple events on their own. That is, the existence of multiple situations of the same type must arise independently. Crucially, freq-adverbs cannot be seen as pluractional operators which yield plurality of events.

This conclusion is in line with the non-uniqueness requirement noted above, and is also supported by the following Hungarian data. The verbs in (15a) appear with a semelfactive affix, and the example describes a unique event. Accordingly, freq-adverbs cannot modify the description. In (15b), the verbs bear an iterative affix; the example describes multiple, iterated situations. These examples allow freq-adverbs, since the adverb modifies a description of multiple situations.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(15) a. ??Feri **sûrûn** kopp-int-ott / köh-int-ett
F-NOM frequently knocked-SEMELFACTIVE-PAST coughed-SEM-PAST
'Feri frequently knocked / coughed'

b. Feri **sûrûn** kop-og-ott / köh-ög-ött
F-NOM frequently knocked-ITERATIVE-PAST coughed-ITERATIVE-PAST
'Feri frequently knocked / coughed'

Q-adverbs, in contrast with freq-adverbs, express quantification over situations. They can modify either unique situation descriptions (as with verbs bearing a semelfactive affix) or complex situations containing multiple events:

(16) Feri **gyakran** kopp-int-ott / kop-og-ott
F-NOM often knocked-SEM.-PAST knocked-ITERATIVE-PAST
'Fred often knocked (once or repeatedly)'

The non-uniqueness requirement imposed by freq-adverbs can also be illustrated without appealing to verbal morphology, as the discussion in section 2 shows. A unique situation – such as electing someone as the chairperson at a newly established company – cannot be modified by a freq-adverb. (17) is correctly predicted to be marked: the freq-adverb, which follows and scopes below the plural expression, modifies a unique situation description (the plural expression appears in boldface below).

(17) ?? A frissen alapított ***vállalatoknál*** **sûrûn** egy szakembert
the recently established companies-at frequently a specialist-ACC
választanak elnöknek
elect-3PL chairperson-DAT
'At recently established companies, frequently a specialist is elected as chairperson'

It follows from the adherence to surface scope that whenever the freq-adverb precedes – and so takes scope over – the plural expression, modification of the same description becomes fully grammatical. Once again, this is expected, since it is a repeated rather than a unique situation that the adverb modifies in this case.

(18) **Sûrûn** választanak egy szakembert elnöknek
frequently elect-3PL a specialist chairperson-DAT
a frissen alapított ***vállalatoknál***
the recently founded companies-DAT
'Frequently, a specialist is elected as chairperson at recently established companies'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



## 5. Adverbs of Counting

Building on data from Hungarian, I argued for a strict distinction among adverbs of counting. Intuitively, multiplicatives specify the number of occurrences of situations; frequency adverbs specify frequency and adverbs of quantification quantify over situations. The adverb classes are distinguished by a number of properties, including morphological forms and the availability of spatial homonyms of the adverbs. The distribution of the adverbs also varies according to adverb types, and is consistent with the classification and description proposed.

The data discussed above are restricted to Hungarian, but the conclusions partially carry over to other languages as well. Consider, for instance, *many times, frequently* and *often* – examples of a multiplicative, a freq-adverb and a Q-adverb, respectively. Similarly to Hungarian, only Q-adverbs can modify statements that hold outside of time (also Johansdottir 2005):

(19) The variables in this equation are ?frequently / often negative

Only Q-adverbs can modify unique situations; multiplicatives and freq-adverbs are marked in this context:

(20) Fred (often) ate a sandwich (??many times) / (??frequently)

Morphological form also provides an argument in line with Hungarian. Freq-adverbs, including *frequently* and *rarely,* bear a general adverbial suffix, *-ly.* The stem, *frequent* and *rare,* can have a non-temporal interpretation. Q-adverbs, like *often* and *seldom,* have neither an identifiable adverbial suffix nor non-temporal use.

The position of the adverbs does not follow straightforwardly from their characterization, but this observation can be related to the lack of pervasive discourse-configurationality in English. A detailed overview of adverb distribution, as well as a more general description and account of these adverb classes crosslinguistically, is left for further research.

## References

Brody, Michael. 1990. Some Remarks on the Focus Field in Hungarian. In *University College London Working Papers in Linguistics* 2.

Cinque, Guglielmo. 1999. *Adverbs and Functional Heads*. Oxford: Oxford University Press.

É. Kiss, Katalin. 2002. *The Syntax of Hungarian*. Cambridge: Cambridge University Press.

Ernst, Thomas. 2002. *The Syntax of Adjuncts*. Cambridge: Cambridge University Press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



van Geenhoven, Veerle. 2004. *For*-adverbials, Frequentative Aspect, and Pluractionality. *Natural Language Semantics* 12.

van Geenhoven, Veerle. 2005. Atelicity, Pluractionality, and Adverbial Quantification. In H. Verkuyl, H. de Swart and A. van Hout, eds., *Perspectives on Aspect*. Dordrecht: Springer.

Johansdottir, Kristin. 2005. Temporal Adverbs in Icelandic: Adverbs of Quantification vs. Frequency Adverbs. *Working Papers in Scandinavian Syntax* 76.

Lewis, David. 1975. Adverbs of Quantification. In E. Keenan, ed,. *Formal Semantics of Natural Language.* Cambridge: Cambridge University Press.

Moens, Mark, and Mark Steedman. 1988. Temporal Ontology and Temporal Reference. *Computational Linguistics* 14.

Stump, Gregory 1981. The Interpretation of Frequency Adjectives. *Linguistics and Philosophy* 4.

Stump Gregory. 1985. *The Semantic Variability of Absolute Constructions*. Dordrecht: Kluwer.

de Swart, Henriette. 1993. *Adverbs of Quantification: A Generalized Quantifier Approach*. New York and London: Garland.

de Swart, Henriette. 1996. (In)definites and Genericity. In M. Kanazawa, C. Piñón and H. de Swart, eds., *Quantifiers, Deduction and Context*. Stanford: Center for the Study of Language and Information.

de Swart, Henriette. 1998. Aspect Shift and Coercion. *Natural Language and Linguistic Theory* 16.

Szabolcsi, Anna. 1997. Strategies for Scope Taking. In A. Szabolcsi, ed., *Ways of Scope Taking.* Dordrecht: Kluwer.

Aniko Csirmaz
Department of Linguistics, University of Utah
Languages and Communication Building
255 S Central Campus Dr, Rm 2300
Salt Lake City, UT 84112 USA

acsirmaz@linguistics.utah.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# Environment prototypicality in syntactic alternation

GABRIEL DOYLE AND ROGER LEVY
*UC San Diego Linguistics*

## 1. Introduction

This paper investigates the effect of changing syntactic categories on speaker choice, using the *needs to be done* ∼ *needs doing* alternation as the testing ground. The two alternants in this alternation have different syntactic properties, and so we hypothesize that the syntactic preferences of the alternation's environment influence alternant choice. Our hypothesis is that, all else being equal, speakers prefer to use an alternant with a syntactic category that is more prototypical given the rest of the sentence. We show an effect of structural bias that argues for this hypothesis.

## 2. Speaker choice and syntactic alternations

For a given situation, there is a large, possibly infinite, set of sentences that could be said, all expressing the same core idea. Different sentences in the set may be more or less appropriate for the situation, and thus better or worse choices for the speaker. The relative appropriateness of a sentence is presumably a complicated calculation, yet speakers choose their sentences fluidly. So how do speakers choose among the various sentences they can use to express an idea?

This is a big question, too big to be answered completely with our current state of knowledge. However, instead of looking at speaker choice in sentence-level variation, we can simplify the problem by investigating how speakers choose between alternants in a syntactic alternation. A syntactic alternation is a situation in which there are multiple related phrases expressing the same semantic idea with different syntactic forms. Canonical examples of this are *that*-omission and the passive, dative, and genitive alternations. Looking at syntactic alternations rather than sentence-level variability simplifies the problem in three important ways:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

- The alternants are nearly meaning-equivalent
- Limited set of alternants makes option comparison simpler
- Smaller region of variation allows for better experimental control

Using syntactic alternations to investigate speaker choice is not a new idea; Weiner and Labov (1983) and Bock (1986) both investigated factors affecting speaker choice in the passive alternation, and in the past few decades, a variety of studies have investigated what syntactic alternations can tell us about the factors that influence speaker choice.

These studies (esp. Weiner and Labov 1983, Bresnan and Nikitina 2007) have dispelled the notion that categorical semantic constraints are the primary determinants of speaker choice. Rather, speaker choice involves an interaction of categorical and gradient constraints. A categorical constraint is a hard effect on the probability of a speaker choosing an alternant; an alternant that violates a categorical constraint has no probability of being uttered except as a speech error. A gradient constraint is a soft effect on this probability; an alternant that violates a gradient constraint has a lower probability of being uttered than an alternant that does not violate the constraint, but the probability does not drop all the way to zero. Categorical constraints define the space of syntactic alternation: where each alternant can occur. When both alternants are available, gradient constraints determine which form will be used.

Previous work on alternations has identified two main types of gradient factors affecting speaker choice: accessibility and priming. In many alternations (Bresnan et al. 2007 for datives, Rosenbach 2003 for genitives, a.o.), speakers prefer the alternant that places an animate concrete NP earlier in the sentence. Rosenbach explains this as a result of a cross-linguistic preference for animate NPs to occur earlier in a sentence, which is argued to be a cognitive universal based on increased cognitive accessibility of animate and concrete NPs. Discourse status, pronominality/definiteness, and weight all exhibit similar accessibility effects on speaker choice (Rosenbach 2003; Bresnan et al. 2007).

Speaker choice is also influenced by the recent occurrence of an alternant. Bock (1986) and Bresnan et al. (2007) show that syntactic parallelism influences speaker choice in the passive and dative alternations, influencing the speaker to repeat the primed structure.

Although many factors have been identified that affect speaker choice, a variety of important factors remain uninvestigated. The present study looks at how the use of different syntactic categories in different alternants affects speaker choice. Many alternations have different structures for their alternants. For instance, the dative alternation switches between having two predicate NPs and having an NP and a PP in the predicate. Changing categories has not yet been studied in these alternations, perhaps because the effect of changing



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



category structure is entwined with changes to the word order. Word order is fixed, though, in the *needs doing* alternation, so the effect of syntactic category can be disentangled from the effect of word order and studied for its influence on speaker choice. Note, though, that this is still not a perfectly clean contrast; *to be* intervenes between *needs* and the verb in one alternant but not the other.

## 3. The anatomy of the *needs doing* alternation

The *needs doing* alternation has not been extensively studied, receiving brief mentions in English grammars (e.g., Quirk et al. 1985) and little other notice. As such, only a quick overview of the alternation will be given. It should be noted that, although throughout the paper we refer to the alternation as the *needs doing* alternation, *do* is clearly not the only verb that can be used. It appears that any passivizable transitive verb can occur. Intransitive verbs cannot be used, because in both alternants "it is not the understood subject of the participle, but its understood object that is identified with the subject of the superordinate clause." (Quirk et al. 1985:1189) This is the only apparent restriction on verbs in the alternation.

As with other alternations, the *needs to be done* and *needs doing* alternants are usually, but not always, approximately equally acceptable. For instance, there is little clear or consistent difference in acceptability between (1a) and (1b), but the acceptabilities of (2a) and (2b) do differ (although (2b) is still attested; see Doyle 2008):

(1) a. The couch needs to be cleaned.
b. The couch needs cleaning.

(2) a. You need to be shown the way.
b. *?You need showing the way.

This raises two important (and entwined) questions: what accounts for the differing acceptability judgments, and how does a speaker choose which alternant to use?

We assume, following previous work, that speaker choice is driven by a set of gradient constraints that influence which alternant will be chosen. We will stay intentionally agnostic about the specific cognitive mechanism of speaker choice, and simply assume that speaker choice is probabilistic. In this framework, we presume that, given a sentence environment $S$, the gradient constraints combine to yield an overall probability $P(\text{needs to be done}|S)$ of choosing one alternant in this sentence. The probabilistic framework implies that the same speaker can choose different alternants every time she sees a given environment, which fits intuitively with what we observe in actual usage. We estimate the probability $P(\text{needs to be done}|S)$ with a probabilistic model, mixed-effects logistic regression. In logistic regression, each of the gradient constraints on



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



speaker choice is a weighted factor on the odds of choosing one alternant over the other; this is the standard model in most alternation studies. Using a mixed-effects regression allows different verbs to have idiosyncratic preferences for the alternants (Bresnan et al. 2007).

## 4. The gerund as a noun and a verb

The alternants in the *needs doing* alternation involve different syntactic categories. The past participle in *needs to be done* is verbal with no nominal properties, while the gerund in *needs doing* is has both verbal and nominal properties (Malouf 2000):

- Gerunds can govern NPs. [verbal]
- Gerunds are modified by adverbs, not adjectives. [verbal]
- A gerundive phrase has the same external distribution as an NP. [nominal]
- The gerund can take an optional genitive or accusative subject. [both]

There are mixed opinions on gerunds' category. Malouf argues that the gerund's properties are the result of mixed category membership; each token is simultaneously a verb and a noun. Others (e.g., Aarts 2004) contend that the gerund is merely category-ambiguous; each token is either a noun or a verb, albeit an atypical member of the category. We will sidestep this debate in the current paper, as the fact that gerunds can simultaneously exhibit both nominal and verbal properties is sufficient for our purposes.

Unlike the gerund, the past participle has no nominal characteristics. It may not be strictly verbal, as it can function as an adjective, but for this study it is sufficient that the past participle is not nominal.

## 5. EPH: Environment Prototypicality Hypothesis

This category difference leads to a simple hypothesis: speakers may prefer the more nominal *needs doing* alternant in more nominal environments. What do we mean by a "more nominal" environment? Consider sentences (3a,b).

(3) a. *The couch needs a to be cleaned
b. The couch needs a cleaning.

*Clean* in each of these sentences is in a prototypical place for a noun. In both sentences, it follows a determiner. This is a highly prototypical place for a noun and a highly non-prototypical place for a verb — so highly non-prototypical, in fact, that it is grammatically unacceptable. Now consider sentences (4a,b).

(4) a. The paper needs to be completely rewritten.
b. ?The paper needs completely rewriting.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Here *rewrite* in each sentence follows an adverb, which is a prototypical place for a verb, but a non-prototypical place for a noun. Since both forms have verbal properties, neither is grammatically unacceptable. The added nominal properties of the gerund, though, make the gerund awkward in this context.

These observations leads to the hypothesis that environment prototypicality is a factor affecting speaker choice, like accessibility or other previously observed effects. Specifically, the Environment Prototypicality Hypothesis predicts that the partially-nominal gerundive form will be preferred in environments that favor nouns, while the non-nominal past participle form will be preferred in environments that favor verbs. The only remaining issue is how to quantify the prototypicality of an environment. We answer this question in Section 7.3.

## 6. Modeling the alternation

To test the Environment Prototypicality Hypothesis, we first build a mixed-effects logistic regression model (Agresti 2002) to determine what previously-researched factors affect speaker choice in this alternation, then add a measure of environment prototypicality to the model to gauge its effect on speaker choice. We present an overview of the model construction here. Doyle 2008 provides more detail about the the dataset, the control factors, and lack of categorical constraints in the alternation.

### 6.1. Dataset

The regression model is trained on a dataset of 1004 sentences from the British National Corpus (BNC), each containing an instance of the alternation. This training set is a subset of 5926 sentences from the BNC, found by a tgrep2 search over a parsed version of the corpus (Doug Roland, p.c.). The search identified sentences containing a form of the word *need* either followed by a gerund or by the words *to be* and a past participle, and thus includes some false positives. These false positives were removed when constructing the training set.

Before being included in the model dataset, each sentence was manually annotated for the control features (animacy, concreteness, etc.). Due to the time demands of annotation, the whole dataset could not be included in the model. Instead, a randomly retrospectively sampled (Agresti 2002) dataset of 1004 sentences was used. Thus, unlike the full search set, in which a majority of the sentences used the *to be* alternant, the training set contained equal numbers of each alternant. Retrospective sampling was used to ensure that, despite the small size of the training set, there would still be enough instances of the rarer *ing* alternant to draw statistically significant conclusions about the relevant factors.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Table 1: List of control factors included in the logistic regression model. Significant control factors, as determined by likelihood-ratio tests, are noted with asterisks. [* – $p < .05$, ** – $p < .01$, *** – $p < .001$]

| Categorical variables | | Continuous variables |
|---|---|---|
| animacy | modality | subject length |
| concreteness*** | telicity (aspect)** | log verb length*** |
| definiteness*** | durativity (aspect) | log PVD length*** |
| pronominality | verb particle* | log AAP length*** |
| relativiziation*** | negation | verb frequency*** |
| tense* | modal | |
| adverb | conjoined material | |

### 6.2. Factors considered

We include 19 control factors in the regression model, based on the previously observed effects in Section 2. These factors are listed in Table 1. We highlight two factors here.

There are two post-construction variables, both based on the length of phrases that follow the alternant. Constituents after the alternant can be grouped into three general categories: post-verbal dependents (PVDs), ambiguously-attached phrases (AAPs), and syntactically separate constituents.

Post-verbal dependents are constituents that unambiguously modify the alternation. Such dependents are arguments or adjuncts of the verb in the alternation. Ambiguously-attached phrases could modify either the verb in the alternation or the sentence as a whole. The last category, syntactically separate constituents, refers to constituents that are clearly unconnected to the alternation. Only PVDs and AAPs are included in the model, since syntactically separate constituents do not modify the alternation.

We are interested in possible weight effects emerging from these phrases, so we included the smoothed log of the length in words of these phrases in the model. If a sentence has more than one post-verbal dependent, their lengths are summed before the log-transform is applied. The same is done if there is more than one ambiguously attached phrase.

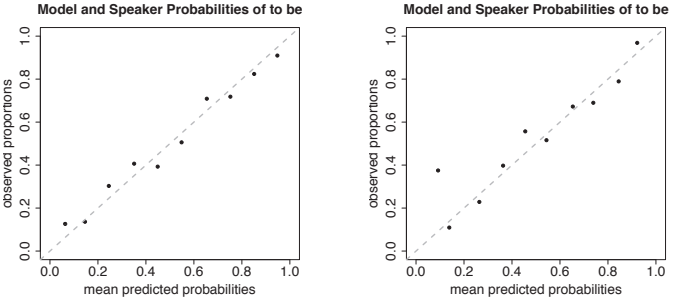
### 6.3. Potential categorical constraints on the alternation

Before we build a regression model, we must first account for any major categorical constraints that could restrict the alternation (Weiner and Labov 1983). Unlike better-studied alternations, there are few proposed constraints on the *needs doing* alternation; in fact, the only proposals in the literature are three speculative constraints from Lynne Murphy (cited in Murray, Frazer, and Simon 1996). We tested these constraints and two of our own devising, but counterexamples to each could be found in the British National Corpus or on



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Figure 1: Correlation between model and speaker probabilities. The x-axis gives the probabilities predicted by the model, and the y-axis gives the probabilities observed in the dataset. The left graph is for a model with all significant control factors, and the right graph is for a model with only a single factor, concreteness.




the Web. These proposals and their counterexamples are discussed in Doyle 2008.

## 7. Results and Discussion

In this section, we discuss the regression model's ability to model speaker choice in the *needs doing* alternation. We begin by examining the model with just the control factors, then investigate the Environment Prototypicality Hypothesis as an explanation for the effects of one of the control factors.

### 7.1. Model Accuracy

We estimate model accuracy in two ways: forced choice and probability matching. In both cases, the accuracy measurements are calculated using 5-way cross-validation, and all accuracy values are given as the mean and standard deviation from 10 trial runs.

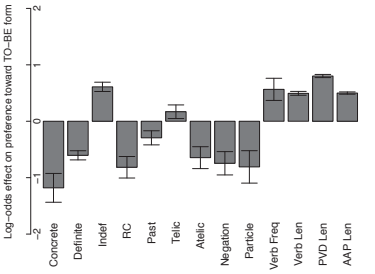
The basic measure of model accuracy forces the model to predict the more likely alternant for each sentence in the dataset. The model succeeds if it predicts the alternant that the speaker used. Under this evaluation metric, the model averages $74.8 \pm .6\%$ accuracy on the test sets. The baseline accuracy is 50%, since each alternant is equally likely in the dataset. However, because we have assumed that speaker choice is probabilistic, forcing the model to choose an alternant loses probability information and potentially deflates its accuracy.

A better way to estimate the model's similarity to non-deterministic speaker choice is to compare the actual proportions of each alternant used in sentences with similar probabilities in the model. We follow the method used by Bresnan et al. (2007). Each sentence $S$ is assigned a probability $P(\text{to be}|S)$ by the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Figure 2: Strengths of the control factors in the regression model. Positive values indicate preference for the *to be* alternant; negative values indicate a preference for the *ing* alternant.




model, and the sentences are divided into 10 bins based on these probabilities. The observed probability of *to be* for each bin is proportion of sentences in the bin that actually use the *to be* alternant, and this is compared to the mean value of $P(\text{to be}|S)$ in each bin. The correlation between the speaker probability estimates and the model probability estimates can then be used to quantify the similarity between the two probabilities.

Figure 1 visualizes these results. If the model were a perfect estimator for speaker choice, then all the points would sit on the dotted grey line and the correlation would be 1. The correlation for the model using the control factors is $R^2 = .994 \pm .004$, showing that the model probabilities tightly fit the observed proportions. By comparison, a version of the model that only uses a single factor to predict speaker choice has a worse line fit and the correlation drops to $.91 \pm .14$. Thus we see that the model is successfully matching the actual probabilistic usage of the alternation.

It is worth noting that the *needs doing* model's accuracy is much lower than that of Bresnan et al's model of the dative alternation, which performed with 95% accuracy. The likely culprit here is retrospective sampling; baseline accuracy on our retrospectively sampled dataset is 50%, whereas their dataset has a baseline accuracy of 79%. The very high correlation between the model and speaker probabilities (comparable to Bresnan et al's) suggests that the model is nonetheless accurate at estimating the speaker probabilities.

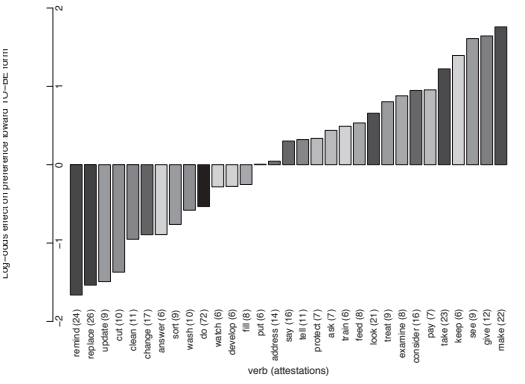
### 7.2. Control Factors

The final version of the model uses the 10 significant control factors out of the original set of 19 (see Table 1). Significance of a factor was assessed by likelihood-ratio tests, which compare the likelihood of the dataset in a model with the factor to the likelihood of the dataset in a model without the factor.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Figure 3: The best linear unbiased predictors of the random effect for verbs with more than five attestations in the dataset. Positive values indicate preference for *to be*. Darker bars indicate verbs with more attestations in the dataset. There are no apparent patterns in the effect strengths for different verbs.




For each of the significant factors, the improvement in the likelihood from including the factor is sufficient to justify the extra degree(s) of freedom its inclusion entails. The strengths of these factors, as linear effects in the log-odds of the *needs to be done* alternant, are shown in Figure 2. A random effect of verb is also included in the model to account for verb-specific preferences between the alternants. The random effects of commonly attested verbs in the dataset are shown in Figure 3.

The control factor that most improves the model is post-verbal dependent (PVD) length. (The random effect of verb is a close second.) This is also one of the strongest control factors, with longer dependents favoring the *needs to be done* alternant. However, since the PVD occupies the same position in the sentence with either alternant, these effects are unlikely to be accessibility-related weight effects. Instead, these effects suggest an underlying environment prototypicality effect.

### 7.3. Structural Bias

We begin by looking at the PVD effect in more depth. Post-verbal dependents directly modify the past participle or gerund, so one would expect them to exert environment prototypicality effects if these effects exist. Additionally, what is a common dependent for a VP and for an NP are quite different. Verbs tend to have adverbs, *by*-phrases, and sentential complements following them, whereas nouns tend to be followed by locative PPs and relative clauses. In the training data, the post-verbal dependents for both constructions tend



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

to look more prototypical of VP dependents than of NP dependents, despite equal numbers of *ing* and *to be* alternants in the dataset. This suggests that increased post-verbal dependent length generally creates a more prototypically verbal environment, and thus that the effect of PVD length is due in part to environment prototypicality. Consider sentences (5a,b).

(5) a. I *need to be told* [that he eats candy]
b. (?)I *need telling* [that he eats candy]

In these sentences, the post-verbal dependent *that he eats candy* is a sentential complement, which is a prototypical dependent for a verb but a non-prototypical dependent for most nouns. Thus we expect to see the *to be* alternant used here, since it better fits the prototypical environment for a verb.

To quantify the prototypicality effect, we introduce structural bias as an approximation of environment prototypicality. The structural bias for the alternation within a given sentence is the ratio of the probability of seeing the current environment if there is an NP in the alternant's position to the probability of the environment with a VP in the alternant's position [Eqn. 1]. These probabilities are difficult to calculate, since it is unclear what the environment of the alternant encompasses. Therefore, we approximate the bias by only considering the post-verbal dependent. Specifically, we use the first word ($W_1$) and syntactic category of the post-verbal dependent ($XP$):

$$\text{Structural bias} = \frac{P(Environment|NP)}{P(Environment|VP)} \approx \frac{P(W_1, XP|NP)}{P(W_1, XP|VP)} \tag{1}$$

High structural bias indicates that the probability of this environment is greater if an NP is observed than if a VP is observed. Thus the Environment Prototypicality Hypothesis predicts that high structural bias will favor the partially-nominal *ing* alternant, and low structural bias (indicative of a more verbal environment) will favor the strictly-verbal *to be* alternant. We can simplify our approximation in Eqn. 1 using Bayes' Rule:

$$\frac{P(W_1, XP|NP)}{P(W_1, XP|VP)} = \frac{\frac{P(W_1, XP, NP)}{P(NP)}}{\frac{P(W_1, XP, VP)}{P(VP)}} \tag{2}$$

$$\propto \frac{count(W_1, XP, NP)}{count(W_1, XP, VP)} \cdot \frac{count(VP)}{count(NP)} \tag{3}$$

$$\propto \frac{count(W_1, XP, NP)}{count(W_1, XP, VP)} \tag{4}$$

Because the count ratio is proportional to the structural bias, it can be used in place of bias in the regression without changing the results (Agresti



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



2002). We estimate the counts in Eqn. 4 using tgrep searches over the Penn Treebank Wall Street Journal corpus (detailed in Doyle 2008).

If PVD length is replaced in the model by structural bias, then structural bias is a significant factor ($p < .0001$), with an effect in the predicted direction: higher structural bias favors the *ing* alternant. This supports the environment prototypicality hypothesis, since we supposed that the post-verbal dependent length effect was due to environment prototypicality, and when post-verbal dependent length is replaced the more direct measure of environment prototypicality, this measure is significant.

When both structural bias and PVD length are in the model, structural bias is not significant. This appears to be a result of the extremely tight correlation ($\rho = -0.91$) between the PVD length and our estimate of structural bias. Therefore, while it appears that environment prototypicality does affect speaker choice, a better estimate of structural bias, one that is less collinear with PVD length, is needed before environment prototypicality can be definitively confirmed as an influence on the speaker choice. In future work, we plan to explore $n$-gram and/or Hidden Markov Models as better measures of environment prototypicality to determine more definitively the effect of changing syntactic categories.

## 8. Conclusion

Speaker choice in the *needs doing* alternation is determined by a variety of gradient factors. We find evidence in support of the Environment Prototypicality Hypothesis by looking at the distribution of dependents of the alternation, although this is somewhat confounded with dependent length. Future work on this and other alternations will hopefully shed further light on syntactic categories' effects on speaker choice.

## Acknowledgments

We wish to thank Joan Bresnan, Grant Goodall, T. Florian Jaeger, Andy Kehler, Tatiana Nikitina, Tom Wasow, Arnold Zwicky, and the members of the UCSD Computational Psycholinguistics Lab for comments and advice on this project.

## References

Aarts, Bas. 2004. Modelling linguistic gradience. *Studies in Language 28*(1), 1–49.

Agresti, Alan. 2002. *Categorical Data Analysis* (2nd ed.). Wiley.

Bock, J. Kathryn. 1986. Structural persistence in language production. *Cognitive Psychology 18*, 355–387.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Bresnan, Joan, Anna Cueni, Tatiana Nikitina, and R. Harald Baayen. 2007. Predicting the dative alternation. In G. Bourne, I. Kraemer, and J. Zwarts (Eds.), *Cognitive Foundations of Interpretation*. Royal Netherlands Academy of Science.

Bresnan, Joan and Tatiana Nikitina. 2007. On the gradience of the dative alternation. In L. Uyechi and L. H. Wee (Eds.), *Reality Exploration and Discovery: Pattern Interaction in Language and Life*.

Doyle, Gabriel. 2008. Determinants of variation in the needs doing construction. Unpublished manuscript, UC San Diego, May 2008 http://idiom.ucsd.edu/∼gdoyle/comps1.pdf.

Malouf, Robert. 2000. *Mixed Categories in the Hierarchical Lexicon*. Stanford: CSLI Publications.

Murray, Thomas, Timothy Frazer, and Beth Lee Simon. 1996. Need + past participle in American English. *American Speech 71*(3), 255–271.

Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech, and Jan Svartvik. 1985. *A Comprehensive Grammar of the English Language*. London: Longman.

Rosenbach, Annette. 2003. Aspects of iconicity and economy in the choice between the s-genitive and the of-genitive in English. In G. Rohdenberg and B. Mondorf (Eds.), *Determinants of Grammatical Variation in English*. de Gruyter.

Weiner, Judith and William Labov. 1983. Constraints on the agentless passive. *Journal of Linguistics 19*, 29–58.

Gabriel Doyle
University of California, San Diego
Department of Linguistics
9500 Gilman Dr., Mail Code 0108
La Jolla, CA 92093-0108

gdoyle@ucsd.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Structural Case and the Typology of Possessive Constructions[1]

MAIA DUGUINE
*U. Basque Country & U. Nantes-Naoned*

## 1. Introduction

This paper shows that, in the nominal domain, a strong correlation exists between three syntactic properties of possessor DPs: (i) the triggering of agreement, (ii) the availability of pro-drop and (iii) the possibility to extract them. I suggest that this distribution derives from a condition on structural case assignment to possessors.

First in Section 2 I discuss the two coexisting patterns of morphosyntactic realization of possessor-possessed relations found in a wide number of languages, identifying a descriptive generalization that had not been noticed previously in the literature. In Section 3 I develop an account in terms of a condition on structural case assignment, and finally in Section 4 I give empirical evidence that strengthens the claim that some but not all possessors are assigned structural case.

## 2. Two Strategies for Possession and the Syntax of Possessors

In many languages, possessive constructions of the type 'Mary's house' surface with an agreement morpheme attached to the 'head noun', which agrees in person and number with the possessor DP. I will refer to this type of morphological realization of possession as **Pattern A(greement)**. The general schema can be represented as in (1) (word order is irrelevant), and is illustrated with Tzotzil (2):[2]

(1) **Pattern A(greement)**: $NP^{possessum}$-AGR $DP_{\varphi}{}^{possessor}$

(2) s-tot li Xun-e — Tzotzil
3-father ART Xun-CL — (Aissen 1987:4)
'Xun's father'

[1] I would like to thank Mark Baker, Aniko Csirmaz, Aritz Irurtzun, Nerea Madariaga, Myriam Uribe-Etxebarria, the audience at BLS 34, and also the audience at the 1st Workshop of the *European Research Nets in Linguistics (U. Basque Country*, where part of this material was presented. This study has been developed thanks to the grant *Juan San Martin* by Udako Euskal Unibertsitatea & Eibarko Udala and the project IT-210-07 of the Basque Government.

[2] Abbreviations: NOM: nominative, GEN: genitive; ACC: accusative, INTER: interrogative, L: linker, ART: article, LOC: locative, INFL: inflection, FUT: future, NMLZ: nominalizer, CL: clitic.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 2.1. Generalization on Pattern A Possessors

Interestingly, if we consider the behavior of possessors in this structure, a strong correlation emerges, that had not been noticed before in the literature. In languages such as Abaza, Hungarian, Nahuatl, Southern Quechua, a number of Mayan languages (Jacaltec, Itzaj, Tzotzil, Tzutujil), and some Austronesian languages (Boumaa Fijian, Chamorro), a possessor DP that triggers agreement can consistently be dropped and wh-extracted from the DP in which it appears (see Duguine 2007).[3] This is illustrated in (3) with Tzotzil:

(3) a. j-moch *pro* — Tzotzil
1-basket — (Aissen 1987:4)
'my basket'

b. Buch'u av-il-be [s-tot *t*]? — Tzotzil
who 2-see-io 3-father — (Aissen 1987:14)
'Whose father did you see?'

I propose to spell out this correlation as the following generalization:

(4) **Generalization on Pattern A possessors:**
In the languages in which the possessum agrees in φ-features with its possessor DP, the possessor can be dropped and extracted.

But what happens when there is no agreement? In the following two sections, I will study some of the languages cited above which, alongside Pattern A, have a second strategy for the morphosyntactic realization of possessor-possessed relations, in which no agreement surfaces. By so doing, we will be able to compare different structures on the basis of minimal pairs, avoiding the interferences with independent, language-specific factors.

### 2.2. Dialectal Variation in Quechua

Quechua displays an interesting dialectal variation with regards to DP-internal agreement. In most dialects, possessive constructions follow what I have called the Pattern A. This is the case of Southern Quechua (SQ), as illustrated in (5) (cf. 2.1). However, Imbabura Quechua (IQ) constitutes an exception: as shown in (6), no agreement affix attaches to nouns in this dialect.

(5) Maria-q wasi-n — Southern Quechua
Maria-GEN house-3SG — (Sánchez 1996)
'Maria's house'

[3] In Hungarian some possessors external to the DP do not seem to be extracted, but rather base-generated there (Den Dikken 1999). There are also languages, such as Finnish, Palauan or Mohawk, that appear at first sight to constitute counterevidence to the generalization (4); in Duguine (2007) I argue that they can be accounted for independently.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(6) Juzi-paj warmi — Imbabura Quechua
José-GEN wife — (Cole 1985:115)
'José's wife'

What is interesting for the issue under discussion is that, in contrast with SQ (7), possessors cannot be dropped or extracted in IQ. This is shown in (8):

(7) a. *pro* wasi-n — Southern Quechua
house-3SG — (Sánchez 1996)
'her/his house'
b. Pi-qpa-ta reqsi-nki [ *t* tura-n-ta]? — Southern Quechua
who-GEN-ACC know-2SG brother-3SG-ACC — (Sánchez 1996)
'Whose brother do you know?'

(8) a. *(pay-paj) wasi — Imbabura Quechua
he-GEN house — (Cole 1985:115)
'his house'
b. *Pi-paj-taj riku-rka-ngui [*t* alku-ta]? — Imbabura Quechua
who-GEN-INTER see-PAST-2SG dog-ACC — (Cole 1985:115)
'Whose dog did you see?'

Thus in IQ the absence of agreement correlates with the impossibility to drop and extract the possessor, contrarily to what we find in SQ, which follows Pattern A. This result, situated at the level of dialectal variation, becomes even more significant when found within a language, as is the case in some Austronesian languages. I discuss three such languages in the following section.

### 2.3. Two Patterns in Austronesian Languages

In addition to Pattern A, in Boumaa Fijian, Chamorro, and Palauan there is a second possessive construction in which a morpheme, also referred to as a 'linker', an 'association morpheme', a 'relator' etc. in the literature, appears between the possessed noun and the possessor DP; I will refer to it as **Pattern L(inker).** Both strategies are schematically represented in (9) (again, word order is irrelevant), and illustrated in (10)-(12) in each of the three languages.

(9) **Pattern A(greement):** $NP^{possessum}$-AGR $DP_{\varphi}{}^{possessor}$
**Pattern L(inker):** $NP^{possessum}$-L $DP_{\varphi}{}^{possessor}$

(10) a. i salappi'-ñiha i famalao'an — Chamorro **Pattern A**
ART money-3PL ART women — (Chung 1998:31)
'the women's money'
b. i kareta-n Carmen agäga' — Chamorro **Pattern L**
ART car-L Carmen red — (Chung 1998:47)
'Carmen's red car'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(11) a. a liga-na a gone.yalewa yai — Boumaa Fijian **Pattern A**
ART hand-3SG ART young girl this — (Dixon 1988:121)
'the hand of this young girl'

b. a liga-i gone.yalewa yai — Boumaa Fijian **Pattern L**
ART hand-L young girl this — (Dixon 1988:123)
'the hand of this young girl'

(12) a. a 'ole'es-el a Marta — Palauan **Pattern A**
ART pencil-3SG ART Martha — (Georgopoulos 1991:53)
'Martha's pencil'

b. a buk er a 'ekabi — Palauan **Pattern L**
ART book L ART girl — (Georgopoulos 1991:31)
'the girl's book'

The presence of agreement correlates with the possibility to drop and extract the possessor, but what happens when there is no agreement, i.e. in Pattern L? Let us first analyze the facts regarding possessor dropping. Chung (1998:49) notes that in Chamorro "when the possessor is null … then the possessed noun must exhibit possessor-noun agreement"; i.e. the possessor cannot be null in Pattern L. Likewise, Dixon (1988:36) notes that in Boumaa Fijian the linker "is suffixed to the possessed noun and is followed by the possessor"; i.e. the possessor must be overt. Finally, the same generalization is observed by Georgopoulos (1991:31) for Palauan: "a pronoun possessor is ... overt when it is object of the [linker]". That is, in all three languages the possessor cannot be dropped in Pattern L, contrary to what happens with Pattern A possessors, as seen in 2.1 and illustrated in (13):

(13) a. Agupa' i kumpliaños-ña *pro* — Chamorro **Pattern A**
tomorrow ART birthday-3SG — (Chung 1998:31)
'Tomorrow is his birthday.'

b. a liga-na *pro* — Boumaa Fijian **Pattern A**
ART hand-3SG — (Dixon 1988:121)
'his/her hand'

c. a 'ole'es-em *pro* — Palauan **Pattern A**
ART pencil-2SG — (Georgopoulos 1991:53)
'your pencil'

Likewise, we find the same correlation between the absence of agreement and the impossibility of extraction: Pattern L possessors cannot be extracted, while, as was shown in 2.1, Pattern A possessors can. The Chamorro data in (14a-b) illustrate this correlation very clearly: *hayi* 'who' cannot be extracted when it is introduced by a linker but it can when the possessed noun agrees with it.

(14) a. *Hayi un-yulang [muñika-n *t*]? — Chamorro **Pattern L**
who INFL-break doll-L — (Sandra Chung p.c.)
'Whose doll did you break?'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. Hayi ti man-mäguf [famagon-ña *t*]? Chamorro **Pattern A**
who not INFL-happy children-3SG (Chung 1991:109)
'Whose children are unhappy?'

The same correlation is found in Boumaa Fijian: while Pattern L possessors must remain to the right of the linker (15a), Pattern A possessors can be extracted (15b). (Given that Palauan is a *wh-in-situ* language (Georgopoulos 1991), it cannot be tested for extraction.)

(15) a. A +i-sele yai [a we-i cei]? Boumaa Fijian **Pattern L**
ART knife this ART belonging-L who (Dixon 1988:171)
'This knife, it is whose?'

b. O cei a o-na +i-sele yai? Boumaa Fijian **Pattern A**
ART who ART belonging-3SG knife this (Dixon 1988:171)
'Whose is this knife?'

Summarizing, in the Austronesian languages Boumaa Fijian, Chamorro and Palauan, depending on the whether the possession relation is realized by means of agreement or not, it will be possible to drop or extract the possessor. Interestingly, this is the same opposition that was introduced in 2.2 between SQ and IQ. These conclusions are summarized in the table in (16).

(16)

| | | Poss. drop | Poss. extraction |
|---|---|---|---|
| Agreement (**Pattern A**) | | ✓ | ✓ |
| No agreement | **Imbabura Quechua** | × | × |
| | **Autronesian Pattern L** | × | × |

The resulting picture is that Pattern A possessors can be dropped and extracted, whereas other types of possessors cannot. What does this distribution follow from? The strong correlation between agreement and pro-drop is not very surprising, as the intuition that the pro-drop and the (rich) agreement phenomena are related is quite well supported empirically. What is more surprising, in fact, is the correlation between agreement and extraction (cf. however Rizzi 1990). It could be argued, for instance, that the extraction facts are not the result of genuine extraction but are cases of resumption by a little *pro*. This hypothesis has the advantage of explaining the correlation between the possibility of (apparent) extraction and pro-drop, and thus, it can transitively account for the correlation between agreement and extraction. However, the data from Chamorro show that these structures do not involve pro-drop but rather genuine extraction. First, if wh-possessors were doubled by a *pro* and did not involve movement, we would expect no island effects, contrary to facts (17).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(17) *Hayi pära un-hanao [pära guma'-ña *t*]? Chamorro
who FUT INFL-go to house-3SG (Chung 1991:115)
'Whose house will you go to?'

A second piece of evidence against a resumption analysis comes from a specific fact about Chamorro: as illustrated in (18), possessor-extraction is possible unless the DP from which it is extracted is headed by an overt article (cf. Chung 1991, 1998). This cannot be explained under a resumption analysis, specially knowing that possessors can be dropped in the same configuration (see (13a) above).[4]

(18) *Hayi ti man-mäguf [i famagon-ña *t*]? Chamorro
who not INFL-happy ART children-3SG (Chung 1991:109)
'Whose children are unhappy?'

Given the facts presented above, I propose the following generalization, which is more precise than the generalization on Pattern A previously given in (4):

(19) **Generalization on languages with Pattern A:** In the languages in which the possessum can agree in φ-features with its possessor DP, the possessor can only be dropped or extracted in agreement configurations.

Note also that the fact that the two patterns can coexist in the same language shows that the properties of possessor DPs with regard to extraction and pro-drop cannot be be said to derive from language-particular factors but are to be related to the morphosyntactic properties of the construction in which they appear.

In section 3, I propose that (19) derives from a condition on structural case.

## 3. Case Condition on Possessor Drop and Extraction

What is there behind the correlation between agreement and the possibility to drop and extract a possessor? First of all, the DP-internal agreement facts in Pattern A suggest that in a parallel fashion to what happens in the clause, there are agree operations in the nominal domain (cf. Szabolcsi 1994, Baker 1996, Sánchez 1996, Chung 1998, Gavruseva 2000 a.o.). This implies that, in terms of the operation AGREE (cf. Chomsky 2000, 2001), in these structures a head Hº with uninterpretable φ-features values them against the possessor DP. Inversely, the absence of agreement in the same language can be taken to reflect the complete absence of φ-AGREE. If this is correct, the generalization (19) can be reinterpreted as follows: extraction and dropping of a possessor take place in configurations

[4] The account cannot either be based simply on the availability of an 'escape hatch' in the left periphery of the DP, given that there are languages, such as English or German, in which whereas extraction from DPs is possible, showing that there actually is an escape hatch (cf. (i)), extraction of possessor DPs is barred (cf. (ii)) (but see Gavruseva (2000) for a mixed account):
(i) Who did you see [a picture of]?
(ii) *Whose did you see [picture]?



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

where it is a probe for φ-AGREE. Could thus φ-AGREE be the condition for dropping and extracting possessors? Not directly: AGREE operations are asymmetric, they do not affect the goal. But still, there is a syntactic operation that does affect the goal DP: structural case assignment. Is there in consequence a causal relationship between structural case assignment and possessor-drop and extraction? The so-called George-Kornfilt hypothesis – by which agreement and structural case are intimately connected (cf. George & Kornfilt 1981, Schütze 1997, Chomsky 2000, 2001) –, suggests that this hypothesis is on the right track. That is, if structural case and agreement are the two sides of the same coin, it is expected that whenever a DP triggers agreement, it is also assigned structural case. This, in turn, suggests that the syntactic behavior of possessors with regards to pro-drop and extraction is related to their being (or not) assigned structural case:[5]

(20) **Case condition on pro-drop and extraction of possessor DPs:** A possessor DP can be dropped or extracted if and only if it bears Structural Case.

Note that (20) implies that possessor DPs are not always assigned structural case. In IQ and the Austronesian Pattern L, possessors cannot be dropped or extracted: this means that there is no structural case-assigning head in these structures.[6,7] The two different patterns can be represented as in (21) and (22).[8]

AGREE

(21) $[_{DP}\ D^o\ [_{HP}\ H^o_{[-\varphi;\ +Case]}\ [_{NP}\ DP_{[+\varphi;\ -Case]}\ \ldots\ N]$ **Pattern A**

(22) a. $[_{DP}\ D^o\ [_{HP}\ H^o\ [_{NP}\ DP_{[+\varphi;\ -Case]}\ \ldots\ N]$ **IQ, Pattern L**

b. $[_{DP}\ D^o\ [_{NP}\ DP_{[+\varphi;\ -Case]}\ \ldots\ N]$

In Pattern A (21), Hº, which has a structural case feature [+Case], agrees with the possessor DP and in turn values the unvalued case feature [-Case] of the DP. In contrast, the pattern in (22) can involve two different settings: either Hº is present but it does not have φ- and case-features (22a) or Hº is not projected at all (22b). In either case, structural case is not assigned to the possessor.[9]

If the hypothesis we have proposed is correct, this means that there is a strong parallelism between the structure of clauses and the nominal structure in (21) in

[5] At this point, the following question arises: what principled explanation is there behind the causal relation in (20)? This question will not be studied here; still, it is possible that structural case plays a role of 'anchoring' for DPs, that permits them to be 'silent' (as *pro* or a trace) at PF.

[6] There could be languages with two such heads in the nominal domain: cf. Baker (1996:26970).

[7] Note that this conclusion fits nicely with the hypothesis that in the clause domain the number of heads with [-φ] and [+Case] can vary crosslinguistically (cf. Béjar 2003, Bianchi 2006).

[8] AGREE in (21) is followed by N-raising, resulting in the attachment of the affix to N.

[9] Not valuing Case features does not lead to crash: those DPs that are not assigned structural case will have theta-related or default morphological case (Schütze 2001). Note that the same happens with φ-features: the absence of valuation can lead to default agreement (cf. Béjar 2003).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

that both have a structural case-marked DP (cf. Szabolcsi 1994, Abney 1987); crucially however, this parallelism does not extend to all types of nominal structures: there will be no DP with structural case in (22).

In this section, we have suggested that the ability for possessor DP to be dropped and extracted is related to the possibility of being assigned structural case. Next, we will see additional evidence that strengthens this hypothesis.

## 4. Variation in the Marking of Possessors

Above, I took the George-Kornfilt hypothesis to constitute evidence in favor of the case condition on possessor-drop and extraction in (20). In this section, I give some additional evidence in support of that hypothesis; specifically, I will show that Pattern A possessors behave actually like structural case-marked clausal arguments do, whereas IQ and Austronesian Pattern L possessors do not.

It is interesting to note, first of all, that Pattern A possessors generally bear a morphological case that corresponds to a clausal structural case. This is what we find in Abaza**,** Hungarian, Mohawk, Nahuatl, Itzaj, Jacaltec, Tzotzil and Tzutujil, where subjects and possessors surface with the same null case (nominative or ergative), but it is also what we find in Inuktitut and Yup'ik, where subjects and possessors bear overt ergative case (Johns 1992 and Abney 1987 respectively).[10] When we turn to the languages with two strategies discussed in 2.1 and 2.2, what we can see is that Pattern A possessors show the same behavior as subjects with regards to case-marking whereas Pattern L possessors do not. Consider first the Chamorro data in (23)-(24). In Chamorro, both clausal subjects and possessors are marked with what Chung (1998) calls 'unmarked case' (23):

(23) a. Ha-li'i' si Juan i pätgun lahi. Chamorro **Subject**
INFL-seeUNMARKED.CASE Juan ART child MALE (Chung 1998:22)
'Juan saw the boy.'

b. i haga-ña si Rita Chamorro **Pattern A**
ART daughter-3SG UNMARKED.CASE Rita (Chung 1998:49)
'Rita's daughter'

(24) i haga-n Rita Chamorro **Pattern L**
ART daughter-L Rita (Chung 1998:49)
'Rita's daughter'

That both clausal subjects and Pattern A possessors surface with unmarked case is particularly relevant, given that Pattern L possessors are never marked with unmarked case (24). These data thus suggest that in Chamorro Pattern A possessors are assigned structural case but Pattern L possessors are not.

Let us now turn to Quechua. At first glance this language does not seem to confirm the distribution between two types of possessors. As shown in (25)-(26),

[10] In Hungarian some possessors surface with a dative marker (Szabolcsi 1994).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

main clause subjects surface with nominative case while possessors surface with genitive case both in SQ (Pattern A) and IQ.

(25) a. Nuqa-ø papa-ta ranti-ni — Southern Quechua
I-**NOM** potato-**ACC** buy-1SG — (Sánchez 1996)
'I buy potatoes.'

b. Juan-ø aycha-ta miku-rka — Imbabura Quechua
Juan-**NOM** meat-**ACC** eat-3SG — (Hermon 1985:21)
'Juan ate meat.'

(26) a. Maria-q wasi-n — Southern Quechua
Maria-**GEN** house-3SG — (Sánchez 1996)
'Maria's house'

b. Juzi-paj warmi — Imbabura Quechua
José-**GEN** wife — (Cole 1985:115)
'José's wife'

However, even if SQ possessors do not pattern with subjects in the morphological manifestation of case, they do so in that they are assigned structural case. The evidence comes from embedded nominalized clauses, where subjects surface with genitive case, but are structural case-marked (cf. Lefebvre & Muysken 1989).[11]

(27) [Xwan-pa hamu-na-n-ta] yacha-ni. — Southern Quechua
Juan-**GEN** come-NMLZ-3-ACC know-1SG — (Lefebvre & Muysken 1989:17)
'I know that Juan is to come.'

(28) [Maria-ø kay-pi ka-j-ta] ya-ni. — Imbabura Quechua
Maria-**NOM** here-in be-NMLZ-ACC think-1SG — (Hermon 1985:23)
'I think that Maria is here.'

If the embedded subject in (27) has structural case, this means that genitive in SQ is the morphological realization of a structural case. Hence, the possessor in (25) surfaces with the same morphological case some structural case-marked subjects do. On the contrary, in IQ embedded subjects bear (null) nominative case (28), then genitive is apparently not a structural case in this dialect. Consequently, the case that appears on the possessor in IQ (26b) must be of a different nature than the genitive case that surfaces on the possessor in SQ (26a).

Another piece of evidence in favor of the account of the generalization (19) in terms of the condition on structural case in (20) comes from Boumaa Fijian. Here there is no overt case marking that differentiates the DPs, but the idea is that if there is some condition that DPs must fulfill specifically when they are assigned structural case, then we expect Pattern A possessors – but not other types of possessors – to be subject to the same condition. As we will see now, this seems to be the case. In Bouma Fijian, subject and object DPs are always headed by an

[11] Genitive has three allomorphs in SQ: *-q*, *-pa*, and *-qpa (*Lefebvre & Muysken 1989:78).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



overt article (29) (cf. Dixon 1988:114-116). As shown in (30)-(31), while Pattern A possessors also are (30), Pattern L possessors are not (cf. (31), and also (11)).

(29) era la'o a gone — Boumaa Fijian **Subject**
3PL go ART child — (Dixon 1988:33)
'The youth is going'

(30) a liga-na a gone.yalewa yai — Boumaa Fijian **Pattern A**
ART hand-3SG ART young.girl this — (Dixon 1988:121)
'the hands of this young girl'

(31) a liga-i gone.yalewa yai — Boumaa Fijian **Pattern L**
ART hand-L young.girl this — (Dixon 1988:123)
'the hands of this young girl'

In consequence, whatever the condition on subjects is that requires them to be headed by an overt article in Boumaa Fijian, Pattern A possessors are subject to it while Pattern L possessors are not. Hence, again, Pattern A possessors behave as clausal structural case-marked DPs do, whereas Pattern L possessors do not.

The last piece of evidence in support of the hypothesis that Pattern A possessors are assigned structural case while Pattern L possessors are not comes from Palauan. Palauan has two different morphosyntactic means to mark (definite) complements, depending on the aspect of the verb. In perfective constructions, the verb agrees with the object (32). In imperfective constructions, in contrast, the object is introduced by the linker *er* (33) (Georgopoulos 1991:29).

(32) ak-uldenges-terir [a resensei er ngak]. — Palauan
1SG-PERF.honor-3PL ART teachers L me — (Georgopoulos 1991:29)
'I respected my teachers.'

(33) ak-uleldanges [er a resensei er ngak].
1SG-IM.honor L ART teachers L me
'I respected my teachers.'

It is remarkable to see that the alternation between object-agreement and introducing the object by means of a linker is completely parallel to the one found in possession structures: in this regard, we could say that (32) illustrates Pattern A at the clausal level, while (33) illustrates Pattern L. But what is more relevant for our discussion is that *er* also precedes oblique phrases:

(34) Ke-mle er tia er oingerang? — Palauan
R.2SG-come L here L when — (Georgopoulos 1991:27)
'When did you come here?'

That is, in Palauan, Pattern L possessors, together with the object DPs of imperfective verbs, are to be grouped with oblique phrases, contrary to Pattern A possessors, which, as subjects and objects of perfective verbs, are not introduced



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



by a linker. This illustrates how, in fact, the distinction between Pattern A and Pattern L possessors parallels the distinction between DP arguments (with structural case) and DP/PP adjuncts (with no structural case).

The different pieces of data presented in this section all converge in one direction: in all the languages under analysis, some possessors but no all behave like clausal structural case-marked arguments, showing a distinction between Pattern A and other types of pattern (Pattern L in the Austronesian languages and the Imbabura Quechua DP). This result, in turn, provides evidence in favor of the case condition on pro-drop and extraction of possessors (20) as way to account for the crosslinguistic correlation between agreement, extraction and dropping of possessors found in the generalization that I proposed in (19).

**References**

Abney, Steve. 1987. *The English Noun Phrase in its Sentential Aspect.* Ph.D. diss., Massachusetts Institute of Technology, Cambridge, MA.

Aissen, Judith. 1987. *Tzotzil Clause Structure.* Dordrecht: Kluwer.

Baker, Mark. 1996. *Polysynthesis Parameter.* New York: Oxford University Press.

Béjar, Susana. 2003. *Phi-Syntax: A Theory of Agreement*. Ph.D. diss., University of Toronto, Canada.

Bianchi, Valentina. 2006. On the Syntax of Person Arguments. *Lingua* 116:2023-2067.

Chomsky, Noam. 2000. Minimalist Inquiries: The Framework. In Martin, Michaels and Uriagereka, eds., *Step by Step*, 89-155. Cambridge, MA: Massachusetts Institute of Technology Press.

Chomsky, Noam. 2001. Derivation by Phase. In M. Kenstowicz, ed., *Ken Hale: A Life in Language*, 1–52. Cambridge, MA: Massachusetts Institute of Technology Press.

Chung, Sandra. 1991. Functional Heads and Proper Government in Chamorro. *Lingua* 85:85-134.

Chung, Sandra. 1998. *The Design of Agreement.* Chicago: University of Chicago Press.

Cole, Peter. 1985. *Imbabura Quechua.* London: Croom Helm.

Den Dikken, Marcel. 1999. On the Structural Representation of Possession and Agreement. In I. Kenesei, ed., *Crossing Boundaries*, 137-178. Amsterdam: John Benjamins.

Dixon, Robert M. W. 1988. *A Grammar of Boumaa Fijian.* Chicago: University of Chicago Press.

Duguine, Maia. 2007. On the Syntax of Possessors. Paper presented at the *XVII Colloquium on Generative Grammar*, Universitat de Girona.

Gavruseva, Elena. 2000. On the Syntax of Possessor Extraction. *Lingua* 110:734-772.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



George, Leland and Jaklin Kornfilt. 1981. Finiteness and Boundedness in Turkish. In F. Heny, ed., *Binding and Filtering*, 105-128. London: Croom Helm.
Georgopoulos, Carol. 1991. *Syntactic Variables.* Dordrecht: Kluwer.
Hermon, Gabriella. 1985. *Syntactic Modularity.* Dordrecht: Foris.
Johns, Alana. 1992. Deriving Ergativity. *Linguistic Inquiry* 23(1):57-87.
Lefebvre, Claire and Pieter Muysken. 1988. *Mixed Categories: Nominalizations in Quechua.* Dordrecht: Kluwer.
Rizzi, Luigi. 1990. *Relativized Minimality.* Cambridge, MA: Massachusetts Institute of Technology Press.
Sánchez, Liliana. 1996. Why does Southern Quechua Agree in Person Nominally? Ms., Carnegie Mellon University.
Schütze, Carson. 1997. *INFL in Child and Adult Languages: Agreement, Case and Licensing.* Ph.D. diss., Massachusetts Institute of Technology, Cambridge, MA.
Schütze, Carson. 2001. On the Nature of Default Case. *Syntax* 4(3):205-238.
Szabolcsi, Anna. 1994. The Noun Phrase. In F. Kiefer and K. Kiss, eds., *Syntax and Semantics 27: The Syntactic Structure of Hungarian*, 179-274. New York: Academic Press.

Maia Duguine
HEIS, Faculty of Philology and History-Geography
EHU/UPV
5, Unibertsitateen ibilbidea
01006 Vitoria-Gasteiz, Basque Country

maia.duguine@ehu.es



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Total Identity in Co-occurrence Restrictions

GILLIAN GALLAGHER
*Massachusetts Institute of Technology*

## 0. Introduction

In this paper, I look at languages that require complete identity between certain classes of non-adjacent consonants and discuss the implications of these data for the Agreement by Correspondence (ABC) analysis of long-distance consonant agreement (Hansson 2001, Rose and Walker 2004).

Some languages exhibit what MacEachern (1999) calls the TOTAL IDENTITY EFFECT. In languages of this type, pairs of similar segments are prohibited from cooccurring in a root while identical segments may cooccur.

(1) Chol (Mayan: Aulie and Aulie 1978, Coon and Gallagher 2008)

| | |
|---|---|
| non-identical ejectives: | *ts'-k', *ts'-tʲ', *p'-k' |
| identical ejectives: | ✓ts'-ts', ✓k'-k', ✓p'-p' |

(2) Muna (Austronesian: van den Berg 1989, Coetzee and Pater in press)

| | |
|---|---|
| non-identical homorganic: | *m-b, *b-p, *p-f |
| identical homorganic: | ✓m-m ✓b-b ✓p-p |

In (1) and (2), a certain class of non-adjacent consonants (ejectives and homorganics, respectively) must be totally identical in order to cooccur.

Total identity requirements contrast with another phenomenon where similar non-adjacent segments are required to agree in a single feature only. In Chumash, for example, stridents must agree in anteriority, but may disagree in other features.

(3) Chumash (data from Hansson 2001:58, taken from Applegate 1972)

| | | |
|---|---|---|
| ʃapitʃʰolit | /**s**-api-**tʃʰ**o-it/ | 'I have a stroke of good luck' |
| ʃapitʃʰouʃwaʃ | /**s**-api-**tʃʰ**o-u**s**-waʃ/ | 'he had a stroke of good luck' |
| haʃxintilawaʃ | /ha-**s**-xintila-waʃ/ | 'his former Indian name' |

In this talk, I argue that total identity is formally distinct from partial identity. In the ABC framework, total and partial identity are analyzed uniformally as effects



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



of constraints demanding identity in *single features* between interacting segments. I argue instead that total identity is an explicit requirement of interacting consonants. It is not the composite effect of multiple single feature identities, as is implicit in the original formulation of ABC. There are two arguments in favor of the proposal. First, single feature harmonies of the type required to analyze total identity are systematically unattested. Second, gradient grammaticality patterns reveal a preference for totally identical pairs of consonants, but not for increasingly similar pairs.

Eliminating feature specific harmony constraints has ramifications for the analysis of cases of partial identity like (3). I show that the ABC account of single feature harmonies overgenerates, predicting many unattested patterns. Competing analyses of minor place harmony as local spreading are preferred, supporting the elimination of feature specific harmony constraints. The rest of this paper is organized as follows. Section 1 presents data on total identity requirements and Section 2 presents the ABC framework. The analysis of total identity within ABC is discussed in Section 3. In Section 4, I address cases of single feature agreement and Section 5 concludes.

## 1. Data: Cases of Total Identity

In languages with co-occurrence restrictions on similar segments, identical segments may be grammatical. In these languages, identical segments are exceptional. They are not treated by the grammar as maximally similar. In this section, I will present two examples of languages which treat identical consonants as exceptional, Chol and Muna.

### 1.1. Chol

Chol (Aulie and Aulie 1978, Coon and Gallagher 2008) is a Mayan language spoken in Chiapas, Mexico by around 150,000 people.

(4) Chol consonant inventory

| | labial | coronal | velar | glottal |
|---|---|---|---|---|
| implosive | b | | | |
| plosive | p | tʲ | k | ʔ |
| ejective | **pʼ** | **tsʼ tʃʼ tʲʼ** | **kʼ** | |
| fricative | | s ʃ | | h |
| affricate | | ts tʃ | | |
| nasal | m | ɲ | | |
| approximant | w | l j | | |

Lexical roots in Chol and other Mayan languages are predominately CVC in shape. The co-occurrence of the five ejective consonants is restricted in Chol. While all ejectives may appear in either initial or final position, two non-identical



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

ejectives may not cooccur. Roots with identical ejectives are given in (5a). The hypothetical roots in (5b), with non-identical ejectives, are all unattested. [1]

| (5) | a: | k'ok' | 'healthy' | b: | *k'ats' |
|---|---|---|---|---|---|
| | | ts'uhts' | 'kiss' | | *p'otʃ' |
| | | tʃ'ɨtʃ' | 'absorb' | | *tʲ'uk' |

The pattern in (5) is not unique to Chol. Other languages with laryngeal co-occurrence restrictions that allow identical pairs of consonants include the Mayan languages Tzotzil (Weathers 1947), Yucatec (Straight 1975), Tzutujil (Dayley 1985), as well as Bolivian and Peruvian Aymara (MacEachern 1999).

### 1.2. Muna

Muna (van den Berg 1989, Coetzee and Pater in press) is an Austronesian language spoken in parts of Indonesia. The consonant inventory of Muna is in (6).

(6) Consonant inventory of Muna

| | labial | coronal | velar | uvular | glottal |
|---|---|---|---|---|---|
| voiceless | p | t | k | | |
| voiced | b | d | g | | |
| implosive | ɓ | ɗ | | | |
| nasal | m | n | ŋ | | |
| voiceless prenasal | $^{m}$p | $^{n}$t, $^{n}$s | $^{ŋ}$k | | |
| voiced prenasal | $^{m}$b | $^{n}$d | $^{ŋ}$g | | |
| voiceless fricative | f | s | | ʁ | h |
| trill | | r | | | |
| lateral | | l | | | |
| glide | w | | | | |

The vast majority of roots in Muna are either CVCV or CVCVCV[2]. Coetzee and Pater (in press) calculated the Observed/Expected(O/E) ratio (Pierrehumbert 1993, Frisch et al. 2004) of all pairs of consonants in "adjacent" position, those separated only by a vowel. An O/E of 1 shows that two consonants cooccur freely. An O/E of less than 1 means that the two consonants cooccur less often than expected, showing the effect of some grammatical restriction. An O/E of greater than 1 means that two consonants cooccur more often than expected. Coetzee and Pater's calculations reveal that Muna has a gradient, place based co-occurrence restriction. Within a major place class, two consonants are less likely to cooccur the more subsidiary features (voicing, stricture, sonorancy) they share.

[1] Pairs of non-identical ejectives all have an O/E of 0 (they are completely unattested). Pairs of non-identical ejectives all have O/Es of well over 1.

[2] There are also vowel initial roots, as well as roots with VV sequences.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The overall pattern for non-identical consonants can be illustrated by a subset of the labials, given in (7).

(7) Co-occurrence of labials in Muna

| consonants | O/E | disagreeing features |
|---|---|---|
| m-f | 1.04 | continuant, nasal, voice |
| b-f | 0.58 | continuant, voice |
| m-p | 0.39 | nasal, voice |
| b-p | 0.10 | voice |
| p-f | 0.07 | continuant |
| m-b | 0.07 | nasal |

In (7), the O/E decreases as the number of disagreeing features decreases. In other words, there is an inverse correlation between similarity and degree of attestation.

While highly similar pairs of consonants are very under-attested in Muna, pairs of identical consonants are over-attested, (8).

(8) m-m 1.24 b-b 2.79 p-p 1.46 f-f 2.5

Other languages with place based co-occurrence restrictions which treat identical consonants as exceptional include Javanese (Uhlenbeck 1949, 1950, Mester 1986) and Ngbaka (Thomas 1963, Mester 1986).

## 2. ABC: The Framework

In the ABC framework, the total identity effect and single feature harmonies are given a unified analysis as effects of correspondence between non-adjacent consonants. Correspondence relations between output consonants are established by CORR-C⇔C constraints (the definition in (9) is from Rose and Walker 2004:491).

(9) CORR-C⇔C Let S be an output string of segments and let $C_i$ $C_j$ be segments that share a specified set of features F. If $C_i$, $C_j \in S$, then $C_i$ is in a relation with $C_j$: that is, $C_i$ and $C_j$ are correspondents of one another.

Rose and Walker propose that CORR-C⇔C constraints are in a fixed hierarchy. Constraints referring to more similar pairs of consonants outrank those referring to less similar pairs. The partial hierarchy in (10) shows the interaction of place and ejection in stops.

(10) CORR-T'⇔T' >> CORR-T'⇔T >> CORR-T'⇔K



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The ranking of IO-faithfulness constraints within this hierarchy determines which class of segments are affected by co-occurrence restrictions in a language.

If two segments stand in correspondence, they are required to agree in certain features by constraints from the CC-IDENT[F] family.

(11) CC-IDENT[F] Let $C_i$ be a segment in the output and $C_j$ be any correspondent of $C_i$ in the output. If $C_i$ is [αF] then $C_j$ is [αF].

As illustration, take the analysis of laryngeal agreement in Bolivian Aymara (de Lucca 1987, MacEachern 1999, Rose and Walker 2004). Homorganic stops must have matching laryngeal features (*k'-k, *$k^h$-k, ✓k'-k', ✓$k^h$-$k^h$).

(12) a: homorganic stops must have identical laryngeal features

| /k'…k/ | CORR-T'⇔T | CC-IDENT[cg] | IO-IDENT[cg] | CORR-T'⇔K |
|---|---|---|---|---|
| ☞ $k'_x…k'_x$ | | | * | |
| $k'_x…k'_y$ | * ! | | * | |
| $k'_x…k_x$ | | * ! | | |
| $k'_x…k_y$ | * ! | | | |

b: heterorganic stops may disagree in laryngeal features

| /k'…p/ | CORR-T'⇔T | CC-IDENT[cg] | IO-IDENT[cg] | CORR-T'⇔K |
|---|---|---|---|---|
| ☞ $k'_x…p_y$ | | | | * |
| $k'_x…p_x$ | | * ! | | |
| $k'_x…p'_x$ | | | * ! | |
| $k'_x…p'_y$ | | | * ! | * |

In ABC, languages differ from one another on two dimensions: 1. the set of consonants that must correspond (e.g. stridents, homorganic stops, voiceless stops) and 2. the feature in which corresponding segments must agree (laryngeal features, minor place, etc.). In Section 3, I propose to eliminate the second locus of variation by replacing feature specific CC-IDENT[F] constraints with a single, total identity constraint CC-IDENT. Support for this move comes from languages with a total identity requirement. In Section 4 I look at the ramifications of CC-IDENT for the analysis of single feature agreement. I show that feature specific CC-IDENT[F] constraints predict unattested harmony patterns. Many single feature harmonies can be better analyzed as either the effect of the total identity constraint CC-IDENT, or of local spreading (Flemming 1995, Gafos 1999, Ní Chiosáin and Padgett 1997).

## 3. Total Identity in ABC

As originally formulated, interacting consonants in an ABC analysis are required to agree with one another on a feature by feature basis. A language with total



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

identity between interacting consonants, then, must have multiple CC-IDENT[F] constraints outranking their IO counterparts. In Chol, for example, ejectives contrast for major place, stridency, and anteriority. Consequently, a feature specific analysis of total identity requires the CC-IDENT[F] constraints in (13).

(13) CC-IDENT[place] CC-IDENT[α strident] CC-IDENT[α anterior]

(14) Total identity is required between Chol ejectives

| /ts'…k'/ | CORR | CC-ID[pl] | CC-ID[strid] | CC-ID[ant] | IO-ID[pl] | IO-ID[strid] | IO-ID[ant] |
|---|---|---|---|---|---|---|---|
| ☞ts'$_x$…ts'$_x$ | | | | | * | * | * |
| ts'$_x$…k'$_x$ | | * ! | * | * | | | |
| ts'$_x$…tʲ'$_x$ | | | * ! | * | * | | |
| ts'$_x$…tʃ'$_x$ | | | | * ! | * | * | |

I propose that total identity is *not* the result of multiple feature specific constraints. Instead, total identity is explicitly required between corresponding segments by a general, non-feature specific constraint, CC-IDENT, given in (15).

(15) CC-IDENT Given two segments in the output $C_i$ and $C_j$, If $C_i$ and $C_j$ stand in correspondence, then $C_i$ and $C_j$ are identical.

The new analysis of Chol is in (16).

(16)

| /ts'…k'/ | CORR | CC-IDENT | IO-ID[place] | IO-ID[strid] | IO-ID[ant] |
|---|---|---|---|---|---|
| ☞ ts'$_x$…ts'$_x$ | | | * | * | * |
| ts'$_x$…k'$_x$ | | * ! | | | |
| ts'$_x$…tʲ'$_x$ | | * ! | * | | |
| ts'$_x$…tʃ'$_x$ | | * ! | * | * | |

There are two arguments in favor of the analysis in (16) over that in (14). First, the feature specific CC-IDENT[F] constraints in (14), which are needed to analyze total identity, are independently unmotivated. Second, under the CC-IDENT[F] formulation, there is nothing special about being *totally* identical as opposed to being *partially* identical. Gradient effects, as in Muna, reveal a preference for totally identical pairs of consonants, but not for increasingly similar pairs.

### 3.1. Some CC-IDENT[F] Constraints are Unmotivated

If the analysis of Chol in (14) were correct, we should be able to motivate each of the three feature specific CC-IDENT[F] constraints independently. Besides the pattern in Chol, we should see languages with *only* major place harmony, or *only* stridency harmony or *only* anteriority harmony among ejectives. The unattested languages in (17) and (18) are predicted.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(17) Major place harmony between ejectives: *tʲʼ-kʼ, *tsʼ-pʼ ✓tʲʼ-tsʼ, ✓tʲʼ-tʃʼ
CC-IDENT[place] >> IO-IDENT[place]
IO-IDENT[α strid] >> CC-IDENT[α strid]
IO-IDENT[α ant] >> CC-IDENT[α ant]

(18) Stridency harmony between ejectives: *tʲʼ-tsʼ, *tʲʼ-tʃʼ ✓tjʼ-kʼ ✓tsʼ-tʃʼ
CC-IDENT[α strid] >> IO-IDENT[α strid]
IO-IDENT[α ant] >> CC-IDENT[α ant]
IO-IDENT[place] >> CC-IDENT[place]

The languages in (17) and (18) show major place harmony and stridency harmony between ejectives, respectively. Both major place harmony and stridency harmony are unattested in Hansson's (2001) survey of consonant harmony systems, whether applying to the class of ejectives or to any other class of segments. Moreover, no language restricts the co-occurrence of only *some* ejectives. In MacEachern's survey of laryngeal co-occurrence restrictions, languages come in two varieties: either all pairs of ejectives (or aspirates or implosives) are prohibited from cooccuring, including identical ones: *kʼ-pʼ *kʼ-kʼ, or only non-identical pairs are disallowed and identical ones are fine: *kʼ-pʼ, ✓kʼ-kʼ. The two CC-IDENT[F] constraints needed to analyze total identity, CC-IDENT[place] and CC-IDENT[strident], are unmotivated.

### 3.2. Gradient Co-occurrence Restrictions and Total Identity

In a feature specific analysis, *total* identity is an accident. Under the CC-IDENT[F] formulation, there is nothing special about being totally identical as opposed to being partially identical. Looking at languages with a total identity requirement, however, it seems that there is something quite special about being totally identical. In languages with place co-occurrence restrictions, for example, identical pairs of consonants may be allowed while increasingly similar pairs of consonants are increasingly disfavored.

The co-occurrence restrictions in Muna expemplify the exceptional status of identical consonants. In Muna, homorganic consonants are increasingly disfavored the more similar they are. Identical consonants, while maximally similar, are completely grammatical.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(19) O/E of Muna root consonants

| consonants | O/E | disagreeing features |
|---|---|---|
| m-f | 1.04 | continuant, nasal, voice |
| b-f | 0.58 | continuant, voice |
| m-p | 0.39 | nasal, voice |
| b-p | 0.10 | voice |
| p-f | 0.07 | continuant |
| m-b | 0.07 | nasal |
| m-m | 1.24 | none |
| b-b | 2.79 | none |
| p-p | 1.46 | none |
| f-f | 2.5 | none |

The feature specific analysis of total identity predicts that a gradient co-occurrence restriction would have exactly the opposite profile from Muna. Increasingly similar pairs of homorganic consonants should be increasingly favored, since they violate fewer CC-IDENT[F] constraints.[3]

(20) Unattested pattern predicted by CC-IDENT[F] analysis

| consonants | O/E | violates |
|---|---|---|
| m-f | 0 | CC-IDENT[αvoi], CC-IDENT[αson], CC-IDENT[αcon] |
| b-f | 0.3 | CC-IDENT[α voice], CC-IDENT[α con] |
| m-p | 0.3 | CC-IDENT[α voice], CC-IDENT[α son] |
| b-p | 0.7 | CC-IDENT[α voice] |
| p-f | 0.7 | CC-IDENT[α continuant] |
| m-b | 0.7 | CC-IDENT[α sonorant] |
| m-m | 1 | none |
| b-b | 1 | none |
| p-p | 1 | none |
| f-f | 1 | none |

In order to account for attested gradient patterns, the grammar must favor totally identical pairs of consonants without favoring partially identical pairs of consonants. This is possible if there are no feature specific CC-IDENT[F] constraints, but only a single total identity constraint.

[3] This of course depends on the theory of gradience in the grammar. I am assuming a model like that developed in Coetzee and Pater (in press), who analyze Muna as a gradient OCP effect with weighted constraints (they do not provide an account of identical consonant grammaticality).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 3.3. Summary

This section has argued that total identity is not the composite effect of multiple single feature harmonies, it is an independent process. The proposed total identity constraint reflects this difference.

In the original ABC proposal, languages vary in two ways – the set of consonants that must correspond (the CORR-C⇔C constraints) and the features corresponding segments must agree in (the CC-IDENT[F] constraints). The proposal here eliminates one of these locuses of variation: corresponding segments must always be completely identical. Languages may only differ in what consonants are required to correspond, i.e. the strength of the co-occurrence restriction. In the next section I evaluate the evidence in favor of feature specific constraints.

## 4. Single Feature Agreement

The evidence for feature specific CC-IDENT[F] constraints comes from the large number of cases where non-adjacent consonants must agree in a single feature only. The original ABC proposal is designed to account for a number of cases of long-distance assimilation that do not result in total identity. In these cases, two non-adjacent consonants are required to agree in a single feature that does not spread through intervening segments. In (21) and (22) I give examples of phenomena of this type from Hansson's survey of consonant harmony systems.

(21) Laryngeal agreement: some or all obstruents must have the same laryngeal features, but may differ in place of articulation

| Kalabari Ijo (Jenewari 1989) | *d-ɓ, *ɗ-b | ✓d-b, ✓ɓ-ɗ |
|---|---|---|

(22) Nasal agreement: an oral consonant is nasal following a root with a nasal.

Yaka (Hyman 1995)

| | | | |
|---|---|---|---|
| kém-ene | 'to moan' | kéb-ele | 'be careful' |
| nók-ene | 'to rain' | lók-ele | 'to bewitch' |

While phenomena like those above do show long-distance agreement in a single feature, the original formulation of ABC massively overgenerates. It predicts many unattested harmony patterns and, moreover, fails to explain why certain harmony patterns are common and others completely absent.

The problems with the ABC account of single feature harmonies is best shown by looking at minor place harmonies. Many of the single feature harmonies that result in partial identity involve agreement in a minor place specification. Coronal harmonies, as in Chumash, are the most prevalent example. Navajo has a similar pattern, alveolar and alveopalatal stridents may not cooccur.

(23) Navajo (Hansson 2001:7 and references therein):

| | |
|---|---|
| ʃí-tʃí:h | 'my nose' |
| si-ts'a:ʔ | 'my basket' |
| si-zid | 'my scar' |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Minor place harmonies all share an important property: they have been analyzed as local agreement. Flemming (1995), Ní Chiosáin and Padgett (1997) and Gafos (1999) show that minor place specifications may spread through intervening segments without any acoustic consequences. They analyze these apparent cases of non-local assimilations as local assimilations. The action-at-a-distance in minor place harmonies is then only apparent: assimilation is local, but has no audible effect on segments that don't contrast for the spreading feature.

A CC-IDENT[F] analysis predicts that stridents or coronals should be able to harmonize for any feature, or any combination of features. Beyond the well-attested minor place harmonies shown above, we also predict languages where stridents must agree in continuancy but not minor place (24), or in both minor place and voicing (25).

(24) *s-ts, *ʃ-tʃ ✓ts-tʃ, ✓s-ʃ

(25) *s-z *s-ʃ ✓s-ts

The predictions in (24) and (25) are not borne out. Coronal harmonies are overwhelmingly minor place harmonies, other contrastive features like voicing and stricture are ignored. This is predicted in a spreading analysis, since voicing and stricture cannot spread unnoticed through intervening segments.

The current proposal predicts that coronal harmonies should either be minor place harmonies, or total identity effects. Indeed, cases of total identity appear to be the only ones that involve multiple harmonies. In Chol and other Mayan languages stridents are required to agree for both anteriority and continuancy, the result of which is total identity.

(26) Total identity (=agreement in [α anterior] *and* [α continuant])

| a: | | | b: | |
|---|---|---|---|---|
| | sus | 'scratch' | | *ts-s |
| | ʃeʃ | 'shrimp' | | *s-ʃ |
| | tsɨts | 'difficult' | | *s-tʃ |
| | tʃitʃ | 'older sister' | | |

In the original ABC proposal, both the set of consonants that must stand in correspondence and the harmonizing feature are independently variable. Consequently, we should find languages that have minor place harmony between only a sub-set of the possible targets.

(27) a: CORR[-continuant], CC-IDENT[α anterior] >> IO-IDENT
b: *ts-tʃ s-ʃ

If there are no feature specific harmony constraints, then the only range of variation is in the set of consonants that must be in correspondence. This seems to be a good prediction. In Chol, total identity is only required between a sub-set of the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



stridents, depending on their similarity. Plain stridents must be totally identical to cooccur. An ejective strident and a fricative, however, may cooccur.

(28) Total identity is not required of all stridents in Chol

| | | | |
|---|---|---|---|
| s̬its' | 'stretch' | tʃ'oʃ | 'worm' |
| sits' | 'saliva' | ʃutʃ' | 'thief' |

While there aren't any languages that pick out a sub-set of the stridents for minor-place harmony, there are languages that pick out a sub-set of the stridents for total identity.

The feature specific CC-IDENT[F] proposal generalizes to the lowest common denominator. It accounts for (21) and (22) at the expense of accounting for anything. The challenge for future research is to find an alternative explanation for phenomena like (21) and (22) without resorting to feature specific CC-IDENT[F] constraints.

## 5. Conclusion

In this talk I have argued that total identity requirements are formally distinct from partial identity requirements. Total identity must be the result of a general, non-feature-specific constraint. The feature specific constraints needed to account for total identity are unmotivated. Feature specific constraints cannot account for gradient co-occurrence restrictions. Eliminating feature specific CC-IDENT[F] constraints has desirable consequences for the analysis of minor place harmonies. CC-IDENT[F] constraints make unattested typological predictions that an analysis with only spreading and total identity does not.

## References

Applegate, Richard B. 1972. *Ineseño Chumash grammar*. Ph.D. diss., University of California, Berkeley.

Aulie, Wilbur and Evelin Aulie. 1978. *Diccionario Ch'ol-Español, Español-Ch'ol*. México: Summer Institute of Linguistics.

van den Berg, René. 1989. *A Grammar of the Muna Language*. Foris, Dordrecht.

Coetzee, Andries W and Joe Pater. in press. Weighted constraints and gradient restrictions on place co-occurrence in Muna and Arabic.

Coon, Jessica and Gillian Gallagher. 2007. Similarity and correspondence in Chol Mayan. Talk presented at *North East Linguistic Society 38*, Ottawa, ON.

Cowan, Marion. 1969. Tzotzil grammar. In *Summer Institute of Linguistics Publications*. Norman: University of Oklahoma.

Dayley, Jon. 1985. *Tzutujil grammar*. Berkeley: University of California Press.

Frisch, Stefan, Janet Pierrehumbert, and Michael Broe. 2004. Similarity avoidance and the OCP. *Natural Language and Linguistic Theory* 22:179-228.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Gafos, Adamantios. 1999. *The articulatory basis of locality in phonology.* New York: Garland.
Hansson, Gunnar Olafur. 2001. Theoretical and typological issues in consonant harmony. Ph.D. diss., University of California, Berkeley.
Hyman, Larry. 1995. Nasal consonant harmony at a distance: the case of Yaka. *Studies in African Linguistics* 24:5-30.
Jenewari, Charles E.W. 1989. Ijoid. In John Bendor-Samuel ed. *The Niger-Congo languages*, 105-118. Lanham: University of Press America.
Kaufman, Terrence. 1971. Tzeltal phonology and morphology. In *University of California Publications in Linguistics, 61*. Berkeley: University of California Press.
de Lucca, Manuel. 1987. *Diccionario practico aymara-castellano castellano-aymara*. Chochabamba: Los Amigos del Libro.
MacEachern, Margaret. 1999. *Laryngeal co-occurrence restrictions*. New York: Garland.
Mester, R. Armin. 1986. Studies in tier structure. Ph.D. diss., University of Massachusetts, Amherst.
Ní Chiosáin, Máire, and Jaye Padgett. 1997. Markedness, segment realization, and locality in spreading. Technical Report LRC-07-01, Linguistics Research Center, University of California, Santa Cruz.
Pierrehumbert, Janet. 1993. Dissimilarity in Arabic verbal roots. In A. Schafer ed., *Proceedings of NELS 23*:367-381.
Rose, Sharon, and Rachel Walker. 2004. A typology of consonant agreement as correspondence. *Language* 80:475-531.
Straight, H. Stephen. 1976. *The acquisition of Maya phonology: Variation in Yucatec child language*. New York: Garland.
Thomas, Jacqueline M.C. 1963. *Le parler Ngbaka de Bokanga: Phonologie, morphologie, syntaxe*. Paris: Mouton.
Uhlenbeck, E. M. 1949. *De structuur van het Javaanse morpheem*. Bandoeng: Nix & Co.
Uhlenbeck, E.M. 1950. The structure of the Javanese morpheme. *Lingua* 2:239-70.
Weathers, Nadine. 1947. Tsotsil phonemes with special reference to allophones of *b*. *International Journal of American Linguistics* 13:108-111.

Gillian Gallagher
Massachusetts Institute of Technology
Department of Linguistics and Philosophy, 32D-808
77 Massachusetts Avenue
Cambridge, MA 02139

gilliang@mit.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Backwards Ellipsis is Right Node Raising[1]

SEUNGWAN HA
*Korea University*

## 1. Backwards Ellipsis

Natural language allows some part of utterance to be unpronounced when the part can be considered as redundant or as the given information. This nonpronunciation is called *ellipsis,* and ellipsis has been an intriguing research topic in syntax since the late sixties, as shown in papers such as Ross (1967).

### 1.1. Forward vs. Backwards ellipsis

Ellipsis can be divided into two different kinds with respect to the direction of ellipsis – forward and backwards ellipsis. Previous literature has mainly focused on *forward ellipsis* where the part subject to be ellipsis follows its antecedent in the previous utterance.[2] Let us consider examples in (1a-b). The VP is elided in the second conjunct in (1a), and the TP is in (1b), both finding its antecedent in the first conjunct.

(1) a. John *admires his teacher*, but Bill doesn't <~~admire his teacher~~>.
(Forward VP-ellipsis)

b. Mary told me *she would buy a present for her daughter*, but she didn't tell me what <~~she would buy for her daughter~~>.
(Forward sluicing)

There is another type of ellipsis, called *backwards ellipsis*, which this paper will be concerned with. Backwards ellipsis is similar to forward ellipsis in that there exists unpronounced material in the sentence. However, it differs from forward ellipsis since the antecedent follows the elided gap. Let us examples of backwards ellipsis in (2).

[1] I would like to thank Barbara Citko, Paul Hagstrom, Kyle Johnson, Jason Merchant for helpful comments and suggestions. All errors are my own.
[2] An Italicized phrase in an example indicates the antecedent of the elided phrase in this paper.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(2) a. Bill DOESN'T <>, but John DOES *admire his teacher*.
(Backwards VP-ellipsis)
b. The journalists want to know IF <>, and WHEN *the suspect will make a statement*. (Backwards sluicing)
(Giannakidou and Merchant 1998: 238)

Notice that the elided gap takes the VP in the second conjunct as an antecedent in (2a), so that the elided VP in the first conjunct is followed by its antecedent in the second conjunct. The same holds for backwards sluicing in (2b). The TP in the first conjunct is elided and its antecedent can be found in the second conjunct.

At the first glance, forward and backwards ellipsis seem to show a mirror image. The only difference appears to be a direction of ellipsis. Thus, let us make a null hypothesis in (3).

(3) Null hypothesis: backwards ellipsis is the same as forward ellipsis, but in the other direction.
a. The elided constituents (i.e. VP in (2a) and TP in (2b)) are followed by its antecedent.
b. Other than that, backwards ellipsis would show the same distribution with forward ellipsis.

### 1.2 Backwards Anaphora Constraint

However, it is not so much difficult to come up with examples where the hypothesis in (3) falls. Let us consider (4a-c).

(4) a. Because Jeff did <>, his children had to *go to church last Sunday*.
b. *Jeff did <> because his children had to *go to church last Sunday*.
c. *Jeff did <>, and his children *went to church last Sunday*, too.

While (4a) is grammatical, (4b-c) are not. Notice, however, that in all cases the elided gap is followed by its antecedent and our null hypothesis would predict all the examples in (4) to be grammatical, contrary to fact. This indicates that there is some difference between backwards ellipsis and forward ellipsis.

Langacker (1969) attempts to capture the differences in acceptability in (4). He proposed a constraint for the cases where the elided gap precedes its antecedent, which is called Backwards Anaphora Constraint (BAC).[3]

[3] Under Langacker's (1969) analysis, the BAC is more generally applied in (i):

(i) Backwards Anaphora Constraint:
An anaphora preceding its antecedent needs to be contained in a subordinate clause.

For example, the pronoun *she* precedes its antecedent *Mary* in (iia-b). However, only (iia) satisfies (i) because the backwards anaphora is in the subordinate clause. Therefore, the backwards



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(5) Backwards Anaphora Constraint
An ellipsis site cannot precede its antecedent when the ellipsis gap occurs in the matrix clause (Langacker 1969)

Under the BAC, it seems that grammaticality of VP-ellipsis in (4a-c) can be captured. (4a) is grammatical since the backwards ellipsis site is in the *because*-clause. Examples in (4b-c) are ungrammatical since backwards ellipsis occurs in the matrix clause. Thus, (4b-c) constitute a violation of the BAC.

## 2. Puzzles

There is a significant problem for the BAC. The BAC incorrectly predicts both (1b) and (2b) to be ungrammatical, which are repeated in (6a-b).

(6) a. Bill DIDN'T <>, but Sally already HAD *called 911*.
b. The journalists want to know IF <>, and (the police wondered) WHEN *the suspect will make a statement*.

Notice that the ellipsis gap is in the matrix clause. However, the gap *can* precede its antecedent. According to the definition in (5), this is the environment where the backwards anaphora should be blocked. Contrary to prediction, (6a-b) are grammatical.

It is interesting to note that the backwards ellipsis seems to be always accompanied by contrastive focus on the pre-elided constituent. The polarity on the auxiliary *didn't* is different from the one in *had* in the second conjunct in (6a), and the complementizer *if* in the first conjunct is contrastively compared with the *wh*-word *when* in the second conjunct. If there is no focus on the constituent, the grammaticality is significantly degraded. Consider (7a-b) which are minimally different from (6a-b).

(7) a. *Bill did <>, and Sally called 911, too.
b. *The journalists have already concluded who <>, but the police still investigates who the suspect killed the other night.

In (7a-b), contrastive focus cannot be assigned on the auxiliary and the *wh*-word because polarity is the same and the same *wh*-word is used between the conjuncts, respectively. This indicates that contrastive focus has something to do with backwards anaphora, but this requirement does not have to be held in forward ellipsis. Under the Backwards Anaphora Constraint, however, it is not clear why contrastive focus matters in backwards ellipsis, but not in forward ellipsis.

---

anaphora is allowed. Consider (iib). The anaphora is in the main clause while its antecedent is in the subordinate clause. This violates the condition in (i), so that (iib) is ungrammatical.

(ii) a. Because she$_i$ needed to start early next morning, Mary$_i$ went to bed on 9 pm.
b. *She$_i$ went to bed on 9 pm because Mary$_i$ needed to start early next morning.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

To summarize so far, we have observed Backwards ellipsis is not just a variant of ellipsis. It does not seem to be a matter of directionality of deletion. Instead, backwards ellipsis seems to be closely related with contrastive focus. Furthermore, the previous account, based on the BAC, undergenerates. The examples above are not constrained by the BAC, because if they were, the examples in (6) would be equally ungrammatical, contrary to fact. In section 3, I will propose a new analysis for backwards ellipsis – an account based on the ellipsis analysis of Right Node Raising.

## 3. Proposal

I propose that backwards ellipsis is Right Node Raising (RNR): the examples in (6a-b) must be explained by a theory of RNR. There are three kinds of analyses for RNR available in previous literature: movement, multiple-dominance, and ellipsis (Ross 1967, Postal 1974, 1998, Hudson 1976, Wexler and Culicover 1980, McCawley 1982, Swingle 1993, Wilder 1997, 1999, Hartmann 2000, Sabbagh 2003, 2007, Abels 2004, An 2007, Ha 2007, among others). Since the main purpose of this paper is not to discuss the analyses of RNR, I will not introduce specifics of each analysis. For the details, readers may refer to Ha (2007).

In section 3.1, I will directly move on to an introduction of the deletion account of RNR, which this paper will be based on.

### 3.1. A deletion account of RNR

In this paper, we assume that RNR is a PF-deletion phenomenon (Wexler and Culicover 1980, Hartmann 2000, Abels 2004, An 2007, Ha 2007, among others). The RNR target does not undergo rightward movement, but stay in-situ in syntax. At PF, The target in the first conjunct is unpronounced, so that we cannot hear it. There are several versions of the deletion accounts in literature (e.g. Strict Phonological Deletion, ellipsis, etc.). Here, we will follow a proposal by Ha (2007) that there exists an elliptical feature for ellipsis and RNR (cf. Merchant 2001), and the sister constituent of the feature is licensed to be elided at PF.

#### 3.1.1. Merchant's e-GIVENness

Merchant (2001, 2006) argues that an elliptical feature (henceforth, E) enters the derivation in a certain functional category when ellipsis occurs in a sentence. For example, the C head may bear an E feature, so that its sister constituent TP is elided at PF. This is how sluicing is derived. The *v* head may bear an E feature. If so, VP-ellipsis is derived.

The E features also impose interface conditions at PF and LF. First, the sister constituent of the E feature is forced to be unpronounced at PF, showing a PF-deletion effect. Second, the elided constituent and its antecedent must be semantically identical at LF. As an LF condition of the E feature, Merchant proposes e-GIVENness conditions which are satisfied when the elided constituent and its antecedent mutually entail each other, modulo ∃-type shifting. The definition is provided in (8).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(8) e-GIVEN
An expression E counts as e-given iff E has a salient antecedent A and, modulo ∃-type shifting,
(i) A entails F-clo (E), and
(ii) E entails F-clo (A). (Merchant 2001: 26)

Let us take an example in (9). This is an example of sluicing. The sentence bears an E feature in the C head in the second conjunct, so that the embedded TP is subject to be elided at PF if the e-GIVENness condition is satisfied.

(9) Jonathan was talking to someone, but I don't know who C[E] <~~he was talking to t~~>.
a. $TP_A$ = ∃x [Jonathan was talking to x]
b. $TP_E$ = ∃x [Jonathan was talking to x]
c. F-clo (A) = F-clo (E) = ∃x [Jonathan was talking to x]

To see whether the TP is e-GIVEN, we will need to consider which phrase is its antecedent. The antecedent can be found in the first conjunct. By existential closure of the indefinite, the antecedent yields (9a). The TP has a *wh*-variable in the second conjunct, which must be existentially closed, as shown in (9b). Now, the conditions in (8) include any focused constituent turns into a variable which must also be existentially closed (i.e. F-closure). Since there is no focused constituent in either the antecedent or the elided phrase, F-clo (A) and F-clo (E) yield the same semantic formula in (9c). $TP_A$ entails F-clo (E) and $TP_E$ entails F-clo (A), which satisfies e-GIVENness in (8). Therefore, the embedded TP in the second conjunct is e-GIVEN, so that it is licensed to be unpronounced at PF.

### 3.1.2. The $E_{RNR}$ analysis of RNR

I argue that an E feature must be employed in RNR (Ha 2007), and the E feature licensing RNR (henceforth, the $E_{RNR}$ feature) is a variant of Merchant's E features. It is similar with the E features licensing VP-ellipsis and sluicing since the e-GIVENness condition must be satisfied between the RNRed constituent and its antecedent, and the sister of the $E_{RNR}$ feature is unpronounced at PF. However, the $E_{RNR}$ feature is different from the other elliptical features, in that unlike the other E features, the $E_{RNR}$ feature does not link to any particular functional head. Rather, it enters the derivation with the contrastively focused pre-RNR constituent.

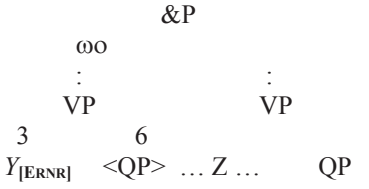
We have already observed in section 2 that contrastive focus is crucial for RNR, and the contrastive focus prior to the RNR target in each conjunct makes it possible to delete the target at PF. Following Ha (2007), I assume that the $E_{RNR}$ feature enters the derivation with a contrastively focused pre-RNR constituent in the first conjunct (Ha 2007, cf. Hartmann 2000). And nonpronunciation of the RNR target is licensed under semantic identity, in particular by e-GIVENness (Merchant 2001). The syntactic, phonological, and semantic requirements that the $E_{RNR}$ feature imposes for RNR are provided in (10).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(10) The $E_{RNR}$ feature (Ha 2007)

a. Syntax of $E_{RNR}$: The $E_{RNR}$ feature enters the derivation with the contrastively focused pre-RNR constituent in the first conjunct.




b. Phonology of $E_{RNR}$: QP → Ø/ $E_{RNR}$ _____.

c. Semantics of $E_{RNR}$: e-GIVENness must be observed in RNR.

i) RNR → F-clo (A)

ii) A → F-clo (RNR).

Let us consider an example in (11) to see how the $E_{RNR}$ analysis works. If our sentence makes use of a RNR construction, the numeration contains contrastively focused lexicons. I assume that contrastively focused lexicons enter the derivation with the $E_{RNR}$ feature. As shown in (11a), the contrastively focused verb LIKES bears the $E_{RNR}$ feature and enters the derivation. The sister constituent of the $E_{RNR}$ feature is determined to be the RNR target in syntax. Phases are spelled out and sent to PF for linearization cyclically (Fox and Pesetsky 2005, cf. Chomsky 2001). Linearization takes place and interface conditions, such as e-GIVENness, are considered, as in (11c-d).

(11) John LIKES <the opera>, but MARY HATES – the opera.

a. **Syntax**: The $E_{RNR}$ feature enters the pre-RNR constituent in the first conjunct.

↓

John $LIKES_{[ERNR]}$ <the opera>, but MARY HATES the opera.

↓

b. **Spellout**: Linearization and check the interface conditions are satisfied.



c. **PF**: Do not pronounce the sister of $E_{RNR}$ d. **LF:** Check e-GIVENness

When the sentence is linearized at the spellout, the linear order is determined by asymmetrical c-command relations between terminal nodes *á la* Kayne's (1994) Linear Correspondence Axiom. In each conjunct, the subject NP asymmetrically c-commands the verb, so that it precedes the verb. The verb asymmetrically c-commands the object DP, so that it precedes the DP. Within the DP, the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

determiner precedes the NP. Assuming the binary branching analysis of coordination (Munn 1993), the first conjunct asymmetrically c-commands the second conjunct. Therefore, all the nodes inside the first conjunct precede nodes in the second conjunct. As a result, the linear order is determined as in (12).

(12) PF-deletion of *the opera*:
John>LIKES>(~~the>opera~~)$_E$>but>MARY>HATES>the opera

The RNR target *the opera* determined by syntax is marked with E, and the pronunciation of the target is skipped at PF.

At LF, the computation system checks whether the RNR target is e-GIVEN. The RNR clause entails F-clo (A), as shown in (13a), and the antecedent clause entails F-clo (E), as shown in (13b). Therefore, the e-GIVENness condition is satisfied.

(13) a. RNR → F-clo (A): JOHN LIKES the opera → ∃x∃R [x R-ed the opera]
b. A → F-clo (RNR): MARY HATES the opera → ∃x∃R [x R-ed the opera]

All the interface conditions imposed by the $E_{RNR}$ feature are met, so (11) is a good RNR example. Let us see how our earlier examples can be explained under this $E_{RNR}$ analysis in the next section.

### 3.2. Backwards ellipsis is RNR

Let us compare (6a-b) with (7a-b), which are repeated in (14) and (15) respectively. In both examples, the elided gap appears in the first conjunct and their antecedent can be found in the second conjunct.

(14) a. Bill DIDN'T <>, but Sally already HAD *called 911*.
b. The journalists want to know IF <>, and (the police wondered) WHEN *the suspect will make a statement*.

(15) a. *Bill did <>, and Sally called 911, too.
b. *The journalists have already concluded who <>, but the police still investigates who the suspect killed the other night.

While contrastive focus is assigned on the auxiliaries and the *wh*-phrase in (14), it does not in (15). I propose that this is the key difference between (14) and (15). Following Ha (2007), the $E_{RNR}$ feature may enter the derivation on the constituents prior to the elliptical target in (14), but it is not the case in (15). Since there is no contrastive focus assigned on the pre-ellipsis target in (15a-b), no $E_{RNR}$ feature can enter the derivation. Consequently, PF-deletion cannot be motivated in (15).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

It is crucial to notice that both (14) and (15) are not examples of VP-ellipsis and sluicing since the counterpart forward ellipsis of (15a-b) is perfectly grammatical, as shown in (16).

(16) a. Sally called 911, and Bill did <>, too.
b. The police still investigates who the suspect killed the other night, but the journalists have already concluded who <>.

If they were ellipsis and followed the same licensing conditions with forward ellipsis, there would be no way to explain why (15) is ungrammatical while its counterpart (16) is grammatical. In other words, if the same E features for VP-ellipsis and sluicing entered the derivation in (15a-b), ellipsis would be licensed on the grounds that the e-GIVENness condition is satisfied.

This indicates that a different E feature – in fact, a different type of E feature – enters the derivation and licenses the PF-deletion in (14). It is different from the other E features because it does not enter in a functional head but enters with a contrastively focused lexicon. The feature is argued to be the $E_{RNR}$ feature and the deletion licensed by the feature is called RNR.

Now, let us consider the examples in more detail. Let us first take the grammatical examples in (14). Note that the auxiliaries are contrastively focused in (14a): *didn't* in the first and *had* in the second conjunct, and the $E_{RNR}$ feature enters the derivation with *didn't*. We assume that there exists a VerumP in between TP and *v*P, and the Verum head has a binary value of polarity: negative and affirmative focus, as shown in (17).[4]

(17) Jeff [$_{VerumP}$ DIDN'T$_{[ERNR]}$ [$_{VP1}$ <~~call 911~~>]] because Sally already [$_{VerumP}$ HAD [$_{VP2}$ called 911]].

I argue that it is the Verum head that bears the $E_{RNR}$ feature and licenses the deletion of VP in the first conjunct. The semantic identity condition is satisfied since VP1 counts as e-GIVEN. This is so because VP1 and VP2 mutually entail each other, modulo ∃-type shifting, as shown in (18). Commonly assumed in ellipsis, morphological mismatches are ignored here (Merchant 2001).

(18) VP1 ↔ VP2 = ∃x [x call 911] ↔ ∃y [y called 911]

Since the e-GIVENness condition is satisfied, the RNR target, which is the sister of the $E_{RNR}$ feature, can be unpronounced at PF.

The same holds for (14b), repeated in (19). The complementizer *if* is compared by the *wh*-phrase *who*, so they are contrastively focused. Thus, the $E_{RNR}$ feature enters the derivation with the complementizer in the first conjunct. To see

[4] It is sometimes called PolarityP in literature (Culicover 1991).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

if the semantic identity condition is met, we consider whether the TP1 *the suspect will make a statement* is e-GIVEN.

(19) The journalists want to know $IF_{[ERNR]}$ <[$_{TP1}$ ~~the suspect will make a statement~~]>, and the police wondered WHEN [$_{TP2}$ *the suspect will make a statement*].

This is shown in (20). TP1 is e-GIVEN on the grounds that TP1 and TP2 mutually entail each other; that is, TP1 entails F-clo (TP2) and TP2 entails F-clo (TP1). Therefore, TP1 can be unpronounced at PF.

(20) a. TP1 = ∃t [the suspect will make a statement (at t)]
b. TP2 = ∃t [the suspect will make a statement at t]
c. F-clo (TP1) = F-clo (TP2) = ∃t [the suspect will make a statement at t]

Let us turn to why (7a-b), repeated in (21a-b), are not grammatical. Let us first take (21a). Given the assumption that the elision of VP in the matrix clause is due to RNR, what we need to show is that (21a) does not provide the necessary environment for licensing RNR. Since the auxiliary does not bear contrastive focus – i.e. the focus value of the Verum head is identically affirmative – the $E_{RNR}$ feature cannot enter the derivation, as shown in (21a). Thus, RNR is not possible, and PF-deletion of the target is not licensed.

(21) a. *Jeff [$_{VerumP}$ did$_{[ø]}$ [affirmative focus] <~~called 911~~>] and Sally [$_{VerumP}$ [affirmative focus] *called 911*], too.
b. *The journalists have already concluded who$_{[ø]}$ <~~the suspect killed the other night~~>, but the police still investigates who *the suspect killed the other night*.

Similarly, since the *wh*-word in each conjunct is identical, no contrastive focus is assigned, which in turns means no $E_{RNR}$ feature enters the derivation. Therefore, PF-deletion of the TP in (21b) is not licensed.

An interesting issue worth mentioning here in backwards sluicing (i.e. RNR of the embedded TP in the first conjunct) is that backwards sluicing is impossible with argument *wh*-phrases (Giannakidou and Merchant 1998). Let us consider (22).

(22) a. *Lucy was wondering *whether* and *who* might come to her party.
b. *The reporters asked *if* and *who* the FBI had arrested.
(Giannakidou and Merchant 1998: 239)

(22a-b) are different from the previous backwards sluicing cases since the *wh*-word, contrastively compared with the complementizer, is an argument. And the question is why this matters. Suppose that a contrastive focus is assigned on *if*,



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

hence bearing the $E_{RNR}$ feature. The computation of e-GIVENness for (22b) would look like (23a-c).

(23) *The reporters asked $IF_{[ERNR]}$ <the FBI had arrested anyone> and WHO the FBI had arrested t.

a. RNR = ∃x [The FBI had arrested x].
b. A = ∃x [The FBI had arrested x].
c. F-clo (A) = F-clo (RNR) = ∃x [The FBI had arrested x]

Since mutual entailment relationship is established between the conjuncts, e-GIVENness is satisfied; thus, RNR is predicted to be licensed in (23), contrary to fact.

Note that similar version of forward sluicing is licensed in (24). This suggests that the problem does not lie on e-GIVENness but on the entrance of the $E_{RNR}$ feature in syntax. For some reason, *if* with argument *wh*-phrases cannot be contrastively focused, while *if* with adjunct *wh*-phrases can be. However, at this point, I do not know why this is so. This will be left for future investigation.

(24) The CNN reporters asked if *the FBI had arrested anyone*, and the FOX news already claimed to know who <~~the FBI had arrested anyone~~>.

There is another possible version of backwards sluicing, which has not been introduced in Giannakidou and Merchant (1998). Let us take (25a-b). Compared with the previous cases, notice that there is no *wh*-phrase in the antecedent clause here. The second conjunct contains an indefinite while *wh*-movement occurs in the first conjunct. Now, a question arises as to whether they are also RNR examples. The issue here is whether the $E_{RNR}$ feature could enter the derivation with the *wh*-constituent in (25)?

(25) a. I don't know which ONE $_{[ERNR]}$(?) <~~Mary bought t for the department~~>, but Mary told us she bought a new espresso machine for the department.
b. I don't remember WHO $_{[ERNR]}$(?) <~~visited our class yesterday~~>, but a professor from the psychology department visited our class yesterday.

It is clear that a certain type of focus needs to be assigned on the *wh*-phrase, given the common assumption that all the *wh*-phrases bear a focus from one way or the other. However, it is not clear if the focus on the *wh*-word is a contrastive focus. One can imagine that the *wh*-word which incurs sluicing bears a contrastive focus in the sense that the *wh*-movement in the second conjunct marks a different scope, compared with the indefinite in the second conjunct (cf. Gengel 2006). If this is true, then the $E_{RNR}$ feature can enter with the *wh*-word, and RNR would be licensed. However, this also requires further investigations.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 3.3. VP-ellipsis

Finally, let us consider (4a), repeated in (26). The elided gap precedes its antecedent. Therefore, from what we have claimed so far in this paper, this must be the case of RNR. However, no contrastive focus is involved here because the polarity is the same between the clauses, which in turn means that no $E_{RNR}$ feature can enter in the *because*-clause. Nevertheless, PF-deletion of the VP in the *because*-clause seems to be possible. How could that be?

(26) Because Jeff did$_{[ø]}$ <>, his children had to *go to church last Sunday*.

Before we try to answer the question, let us first compare (26) with the previous case in (4b), repeated in (27). The clear difference is that the ellipsis clause is in the adjunct clause in (26), but it is in the matrix clause in (27).

(27) *Jeff did <> because his children had to *go to church last Sunday*.

We assume that the adverbial clause is base-generated to *v*P as an adjunct, where VP-ellipsis is licensed under semantic identity with the matrix VP, as shown in (28).

(28) His children had to go to church last Sunday [$_{CP}$ because Jeff did $v_{[E]}$ <~~go to church last Sunday~~>].

The surface form is derived by dislocation of the adjunct clause, as shown in (29). This suggests that (26) is a case of normal VP-ellipsis, while (27) is an example of RNR.

(29) [$_{CP}$ Because Jeff did $v_{[E]}$ <~~go to church last Sunday~~>], his children had to go to church last Sunday.

## 4. Conclusion

In this paper, we observed examples of ellipsis where the antecedent follows the elided gap, and attempted to characterize the nature of the deletion. We concluded that what looks like backwards ellipsis is, in fact, RNR, on the grounds that forward ellipsis accounts fail to account for the examples of backwards ellipsis and there is a substantial similarity between backwards ellipsis and RNR. We applied the $E_{RNR}$ analysis, proposed by Ha (2007), to backwards ellipsis cases, and found out they fit in Ha's analysis. Therefore, we conclude that backwards ellipsis is not a type of ellipsis, but it is a RNR construction.

## References

Abels, Klaus. 2004. Right Node Raising: Ellipsis or ATB movement? In Keir Moulton, and Matthew Wolf (eds.), *Proceedings of the 34th North East*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



*Linguistics Society*, 44-59. Amherst: Graduate Linguistics Student Association Publications, University of Massachusetts.
Chomsky, Noam. 2001. Derivation by phase. In Michael Kenstowicz, ed., *Ken Hale. A Life in Language*, 1-52. Cambridge, MA: Massachusetts Institute of Technology Press.
Fox, Danny and David Pesetsky. 2005. Cyclic linearization of syntactic structure. *Theoretical Linguistics* 31: 1-45.
Giannakidou, Anastasia, and Jason Merchant. 1998. Reverse sluicing in English and Greek. *Linguistic Review* 15: 295-333.
Ha, Seungwan. 2007. Ellipsis, Right Node Raising, and Across-the-Board Constructions. Ph.D. diss, Boston University.
Hartmann, Katharina. 2000. *Right Node Raising and Gapping: Interface Conditions on Prosodic Deletion*. Amsterdam: John Benjamins.
Kayne, Richard. 1994. *The Antisymmetry of Syntax.* Cambridge, MA: Massachusetts Institute of Technology Press.
Langacker, Ronald. 1969. On pronominalization and the chain of command. In David A. Reibel and Sanford A. Schane (eds.) *Modern Studies in English*. New Jersey: Prentice-Hall, 160-186.
Merchant, Jason. 2001. *The Syntax of Silence.* Oxford: Oxford University Press.
Munn, Alan. 1993. *Topics in the syntax and semantics of coordinate structures*. Ph.D. diss, University of Maryland, College Park.
Postal, Paul. 1998. *Three Investigations of Extraction*. Cambridge, MA: The Massachusetts Institute of Technology Press.
Ross, John. 1967. Constraints on variables in syntax. Ph.D. diss, Massachusetts Institute of Technology.
Sabbagh, Joseph. 2007. Ordering and linearizing rightward movement. *Natural Language and Linguistic Theory* 25:349-401.
Swingle, Kari. 1993. The role of prosody in Right Node Raising. Ms., University of California, Santa Cruz.
Wexler, Ken, and Peter Culicover. 1980. *Formal Principles of Language Acquisition*. Cambridge, MA: Massachusetts Institute of Technology Press.
Wilder, Chris. 1999. Right Node Raising and the LCA. In *Proceedings of the 18th West Coast Conference in Formal Linguistics*, 586-598. Somerville, MA: Cascadilla Press.

Seungwan Ha
Research Institute of Language and Information
Korea University
5-ka Anam-dong, Sungbuk-ku
Seoul 136-701
South Korea

seungwan@korea.ac.kr



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# Perceptual Errors or Deliberate Avoidance? Types of English /r/-Dissimilation

NANCY HALL
*California State University Long Beach*

## 0. Introduction

American English avoids the presence of multiple /r/s in a word through several means. The purpose of this paper is to classify the types of /r/-dissimilation that exist in contemporary English, and to argue that these different types have different causes. Long-distance /r/-dissimilation is likely to result from perceptual errors rather than active avoidance of multiple /r/s, but short-distance /r/-dissimilation is likely to reflect an active avoidance of /rVr/ sequences.

## 1. Long-Distance /r/-Dissimilation

### 1.1. Dissimilatory Deletion

The most common type of /r/-dissimilation in American English is the deletion of one /r/ in a word containing two or more /r/s. This process was first extensively described by Hempl (1893), and remains common in modern American dialects. Some typical examples of this process are given below. The /r/ that has been reported as dropping is enclosed in parentheses. In some cases, dissimilation follows syncope of one vowel in a /VrV/ sequence; in these words, both the vowel and /r/ are parenthesized[1].

| (1) | Sources[2] |
|---|---|
| *adve(r)sary* | T1936 |
| *Be(r)nard* | KK1953, C2005 |
| *afte(r)wards* | H1893, T1936, KK1953, Y1983 |

[1] For more extensive data, including additional published descriptions and new corpus and elicitation studies, see Hall (2008).

[2] Throughout this paper, the following sources are abbreviated in numbered examples by their authors' initials and years of publication: Canepari 2005, Hempl 1893, Kenyon & Knott 1953, Merriam-Webster 1994, Randall 1988, Sherwood 1837, Thomas 1936, Yamada 1983. G2006 refers to the website http://www.barelybad.com/words1.htm#rsareus. Thanks to the dozens of linguists who individually sent me examples; I have acknowledged by name those who contributed examples not found in any published source.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



| | |
|---|---|
| *ape(r)ture* | Y1983 |
| *be(r)serk* | B. Vaux (p.c.) |
| *bomba(r)dier* | R1988 |
| *Cante(r)bury* | KK1953, C2005 |
| *cate(r)pillar* | Y1983, R1988, M1994 |
| *cereb(r)al palsy* | J. Hall (p.c.) |
| *comfo(r)ter* | H1893, KK1953, Y1983 |
| *easte(r)ner* | KK1953 |
| *elde(r)berry* | KK1953, M1994, C2005 |
| *ente(r)prise* | H1893, KK1953 |
| *ent(r)ep(r)eneur* | G2006 [either /r/ could delete] |
| *forme(r)ly* | H1893, KK1953 |
| *furthe(r)more* | KK1953, Y1983 |
| *gove(r)nor* | T1936, KK1953, M1994 |
| *hambu(r)ger* | B. Erickson, B. Vaux (p.c.) |
| *imp(r)opriety* | KK1953, Y1983 |
| *inf(r)astructure* | G2006 |
| *interp(r)et* | KK1953 |
| *lit(er)ature* | G2006 |
| *northe(r)ner* | H1893, T1936, KK1953, C2005 |
| *ove(r)ture* | Y1983 |
| *paraphe(r)nalia* | KK1953, M1994 |
| *pa(r)ticular* | H1893, T1936, KK1953, Y1983 |
| *pe(r)formance* | H1893, T1936, KK1953, Y1983 |
| *pe(r)fumery* | H1893, KK1953, Y1983 |
| *pre-p(r)ofessional* | KK1953 |
| *p(r)ofessor* | T1936 , C2005 |
| *p(r)oportion* | KK1953, Y1983 |
| *p(r)oprietor* | KK1953 |
| *repe(r)toire* | G2006, D. Kamholz (p.c.) |
| *rese(r)voir* | KK1953, C2005 |
| *resp(ir)atory* | Y1983, G2006 |
| *San Berna(r)dino* | KK1953 |
| *sec(r)etary* | KK1953, Y1983, C2005 |
| *southe(r)ner* | KK1953, C2005 |
| *spect(r)ogram* | author's observation |
| *stenog(r)apher* | C2005 |
| *su(r)prise* | H1893, T1936, KK1953, Y1983, M1994, R1988 |
| *su(r)veyor* | KK1953, Y1983 |
| *synch(r)otron* | M1994 |
| *temp(er)ature* | T1936, Y1983 |
| *the(r)mometer* | H1893, T1936, KK1953, Y1983, M1994 |
| *ve(r)nacular* | KK1953, Y1983, M1994 |
| *vet(er)inarian* | G2006 |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

For the words above, the dissimilated pronunciations are never obligatory, but in some words, such as *berserk* and *surprise*, the dissimilated version is the most common pronunciation. In general, /r/-dissimilation of this type is little stigmatized, except when it involves deletion of a stressed onset /r/, as in *lib(r)ary*, *lib(r)arian*, or *f(r)ustrated*. Each of these pronunciations is considered uneducated. For most items, speakers tend to be aware that the /r/ exists even if they do not pronounce it; but for a few items such as *barbiturate* and *paraphernalia*, many speakers are not aware of the second /r/ and omit it in spelling. There are a few other words in which a historical /r/ has been permanently dropped: the city once called *Alburquerque* is now officially *Albuquerque*, and the term *cater-cornered* seems to have been replaced by *catty-corner*.

It is not fully predictable which words will undergo dissimilation and which will not, and there appear to be significant differences between different dialects of American English in this respect, as well as difference between individuals. However, there are some noticeable trends in the process. In most dialects, only a completely unstressed /r/ deletes through dissimilation. Some dialects additionally delete coda /r/ in stressed syllables, in words like *co(r)ner* or *fo(r)ward*. Usually it is the first of the two /r/s in the word that deletes (although there are a few common exceptions, like *paraphe(r)nalia*.) Dissimilation never deletes a word-initial or word-final /r/. It is very commonly triggered by a word-final /r/, but rarely by a word-initial /r/. Dissimilation may occasionally operate across word boundaries within common collocations like *wa(r)m weather* (Hempl 1893) and *more o(r) less* (Kenyon & Knott 1953), but does not work productively across word boundaries in new collocations.

### 1.2. Long-Distance Dissimilation through Sound Substitution

There are a smaller number of words in which one of two /r/s changes to another sonorant, as shown below.

| | | | | |
|---|---|---|---|---|
| (2) | r → j | *defibrillator* | difɪbjəleɪɪɹ˞ | G2006, B. Kennedy |
| | | *February* | fɛbjuɛri | S1837, H1893, G2006 |
| | r → l | *frustrated* | flʌstreɪɪɪd | S1837 |
| | | *fritters* | flɪɹ˞z | S1837 |
| | r → n | *Purmort* | p˞mɛnt | H1893 |

However, dissimilation through segment substitution is rare compared to dissimilation through deletion. As seen by the dates on the references above, most examples of this process are very old and may reflect much earlier stages of the development of English.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 2. A Perceptual Account of Long-Distance /r/-Dissimilation

Ohala (1981) proposes that dissimilation, as a diachronic change, is a result of perceptual hypercorrection for phonetic assimilation. Speakers coarticulate speech segments, so that each segment is affected by the segments before and after it. A sequence /np/, for example, is likely to sound similar to [mp] due to anticipatory coarticulation of the nasal with the labial stop. Listeners are required to compensate for this coarticulation in order to correctly decipher the intended string of phonemes. Ohala points out that a listener could make at least two possible errors. One error would be to underestimate the extent of coarticulation, thinking that a phonetic [mp] from /np/ is actually intended as /mp/. This error would result in the listener learning an assimilated form of the sequence. Another possible error is to overestimate the extent of coarticulation, and hence factor out perceived coarticulation where there was none. In this case, the listener would mistakenly believe that two sounds with identical features, such as [mp], were intended to have different features, such as /np/. The listener would therefore internalize a dissimilated representation.

It is plausible that long-distance /r/-dissimilation could occur this way, because liquids, including /r/, are known to have long-range acoustic effects. These effects, often called "resonances" (Kelly & Local 1986) have been documented for several British dialects (the relevant experiments have not yet been carried out on American dialects). Tunley (1999) shows that that an /l/ raises the F2 and F3 of nearby high vowels, relative to a neutral /h/, while /r/ lowers the F2 and F3 of the vowels, two syllables in each direction. West (1999a) gives articulatory evidence that the articulation of /r/ is spread over several syllables: her EPG and EMA study finds lower F3, more lip rounding, and the tongue higher and backer preceding /r/ than /l/. Heid & Hawkins (2000) find acoustic effects of /r/ as far as five syllables in advance of the /r/ itself.

These long-range resonances could cause one /r/ to mask the presence of another in the same word. In a word like *surprise*, the rhoticity of the first vowel could be mistakenly attributed to anticipatory effects of the second /r/, so that the listener believes that /səpraɪz/ was intended. Although experimental work is needed to confirm that such errors are possible, the data on long-distance /r/-dissimilation seem consistent with the perceptual theory. This theory explains why it is /r/ and not some other consonant that undergoes long-distance dissimilation: /r/ has long-range acoustic effects, which most consonants do not.[3] The perceptual theory can also explain why this dissimilation is primarily anticipatory. There is some indication that /r/ has a stronger effect on preceding than following vowels: West (1999b:419) found 'robust anticipatory, not perseverative, resonance distinctions'. Thus, it is more likely that a later /r/ would mask an earlier /r/ than vice versa. It is also unsurprising under the perceptual theory that word-initial and word-final /r/ do not delete. These positions are perceptually priveleged

[3] The sound /l/ also has long-range resonances, and /l...l/ sequences may dissimilate as well, in words like *fu(l)fill, ophtha(l)mologist,* and *Pache(l)bel*.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



and an /r/ in such a position is unlikely to be mistaken for a [ə]. It is also unsurprising that unstressed /r/ (especially /ər/, which is acoustically realized as [ɚ]) would undergo dissimilation more often than stressed /r/: again, unstressed material is less perceptually prominent.

## 3. Assimilatory /r/-Insertion

Another prediction of the perceptual account is that perceptual errors should be possible in two directions. The resonances of one /r/ may mask the presence of an earlier /r/; but a listener could also make the opposite mistake of interpreting the resonances of one /r/ as the presence of a second /r/. Hence, /r/ should sometimes be inserted in the same sorts of environments where it typically deletes. This does in fact occur: in a number of words that standardly contain one /r/, it is common to hear speakers insert a second /r/, usually earlier in the word, as in the examples below.

| | | | |
|---|---|---|---|
| (3) | *familiar* | fəˑmɪljəˑ | S1837, T1936 |
| | *persevere* | pəˑsəˑvir | E1999, G2006 |
| | *photographer* | fəˑtɑgəˑfəˑ | G2006, R. Sittler (p.c.) |
| | *pejorative* | pəˑdʒorətɪv | G2006 |
| | *lavatory* | lævəˑtori | J. Kammert (p.c.) |
| | *integral* | ɪntəˑgrəl | G2006, P. Brians |

If long-distance /r/-dissimilation were motivated by a desire to avoid the presence of two /r/s in a word, then this type of /r/-insertion would seem unmotivated. However, it can be explained neatly under the perceptual account: rhotic resonances color an earlier /ə/ to the point that it sounds like [ɚ], and hence is internalized by some listeners as containing a second rhotic.

## 4. Non-Perceptual Causes of Dissimilation

The question of whether dissimilation is caused by perceptual errors is controversial. Another cause of dissimilation could be deliberate avoidance of multiple /r/s in a word, caused by a grammatical constraint against such a structure. The grammatical constraint could be grounded in the articulatory difficulty of repeated sounds, or in processing constraints on repeated elements (Frisch 2004).

To show why this is not the most likely cause of American long-distance /r/-dissimilation, I will contrast this process with another dissimilatory phenomenon in English: the avoidance of /rər/. This sequence is removed or avoided through diverse methods, some of which are clearly deliberate and not explainable as misperception. Some of these methods could in principle also be used to achieve long-distance /r/-dissimilation, but they are not. This suggests that long-distance and short-distance /r/-dissimilation are distinct phenomena. The fact that known methods of deliberate short-distance dissimilation are not extended to long-distance dissimilation suggests that speakers do not deliberately avoid the presence of multiple /r/s separated by more than a vowel.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 5. Short-Distance [r]-Dissimilation

### 5.1. Avoidance of rVr through Deletion

The sequence of /rVr/ (where V is a vowel), and especially /rər/ (phonetically [rə˞]), is avoided through a number of means in English. In words that have /rər/ in medial position, it is common for one of the /r/s to delete. In the examples below, we see that the /r/ that deletes is the one that is adjacent to a consonant.

(4)

| | |
|---|---|
| *inf(r)ared* | Y1983, B. Samuels |
| *p(r)erogative* | Y1983, G2006 |
| *Ghira(r)delli* | (brand of chocolate and square in San Francisco) |
| *Garra(r)d* | (county in Kentucky) |

Such deletion is largely confined to /rər/, but occasionally occurs with other /rVr/ sequences as well. The Burberry clothing line *Prorsum* is reportedly pronounced [porsəm] by rhotic speakers, and loss of the first /r/ in *lib(r)ary* is a well-known shibboleth. Some speakers also drop the second /r/ in *rural*.

In final position, it is common for /rər/ to reduce to [r], especially in the word *mirror* and other monomorphemes. Such reduction seems less common when the final /ər/ is a suffix, in words like *hearer*.

(5)

| | |
|---|---|
| *mirr(or)* | mir |
| *err(or)* | ɛr |
| *terr(or)* | tɛr |
| *jur(or)* | dʒur ~ dʒə˞ |

This type of reduction is somewhat stigmatized. For example, the prescriptivist Elster (1999:257) writes: 'Mirror has two syllables. Avoid the pronunciation of the slovenly speaker who says MEER, like the word mere, and the illiterate speaker who says MUR'.

Some speakers, perhaps in reaction to such stigmatization, avoid /rər/ in the words above through the opposite tack of changing the schwa to a full vowel, [o]. This pronunciation seems more acceptable, and is even associated with particularly educated speakers.

(6) 'Overpronunciation' of /rər/

| | |
|---|---|
| *error* | ɛror |
| *juror* | dʒuror |

Speakers of some American dialects may also drop only the final /r/ in words like *mirror*. I have heard the pronunciation [mɪrə] from some otherwise highly rhotic Arkansas speakers.

The cause of these reductions is debatable, but they could well result from the difficulty of perceiving /rər/, which is typically produced as [rə˞]. On spectrograms, the difference between words like *mere* and *mirror* appears to be primarily



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



in the length of the final rhotic section: both words have a period of low F3 values at the end, but for *mirror* it is longer than for *mere*. In fast speech, it might be difficult to accurately judge the intended length, and hence possible to mistake final [rə˞] for [r].

### 5.2. Avoidance of /rər/ through Morphological Means

Since English has several affixes and clitics containing /r/, there are ways that /rər/ can be avoided through morphological choices or morphological haplology.

In forming adjectival comparatives, there is a choice between using the suffix *-er* as in *prettier* or the separate word *more* as in *more pretty*. Typically monosyllables take the suffix *-er*. Yet Mondorf (1993), in a corpus study of comparatives in writing, shows that monosyllables ending in /r/ are suffixed less often than other monosyllables, making words like *barer, sourer*, *clearer*, *dearer*, *purer*, *rarer*, and *surer* less common than would be expected, in favor of *more bare*, *more clear*, etc. The effect is gradient, not absolute; all of the *-er* forms above are acceptable (although many speakers find *sourer* hard to pronounce).

Another morphological effect that may be related to /rər/ avoidance is the avoidance of the contracted form *where're*. Dixon (1982) notes that some speakers seem to contract *where is* not to *where're*, but to *where's*, as in (b) below. This apparent number mismatch between the copula and following noun phrase is possible only when the copula is contracted, and only when the contracted copula directly follows *where*: in other words, only where a /rər/ sequence would otherwise result.

(7) Dixon (1982:235)

| | | |
|---|---|---|
| a. | *Where are the lions?* | *Where're the lions?* |
| b. | **Where is the lions?* | *Where's the lions?* |
| c. | *Where the hell are the lions?* | *Where the hell're the lions?* |
| d. | **Where the hell is the lions?* | **Where the hell's the lions?* |

Dixon argues that this pattern "is undoubtedly due to a desire to avoid the infelicitous phonological sequence *where're*." This conclusion is controversial; Nathan (1981), for example, points out that the pattern is limited by complex syntactic restrictions and concludes that "it is certainly no longer a purely phonological phenomenon, if it ever was." Nevertheless, it is possible that the phonological badness of /rər/ was one of the factors originally stimulating the expanded use of *where's*, even if the pattern has since become grammaticized in a way that is more syntactic than phonological.[4]

Another morpheme that seems to be blocked after /r/ is the derivational suffix *-ery*. This suffix creates a noun, often meaning a profession or workplace. Although the CELEX database (Baayan et al. 1995) contains 96 examples of monosyllables taking this suffix, in none of these does the suffix *-ery* attach to a base

[4] Thanks to Matt Wolf for bringing this pattern to my attention.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

ending in /r/. The examples below contrast monosyllables that do take *-ery* with semantically similar monosyllables ending in /r/ that do not take *-ery*.

(8) Avoidance of *-ery* after /r/

| | |
|---|---|
| *winery* | ?*beerery* |
| *mockery*, *railery* | **jeerery*, **cheerery*, **leerery* |
| *thievery*, *thuggery*, *foolery*, *roguery*, *knavery, witchery* | ?*whorery*, **boorery* |
| *piggery* | **boarery* |
| *machinery* | **gearery*, **wirery* |
| *deanery*, *popery* | **czarery* |
| *Hair Cuttery* | **shearery* |

A second factory preventing *-rery* from surfacing is an apparent morphological haplology. There are a large number of cases where *-ery* is added to a base or two or more syllables ending in /ər/, but the expected sequence /ərəri/ does not result: instead, the sequence reduces to /əri/, as pointed out by Dressler (1977).

(9)

| | | | |
|---|---|---|---|
| *confection* | *confectioner* | *confectionery* | |
| BUT: | | | |
| *slaughter* | *slaughterer* | *slaughtery* | **slaughterery*, etc. |
| *embroider* | *embroiderer* | *embroidery* | |
| | *soldier* | *soldiery* | |
| *upholster* | *upholsterer* | *upholstery* | |

While /rər/ is sometimes avoided through morphological means, it is not always avoided. The agentive suffix *-er* seems to have an unrestricted ability to combine with /r/-final verbs, producing nouns such as *perjurer*, *caterer*, *loiterer*, etc. Perhaps this common suffix is simply too useful to restrict.

### 5.3. Avoidance of /rər/ through Blocking of /r/-Insertion

Various English dialects have processes that insert /r/ in various environments. This section reviews three cases where such insertion is blocked by a nearby /r/.

Some non-standard dialects of English insert /r/ after final /ə/, especially in words with an orthographic *-o* or *-ow*, so that a word like *yellow* is pronounced [jɛlə˞]. This /r/ insertion is commonly (although not universally) blocked in words ending in /rə/. For example, in the Great Smoky Mountain dialect (Hall 1942), /r/-insertion applies to the words in (a) but not those in (b), which are pronounced with final [ə].

(10) /r/-insertion: *banjo, mosquito, piano, potato, tobacco, tomato, fellow, follow, hollow, meadow, mellow, pillow, shadow, shallow, tallow, wallow, widow, window, yellow*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

no /r/-insertion: *furrow, harrow, narrow, sparrow, tomorrow, wheelbarrow, Dillsboro, Middlesboro*.

Shores (2000) reports a similar pattern in Tangier Island, Virginia, with the twist that words historically ending in /rə/ may be pronounced with final [ə], [i], or no vowel at all, as shown below.

(11)

| | |
|---|---|
| *wheelbarrow* | wilbærə ~ wilbær |
| *tomorrow* | təmɑrə ~ təmɑr |
| *borrow* | bɑri |

Another type of /r/-insertion occurs in non-rhotic dialects, where /r/ is pronounced only before vowels. In these dialects, a word-final /r/ is pronounced only if the next word begins with a vowel ("linking /r/", as in (a) below), and an "intrusive /r/" may be inserted when a vowel-final word precedes a word beginning with a vowel, as in (b). However, some British speakers report that linking and intrusive /r/ are avoided after words ending in /rV/ as in (c) and (d), where their presence would create an /rVr/ sequence (Wyn Johnson, p.c.).

(12)

| | Linking [r]: | | Intrusive [r]: | |
|---|---|---|---|---|
| /r/ present: | a. | a river of it<br>pour a glass | b. | Rita r is<br>law r and order |
| /r/ absent: | c. | an error in it<br>a roar of laughter | d. | Farrah is<br>raw apples |

I do not know whether this pattern exists in any non-rhotic American dialects; John McCarthy (p.c.) reports that the blocking does not seem to occur in his native Boston dialect.

One more type of /r/-insertion which may be blocked due to avoidance of /rVr/ is *warsh*-type insertion. Many Americans insert an /r/ into /ɑʃ/ or /ɔʃ/ sequences, in words like *wash, squash, gosh* (Gick 1999:33) and *mosh* (Eggcorn Database, http://eggcorns.lascribe.net). I have not heard /r/ inserted in *frosh* (slang for *freshman*), or *rosh hashana*, where it would create an /rɑr/ or /rɔr/ sequence.

### 5.4. Avoidance of /rVr/ in Naming Choices

Martin (2007) shows that identical liquids separated by a vowel are statistically underrepresented (compared to non-identical liquids separated by vowels) in popular baby names, product names, and names chosen by participants in fantasy role-playing games. Since name choice is one of the few situations in which speakers get to choose between a wide range of phonological forms, it provides an additional piece of evidence that /rVr/ (as well as /lVl/) is dispreferred.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



## 6. Causes of Short-Distance Dissimilation

We have seen that /rər/, and to some extent /rVr/ more generally, are avoided through a great variety of means. Although most of these means are gradient rather than absolute, together they strongly suggest that /rər/ is dispreferred in English phonology. Furthermore, several of the methods of /rər/ avoidance described above cannot be attributed to misperception, and clearly involve some level of deliberate avoidance. The morphological choice of *more sour* over *sourer* must be purposeful; it is implausible that anyone mishears one as the other. Misperception could not explain why speakers don't add the suffix *-ery* to bases ending in /r/, or why they substitute *where's* for *where're*, or why they avoid /rVr/ when choosing names. I conclude that some if not all of the /rər/ avoidance methods discussed above are active, deliberate strategies, rather than being a result of misperceptions.

Interestingly, none of these deliberate methods are used to achieve long-distance dissimilation, although several in principle could be. Whereas *-ery* does not attach to /r/-final bases, it does attach to bases containing a non-final /r/, producing words like *trickery* and *rockery*. In Tangier Island, final /r/-insertion does not apply where it would create /rər/, but it does apply in at least one word with an earlier /r/, *Bristow*. While comparatives containing /rər/ like *sourer* are dispreferred, comparatives like *brighter* and *redder*, which contain two /r/s separated by several segments, seem perfectly acceptable. Intrusive and linking /r/ are not blocked by an /r/ earlier in the word either. I do not know whether liquids separated by more than a vowel are dispreferred in name choice.

## 7. Conclusion

I propose that the best way to make sense of this difference between long and short-distance /r/-dissimilation is to conjecture that they have different causes. Long-distance /r/-dissimilation is not actively favored by the phonological grammar; it happens to occur sometimes when words are imperfectly transmitted from speaker to speaker due to misperceptions caused by the spread-out acoustic qualities of /r/. The same acoustic ambiguity also causes the opposite process of assimilatory /r/-insertion. Short-distance /r/-dissimilation, on the other hand, is actively favored by the grammar, and almost all available means of avoiding /rər/ are employed to some extent. There seem to be no opposing processes that would favor creating /rər/ sequences.

## References

Baayan, R. H., R. Piepenbrock and L. Gulikers. 1995. The CELEX Lexical Database (CD-ROM).

Canepari, Luciano. 2005. *A Handbook of Pronunciation*. München: Lincom Europa.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Dixon, R. M. W. 1982. *Where Have All the Adjectives Gone? and Other Essays in Semantics and Syntax*. Berlin: Mouton.

Dressler, Wolfgang U. 1977. Phono-morphological Dissimilation. In *Phonologica 1976*, 41-8.

Elster, Charles Harrington. 1999. *The Big Book of Beastly Mispronunciations: The Complete Opinionated Guide for the Careful Speaker*. Boston: Houghton Mifflin Company.

Frisch, Stefan A. 2004. Language Processing and OCP effects. In Bruce Hayes, Robert Kirchner and Donca Steriade, eds., *Phonetically-based Phonology*, 346-371. Cambridge: Cambridge University Press.

Gick, Bryan. 1999. A Gesture-Based Account of Intrusive Consonants in English. *Phonology* 16:29-54.

Hall, Joseph Sargent. 1942. *The Phonetics of Great Smoky Mountain Speech*. New York: King's Crown Press.

Hall, Nancy. 2008. *R-Dissimilation in American English*. Unpublished manuscript.

Heid, Sebastian and Sarah Hawkins. 2000. An Acoustical Study of Long Domain /r/ and /l/ Coarticulation. In *Proceedings of the Fifth Seminar on Speech Production: Models and Data*, 77-80. Kloster Seeon, Bavaria, Germany.

Hempl, George. 1893. Loss of r in English through Dissimilation. *Dialect Notes* 1:279-81.

Kelly, J. and J. K. Local. 1986. Long-Domain Resonance Patterns in English. In *International Conference on Speech Input/Output; Techniques and Applications*. London: Institute of Electrical Engineers, 304-309. Conference Publication no. 258, 56-59.

Kenyon, John Samuel and Thomas Albert Knott. 1953. *A Pronouncing Dictionary of American English*. Springfield, Mass.: Merriam-Webster.

Martin, Andrew. 2007. *The Evolving Lexicon*. Ph.D. diss., University of California, Los Angeles.

Merriam-Webster, Inc. 1994. *Merriam-Webster's Dictionary of English Usage*. USA: Merriam-Webster.

Mondorf, Britta. 1993. Support for *More*-Support. In *Determinants of Grammatical Variation in English*, no. 43 in Topics in English Linguistics, 251-304. Berlin: Mouton de Gruyter.

Nathan, Geoffrey S. 1981. What's These Facts About? *Linguistic Inquiry* 12:151-153.

Ohala, John J. 1981. The Listener as a Source of Sound Change. In *Papers from the Parasession on Language and Behavior*, 251-274. Chicago: Chicago Linguistics Society.

Randall, Bernice. 1988. *Webster's New World Guide to Current American Usage*. New York: Webster's New World.

Sherwood, Adiel. 1837. *A Gazetteer of the State of Georgia: Embracing a Particular Description of the Counties, Towns, Villages, Rivers, &c., and Whatsoev-*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



*er is Usual in Geographies, and Minute Statistical Works; Together with a New Map of the State. Third edition.* Washington City: P. Force.

Shores, David L. 2000. *Tangier Island: Place, People, and Talk*. Newark: University of Delaware Press.

Thomas, Charles Kenneth. 1936. Pronunciation in Upstate New York (VI). *American Speech* 11:307-313.

Tunley, Alison. 1999. *Coarticulatory Influences of Liquids on Vowels in English*. Ph.D. diss., University of Cambridge.

West, Paula. 1999a. The Extent of Coarticulation in English Liquids: an Acoustic and Articulatory Study. In *Proceedings of International Congress of Phonetic Sciences 99*. Vol. 3. 1901-1904.

West, Paula. 1999b. Perception of Distributed Coarticulatory Properties of English /l/ and /r/. *Journal of Phonetics* 27:405-426.

Yamada, Norio. 1983. A Constraint on Phonological Variables. *Linguistic Analysis* 12:29-84.

Nancy Hall
Department of Linguistics, PSY 114
California State University Long Beach
1250 Bellflower Boulevard
Long Beach, CA 90840-0902

hall.nancy@gmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# The Morphology-Phonology Connection

SHARON INKELAS
*University of California, Berkeley*

## 0. Introduction

This paper addresses several general issues in the connection between morphology and phonology, where morphology is understood to involve generalizations about form and meaning that relate words to one another within a language, and phonology is understood to involve generalizations about the sound patterns in that language. Morphology and phonology intersect insofar as the statement of morphological generalizations includes information about sound patterns (realizational morphology), and insofar as the statement of phonological generalizations includes information about morphology (morphologically conditioned phonology). This intersection is extensive, blurring the distinction between morphology and phonology in many situations. The recent literature features three approaches which focus squarely on the morphology-phonology interface: Cophonology Theory (Orgun 1996, Inkelas et al. 1997, Inkelas 1998, Anttila 2002, Inkelas and Zoll 2007), Stratal Optimality Theory (Kiparsky 2000; 2003b; a), and Indexed Constraint Theory (McCarthy and Prince 1995, Pater 2000, Itô and Mester 1999, Alderete 2001, and Smith 1997). This paper argues that Cophonology Theory succeeds best of the three in capturing three generalizations that unify morphologically conditioned phonology and realizational morphology:

SUBSTANCE: Morphologically conditioned phonology and realizational morphology involve the same operations
SCOPE: Morphologically conditioned phonology and realizational morphology have identical scope of application within a word
LAYERING: Morphologically conditioned phonology and realizational morphology are identical in their interactions in complex words

Sections 1 and 2 introduce examples of morphologically conditioned phonology and realizational morphology, and Section 3 introduces the theories being compared. SUBSTANCE, SCOPE and LAYERING are discussed in sections 4-6.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Sharon Inkelas

## 1. Morphologically conditioned phonology

Morphologically conditioned phonology is the situation in which a particular phonological pattern is imposed on a proper subset of morphological constructions (affix, reduplication, compounding) and thus is not fully general in the lexical phonology of the language. We will see three examples here.

In Mam, suffixes partition into two classes (Willard 2004, based on England 1983). 'Dominant' affixes cause long root vowels to shorten (1a); 'Recessive' suffixes preserve root vowel length (1b). Dominant vs. recessive status is not predictable; it must be learned individually for each affix.

(1)

| | | | | | |
|---|---|---|---|---|---|
| a. | Dominant suffix: shortens long root vowel | | | | |
| | facilitative | l**ii**ch'- | → | lich'-ich'iin | 'break/breakable' |
| | resultant locative | j**uu**s- | → | jus-b'een | 'burn/burned place' |
| | directional | j**aa**w- | → | jaw-nax | 'go up/up' |
| | participial | n**oo**j- | → | noj-na | 'fill/full' |
| b. | Recessive suffix: preserves root vowel length | | | | |
| | intransitive verbalizer | muq- | → | muq-oo | 'bury (n.)/bury (v.)' |
| | | b'**ii**tz- | → | b'**ii**tz-oo [b'liitza] | 'song/sing' |
| | instrumental | luk- | → | luk-b'il | 'pull up/instrument for pulling up' |
| | remainder | w**aa**- | → | w**aa**-b'an | 'eat/remains of food' |

In Malayalam, gemination applies at the internal juncture of subcompounds (compounds with head-modifier semantics) (b) but not at the internal juncture of cocompounds (with coordinate semantics) (c) (Mohanan 1995:52):

(2)

| | | | | |
|---|---|---|---|---|
| a. | meeşa | 'table' | pei | 'box' |
| | kasaala | 'chair' | -kaḷə | (plural suffix) |
| b. | [meeşa-ppei]$_S$ –kaḷə | | 'boxes made out of tables' | |
| c. | [meeşa-pei]$_C$ -kaḷə | | 'tables and boxes' | |

In English, suffixes fall into two classes (Allen 1978, Siegel 1974, Chomsky and Halle 1968, Kiparsky 1982a): those which shift stress and those which do not.

(3)

| Base | Stress-shifting suffix | Non-stress-shifting suffix |
|---|---|---|
| párent | parént-al | párent-ing |
| président | prèsidént-ial | présidenc-y |
| áctive | àctív-ity | áctiv-ist |
| démonstràte | demonstrative | démonstràtor |

In all three of these examples, some morphological constructions in the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

language (affixation, compounding) are associated with a pattern that other constructions (other affixation, other compounding) are not.

## 2. Realizational morphology

Realizational (or process) morphology is the situation in which a morphological category is exponed by a phonological process other than concatenation of segmental morphemes. Three clear examples are cited below.

In Tohono O'odham, a well-known process of subtractive morphology derives perfective verbs from imperfectives by deleting a final segment. Before a final coronal consonant, a high vowel deletes as well. Examples come from Yu (2000:129-30), citing Zepeda 1984, and Anderson (1992), citing Zepeda 1983:

(4)

| Imperfective | Perfective | gloss | data source |
|---|---|---|---|
| síkon | síko | 'hoe object' | Yu 2000 |
| híwa | híw | 'rub against object' | Yu 2000 |
| hiːnk | hiːn | 'bark' | Anderson 1992 |

In Keley-i (Malayo-Polynesian), nonperfect aspect is marked by consonant gemination, providing a coda to what would otherwise be the leftmost light syllable (Samek-Lodovici 1992, citing original sources) (5a-c). In a word with all closed (heavy) syllables (5d), gemination is blocked.

(5)

| | (a) | (b) | (c) | (d) |
|---|---|---|---|---|
| Base: | pili | duyag | ʔagtu | duntuk |
| Subject focus: | um-pi**ll**i | um-du**yy**ag | man-ʔagtu | um-duntuk |
| Object focus: | pi**ll**i | du**yy**ag | ʔagtu | duntuk |
| Access. focus: | ʔi-**pp**ili | ʔi-**dd**uyag | ʔi-ʔʔagtu | ʔi-**dd**untuk |

English provides a familiar third example: stress shift marks the conversion from verbs to nouns in English (e.g. Kiparsky 1982b):

(6)

| | | |
|---|---|---|
| condúct | → | cónduct |
| abstráct | → | ábstract |
| recórd | → | récord |

## 3. Three approaches to morphologically conditioned phonology

We turn next to a brief presentation of three theories designed to cover morphologically conditioned phonology. For maximum comparative effect, and given the limited space available, it is necessary in these sketches to portray the strictest version of each theory, ignoring nuanced variations of each.

### 3.1. Cophonology Theory

In Cophonology Theory (Orgun 1996; Inkelas et al. 1997; Inkelas 1998; Anttila



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

2002), a member of the family of construction grammar theories (Goldberg, et al.), the morphological grammar consists of a set of word-building constructions. Each construction embodies both a meaning function, which could be inflectional, derivational, or even the identity function, as well as a form function (cophonology), e.g. a set of ordered phonological rules or ranked constraints.

For example, the *–ify* construction in English is associated with a meaning function that takes a nominal stem as input and produces an output whose form is predictable from the form of the input by means of a phonological mapping that concatenates the stem with the string *–ify* and performs such phonological operations as (re)syllabification, stress shift, trisyllabic laxing, and velar softening. In (7), only the form function is denoted, as *f(x)*, where *f* represents the cophonology and *x* represents the phonological form of the input string(s).

(7)




The cophonology of the comparative *–er* suffix in English differs from the cophonology of *–ify* in numerous ways: it is stress-preserving, not stress-shifting; it requires roughly monosyllabic inputs; it does not trigger Trisyllabic laxing or velar softening. In Cophonology Theory, each individual morphological construction has its own, potentially unique, cophonology; similarities among the cophonologies of constructions in the same language are captured with meta-generalizations formalized as a 'grammar lattice' in Anttila 2002. Precedents for cophonologies can be found in Poser 1984 and Bochner 1992.

### 3.2. Stratal Optimality Theory (Kiparsky 2003b)

A descendant of Lexical Morphology and Phonology (LMP; Kiparsky 1982), Stratal OT posits that every language has three strata, each with its own phonological system:

(8)

Stem stratum
↓
Word stratum
↓
Postlexical stratum

In Stratal OT, the phonological differences between *–ify* and *–er* would be modeled by assigning *–ify* to the Stem stratum, which imposes resyllabification, stress shift, Trisyllabic laxing and velar softening, and *-er* to the Word stratum, which imposes only resyllabification. Stratal OT thus can be characterized as a very restrictive version of Cophonology Theory in which every morphological



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



construction is associated either with the 'Stem' or the 'Word' cophonology.

### 3.3. Indexed Constraint Theory

Unlike **Cophonology Theory** and **Stratal OT**, both of which assume that a language can have multiple cophonologies, Indexed Constraint Theory assumes a single phonological grammar for each language. Because Indexed Constraint Theory was formulated within OT, it is always discussed with reference to OT constraints, though it also resembles the rule-based theory of *The Sound Pattern of English* (Chomsky & Halle 1968), which assumed a fixed set of general rules for each language, plus a contingent of minor rules indexed to particular lexical or morphological contexts. In Indexed Constraint Theory, morphologically conditioned phonology is handled by indexing constraints to individual morphological contexts, e.g Max-$C_{root}$, Max-$C_{affix}$, Max-$C_{BR}$, etc. Proponents include McCarthy and Prince 1995; Smith 1997, Itô and Mester 1999; Pater 2000, 2006; and Alderete 2001, among others.

With this brief introduction to the three theories being compared, we now test them, using evidence from realizational morphology and morphologically conditioned phonology, against the SUBSTANCE, SCOPE and LAYERING generalizations, to be motivated in the following sections.

## 4. SUBSTANCE

The SUBSTANCE generalization holds that realizational morphology and morphologically conditioned phonology overlap substantively to the point of being essentially indistinguishable. In a brief tour below, we will see seven different phonological effects, each instantiated once as realizational morphology and once as morphologically conditioned phonology.

### 4.1. Segment deletion

As seen earlier, in Tohono O'odham, final segment deletion marks the perfective category in verbs. Along similar lines, final vowel deletion marks nominative case in Lardil (9) (Blevins 1997:249, citing original sources):

(9)

| NonFuture Accusative | Nominative | gloss |
|---|---|---|
| kentapal-in | kentapal | 'dugong' |
| ngaluk-in | ngalu | 'storey' |
| mayarra-n | mayarr | 'rainbow' |
| mela-n | mela | 'sea' |

Segment deletion commonly occurs as a morphologically conditioned phonological process, as well. In Turkish, vowel hiatus arising at morpheme boundaries is repaired in most cases by glide epenthesis, but in one case – that of the progressive suffix *–Iyor* –by vowel deletion:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(10)

| | C-final root | | V-final root | |
|---|---|---|---|---|
| | 'do' | 'come' | 'understand' | 'say' |
| | yap | gel | anla | söyle |
| Facilitative/-Iver/: | yap-ıver | gel-iver | anl**a-y**ıver | söyl**e-y**iver |
| Progressive/-Iyor/: | yap-ıyor | gel-iyor | anl-ıyor | söyl-üyor |

### 4.2. Gemination

In section 1 we saw gemination serving as the sole mark of nonperfect aspect in Keley-i, and as morphologically conditioned phonology in Malayalam, where it served as a phonological accompaniment to subordinate compounding. Here we see two additional examples. In Woleaian, denotatives are formed by geminating the stem-initial consonant (Kennedy 2003:174). This is realizational morphology:

(11)

| | | | |
|---|---|---|---|
| fili | → | ffili | 'choose it/to choose' |
| βuga | → | bbuga | 'boil it/to boil' |
| tabee-y | → | ttabe | 'follow it/to follow' |

In Hausa, prefixing pluractional verb reduplication includes a process of stem-initial gemination that other prefixing reduplication constructions to not exhibit (Newman 2000:235, 425). This is morphologically conditioned phonology:[1]

(12)

| | | | |
|---|---|---|---|
| búgà: | → | búbbúgà: | 'beat' |
| dánnè: | → | dáddànné: | 'press down, oppress' |
| gyà:rú | → | gyàggyà:rú | 'be well repaired' |

### 4.3. Truncation to a prosodic constituent

Truncation can serve as realizational morphology, e.g. Spanish nickname formation (13) (Pineros 2000:71); it also commonly accompanies affixation, e.g. in Swedish nicknames (14) (Weeda 1992:121, citing original sources):

(13)

| | | |
|---|---|---|
| Ricardo | → | Rica |
| Armando | → | Arma |
| Jesus | → | Jesu |
| Concepción | → | Conce |

(14)

| | | | | |
|---|---|---|---|---|
| a. | alkoholist | → | alk-is | 'alcoholic' |
| | laboratori:um | → | labb-is | 'lab' |
| b. | mats | → | matt-e | (proper name) |
| | fabian | → | fabb-e | (proper name) |

### 4.4. Dissimilation and 'exchange' rules

Both realizational morphology and morphologically conditioned phonology

[1] 'ř' represents trilled r, written in Hausa as an r-tilde. Plain 'r' is a rhotic approximant.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



include effects where one segment surfaces with a value opposite either to its own input value ('Exchange rules', 'toggles') or to the output value of another segment in the same word ('dissimilation'). For a survey, see Kurisu 2001.

In Nuer (Frank 1999), input/ouput vowel length dissimilation marks the singular/plural distinction in nouns. (The language has multiple ways of marking the number distinction, of which this 'exchange' process is just one.)

(15)

| | Nominative singular | Nominative plural | gloss |
|---|---|---|---|
| a. | ley | leey | 'animal(s)' |
| | wuɔ̱k | wuɔ̱ɔ̱k | '(upper) arm(s)' |
| b. | ka̱at | ka̱t | 'vulture(s)' |
| | yieer | yiër | 'river(s)' |

In Hausa, 'stabilizer' clitics have a fixed segmental component (***ne:*** for masculine, ***ce:*** for feminine) but exhibit tone polarity. The stabilizer surfaces with tone opposite from that of the preceding syllable (Newman 2000:160ff., 598):

(16)

| …L-H | | …H-L | |
|---|---|---|---|
| gwàdò né: | 'it's a blanket' | kè:ké nè: | 'it's a bicycle' |
| zó:bè: né: | 'it's a ring' | nán nè: | 'it's there (by you)' |
| mó:tà: cé: | 'it's a car' | ákwálá: cè: | 'it's a piece of junk' |
| gó:nâ-ř cé: | 'it's the farm' | rì:gá: cè: | 'it's a gown' |

### 4.5. Stress/pitch-accent (re)assignment

Stress and accent shift commonly expone morphological categories on their own, as seen in the example of English verb-to-noun conversion in (6), and are also very frequently morphologically conditioned concomitants of affixation and other overt morphological processes, as in the example of English stress-shifting suffixes in (3).

### 4.6. Review

The phonological operations used to realize morphological constructions are essentially the same operations that can accompany overt affixation, reduplication and compounding. There is no clear basis for distinguishing the two (cf. Anderson 1975). A more comprehensive survey might well find that certain types of phonological effects are much more rarely found as the sole markers of morphological categories than others are, and that certain types of phonological effects are more likely to be morphologically restricted (in any way) than others are. The reasons for this would be interesting to explore. However, for present purposes the overlap in type is more significant. It creates a problem of discriminability. Theories which offer separate treatments of realizational morphology and morphologically conditioned phonology require some criteria for telling the two part, even when they resemble one another in form.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The practical criterion seems to be that a phonological alternation is classified as 'realizational morphology' if it is the sole exponent of a morphological construction, whereas it is classified as 'morphologically conditioned phonology' if it accompanies something else which is judged to be the primary exponent of a morphological construction (affixation, reduplication, compounding). All of the examples discussed in Section 4 were tacitly classified according to this criterion. The problem is that in many cases it is difficult or impossible to determine which phonological effect is the primary marker of a morphological construction (i.e. morphology), and which is the secondary phonological correlate (i.e. morphologically conditioned phonology).

In Hausa (Newman 2000), the dimensions of whether a morphological construction is tone-replacing and/or has overt affixation are independent, so that the same tone-replacement phenomenon in some cases is classified as realizational morphology (17a) and in others as morphologically conditioned phonology (17c).

(17)

| | base tone replaced | base tone preserved |
|---|---|---|
| zero derivation | ✓ | ✓ |
| overt affixation | ✓ | ✓ |

a. No affixation; tone replacement (imperative formation)
   ká꞉mà꞉ → kà꞉má꞉ 'catch (!)'
   bíncìké꞉ → bìncìké꞉ 'investigate (!)'
   nánné꞉mó꞉ → nànnè꞉mó꞉ 'seek repeatedly (!)' (< né꞉mó꞉ 'seek')
b. No affixation, no tone replacement (Grade 2 verbal noun formation)
   fànsá꞉ → fànsá꞉ 'redeem/redeeming'
   tàmbáyà꞉ → tàmbáyà꞉ 'ask/asking'
c. Overt affixation, tone replacement (various plural classes)
   má꞉làm → mà꞉làm-ái 'teacher-pl' -LH
   rì꞉gá꞉ → rí꞉g-únà꞉ 'gown-pl' -HL
   tàmbáyà꞉ → támbáy-ó꞉yí꞉ 'question-pl' -H
d. Overt suffixation, no tone replacement (various)
   dáfà꞉ → dáfà꞉-wá 'cook-ppl' -LH
   gàjé꞉ré꞉ → gàjé꞉r-ìyá꞉ 'short-fem' -LH
   hù꞉lá꞉ → hù꞉lâ-ř 'hat-def' -L

For theories making any kind of analytical distinction between the two effects, treating exactly the same process, tone replacement, as morphology in (17a) but phonology in (17c) poses a duplication problem.

In Barasana, a paradox is actually created. A number of Barasana suffixes exert effects on stem tone. The Non3rdSubj suffix *-bɨ* causes H tone to align all the way to the right in words containing it, while the Interrogative suffix *-ri* causes H to align all the way to the left (Pycha 2005, citing Gomez-Imbert and Kenstowicz 2000):



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(18)

| | |
|---|---|
| baa-bɨ<br>HH H | 'swim-non3rdSubj = I/you/we swim' |
| baa-ri<br>H | 'swim-Interr = did he/she/they swim?' |

These suffixes exhibit what Pycha (2005) calls mutual partial blocking. Their segmental components cannot co-occur (18a), nor can their mutually incompatible effects on tone both be realized. In words where both meanings are desired, we find the segments of the Interrogative—and the tones of the Non3rdSubj (18b):

(19) a. *baa-ri-bɨ, *baa-bɨ-ri 'did I/you/we swim?'
b. baa-ri 'did I/you/we swim?'
HH H

Pycha's interpretation of the facts in (18) is that both categories (Non3rdSubj, Interrogative) achieve exponence, by using the segments of one and the cophonology of the other. The paradox this poses for a theory that distinguishes realizational morphology from morphologically conditioned phonology is that the tone pattern of the Non3rdSubject must, by the criterion used above, be analyzed as morphologically conditioned phonology based on the fact that it co-occurs with a 'primary' exponent, namely the suffix *-bɨ*, yet its ability to expone the Non3rdSubject even when *-bɨ* is absent identifies it as realizational morphology. This is a paradox.

One possible way to avoid the problems illustrated in Hausa and Barasana would be to reduce everything to morphologically conditioned phonology, reanalyzing apparent cases of realizational morphology as zero derivation accompanied by morphologically conditioned phonology. This would, however, pose a problem in Barasana, where the morphologically specific tonal effects of the Non3rdSubj are present even when the affiliated suffix is not. Alternatively, we could try to reduce all morphologically specific phonological effects to realizational morphology, reanalyzing apparent cases of morphologically conditioned phonology as instances of 'extended exponence', the multiple marking of a morphological category (e.g. Matthews 1972; Stump 1991). Multiple exponence of overt morphology is a common enough phenomenon; in Hausa, for example, the formation of class 13 noun plurals involves suffixation *and* reduplication, as well as tone replacement (Newman 2000:458):

(20)

| | | |
|---|---|---|
| tsírò: | → tsìré-tsìré | 'shoot, sprout(s)' |
| kwánà: | → kwàné-ksàné | 'corner, curve(s)' |
| hábáicì: | → hàbàicé-hàbàicé | 'innuendo(s)' |

The challenge for any theory of morphologically specific phonological effects is in accounting for their overlap in substance, which makes them difficult to



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

distinguish from one another and creating a potential duplication problem. Observations like these have been made before in the literature, leading to proposals that realizational morphology and morphologically conditioned phonology should be analyzed in the same way (Ford and Singh 1983; Poser 1984; Dressler 1985; Ford and Singh 1985; Singh 1987; Anderson 1992; Bochner 1992; Singh 1996). We turn next to a discussion of how the three theories compared in this paper do in this regard.

### 4.7. Theoretical discussion

Cophonology Theory is naturally suited to capturing the overlap in substance between realizational morphology and morphologically conditioned phonology, since it uses exactly the same mechanism – a cophonology – to account for both. For example, truncation is modeled by a cophonology which maps an input to an output of a certain size. In the English examples below, the output of the truncating cophonology, *g(x)*, is two syllables. In the construction on the left, in which truncation is the sole mark of the construction, the input is the long stem *Rebecca* and the truncating cophonology produces the disyllabic output *Becca*. In the construction on the right, in which truncation to two syllables accompanies overt suffixation of *-y*, the input is *Becky*, with material from the stem and the suffix both competing for a spot in the disyllabic output. The inputs differ, because the constructions differ, but the cophonologies are the same.

(21) *g(x):* a cophonology limiting the output to two syllables (σσ >> Max)




*(Realizational morphology)* *(Morphologically conditioned phonology)*

By collapsing the formal treatments of realizational morphology and morphologically conditioned phonology, Cophonology Theory eliminates the analytical ambiguity of cases of the type discussed in Section 4.6.

In Indexed Constraint Theory, all phonological alternations are accomplished by the ranking of phonological constraints, and thus the expectation is that Indexed Constraint Theory should make essentially the same predictions as in Cophonology Theory regarding the substance of realizational morphology and morphologically conditioned phonology, even though the mechanism of relating phonological subpatterns to particular constructions is different from the mechanism used in Cophonology Theory. (We will come back to this issue in later sections.)

For example, Kurisu (2001) has proposed that the constraint REALIZE-MORPH



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(RM) could be responsible for many effects classified here as realizational morphology; RM essentially requires that the phonological output of a morphological construction be non-homophonous with the input, such that a construction with no overt affix or other morphological exponent would be required through RM to undergo some phonological change. The resulting change is predicted to be the least expensive one, as determined by the ranking of markedness and faithfulness constraints of the grammar. In Icelandic, deverbal nouns are formed by deleting the final vowel from the infinitive:

| | | | | |
|---|---|---|---|---|
| (22) | klifra | → | klifr | 'climb/climbing' |
| | grenja | → | grenj | 'cry/crying' |
| | söötra | → | söötr | 'sip/sipping' |
| | puukra | → | puukr | 'conceal/concealment' |

Kurisu derives this outcome by ranking Dep and RM above Max, such that the need to satisfy RM compels a Max violation.

(23)

| | /klifra/ | RM | DEP | MAX |
|---|---|---|---|---|
| a. | klifra | !* | | |
| ☞ b. | klifr | | | * |
| c. | klifrata | | *! | |

RM is a type of indexed constraint; it is an anti-faithfulness constraint indexed to a morphological constituent, in this case deverbal noun. Indexed Constraint Theory commonly indexes faithfulness constraints as well: Base-Reduplicant Correspondence Theory indexes faithfulness constraints to Base and Reduplicant constituents (McCarthy & Prince 1995), Smith (1999) indexes faithfulness constraints to nouns vs. verbs, etc. The same approach ought to be able to capture the morphologically conditioned phonological effects we have seen thus far. For example, Ito & Mester (1997) analyze a case of truncation in German comparable to the *Rebecca* → *Becky* example, above, exploiting an abstract morpheme TRUNC which is compelled, by indexed constraints, to be faithful segmentally to the full stem *and* to fit, with the German equivalent of *–y*, into two syllables. This constraints that participate in this analysis are very similar to the ones in a cophonology account, and while the theories differ in other ways they make similar predictions about substance.

In contrast to Cophonology Theory and Indexed Constraint Theory, Stratal OT has little to say about realizational morphology or its relation to morphologically conditioned phonology, making it hard to evaluate any predictions Stratal OT might make about substance. Like LMP, Stratal OT focuses on generalizations holding over stems and words, but ignores alternations that are construction-specific. Since not all stem morphology in English is truncating, Stratal OT cannot accomplish the truncation seen in *Rebecca* → *Becca* through Stem



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

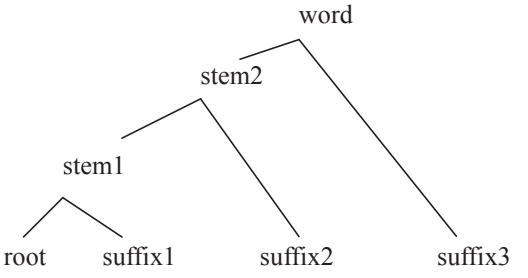
phonology. Instead it would require some constraint or constraint ranking specific to nickname formation – i.e. indexed constraints or cophonologies, merging Stratal OT with one or the other of the two approaches with which it contrasts.

## 6. SCOPE

With both morphologically conditioned phonology and realizational morphology, the SCOPE p of the phonological effect(s) is the stem produced by the word formation process in question. By associating cophonologies with morphological constructions, Cophonology Theory predicts that the scope of each cophonology will be the morphological subconstituent built by the associated construction.

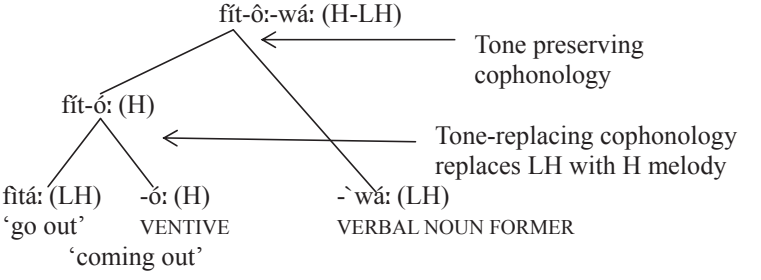
For example, in a word with three suffixes, Cophonology Theory predicts that the cophonology of Stem2 can affect the surface form of Stem1 and Suffix2, but that the cophonology of Stem2 *cannot* affect the surface form of Suffix3:

(24)




A case study from Hausa illuminates the significance of this type of prediction. Cophonology Theory predicts that if a tone-replacing construction is embedded within a tone-preserving construction, it will not replace the tones of any affixes introduced by the outer construction; these are outside its scope. The ventive construction is tone-replacing (Newman 2000:663): *fìtá:* (LH) 'go out' → *fít-ó:* (H) 'come out', *gángàrá:* (HLH)'roll down' → *gángár-ó:* (H) 'roll down here', etc. As seen in (25), a ventive stem can be converted to a verbal noun through the suffixation of *-`wá:,* the tone-preserving verbal noun-forming suffix:

(25)




The outer suffix retains its lexical LH tone pattern; it is immune to the tone



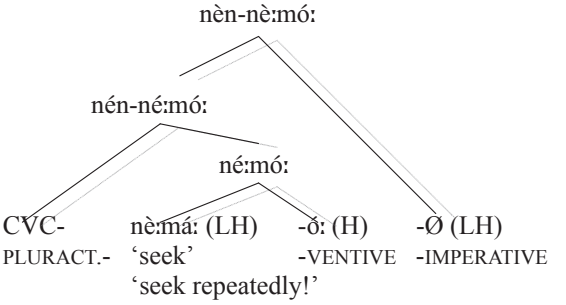
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

replacement pattern which is imposed on the ventive stem subconstituent by the ventive cophonology. Scope effects of this kind are an intrinsic prediction of Cophonology Theory.

Stratal OT can handle some but not all scope effects. Like Cophonology Theory, Stratal OT assumes a layered structure in which the cophonology of an higher (e.g. Word) level applies to the output of the cophonology of an earlier (e.g. Stem) level. Stratal OT thus predicts that the Word cophonology will have scope over Stems (and the suffixes combining with them to form Words), but that the Stem cophonology will not have scope over Word-forming suffixes.

The challenge faced by Stratal OT is describing the scope of morphologically specific phonological effects that are not general within Stems or Words. To model the division between tone-preserving and tone-replacing morphology in Hausa, for example, Stratal OT must assign one effect, e.g. tone replacement, to Stems, and the other, e.g. tone-preservation, to Words. However, tone-replacing and tone-preserving morphological constructions can be embedded in either order. In (26), the tone-replacing ventive construction is embedded within the tone-preserving pluractional, which in turn is embedded within the tone-replacing imperative (represented with a dummy suffix for graphical clarity). If Words and Stems are strictly ordered, Stratal OT cannot handle this case:

(26)




Indexed Constraint Theory faces two challenges in describing and predicting SCOPE effects. One, addressed here, is the question of what constraints are indexed to. (The other is layering, discussed in Section 6). The indexation issue can be illustrated in Hausa with the tone-replacing cophonology associated with the Ventive (and several other morphological constructions) and the tone-preserving cophonology associated with verbal noun-forming -`*wá* (and many other affixes). Cophonology Theory would posit the constraint rankings in (27):

(27)

| | |
|---|---|
| Ventive cophonology | Tone=H » Ident-tone, Tone = LH |
| -`*wá:* verbal noun cophonology | Ident-tone » Tone=H |

Indexed Constraint Theory has one constraint ranking for the entire language. The cophonologies in (27) could translate into indexed constraints as follows:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(28) a. Ident-tone-$_{\text{wá:}}$ » Tone=H » Ident-tone
b. Tone=$H_{\text{Ventive}}$ » Ident-tone » Tone=H

The ranking in (28a) indexes faithfulness: the verbal noun-former *-ˋwá:* is specially faithful, outranking the general markedness constraint Tone=H to which other stems are subject. The alternative ranking in (28b) indexes markedness constraints. All-H is the unmarked pattern for the Ventive, but faithfulness trumps markedness for other constructions, which are therefore are tone-preserving. It does not matter here which method is chosen; the literature on Indexed Constraint Theory favors indexing faithfulness, rather than markedness constraints (see e.g. Alderete 2001, though cf. Inkelas & Zoll 2007).

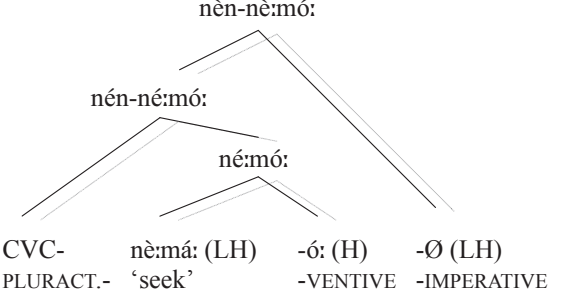
On either option, capturing SCOPE requires indexed constraints to refer not to morphemes, but to complex stems. The H tone mandate of the ventive, captured in the constraint Tone=$H_{\text{Ventive}}$, must refer to the entire ventive stem, not just the ventive suffix *-ó:*, in order to generate, for input *nè:má:*, the correct output *né:mó:*.

For this reason, recent work in Indexed Constraint Theory has moved in the direction of Cophonology Theory by indexing constraints to subconstituents of words, not individual morphemes (e.g. Alderete 2001).

## 6. Layering

A corollary of the scopal prediction of **cophonologies** is layering, the effect in which, given a structure where X is a daughter of Y, the output of the cophonology associated with X is the input to the cophonology of Y. This prediction holds for both realizational morphology and morphologically conditioned phonology. A good illustration of this prediction can be found in example (26), repeated below, which contains two tone-replacing morphological constructions. The inner one (ventive) imposes all-H; the outer one (imperative) imposes LH. The word surfaces LH, as Cophonology Theory predicts.

(29)




The way two cophonologies in the same word interact depends intrinsically on the hierarchical structure of the word. The outer construction has the last say.

Stratal OT also predicts layering, to which Kiparsky 2000 has pointed as a



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



possible explanation for phonological opacity. The problem for Stratal OT, as mentioned above, is simply that it does not provide *enough* layers to capture the richness of morphologically conditioned phonology and realizational morphology within a language.

In contrast to Cophonology Theory and Stratal OT, in which the interaction between morphologically conditioned phonological patterns follows from the hierarchical structure of a given word, in Indexed Constraint Theory interactions of these types follow from constraint ranking, which is fixed in the language. To illustrate this, consider the constraint ranking needed to generate the imperative ventive word in (32), in which the LH imperative tone melody takes precedence over the all-H melody associated with the ventive:[2]

(30) $\text{Tone=LH}_{\text{imperative}}$ » $\text{Tone=H}_{\text{Ventive}}$ » Ident-tone » Tone=H, Tone=LH

| | $[[\text{nè:má: -ó:}]_{\text{Ventive}}\ \text{–Ø}]_{\text{Imper.}}$ | $\text{TONE=LH}_{\text{Imper.}}$ | $\text{TONE=H}_{\text{Vent}}$ | IDENT |
|---|---|---|---|---|
| a. | né:mó: | *! | * | * |
| ☞ b. | nè:mó: | | * | |

The outcome of this tableau is determined by the highest ranked morphologically indexed constraint, *not* by the hierarchical structure of the word.

If the morphological constructions involved always occur in a fixed order, then layering of cophonologies and ranking of indexed constraints make essentially the same predictions. However, there are good examples of languages in which the same constructions can occur in either order, with different phonological results. This was an important result of Mohanan 1986, in which it was demonstrated that the two types of compounds in Malayalam could embed inside each other; a similar freedom of combination occurs in Turkish, as pointed out in detail in Inkelas and Orgun 1998, and in Cibemba, as pointed out by Hyman 1994. Indexed Constraint Theory does not capture the overarching generalization that scope is related to hierarchical position.

## 7. Conclusion

Cophonology Theory has clear advantages over Indexed Constraint Theory and Stratal OT in capturing SUBSTANCE, SCOPE, and LAYERING. Yet cophonologies have been viewed with concern, principally over the issue of cophonology proliferation: without a lid on cophonology variability, a language might vary as much internally as unrelated languages can vary (see e.g. Benua). This concern has been addressed in two ways in the literature (Inkelas and Zoll 2007). On the formal side, Anttila (2002) has proposed that cophonologies in the same language must conform to a master ranking of constraints; only constraints left unranked in this master ranking are allowed to vary in their ranking across individual

[2] Note that this ranking indexes markedness constraints, rather than faithfulness constraints. An indexed faithfulness account would be much more challenging to develop.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



cophonologies. More substantively, researchers such as Bermudez-Otero and McMahon (2006) have observed that cophonological diversity arises from diachronic change, and that languages change too slowly and in too systematic a fashion to permit the kind of wildly divergent cophonologies that have been cited as a reason to avoid Cophonology Theory.

We have also seen in this study, however, that Cophonology Theory, Stratal OT and Indexed Constraint Theory have many properties in common, and whatever successor to these theories ultimately ends up being adopted will share their common goal of tying morphologically conditioned phonological effects to morphological subconstituents of complex words.

**References**

Alderete, John. 2001. Dominance effects as transderivational anti-faithfulness. *Phonology* 18: 201-253.

Allen, Margaret. 1978. *Morphological investigations*. Ph.D. diss., Massachusetts Institute of Technology.

Anderson, Stephen R. 1975. On the interaction of phonological rules of various types. *Journal of Linguistics* 11: 39-63.

Anderson, Stephen R. 1992. *A-morphous morphology*. Cambridge: Cambridge University Press.

Anttila, Arto. 2002. Morphologically conditioned phonological alternations. *Natural Language and Linguistic Theory* 20: 1-42.

Bermudez-Otero, Ricardo, and April Mcmahon. 2006. English phonology and morphology. In B. Aarts and A. McMahon, eds., *The Handbook of English Linguistics*, Oxford: Blackwell.

Blevins, Juliette. 1997. Rules in Optimality Theory: two case studies. In I. Roca, ed., *Derivations and Constraints in Phonology*, 227-260. Oxford: Clarendon Press.

Bochner, Harry. 1992. *Simplicity in generative morphology*: *Publications in Linguistic Sciences 37*. Berlin: Walter de Gruyter.

Chomsky, Noam, and Morris Halle. 1968. *The sound pattern of English*. New York: Harper and Row.

Dressler, Wolfgang. 1985. *Morphonology, the dynamics of derivation*. Ann Arbor: Karoma Publishers.

England, Nora. 1983. *A Grammar of Mam*. Austin: University of Texas Press.

Ford, Alan, and Rajendra Singh. 1983. On the status of morphophonology. In J. F. Richardson, M. Marks and A. Chukerman, eds., *Papers from the parasession on the interplay of phonology, morphology and syntax*, 63-78. Chicago: Chicago Linguistic Society.

Ford, Alan, and Rajendra Singh. 1985. Towards a non-parametric morphology. In M. Niepokuj, M. VanClay, N. Nikiforidou and D. Feder, eds., *Papers from BLS 11*, 87-95. Berkeley: Berkeley Linguistic Society.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Frank, Wright. J. 1999. Nuer noun morphology. MA thesis, University of New York at Buffalo.

Gomez-Imbert, Elsa, and Michael Kenstowicz. 2000. Barasana tone and accent. *International Journal of American Linguistics* 66: 419-463.

Hyman, Larry M. 1994. Cyclic phonology and morphology in Cibemba. In J. Cole and C. Kisseberth, eds., *Perspectives in Phonology*, 81-112. Stanford: Center for the Study of Language and Information.

Inkelas, Sharon. 1998. The theoretical status of morphologically conditioned phonology: a case study from dominance. *Yearbook of Morphology 1997*, 121-155.

Inkelas, Sharon, and Cemil Orhan Orgun. 1998. Level (non)ordering in recursive morphology: evidence from Turkish. In S. Lapointe, D. Brentari and P. Farrell, eds., *Morphology and its relation to phonology and syntax*, 360-392. Stanford: Center for the Study of Language and Information.

Inkelas, Sharon, Cemil Orhan Orgun, and Cheryl Zoll. 1997. Implications of lexical exceptions for the nature of grammar. In I. Roca, ed., *Constraints and Derivations in Phonology,* 393-418. Oxford: Clarendon Press.

Inkelas, Sharon, and Cheryl Zoll. 2007. Is Grammar Dependence Real? A comparison between cophonological and indexed constraint approaches to morphologically conditioned phonology. *Linguistics* 45.133-171.

Itô, Junko, and Armin Mester. 1999. The phonological lexicon. In N. Tsujimura, ed., *The handbook of Japanese linguistics*, 62-100. Malden, MA: Blackwell.

Kennedy, Robert. 2003. *Confluence in phonology: evidence from Micronesian reduplication*. Ph.D. diss., University of Arizona.

Kiparsky, Paul. 1982a. Lexical morphology and phonology. In I.-S. Yang, ed., *Linguistics in the Morning Calm*, 3-91. Seoul: Hanshin.

Kiparsky, Paul. 1982b. Word-formation and the lexicon. In F. Ingemann, ed., *1982 Mid-America linguistics conference papers.* Lawrence, KS: University of Kansas.

Kiparsky, Paul. 2000. Opacity and cyclicity. *The Linguistic Review* 17: 351-367.

Kiparsky, Paul. 2003a. Fenno-Swedish Quantity: Contrast in Stratal OT. Stanford University, ms.

Kiparsky, Paul. 2003b. Finnish noun inflection. In D. Nelson and S. Manninen, eds., *Generative approaches to Finnic and Saami linguistics*, Stanford: Center for the Study of Language and Information.

Kurisu, Kazutaka. 2001. *The phonology of morpheme realization*. Ph.D. diss., University of California, Santa Cruz.

Matthews, P. H. 1972. *Inflectional Morphology: A Theoretical Study Based on Aspects of Latin Verb Conjugation*. Cambridge: Cambridge University Press.

Mccarthy, John, and Alan Prince. 1995. Faithfulness and reduplicative identity. In J. Beckman, L. Dickey and S. Urbanczyk, eds., *University of Massachusetts Occasional Papers in Linguistics 18: Papers in Optimality Theory*, 249-384. Amherst, MA: Graduate Linguistic Student Association.

Mohanan, K. P. 1995. The organization of the grammar. In J. Goldsmith, ed., *The*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



*handbook of phonological theory*, 24-69. Cambridge, MA: Blackwell Publishers.
Newman, Paul. 2000. *The Hausa language: an encyclopedic reference grammar*. New Haven: Yale University Press.
Orgun, Cemil Orhan. 1996. *Sign-based morphology and phonology: with special attention to Optimality Theory*. Ph.D. diss., University of California, Berkeley.
Pater, Joe. 2000. Non-uniformity in English secondary Stress: the role of ranked and lexically specific constraints. *Phonology* 17.237-274.
Pineros, Carlos-Eduardo. 2000. Prosodic and segmental unmarkedness in Spanish truncation. *Linguistics* 38.63-98.
Poser, William J. 1984. *The phonetics and phonology of tone and intonation in Japanese*. Ph.D. diss., Massachusetts Institute of Technology.
Pycha, Anne. 2005. Partial Blocking. Paper presented at 41st Regional Meeting of the Chicago Linguistic Society.
Samek-Lodovici, Vieri. 1992. A unified analysis of crosslinguistic morphological gemination. *Proceedings of CONSOLE-1*, Utrecht.
Siegel, Dorothy. 1974. *Topics in English morphology*. Ph.D. diss., Massachusetts Institute of Technology.
Singh, Rajendra. 1987. Well-formedness conditions and phonological theory. In W. Dressler, et al. eds., *Phonological 1984*. Cambridge: Cambridge University Press.
Singh, Rajendra. 1996. Natural phono(morpho)logy: a view from the outside. In B. Hurch and R. Rhodes, eds., *Natural phonology: the state of the art. Papers from the Bern Workshop*, Berlin: Mouton.
Smith, Jennifer. 1997. Noun faithfulness: on the privileged status of nouns in phonology. ms. 242-1098.
Stump, Gregory. 1991. A paradigm-based theory of morphosemantic mismatches. *Language* 67: 675-725.
Weeda, Donald Stanton. 1992. *Word truncation in prosodic morphology*. Ph.D. diss., University of Texas, Austin.
Willard, E. Rainbow. 2004. Dominance effects in a dialect of Mam Maya. Paper presented at Linguistic Society of America annual meeting, Boston.
Yu, Alan C.-L. 2000. Stress Assignment in Tohono O'odham. *Phonology* 17: 117-135.
Zepeda, Ofelia. 1983. *A Papago grammar*. Tucson: University of Arizona Press.
Zepeda, Ofelia. 1984. *Topics in Papago morphology*. Ph.D. diss., University of Arizona.

Sharon Inkelas
Department of Linguistics
University of California
Berkeley, CA 94720-2650

inkelas@berkeley.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Reflexives and the Shift between First and Second Person: The Case of Japanese[1]

OSAMU ISHIYAMA
*Ball State University and University at Buffalo – SUNY*

## 0. Introduction

The shift of person categories is not uncommon in the world's languages. In particular, it is widely observed that third person forms have come to be used as second person forms in some European languages for the purpose of politeness. For example, German uses the third person *Sie* as a polite second person pronoun. Similarly, Spanish polite second person pronoun *usted* comes from the nominal form *vuestra merced* 'your grace' which is formally a third person form. The same type of development is suggested for pronouns from other languages, such as Portuguese *você* (from *Você Mercê* 'your grace') and Italian *lei* (from *la vostra Signoria* 'your lord') (Mühlhäusler and Harré 1990). A similar situation holds for Asian languages such as Thai, Burmese, and Vietnamese where lexical nous 'servant' and 'lord' are used for the first and second person, respectively.

In Japanese, it is argued that the shift of person categories is not limited to the cross-linguistically common shift from the third to first/second person. The shifts from the first to second person as well as from the second person to first person are reported (Whitman 1999, Shibasaki 2005). Consider the following examples.

(1) [from first person to second person]
  a. (Kojiki, 712) (Whitman 1999:358)
    koto-na-gusi we-gusi ni **ware** wehinikeri
    matter-none-sake laugh-sake on ware got.drunk
    'On that blameless sake, that laughing sake, I (ware) got drunk.'
  b. (Uji Shui Monogatari, 1218) (Whitman 1999:358)
    **ware** ha miyako no hito ka. iduko he ohasuru zo.
    ware TOP capital GEN person Q where to go.HON EMPH
    'Are you (ware) from the capital? Where are you going?'

[1] I am grateful to David Fertig, David Zubin, and Mitsuaki Shimojo for their valuable comments. All errors are mine.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(2) [from second person to first person]
a. (Genji Monogatari, Miyuki, 1002)
"Naishi-no-Kami ni, **ore** wo, mooshiinashi tamahe."
mistress.of.staff DAT ore ACC put.up RESP
'Put me (ore) up for Mistress of Staff.'
b. (Koshoku Ichidai Otoko, Book 6, 1682)
**Ore** wa kurumi-ae no mochi o aku hodo.
ore TOP walnut-dressed GEN rice.cake ACC get.tired extent
'I (ore) want to eat rice cake dressed with walnuts to my heart's content'

(1) illustrates a case of the shift from the first to second person, whereas (2) exemplifies a shift from the second to first person. Previous studies also note that the shift from the first to second person is much more common that the shift from the second to first person.

This study argues that the forms that underwent the shift between the first and second person are actually reflexives or markers of self, thus the alleged shift should be simply seen as the first or second person interpretation of reflexives. The rest of this paper is organized as follows. Section 1 briefly discusses the previous approach to the problem and its problems. The approach of this study is described in Section 2. Section 3 presents a case study. Finally, Section 4 discusses some implications of this study.

## 1. Whitman's Approach

This section briefly describes Whitman's (1999) approach to the shift and its problems. Whitman (1999) presents an explanation based on the notion of empathy and direct discourse perspectives formulated in the works of Kuno (see for example Kuno 1972, 1987, 2004, Kuno and Kaburaki 1977). Whitman argues that the shift between the first and second person (or intrapersonal pronoun shift, as he calls it) is motivated by reflexive functions in the so-called long-distance binding or logophoric context. Kuno's studies show that Japanese reflexives in the logophoric context are represented as first or second person pronouns in direct discourse representations. For example, the reflexive *jibun* as the subject of the complement clause in the Modern Japanese equivalent of *John said that he (jibun) is a genius* will be replaced by a first person pronoun in its direct discourse representation, the equivalent of *John said, "I am a genius."* Whitman suggests that this line of explication may extend beyond the logophoric context and argues for the directionality of shift from pronouns to reflexives as well as from reflexives to pronouns. He argues that this is how reflexives have come to be reanalyzed as first or second person pronouns. In other words, intrapersonal pronoun shift is mediated by pronouns used reflexively. Although the notion of reflexive and empathy, as we will see below, are important in this study too, it is hard to see how his approach can explain the whole range of phenomena associated with shift of person categories. The following issues pose problems for his approach: (i) the fact that the shift from the first to second person is more



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



common that the shift from the second to first person is left unexplained, (ii) not all instances of the shift involves the long-distance binding context even in the stage when the shift supposedly started and the directionality of the shift (especially the shift from pronouns to reflexives) is hard to be motivated, and (iii) Whitman notes that it is difficult to decide the original function of some forms definitively (i.e. a first/second person pronoun or a reflexive).

## 2. Approach of this Study

In the previous section, Whitman's (1999) approach regarding the shift of person categories or what he calls intrapersonal pronoun shift (i.e. shift between the first and second person category) as well as its problems were discussed. His claim is problematic in the following areas: (i) the fact that the shift from the first to second person is more common than the shift from the second to first person is left unexplained, (ii) the context in which the shift occurs and its directionality, and (iii) difficulty to determine the original person category of some forms. In light of these observations, the present study employs a similar, but somewhat different approach to the shift of person categories. Whitman's approach states that first and second person forms undergo the shift when they are used reflexively in the logophoric context. This study, on the other hand, argues that items that supposedly went through the shift of person categories are not semanticized first/second person pronouns, but simply reflexives or markers of self. In fact, some researchers have pointed out that there is no need to treat the so-called personal pronouns and reflexives separately at least in Pre-Modern Japanese. For example, in his grammar of classical Japanese, Vovin classifies personal pronouns and reflexives as a single category, using the term *personal-reflexive pronouns* because "in the language of Classical Japanese prose most of them can be used in both functions" (2003:97). Therefore, under this approach, the shift of person categories is not mediated by the reflexive function in the long-distance binding context as is the case with Whitman's (1999) approach, but explained within the scope of normal reflexive behaviors. That is to say, being morphologically invariant, Japanese reflexives can be used for any person category given the right context. The so-called personal pronoun function is a reflection of pragmatic interpretation of reflexives as having first and second person referents, which may or may not semanticize. This approach of treating the items that underwent the shift of person categories as reflexives also has the advantage of handling the issues that arose from Whitman's (1999) approach.

The first issue to be discussed is that of scarcity of the shift from the second to first person compared to the shift from the first to second person. Previous studies have observed that the shift from the first to second person is much more common than the other way round. However, the problem is simply mentioned, but largely left unexplained. The root of the problem seems to lie in the fact that Whitman (1999) argues that the shift from pronouns to reflexives is possible, in addition to the expected 'shift' from reflexives to pronouns (i.e. pronoun interpretation of reflexives). Under the approach of this study, on the other hand, the forms in



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



question are reflexives in the first place that give rise to pragmatic interpretation of the first and second person. As mentioned above, semanticization of this pragmatic interpretation is a possible, but not a necessary consequence. Therefore, I claim that the question that needs to be asked is not 'why is the shift from the first to second person more common than the shift from the second to first person?, but 'why are reflexives interpreted as the first person more often than as the second person?' I argue that the answer to this question lies in the notion of empathy (e.g. Kuno 1987, 2004, Kuno and Kaburaki 1977). In his series of influential works (see Kuno 2004 for a concise summary), Kuno proposes the notion of empathy and various empathy hierarchies.[2] He defines empathy as "the speaker's identification, which may vary in degree with a person/thing that participates in the event or state that he/she describes in a sentence" (2004:316). Although Kuno proposes several hierarchies, the one particularly relevant to this study is the speech act empathy hierarchy which states that it is easiest to empathize with the speaker. The notion of empathy can be applied to answer the question raised above, namely 'why do reflexives get pragmatic interpretation of the first person more often than the second person?' Reflexives, especially syntactically unbound ones that is in the subject position, tend to be interpreted as first person because they are both high in empathy. Situations under which reflexives are given the second person interpretation are usually limited to such circumstances as questions and orders. It is natural that reflexives used in questions and orders are pragmatically intended for the second person for epistemological reasons: it is much more common to ask questions for or give orders to the addressee than anyone else.

The second issue concerns the context in which the so-called shift occurs and its directionality. The contexts in which the shift is observed are more diverse than the ones demonstrated by Whitman. Not all instances of the shift involve the logophoric context. Recall Whitman's own example in (1b) where *ware* which is said to have shifted from the first to second person is used for the second person without involving the logophoric context. Some might argue that (1b) represents the usage after the shift has already completed. However, this argument faces difficulty because the example is from the time when the shift started according to Whitman. The approach of this study, on the other hand, is unaffected by this problem, because it does not consider a particular syntactic context as a source of the phenomenon in question. As we will see below, Japanese reflexives can be used in a wide range of contexts. In addition to the canonical locally bound reflexives and the ones in the logophoric context (i.e. long-distance binding context), syntactically unbound reflexives are not uncommon in discourse.

The third and last issue to be discussed is indeterminacy with respect to the original category of the item that underwent the 'shift'. Whitman (1999) notes that the original person category cannot be shown definitively for some forms.

[2] Whitman also discusses empathy, but his argument is largely in conjunction with long-distance binding contexts.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



This question turns out to be the easiest to deal with under the approach of this study. Person categorical indeterminacy is expected from the beginning, because it maintains that the items in question are reflexives which are unspecified for person categories.

Based on the discussions of the present section, the next sections will examine diachronic development of *temae* '(lit.) in front of hands' which has been presented in previous studies as a case of intrapersonal pronoun shift (cf. Whitman 1999, Miwa 2000, 2005, Shibasaki 2005).

## 3. Case of *Temae* 'in front of hands'

Morphologically, *temae* consists of *te* 'hand' and *mae* 'front', and according to comprehensive dictionaries such as Nihon Kokugo Daijiten (Nihon Daijiten Kankokai 1972-1976), various nominal uses of *temae* are attested since the 12th century. In a literal sense, it meant 'in front of the speaker' or 'the area that is close to the speaker', but the extended uses such as 'one's skill (especially in the context of martial arts and tea-making)' and 'one's economic situation' were also attested.

Its use for person referents, on the other hand, is found primarily since the 17th century. It has been presented in previous studies such as Shibasaki (2005) as a form that shifted its category from the first to second person. However, this study argues that this view needs to be reexamined because the present study maintains that forms that underwent the alleged shift are actually reflexives. Therefore, it is expected that it can be used for both first and second person referents. Consider the following examples.

(3) [*temae* for first person] (Yotsuya Kaidan, Act 5, 1825)
Sate sate fuugana jyuukyo jya na. Iya, **temae** koto wa,
well well elegant house COP FP um temae thing TOP

kono atari ni jyuukyo itasu mono jya ga, …
this neighborhood in reside do.HUMBL person.HUMBL COP but

'Well, well, it is an elegant house. I (temae) also reside in the neighborhood, but ….'

(4) [*temae* for second person] (Yotsuya Kaidan, Act 3, 1825)
…Sorya **o-temae**, kore made nengoroni shita kahi ga nai toiumono.
then HP-temae this until closely did worth NOM not.exist COMP
'Well, if you (temae) say so, that would make our close relations up until now useless.'

As you can see in the above examples, *temae* is used for the first person in (3), but for the second person in (4). In (3) the speaker, in search of his missing hawk, refers to himself as *temae* in conversation with a woman at her house. In (4), on



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

the other hand, the speaker calls the addressee *temae* when responding to the remark made earlier by the addressee who indirectly asked for money from the speaker. Considering this indeterminacy with respect to person category and the fact that these examples are from the same text, it seems that the position of this study that *temae* is not a pronoun of a particular person category, but a reflexive unspecified for person is a more likely scenario than the view that *temae* was originally a first person form and later became a second person form. It should also be noted that *temae* is syntactically unbound in both examples.

The basic use of *temae* as a reflexive does not seem to change in Modern Japanese either where the form is generally considered as a second person pronoun. Consider the following examples.

(5) a. [*temae* for first person] (Neko, Chapter 9, 1905)
"Doomo soo, go-kenson de wa osoreiru.
well such HP-modesty COP TOP sorry

Kaette **temae** ga itamiiru."
on.the.contrary temae NOM be.ashamed

'Well, I feel sorry if you are being modest like that. It would make me (temae) feel ashamed.'

b. [*temae* for second person] (Botchan, Chapter 4, 1906)
**Temae** no warui koto wa warukatta to it-teshimaw-nai-uchi
temae NOM wrong thing TOP was.wrong COMP say-ASP-NEG-until

wa tsumi wa kie-nai mon da.
TOP guilt TOP vanish-NEG thing COP

'You guys, I thought to myself… Until you acknowledge that what you (temae) did was wrong, you're still guilty in my eyes.'

In (5a) the speaker designates himself as *temae* when he tries to persuade his friend's uncle to sit in the better part of the room (close to *tokonoma* 'alcove'). In (5b), thinking about the prank his students did to him, the protagonist teacher refers to his students as *temae*. Again, *temae* in the above examples is syntactically unbound.

However, contrary to the claim of this study that *temae* is a reflexive, it is the intuition of contemporary speakers that *temae* is a derogatory second person pronoun. Where does that intuition come from, since it can be used for both first and second person, as we saw above? I argue that the intuition comes from the Present-Day Japanese use of *temae* where it is mostly used as a derogatory term for the addressee, and the intuition of contemporary speakers is reasonable in that the item is usually pronounced as *temee* with some phonological weakening in



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Present-Day Japanese. It is not pronounced in this way when *temae* is given the first person or spatial interpretation, which opens the possibility that at least *temee* (phonologically reduced version), not *temae*, has semanticized as a contemptuous second person form.

## 4. Conclusion and Implications

In this paper, I argued that forms that allegedly underwent the shift between the first and second person should be seen as reflexives unspecified for a person category. This approach can account for why the 'shift' from the first to second person is much more common: both reflexives and first person pronouns are high in empathy, which makes the first person use or interpretation more frequent. There is another important issue to which the approach of this study can offer a possible solution. Some previous studies have suggested that there is a necessary connection between the shift of person categories and pragmatic depreciation of the item. That is to say, when the item shifts from the first to second person, it loses some politeness value toward the addressee. For example, Miwa (2000, 2005) proposes that pragmatic depreciation arises as a result of using a first person form which is associated with the speaker's self-belittlement or self-assertion for a second person referent. However, since he does not give a detailed account of his suggestion, it is not immediately clear how things of the opposite nature, namely self-belittlement and self-assertion, can yield the same effect of pragmatic depreciation. Similarly, Shibasaki (2005) claims that there is a necessary connection between the shift of person categories and pragmatic depreciation. In particular, Shibasaki argues that first person forms never shift to second person forms without pragmatic depreciation. His argument can be illustrated in the following example in which *ware* is used for both first and second person.

(6) [*ware* for first and second person] (Amakusa Isopo Monogatari, 16C) (Shibasaki 2005:172)
Isopo ga iu ni wa "**Ware** wa ningen de gozaru".
Isopo NOM say to TOP ware TOP human COP POL

Shanto ayasyuu iwa-ruru wa
Shanto suspiciously say-HON TOP

"**Ware** ni sore woba towa nu…"
ware to that ACC ask NEG

'Isopo said that, "I (ware) am mankind. " Shanto suspiciously said, "I don't ask you (ware) such an obvious thing."'

The first *ware* is used for the first person, and since it occurs with the polite marker *gozaru*, its use is not disrespectful for the addressee. The second *ware*, on



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

the other hand, is used for the second person, and its use is not polite, if not disrespectful, as can be seen in the lack of polite forms. Shibasaki presents (6) as a transitional example that captures the shift form the first person to second person as well as pragmatic depreciation that accompanies it. At first glance, it looks like the example conforms to his argument. However, it is not obvious why one should look at the above example as a case where a semanticized personal pronoun is being used for different person categories, since person categorical indeterminacy can be explained more naturally under the assumption that the item is not semanticized for a particular person category in the first place (i.e. reflexives). Additional evidence against the claim that there is a necessary relation between the shift of person categories and pragmatic depreciation comes from examples like (1) presented earlier where *ware* is used for the second person without pragmatic depreciation. That (1b) is addressed to a social equal's wife and that the humble form of the verb 'to say' is used suggest that *ware*, even though it is used for the second person, is not derogatory or 'lowering' (cf. Whitman 1999). These examples show that the so-called shift does not have to be accompanied by pragmatic depreciation.

Although there is no necessary connection between the shift and pragmatic depreciation, it is generally the case that many post-shift second person uses carry derogatory sense. The reflexive analysis can offer a possible solution to this problem too. Since this study maintains that the so-called shift is a reflection of reflexives being interpreted pragmatically as the first or second person depending on the context, the question to be asked within the present framework is: 'why is the second person interpretation of reflexives often derogatory?' Although the approach of this study does not predict that there is a necessary or inherent relation between the second person use of reflexives and pragmatic depreciation, it is able to offer an explanation as to why the second person use can be or come to be perceived to be derogatory. From the perspective of this study, the derogatory status of the second person interpretation is due to the discourse behavior of reflexives. Zubin, Chan, and Li (1990), and Li (1991) have demonstrated that reflexives in languages like Mandarin and Korean can be used to indicate self-objectification or self-reflection in discourse. The same can be said about the Japanese reflexive. Consider the following example where the syntactically unbound reflexive *jibun* is used for self-objectification.

(7) [unbound *jibun* for self-objectification] (Botchan, Chapter 6, 1906)

a. Gakkoo no shokuin ya seito ni kashitsu no aruno wa,
school GEN staff and student LOC mistake GEN exist TOP

b. minna **jibun** no katoku no itasu tokorode,
all self GEN lack.of.virtue NOM do CONJ

nanika jiken ga aru tabini,
some incident NOM exist every.time



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



c. **jibun** wa yoku korede koochoo ga tsutomaru kato
self TOP well this principal NOM can.serve COMP

hisokani zanki no nen ni taen ga,
secretly shame GEN feeling DAT cannot.stand but

d. fukoonishite konkai mo mata kakaru soodoo o hikiokoshitano wa,
unfortunately this.time also again like.this trouble ACC cause TOP

e. fukaku shokun nimukatte shazaishi nakerebanaran. […]
deeply you facing apologize must.do

'(a) As for the mistakes of school staff and students, (b) (they) are all the result of self's (jibun = my) lack of virtue, and every time there are some troubles, (c) self (jibun = I) secretly cannot help feeling the sense of shame that how (I) can serve as a principal like this, and (d) unfortunately, for the fact that (students) have again caused a trouble like this, (e) (I) must apologize to you sincerely. […]

(7) is uttered by the principal of a school (where the protagonist has just started working) at the teachers' meeting. The teachers are discussing mischief that some students have conducted in order to harass their newly arrived teacher from Tokyo (the protagonist). There are two instances of syntactically unbound *jibun*, one in (b) and the other in (c). It should be noted that in both instances, although the principal is speaking in front of other teachers, he gives the impression that the utterance is addressed not to other teachers, but to himself. In fact, the entire utterance is in a self-reflective state. This is shown by the striking fact that the speaker uses the first person deixis only twice and both of them are realized as a reflexive. By choosing a reflexive instead of personal pronouns whose function is to designate an entity as someone who is present in the speech situation, the school principal successfully achieves the rhetorical effect of self-reflection. If first person pronouns were used in (7), the sense of self-reflection would be lost. In other words, reflexives in (7) are used to objectify the speaker in his thought/speech. This clearly parallels the use of reflexives for self-objectification or in a self-reflective state in discourse that Zubin et al. (1990) and Li (1991) have demonstrated with regards to Mandarin and Korean. Generally speaking, if events are told from the perspective of someone, it is most likely to be from that of the speaker since obviously the speaker is most accessible to himself/herself. Because empathy is the speaker's identification with someone or something, it is easier for the speaker to empathize with himself/herself than with any other entity in the discourse.

What about reflexives for the second person? Li (1991:143-145) shows that syntactically unbound Mandarin reflexive *ziji* in interactional discourse can



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

function as an indication that the speaker is 'thinking for' the addressee or 'leading the addressee's thought'. This is illustrated in the following example.

(8) [Chinese reflexive *ziji* for 'leading addressee's thought'] (Li 1991:143-144)
a. Ni xiangxiang kan, zai zher gan xiaqu you shenmo yisi ne?
you think see at here work continue there.is what meaning FP

b. Zhe huor you lei, gongzi you di,
this job also tire salary also low

c. **ziji** nianling you zhemo da le,
self age also so old FP

d. zaodiar tuixiu zai jia bao sunzi duo hao a!
early a.little at home hold grandson so.much good FP

'(a) Think about it, what's there (to self) to continue working there? (b) The work load is heavy, and the pay is low, (c) and self (ziji = you) is already so old; (d) how much more fun it would be to retire a little early and play with (self's) grandson at home! …"

In the above example, the speaker is trying to persuade the addressee to retire from work. In doing so, the speaker empathizes with or takes the perspective of the addressee with the use of reflexive rather than a second person pronoun. Li (1991: 144) points out that the speaker is trying to think in the way addressee would think or in the way the speaker hopes the addressee would think. This is done through the use of reflexives which present an entity as someone who should be seen objectively rather than personal pronouns which highlight the status of an entity as someone who is present in the current speech situation. In other words, the speaker is thinking in a self-reflective mode for the addressee or inducing him/her to self-reflect. This use of reflexives in interactional discourse is what Li calls "leading the addressee's thought". It seems that this mechanism can be extended to a different function, namely sarcasm or criticism. By leading the addressee's thought, the speaker is able to induce the addressee to evaluate his/her thought/action objectively, thus being pragmatically perceived as a sort of criticism/sarcasm by the addressee. Therefore, in this context too, the referent of reflexive is necessarily non-first person. Consider the following example.

(9) (Yotsuya kaidan, Act 5, 1825)
Hiite kaera ba, saa kisama ga hik-e. Iya **temae** hiite ik-e.
pull return if EXCL you NOM pull-IMP no temae pull go-IMP
'If you are telling me to go back, you pull the leash of the dog. No, you (temae) pull it and go!'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



In (9) the speaker is clearly upset and bellicose, as can be seen in the use of imperatives. This example is particularly interesting in that the speaker first refers to the addressee by a second person pronoun *kisama* and later by a reflexive *temae*. According to the approach of the present study, this suggests that the speaker appeals to the addressee directly in the first half of the utterance by using the marker of the speech role of the addressee, and in the second half he is trying to lead addressee's thought or action by speaking of the way he hopes the addressee would act by the use of the reflexive. Or it is more appropriately characterized that the speaker is pushing the addressee to think and act in the way speaker wishes, thus the utterance gives the impression of criticism. This switch of an address term from a pronoun to a reflexive illustrates the dramatic effect of the derogatory use of a reflexive.

The account based on discourse behavior of reflexives does not state that there is a necessary relation between the post-shift second person use and pragmatic deprecation, since there is nothing inherently derogatory about empathizing with the addressee or taking the perspective of the addressee. For example, in (8) and (1b), Chinese *ziji* and Japanese *ware* are used for the second person in a non-derogatory way: see also (4) in which *temae* for the second person is modified by the polite prefix *o*-. However, the approach of this study is also able to offer a possible explanation as to why many instances of reflexives for the second person carry derogatory sense. It comes from their discourse use for leading the addressee's thought. Therefore, unlike previous studies such as Miwa (2000, 2005) and Shibasaki (2005) who argue for a necessary relation between the shift and pragmatic depreciation, this study can account for both derogatory and non-derogatory use for the second person.

## References

Kuno, Susumu. 1972. Pronominalization, Reflexivization, and Direct Discourse. *Linguistic Inquiry* 3: 161-195.

Kuno, Susumu. 1987. *Functional Syntax: Anaphora, Discourse, and Empathy*. Chicago: University of Chicago Press.

Kuno, Susumu. 2004. Empathy and Direct Discourse Perspectives. In Lawrence Horn and Gregory Ward, eds., *The Handbook of Pragmatics*, 315-343. Malden, MA: Blackwell.

Kuno, Susumu, and Etsuko Kaburaki. 1977. Empathy and Syntax. *Linguistic Inquiry* 8: 627-672.

Li, Naicong. 1991. Perspective-Taking in Mandarin Discourse. Ph.D. diss., State University of New York at Buffalo.

Miwa, Masahi. 2000. *Ninshoshi to keigo [Personal Pronouns and Honorifics]*. Kyoto: Jinbunshoin.

Miwa, Masahi. 2005. *Ichininsho nininsho to taiwa [First/second person and dialogue]*. Kyoto: Jinbunshoin.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Nihon Daijiten Kankokai. 1972-1976. *Nihon Kokugo Daijiten*, 21 vols. Tokyo: Shogakkan.

Shibasaki, Reijirou. 2005. Personal Pronouns and Argument Structure: Discourse Frequency, Diachrony and Typology. Ph.D. diss., University of California, Santa Barbara.

Vovin, Alexander. 2003. *A Reference Grammar of Classical Japanese Prose*. New York: RoutledgeCurzon.

Whitman, John. 1999. Personal Pronoun Shift in Japanese: A Case Study in Lexical Change and Point of View. In A. Kamio, K. Takami and S. Kuno, eds., *Function and Structure: In Honor of Susumu Kuno*, 357-386. Philadelphia: John Benjamins.

Zubin, David, A., Soon Ae Chun, and Naicong Li. 1990. Misbehaving Reflexives in Korean and Mandarin. In Kira Hall, Jean-Pierre Koenig, Michael Meacham, Sondra Reinman, and Laurel A. Sutton, eds., *Proceedings of the Sixteenth Annual Meeting of the Berkeley Linguistics Society*, 338-352. Berkeley: Berkeley Linguistics Society.

Osamu Ishiyama
Ball State University
Department of Modern Languages and Classics
North Quad 138
Muncie, IN 47306

oishiyama@bsu.edu

University at Buffalo – SUNY
Department of Linguistics
609 Baldy Hall
Buffalo, NY 14260

oi2@buffalo.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Event Integration Patterns in Sidaama (Sidamo)[1]

KAZUHIRO KAWACHI
*Research Institute for Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies, and Meiji Gakuin University*

## 0. Introduction

This study examines how Sidaama (Sidamo), a Cushitic language of Ethiopia, expresses components of different types of events to test Talmy's (1985, 1991, 2000) typological hypotheses concerning event integration. It shows that although this language clearly exhibits the verb-framed language pattern in the event domains of motion, state change, and realization, it does not clearly exhibit this pattern in the domains of temporal contouring and action correlation.

The paper is organized as follows. Section 1 reviews Talmy's typology of event integration. Section 2 describes the ways that Sidaama expresses the different types of events that are relevant to this typology. Section 3 discusses the issues that the findings of the present study raise. Section 4 concludes the paper.

## 1. Literature Review

According to Talmy (1991, 2000), the cognitive process of event integration is the conceptual integration or conflation of an event as unitary that, more analytically, would be conceptualized as complex; in language, this process emerges as the expression of an event in a single clause that, more analytically, would be expressed by means of a more complex syntactic structure. Talmy argues that although languages can differ as to what can be conceptualized as single events and expressed in a single clause, there is a class of events that tend to be recurrently conceptualized as macro-events and expressed in single clauses across

[1] I would like to express my sincere thanks to Dr. Abebayehu Aemero Tekleselassie (K'eweena dialect) for the consultation sessions and discussions on various aspects of Sidaama over the years, and to Sileshi Workeneh (Alatta dialect), Solomon Shaamanna (Alatta dialect), and Yehualaeshet Aschenaki (K'eweena dialect) for being my consultants during my fieldwork in the Sidaama zone in March 2008. I am profoundly grateful to Dr. Leonard Talmy, Dr. Matthew S. Dryer, and Dr. Jürgen Bohnemeyer for their advice and comments on earlier versions of the present paper. Many thanks also go to Justin Boffemmyer for his valuable comments on this paper.

List of Abbreviations. ALL: Allative, CNN, Connective, COM: Comitative, EMPH: Emphatic, EP: Epenthetic vowel, INF: Infinitive, LV: Lengthened vowel.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



languages. A macro-event is made up of two major components, a framing event and a co-event, as well as the support relation (e.g. manner, cause) of the co-event to the framing event. The framing event, which is the main event of a macro-event, constitutes the schematic component of the macro-event, and has a framing function relative to the macro-event. It "provides for the whole macro-event the overarching conceptual framework or reference frame within which the other included activities are conceived of as taking place", and represents "the upshot — relative to the whole macro-event" in the sense that "it is the framing event that is asserted in a positive declarative sentence, that is denied under negation, that is demanded in an imperative, and that is asked about in an interrogative"; moreover, it determines the overall temporal and spatial frameworks, the argument structure, and the syntactic complement structure (Talmy 2000:219).

The framing event consists of a figural entity, a ground entity, an association function, which associates the figural entity to the ground entity, and an activation process, which has the value of transition or fixity. The association function constitutes a core schema by itself (or together with the ground entity). Except for a realization event, which always requires an agent, a macro-event may or may not include an agent; if included in a macro-event, the agent might cause the framing event, the co-event, or both.

According to Talmy's typology of event integration, there are two major typological types, verb-framed languages (V-languages) (e.g. Romance languages) and satellite-framed languages (S-languages) (e.g. Germanic languages). V-languages typically encode the core-schematic component of a framing event in the predicate verb (framing verb), and express a co-event component (e.g. a specific manner) in an adverbial subordinate clause (or a non-predicate verb), whereas S-languages characteristically use a satellite (framing satellite) to express the core-schematic component of a framing event, and encode the co-event component in the verb root. This contrast applies not only in the event domain of motion, but also in four other domains: state change, realization, temporal contouring, and action correlation.

As mentioned above, the core schema of a framing event is called the association function, which associates the figure entity with the ground entity. (1) (adapted from Talmy 2000:214) lists the association function of each type of event in square brackets (i.e. [ ]). In an S-language, the association function is expressed with a satellite, whereas the co-event is expressed with a predicate verb, as shown in the English examples of each of the five event domains after the square brackets in (1), where the satellite is in italics.

(1) a. motion [association function: path] e.g. *The ball rolled **in***.
b. state change [association function: transition type (entry into a state, departure from a state, lack of transition)] e.g. *The candle blew **out***.
c. realization [association function: (confirmation of the implicature of) the fulfillment of the agent's goal] e.g. *The police hunted the fugitive **down***.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



d. temporal contouring [association function: aspect (e.g. continuation, completion, repetition)] e.g. *They talked **on***.
e. action correlation [association function: correlation of one action with respect to another] e.g. *I sang **along** with him*.

In a V-language, on the other hand, the association function is expressed by a predicate verb, whereas the co-event is expressed by a non-predicate verb or adverbial.

There are many single-language and cross-linguistic studies on motion (e.g. Aske 1989, Slobin 1996, Im 2001, Brown 2003, Zlatave & Yangklang 2003, Bohnemeyer et al. 2007)[2] and some studies on state change and realization (e.g. Levin & Rappaport Hovav 1996) that have used or tested Talmy's typology of event integration, but there seem to be few studies that have been conducted in terms of his typology specifically on expressions of temporal contouring and action correlation in a particular language or across languages aside from his own research. Moreover, there seem to be no studies that have looked at any Cushitic languages under this framework. Thus, the present study is novel in that what it examines are the patterns of expressing all five event domains in an African language.

## 2. Event Integration Patterns in Sidaama

Sidaama is a Highland East Cushitic language spoken in South Central Ethiopia (Kawachi 2007). The case system of this language is accusative. It is a verb-final language whose word order is predominantly SOV, and uses suffixation (and also suprafixation for marking some grammatical cases).

This language has two types of multi-verb constructions. One is the temporal sequence construction, which takes the form V1-PERS-*e* V2 (or less commonly, forms with more than two non-predicate verbs), where the non-predicate verb takes (or the non-predicate verbs each take) the connective suffix *-e* as well as a person suffix, and the predicate verb takes another type of person suffix and the aspect suffix (and the gender suffix as well in the case of the first- and second-person singular).[3] This construction is used to indicate that the event component expressed by the non-predicate verb precedes (or those expressed by the non-predicate verbs precede) that expressed by the predicate verb. The other type of construction has the form, V1-PERS-*a*-*nni* V2, where the non-predicate verb takes the infinitive suffix *-a* and the manner/concomitance or instrumental suffix *-nni* in addition to the same type of person suffix as the one used for the

[2] However, despite their large number, even studies on motion tend to include only the manner of motion (and sometimes the cause of motion, at most) in the relation of a co-event to the framing event in a motion macro-event, and to argue against the essence of Talmy's typology with minor counterexamples from manner of motion expressions without taking any other type of co-event into consideration.

[3] Henceforth, the temporal sequence construction will be treated as if it always had only two verbs, V1 (the non-predicate verb) and V2 (the predicate verb).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



non-predicate verb in the temporal sequence construction, and the predicate verb takes another type of person suffix and the aspect suffix (and the gender suffix as well for the first- and second-person singular). It has one of the following three interpretations, depending on the combination of the types of the verbs used: (i) the manner/concomitance interpretation ('V2 with the manner or concomitance of V1'), (ii) the extended causation interpretation ('V2 by doing V1 continuously'), or (iii) the 'while' interpretation ('while V1, V2').

The present section shows that Sidaama clearly exhibits the V-language pattern in expressing motion, state change, and realization events, but it often does not follow this pattern in expressing temporal contouring and action correlation events. Note that what is of concern here is what grammatical categories Sidaama uses to express the different components of the five types of events, and neither the question of the definition of a macro-event nor that of single-clausehood in Sidaama are brought up, though they are very important issues (see Kawachi 2007).

### 2.1. Motion

Sidaama basically shows the V-language pattern in expressing motion macro-events. Either of the multi-verb construction types can be used where V1 expresses a co-event and V2 expresses a path. Which construction is used depends on the type of co-event. When the co-event is a manner of motion, although there are limited cases where manner of motion verbs can take path expressions directly without any path of motion verb (Kawachi 2007, in press), either of the two constructions can usually be used with almost no difference in meaning in most cases, as in (2), except that the manner tends to be more emphasized in the manner/concomitance construction than in the temporal sequence construction.

(2) kaase min-i giddo-ra
ball(NOM.F) house-GEN.M inside-ALL

{ a. gongo'm-i-t-e
roll-EP-3SG.F-CNN
b. gongo'm-i-t-a-nni
roll-EP-3SG.F-INF-MANNER } e'-'-ino.
enter-3SG.F-PERF.3

'The ball rolled into the cave.' (Lit. a. 'The ball rolled and entered the house.' / b. 'The ball entered the house, rolling.')

When the co-event is in a concomitance relation to the framing event of motion, one of the multi-verb constructions in which V2 is a path of motion verb is used depending on the type of V1, which expresses the cause of motion; the manner/concomitance construction is used if V1 is an action verb (e.g. 'to whistle' in 'He passed by me, whistling.'), and the temporal sequence construction is used if V1 is a state-change verb (e.g. 'to lean' in 'He left, with his body leaning to one side.'). For a motion event where the co-event has the relation of a cause to the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

framing event (e.g. 'She kicked the ball across the field.'), the temporal sequence construction with the cause of motion expressed by V1 and the path expressed by V2 is often used, but if such a motion event involves extended causation (e.g. 'She kicked the ball across the field.' when her kicking the ball continues across the field), the extended causation construction is used. When the co-event is in a precursion (e.g. 'I locked him in the house.') or enablement (e.g. 'He opened the door, and entered.') relation to the framing event of motion, the temporal sequence construction is often used, where the co-event appears in V1 and the path in V2.

Whatever relation the co-event bears to the framing event, and whichever of the two types of constructions is used for a motion event, V2 normally expresses the path. Thus, Sidaama basically follows the V-language pattern with respect to this event type.

### 2.2. State Change

Sidaama also clearly shows the V-language pattern in state change expressions. It expresses the core schema (with the association function being a transition type and the ground entity being the changed property) with a predicate verb, and a co-event often expressed by V1 of one of the multi-verb constructions, as in (3a), (4a), and (4b), or occasionally with an adjunct, as in (3b).

(3)

| | | | |
|---|---|---|---|
| šaam-u | a. | t'aw-ø-e | ba'-ø-ino. |
| | | burn-3SG.M-CNN | disappear-3SG.M-PERF.3 |
| candle-NOM.M | b. | bubbe-te-nni | t'o-ø-ino. |
| | | wind-GEN.F-INST | go.out-3SG.M-PERF.3 |

a. 'The candle burned out.' (Lit. 'The candle burned and disappeared.')
b. 'The candle blew out.' (Lit. 'The candle went out by the wind.')

(4)

| | | | |
|---|---|---|---|
| isi | uddanó | a. | huunč'-ø-e |
| | | | squeeze-3SG.M-CNN |
| 3SG.M.NOM | clothes(ACC) | b. | huunč'-ø-a-nni |
| | | | squeeze-3SG.M-INF-INST |

mool-s-ø-ino.
become.dry-CAUS-3SG.M-PERF.3
a. 'He squeezed the clothes (usually, one time), and then dried them.'
b. 'He dried the clothes by squeezing them (multiple times at certain intervals).'

### 2.3. Realization

Also for realization events, which Talmy (2000:271) points out could be regarded as a special type of (agentive) state change events, Sidaama basically follows the V-language pattern. It usually uses the temporal sequence construction, where V2 expresses the association function of the fulfillment of the agent's goal or the confirmation of its implicature, and V1 expresses the co-event of its cause. For example, in (5), the agent's action of hunting, which does not imply the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

fulfillment of the goal, appears as V1, and the fulfillment of his intention to catch the thief is expressed in V2.

(5) isi mooranč́ó ugaat'-ø-e amad-ø-ino.
3SG.M.NOM thief(ACC) hunt-3SG.M-CNN catch-3SG.M-PERF.3
'He hunted the thief down.' (Lit. 'He hunted for and caught the thief.')

### 2.4. Temporal Contouring

The semantic domain of temporal contouring consists of various aspectual categories. Sidaama may use framing verbs for (i) completion/termination and (ii) initiation, but not for (iii) continuation, (iv) habitualness, (v) repetition, (vi) gradualness, or (vii) frequency. In a macro-event in any of these categories, the support relation that the co-event has in relation to the framing event is "a constitutive relation, in effect 'filling in' the conceptual region outlined by the temporal contour" (Talmy 2000:232).

(i) Completion/termination: There are a few verbs for completion/termination that are used as V2 of the temporal sequence construction; the transitive verbs, *gud-* 'to finish (doing a bounded action)' and *ka'-* 'to finish (doing an unbounded action)', often serve as framing verbs, and the intransitive verb, *goof-* 'to come to an end (often, after consumption)', may also be used this way in some contexts. There is also a verb of (usually, permanent) termination, *agur-* 'to stop doing', that takes the infinitive form. The completion of an action or state change can also be expressed by two types of perfective suffixes on the verb, which are interchangeable with each other without any difference in meaning in most cases when attached to predicate verbs, and do not differ very much except that one is more likely to be used than the other when the completion is relatively close to the moment of utterance.

(ii) Initiation: Sidaama can use a verb of initiation borrowed from Amharic, *ǰammar-* 'to start to do', which takes the infinitive form. There is also a construction that is used for the initiation sense of 'to be about to do'; it takes the form of V-*a*-PERS(-GENDER)-*ra* or V-PERS-*a*-*ra*, where a verb is accompanied by the infinitive suffix *-a*, the person suffix, (the gender suffix), and the dative suffix *-ra*. This infinitive-dative form of a verb can be followed by the verb *ka'-*, which is also used for completion or termination, as mentioned above, or the noun-phrase clitic *=ti*, to express 'be about to do'. It can also be followed by the verb *y-* 'to say' with the person suffix and the infinitive suffix in a subordinate clause ending with the suffix *-nni* 'while' or the clitic *=nna* 'and, while' to express 'when someone/something is about to do (something)'. Sidaama also has one verb that lexicalizes initiation: *t'int-* 'to start to build a house/plait a basket', though it is used exclusively for one of these two actions, and takes as its object either of the nouns, *mine* 'house' or *saffe* 'savanna grass container', but not any other noun.

(iii) Continuation: Continuation can be expressed with aspectual constructions or with lexical verbs. The two aspectual constructions, the continuous aspect



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



construction ('have been doing something/in a state') and the present progressive construction (with an action verb: 'be doing something'), both use the existential/locational verb as V2 of the temporal sequence construction and the manner/concomitance construction, respectively. Sidaama also has three verbs that lexicalize continuation: *hos-* 'to spend all day doing', *gal-* 'to spend all night doing', and *keešš-* 'to stay long in one place doing', which are each often used as V2 of the temporal sequence construction. Nevertheless, continuation per se is not expressed by a framing verb.

(iv) Habitualness: There is no verb root that conveys habitualness. This aspectual notion is expressed with the imperfect suffix on the verb (e.g. *insa adó ag-g-anno* [3PL.NOM milk(ACC) drink-3PL-IMPERF.3] 'They (habitually) drink milk.'), an adverbial like the following, or both: *duučča wote* [all time] 'every day, all the time', *wo'ma-nka wote* [all-EMPH time] 'always', *wo'ma-nka yanna/duučča-nka yanna* [all-EMPH time] 'always', *barro barr-u-nni* [day day-GEN.M-INST] 'every day', *duučča(-nka) barra* [all(-EMPH) day] 'every day', *hašša hašša* [evening evening] 'every evening', *hašša hašš-u-nni* [evening evening-GEN.M-INST] 'every evening', *dir-u duučča* [year-GEN.M all] 'every year', *dir-u baala* [year-GEN.M total] 'every year'.

(v) Repetition: Repetition can be expressed by the verb *hig-* 'to return' or *k'ol-* 'to turn, return' used as the non-predicate verb of the temporal sequence construction (*hig*-PERS-*e* or *k'ol*-PERS-*e* 'again'), by its reduplication (*hig*-PERS-*e hig*-PERS-*e* or *k'ol*-PERS-*e k'ol*-PERS-*e* 'again and again'), or by the reduplicated form of the verb *rak-* 'to hurry' used as the non-predicate verbs of the temporal sequence construction (*rak*-PERS-*e rak*-PERS-*e* 'again and again'). There is also an idiomatic adverbial for 'one after another': *aana aana-ho* [top top-LOC.M]. In any of these cases, the repeated action, that is, the co-event of repetition, appears as the predicate verb.

The repetition of an action might also be expressed by the reduplication of a verb (e.g. *šaf-* 'to shake'/*šaššaf-* 'to shake repeatedly', *gan-* 'to hit'/*gangan-* 'to beat'). In this case, the repeated action is expressed by the verb root, while the repetition is indicated by the morphological process of reduplication.

(vi) Gradualness: When the verb is a state change verb, gradual state change ('be in the process of entering a state') can be expressed in the present-progressive aspect construction, which uses the existential/locational verb as V2 of the manner/concomitance construction and a state change verb as its V1. Gradualness can also be expressed by an adverbial that is in the form of V1 of the temporal sequence construction (*sununni (sununni) y-/ass-/ikk*-PERS-*e* [slowly (slowly) say-/do-/become-PERS-CNN] 'gradually', *šiima šiima ass*-PERS-*e* [small small do-PERS-CNN] 'gradually') or an oblique NP adverbial (e.g. *yanna yanna-te-nni* [time time-GEN.F-ABL] 'gradually', *bero-nni tečču* [yesterday-ABL today] 'gradually', *aana aana-ho* [top top-LOC.M] 'one after another' (for a state-change of a group of objects)). Although Sidaama has a large class of state change verbs, the gradualness of a change is not expressed by a verb root.

(vii) Frequency: Sidaama has adverbials for different levels of frequencies of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

actions (*yanna yanna-te-nni* [time time-GEN.F-ABL] 'from time to time', *horonta/horonka/horñanka/takkonta* 'never', *duučča-nka-wote/wo'ma-nka-wote* [all-EMP-time] 'frequently, almost always'). It can also reduplicate the form of the verb *sa'-* 'to pass' used as the non-predicate verbs of the temporal sequence construction to express 'sometimes' (*sa'*-PERS-*e sa'*-PERS-*e* [pass-PERS-CNN pass-PERS-CNN]). In either case, the co-event, namely the action depicted as occurring with a particular frequency, appears in the predicate verb.

### 2.5. Action Correlation

The event category of action correlation concerns what Talmy (2000:253) calls 'coactivity', where one Agent performs an activity in correlation with a (usually) same-category action performed by another entity, an Agency (either animate or inanimate). As in a macro-event of temporal contouring, with action correlation, the co-event is in a constitutive support relation to the framing event, where the figure is the Agent's action, the ground is the Agency's same or same-category action (or the Agency's complementary action in the case of 'demonstration'), and the association function is the correlation of one action with respect to another. There are five subtypes of action correlation: 'concert' ('act in concert with NP at V-ing'), 'accompaniment' ('act in accompaniment of/as an adjunct to, accompany/join (in with) NP at V-ing'), 'imitation' ('V in imitation of NP, imitate/copy NP at V-ing'), 'surpassment' ('surpass/best/beat NP at V-ing'), and 'demonstration' ('demonstrate to NP one's V-ing'). In the first four, the Agent and the Agency perform the same or same-category actions, whereas in 'demonstration', they perform different-category actions.

Out of the five action correlation categories, Sidaama deviates from the V-language pattern in expressing four of them, (i) concert, (ii) accompaniment, (iii) imitation, and (iv) surpassment, though it uses a predicate verb for the other category, (v) demonstration.

(i) Concert: The action correlation notion of concert, where the Agent and the Agency are both engaged in a joint activity, each making a contribution of equal importance to the whole, is expressed, not by a framing verb, but by an oblique NP constituent, as in (6) and (7a), or by an idiomatic expression, as in (7b), that serves as V1 of the temporal sequence construction.

(6)

| | | | |
|---|---|---|---|
| ise | isí ledo | sirb-i-t-ino. | |
| 3SG.F.NOM | 3SG.M.GEN COM | sing-EP-3SG.F-PERF.3 | |
| | ledo-si | | |
| | COM-3SG.M.POSS | | |

'She sang together with him.'

(7)

| | | | |
|---|---|---|---|
| ise = nna | isi | a. mitte-e-nni | dikkó |
| 3SG.F.NOM=and | 3SG.M.NOM | one.F-LV-INST | market(OBL) |
| | | b. ikk-i-t-e | |
| | | become-EP-3PL-CNN | |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

haɗ-ɗ-ino.
go-3SG.L-PERF.3
a. & b.: 'She and he went to the market together.'

(ii) Accompaniment: Sidaama does not have any expression that is devoted to the notion of accompaniment, where the Agent's action is secondary or additional to the Agency's action. For this category, a construction using the comitative noun *ledo* such as in (6) may be casually used, or a two-clause construction with the conjunctive clitic =*nna*, where the Agency's action expressed in the subordinate clause serves as the ground, may be used as in (8). Thus, the construction as a whole can be regarded as expressing accompaniment, but the co-event appears in the verb of the main clause.

(8) ise dod-d-a=nna isi=no dod-ø-ino.
3SG.F.NOM run-3SG.F-INF=while 3SG.M.NOM=also run-3SG.M-PERF.3
'While she ran, he also ran.'

Sidaama does not have a verb that specifically refers to 'to join'. The verb *t'aad-* 'to meet, join' could be used, but the event may be interpreted as the Agent's meeting with the Agency or the Agent's joining with the Agency.

(iii) Imitation: The framing event of imitation also appears in an adverbial rather than in a predicate verb. The verb *ikk-* 'to become' is used as V1 of the temporal sequence construction to literally mean 'X becomes Y, and V2', as in (9).

(9) isi isé ikk-ø-e sirb-ø-ino.
3SG.M.NOM 3SG.F.OBL become-3SG.M-CNN sing-3SG.M-PERF.3
'He sang in the imitation of her.' (Lit. 'He became her, and sang.')

Although the verb *ikk-* could be used as a predicate to express one entity's equality or similarity with another (e.g. *isi isé ikk-ø-ino.* [3SG.M.NOM 3SG.F.OBL become-3SG.M-PERF.3] 'He became equal/similar to her (with respect to e.g. height, behavior, appearance, wealth, etc.).'), Sidaama does not have any construction that uses a verb for imitation as a predicate.

(iv) Surpassment: For a type of surpassment, Sidaama can follow the V-language pattern; it can use the temporal sequence construction in which V2 expresses the schematic core of the framing event of surpassment and V1 expresses a co-event, as in (10). However, this is limited to a racing context.

(10) ise isó daak-k-e k'olč-i-t-anno.
3SG.F.NOM 3SG.M.ACC swim-3SG.F-CNN outdistance-EP-3SG.F-IMPERF.3
'She swims faster than him.' (Lit. 'She swims and outdistances him.')

In other contexts, Sidaama does not follow the V-language pattern. As in (11), the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

notion of surpassment shows up as an adverbial or V1 of the temporal sequence construction, and a co-event appears as the predicate verb.

(11) ise 3SG.F.NOM { a. insá 3PL.GEN.F ale-e(-nni) aboveness-LV(-LOC) (ass-i-t-e) (do-EP-3SG.F-CNN) / b. insá-nni 3PL.GEN.F-ABL roor-s-i-t-e exceed-CAUS-EP-3SG.F-CNN } sagalé food(ACC) k'iš-š-anno. cook-3SG.F-IMPERF.3
'She cooks better than them.' (Lit. a. 'She (does) above them (and) cooks food.' / b. 'She exceeds them and cooks food.')

(v) Demonstration: For the framing event of demonstration, Sidaama has two verbs that can be used as predicates: *ros-i-s-* [learn-EP-CAUS-] 'to teach, show (for the purpose of teaching)' and *leell-i-š-* [become.visible-EP-CAUS-] 'to show, demonstrate'. They are used as in (12), and neither of them uses either of the multi-verb constructions.

(12) ise isó/isí-ra hiitto
3SG.F.NOM 3SG.M.ACC/3SG.M.GEN-DAT.PRON how
sirb-i-n-a-nni-gede sing-EP-how.to-INF-INST-like { leell-i-š-š-ino. become.visible-EP-CAUS-3SG.F-PERF.3 / ros-i-s-s-ino. learn-EP-CAUS-3SG.F-PERF.3 }
'She demonstrated to him how to sing.'

## 3. Discussion

As described in the previous section, Sidaama clearly shows the V-language pattern in the three event domains of motion, state change, and realization, but often does not in the other two event domains of temporal contouring and action correlation. There are different factors that might contribute to such a deviation of this language from the typological pattern.

First, though not as sharp as in Sidaama, similar deviations are found at least in Japanese and Korean, and Sidaama might constitute a subtype of V-languages with these languages, differently from Romance languages, which Talmy demonstrates exhibit the V-language pattern in all five domains. For example, Japanese normally does not use a framing verb for the temporal contouring categories of habitualness, gradualness, and frequency, or for the action correlation categories of concert and surpassment, though it may use a framing verb for other categories of temporal contouring and action correlation. Talmy's findings on the V-language pattern in expressing temporal contouring and action correlation are based mainly on Romance languages, and it might be possible that other subtypes of V-languages do not necessarily follow the V-language pattern in expressing events in these domains.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Second, the deviation of Sidaama and other languages from the V-language pattern in the semantic domains of temporal contouring and action correlation may be due to the diversity of their categories. These semantic domains are miscellaneous (for example, the figure and ground entities in these semantic domains vary depending on the category, unlike in the other three semantic domains), though the co-event is invariantly constitutiveness, and the categories of each of the semantic domains might differ as to how the typological difference is relevant; in other words, languages may be more likely to show the V-language pattern in some categories of these semantic domains than in others.

Third, the deviation may occur because the framing events of the two semantic domains are too abstract. Compared to the framing events of motion, state-change, and realization, those of temporal contouring and action correlating seem to be very abstract, perhaps to the extent that it is difficult to represent "the upshot — relative to the whole macro-event" (Talmy 2000:219) without a co-event expressed. In the case of motion, state-change, and realization, the expression of the framing event, as in the English examples *The ball went down. / The candle went out. / The police captured the fugitive.*, by itself, can be a complete description of what has happened, even if no co-event is mentioned at all. On the other hand, in the case of temporal contouring and action correlating, the expression of the framing event alone cannot be an informative description of what has happened, when used out of context, as in the English examples *She continued (to do something). / She finished (doing something). / She did (something) together/along with him. / She did (something) in the imitation of him.* Thus, a co-event needs to be mentioned to convey the upshot of the whole event. In other words, the existence of a co-event is required in these event categories. As an obligatorily used constituent, a verb may be used for this purpose. If a verb is employed for the co-event, a non-verbal constituent can appear to express the framing event. An S-language can do this easily with a satellite. On the other hand, a V-language may have to express the framing event with an adverbial or a non-predicate verb of a multi-verb construction, and deviate from the prototypical V-language pattern.

Nevertheless, all these are mere speculation, and detailed research on other V-languages is awaited.

## 4. Conclusion

As shown so far, although it follows the V-language pattern described by Talmy closely in expressing the event domains of motion, state change, and realization, Sidaama deviates from this pattern in its expressions of some types of temporal contouring and of most types of action correlation, just as at least a few other languages that are also classified as V-languages do. An investigation of how other V-languages express temporal contouring events and action correlation events might make it possible to find further typological sub-classification.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



**References**

Aske, Jon. 1989. Path Predicates in English and Spanish: A Closer Look. *Proceedings of the 15th Annual Meeting of the Berkeley Linguistics Society*, 1-14. Berkeley: Berkeley Linguistics Society.

Bohnemeyer, Jürgen, Nicholas J. Enfield, James Essegbey, Iraide Ibarretxe-Antuñano, Sotaro Kita, Friederike Lüpke, and Felix K. Ameka. 2007. Principles of Event Segmentation in Language: The Case of Motion Events. *Language* 83(3): 495-532.

Brown, Penelope. 2003. Position and Motion in Tzeltal Frog Stories: The Acquisition of Narrative Style. In Strömqvist, Sven, and Ludo Verhoeven, eds., *Relating Events in Narrative, Volume 2: Typological and Contextual Perspectives*, 37-57. Mahwah, NJ: Erlbaum.

Im, Sung-chool. 2001. *Typological Patterns of Motion Verbs in Korean.* Ph.D. diss., University at Buffalo, State University of New York.

Kawachi, Kazuhiro. 2007. *A Grammar of Sidaama (Sidamo), a Cushitic Language of Ethiopia.* Ph.D. diss., University at Buffalo, State University of New York.

Kawachi, Kazuhiro. In press. Manner of Motion Verbs in Sidaama and Boundary Crossing. *Proceedings of the 43rd Annual Meeting of the Chicago Linguistic Society (2007), Volume 2: Panels*. Chicago: Chicago Linguistic Society.

Levin, Beth, and Malka Rappaport Hovav. 1996. Lexical Semantics and Syntactic Structure. In Shalom Lappin, ed., *The Handbook of Contemporary Semantic Theory*, 487-507. Oxford: Blackwell.

Slobin, Dan I. 1996. Two Ways to Travel: Verbs of Motion in English and Spanish. In Masayoshi Shibatani and Sandra A. Thompson, eds., *Grammatical Constructions: Their Form and Meaning*, 195-220. Oxford: Clarendon Press.

Talmy, Leonard. 1985. Lexicalization Patterns. In Timothy Shopen, ed., *Language Typology and Syntactic Description, vol.3: Grammatical Categories and the Lexicon*, 57-149. Cambridge: Cambridge University Press.

Talmy, Leonard. 1991. Path to Realization: A Typology of Event Conflation. *Proceedings of the 17th Annual Meeting of the Berkeley Linguistics Society*, 480-519. Berkeley: Berkeley Linguistics Society.

Talmy, Leonard. 2000. *Toward a Cognitive Semantics, Volume II: Typology and Process in Concept Structuring.* Cambridge, MA: MIT Press.

Kazuhiro Kawachi
Research Institute for Languages and Cultures of Asia and Africa,
Tokyo University of Foreign Studies
3-11-1 Asahi-cho, Fuchu-shi, Tokyo 183-8534

Meiji Gakuin University
1518 Kamikurata-cho,
Totsuka-ku, Yokohama-shi
Kanagawa 244-8539 Japan

kazuhirokawachi@gmail.com, kazuhirokawachi@hotmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Modification within a Noun Phrase in Sidaama (Sidamo)[1]

KAZUHIRO KAWACHI[i] and ABEBAYEHU AEMERO TEKLESELASSIE[ii]
[i] *Research Institute for Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies, and Meiji Gakuin University*
[ii] *George Washington University*

## 0. Introduction

This study shows that the notion of modification within a noun phrase in Sidaama (Sidamo), a Cushitic language of Ethiopia, is often somewhat different from this notion as traditionally used in linguistics. In this language, although there are a few cases where modification in its ordinary sense, which is syntactic, is relevant, a grammatical distinction is made in several portions of the grammar in terms of whether or not a noun is Modified (henceforth, Modified and related words such as Unmodified, Modify, Modification, and Modifiers are capitalized for Sidaama grammar) by the possessive pronominal suffix, as well as a syntactic modifier like an adjective, a numeral, an adnominal demonstrative, an adnominal interrogative, a genitive noun phrase, and a relative clause.

The paper is organized as follows. Section 2 briefly discusses how the notion of modification is used in linguistics. Section 3 describes the ways in which Sidaama makes a distinction between Modified and Unmodified common nouns in noun phrases. Section 4 looks at constructions in other languages that appear to make distinctions in terms of modification to examine whether any of them are similar to the Modification distinction in Sidaama. Section 5 concludes the paper.

[1] We would like to express our sincere thanks to Matthew S. Dryer, Leonard Talmy, and Jürgen Bohnemeyer for their advice on a study on which portions of the present paper are based (Kawachi 2007). Our many thanks also go to Sileshi Workeneh, Solomon Shaamanna, and Yehualaeshet Aschenaki for being the first author's consultants during his fieldwork in the Sidaama zone in March 2008, to Abdi Hajikandi for his comments on Persian forms, and to Justin Boffemmyer and Ichiro Yuhara for their comments on portions of earlier versions of this paper. We would also wish to convey profound gratitude to the audience at BLS, especially, Bernard Comrie, Larry Hyman, and George Bergman, for their comments and discussions.

List of Abbreviations. [ACC]: Accusative (marked with the suprafix), (ACC): Accusative (not marked with the suprafix), ALL: Allative, EP: Epenthetic vowel, EZ: Ezafe suffix, [GEN]: Genitive (marked with the suprafix), (GEN): Genitive (not marked with the suprafix), MOD: Modified, NPC: Noun-phrase clitic, [OBL]: Oblique (marked with the suprafix), UMD: Unmodified.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Kazuhiro Kawachi and Abebayehu Aemero Tekleselassie

## 1. The Notion of Modification in Traditional Terms in Linguistics

When a non-polysynthetic language is dealt with, in traditional terms, modification within a noun phrase means the attribution of a property to or the restriction of the meaning of the head noun by using another syntactic constituent within that noun phrase. It is a syntactic notion, and excludes the morphological notion of affixation. Thus, an affix bound to a noun, which is not a syntactic constituent, is not regarded as a modifier. In grammatical descriptions, modifiers of nouns normally include such constituents as adjectives, numerals, adnominal demonstratives, adnominal interrogatives, (commonly, genitive) noun phrases, articles, relative clauses, adpositional phrases, and locative adverbials (Dryer 2007). In most syntactic frameworks, modifiers have to be phrasal constituents. For example, Stowell (1981) posits that every modifier must be a maximal projection of some phrasal category. Rubin (1994) proposes a model where modifiers are headed by a functional category, MOD, which takes as its complement the material denoting the content of the modification.

## 2. Modification within a Noun Phrase in Sidaama

Sidaama is a Highland East Cushitic language spoken in South Central Ethiopia (Kawachi 2007). Its case system is accusative. This language is a verb-final language whose word order is predominantly SOV, and uses suffixation (and also suprafixation for marking some grammatical cases, as discussed later). The location of high pitch in a word is usually predictable; high pitch normally falls on the penultimate vowel segments of the citation forms of most nouns and adjectives.

Modification within a noun phrase in Sidaama usually concerns whether or not a common noun is accompanied not only by an adnominal (such as an adjective, a numeral, an adnominal demonstrative, an adnominal interrogative, or a relative clause) or a genitive noun phrase, but also by the possessive pronominal suffix (1SG: *-'ya*, 2SG: *-kki*, 3SG.F: *-se*, 3SG.M: *-si*, 1PL: *-nke*, 2PL: *-'ne*, 3PL: *-nsa*), which is bound to the noun.[2] The distinction between Unmodified common nouns (those accompanied neither by a syntactic modifier nor the possessive pronominal suffix) and Modified common nouns (those accompanied by a syntactic modifier/syntactic modifiers, the possessive pronominal suffix, or both) emerges in the following seven places in the grammar of this language.[3]

[2] When the possessor of a noun is expressed by a genitive NP, the possessive pronominal suffix cannot attach to the noun.

[3] Note that this distinction cannot be reduced to a distinction of definiteness. Although the definite suffix *-nni* occurs in limited contexts (see (vi) and (vii)), Sidaama common nouns do not make a definiteness distinction morphologically in other cases (for example, in (1), the subject NP can be interpreted either as definite or indefinite). The indefiniteness of the referent of a noun phrase can be indicated by the use of an idiomatic expression where the relative clause with the verb *ikk-* 'to become' modifies the head common noun (in the form of *ikk-i-t-ino* [become-EP-3SG.F/3PL-PERF.3] for the third-person singular feminine and the third-person plural or *ikk-ø-ino* [become-3SG.M-PERF.3] for the third-person singular masculine) (e.g. *ikk-ø-ino beett-i*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 2.1. Different allomorphs of the nominative case suffix on masculine common nouns

The nominative case suffix on masculine common nouns has different allomorphs: *-u* for Unmodified ones, as in (1), and *-i* for Modified ones, as in (2a) and (2b). Each allomorph replaces the final vowel of the stem (e.g. *o* of *beetto* 'child').[4]

(1) beett-u da-ø-ino.
child-NOM.M.UMD come-3SG.M-PERF.3
'The boy came.'

(2) (a) seed-u beett-i
tall-NOM.M child-NOM.M.MOD
(b) beett-i-se
child-NOM.M.MOD-3SG.F.POSS
} da-ø-ino.
come-3SG.M-PERF.3
'(a) The tall boy/(b) Her son came.'

### 2.2. Different allomorphs of the genitive case suffix on common nouns

The genitive case suffix has two different sets of allomorphs, which are distinctively used for Unmodified common nouns (FEM: *-te*/MASC: *-u*) and Modified ones (FEM: *ø*/MASC: *-i*); *-te* is added to the stem, whereas *-u* and *-i* each replace the final vowel of the stem. Examples of genitive forms of Unmodified feminine and masculine common nouns are shown in (3), and those of Modified feminine and masculine common nouns are shown in (4) and (5). As indicated in (3) (*min-ú*) and (5) (*beettó-se, min-í-si*), roughly speaking, the genitive forms of syntactically unmodified common nouns (Unmodified nouns as well as those having the possessive pronominal suffix but no syntactic modifier) are additionally marked with a suprafix, which is realized as high pitch on their final vowel segments (see the end of the present section for a discussion on the genitive suprafix).

(3) beettó-te uddano min-ú
child[GEN]-GEN.F.UMD clothes(NOM.F) house-GEN.M.UMD[GEN]
giddo no.
inside exist.3
'The girl's clothes are in the house.'

(4) hatté beetto uddano
that.F.GEN[GEN] child(GEN.F.MOD) clothes(NOM.F)
insá min-i giddo no.
3PL.GEN[GEN] house-GEN.M.MOD inside exist.3
'That girl's clothes are in their house.'

---

*da-ø-ino*. [become-3SG.M-PERF.3 child-NOM.M.MOD come-3SG.M-PERF.3] 'A boy came.').

[4] The nominative suffix on feminine common nouns is zero, regardless of Modification.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(5) beettó-se uddano
child(GEN.F.MOD)[GEN]-3SG.F.POSS clothes(NOM.F)
min-í-nsa giddo no.
house-GEN.M.MOD[GEN]-3SG.PL.POSS inside exist.3
'Her daughter's clothes are in their house.'

**2.3. Different allomorphs of the dative-locative case suffix on common nouns**

Different sets of allomorphs of the dative-locative case suffix are used for Unmodified common nouns (FEM: *-te*/MASC: *-ho*) and Modified ones (*-ra* regardless of gender). (6) contains the Unmodified forms of two nouns, one in the dative and the other one in the locative. (7) and (8) each contain the Modified forms of the same two nouns in the same two cases as in (6).

(6) insa haissó saada-te t'awo-ho
3PL.NOM grass[ACC] cows-DAT.UMD.F field-LOC.UMD.M
u-i-t-ino.
give-EP-3PL-PERF.3
'They gave grass to the cows in the field.'

(7) insa haissó hatté
3PL.NOM grass[ACC] that.F.GEN[GEN]
saadá-ra dangur-í
cows(GEN.F.MOD)[GEN]-DAT.MOD Dangura-GEN.PROP.M[GEN]
t'aw-í-ra u-i-t-ino.
field-GEN.M.MOD[GEN]-LOC.MOD give-EP-3PL-PERF.3
'They gave grass to those cows in Dangura's field.'

(8) insa haissó
3PL.NOM grass[ACC]
saadá-se-ra
cows(GEN.F.MOD)[GEN]-3SG.F.POSS-DAT.MOD
t'aw-í-si-ra
field-GEN.M.MOD[GEN]-3SG.M.POSS-LOC.MOD
u-i-t-ino.
give-EP-3PL-PERF.3
'They gave grass to her cows in his field.'

**2.4. Use of the oblique case vs. the allative case for masculine common nouns that refer to the goal of motion**

To express the goal of motion, for Unmodified masculine common nouns, the oblique case, which is indicated with a suprafix on the final vowel segment of a syntactically unmodified common noun, is used, as in (9), and for Modified masculine common nouns, the allative case, which is marked with the suffix *-ra*,



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



is used, as in (10a) and (10b).[5]

(9) ise t'awó haɗ-ɗ-ino.
3SG.F.NOM field[OBL]go-3SG.F-PERF.3
'She went to the field.'

(10) ise
3SG.F.NOM
{(a) šaan-ú t'aw-í-ra
cabbage-GEN.M.UMD[GEN] field-GEN.M.MOD[GEN]-ALL
(b) t'aw-í-si-ra
field-GEN.M.MOD[GEN]-3SG.M.POSS-ALL}
haɗ-ɗ-ino.
go-3SG.F-PERF.3
'She went (a) to the cabbage field/(b) to his field.'

**2.5. Different forms of the noun-phrase clitic starting in *t* (FEM)/*h* (MASC) when bound to a predicate common noun**

The noun-phrase clitic, which attaches to a predicate common noun, takes different forms depending on whether the noun is Unmodified (FEM: =*te*/MASC: =*ho*), as in (11), or Modified (=*ti*), as in (12a) and (12b).

(11) hatti saa=te.
that.one.F.NOM cow=NPC.PRED.UMD.F
'That one (FEM) is a cow.'

(12) hatti
that.one.F.NOM
{(a) ise t'ur-t-ino saa=ti.
3SG.F.NOM milk-3SG.F-PERF.3 cow=NPC.PRED.MOD
(b) saa-si=ti.
cow-3SG.M.POSS=NPC.PRED.MOD}
'That one (FEM) is (a) the cow that she milked/(b) his cow.'

**2.6. Use vs. non-use of the definite suffix *-nni* on a genitive common noun in a predicate**

When a genitive noun is followed by the noun-phrase clitic (FEM: =*te*/MASC: =*ho*) in a predicate, the definite suffix *-nni* has to intervene between the genitive common noun and the clitic, if the genitive common noun is Unmodified, as in (13), whereas *-nni* does not occur between them if the genitive common noun is Modified, as in (14a) and (14b).

[5] For feminine common nouns that refer to the goal of motion, oblique case forms are always used.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(13) kuni min-i
this.M.NOM house-NOM.M.MOD
beett-ú-nni = ho.
child-GEN.M.UMD[GEN]-DEF=NPC.PRED.UMD.M
'This house is the boy's.'

(14) kuni min-i
this.M.NOM house-NOM.M.MOD
{(a) busul-ú beett-í = ho.
smart-GEN.M[GEN] child-GEN.M.MOD[GEN]=NPC.PRED.UMD.M
(b) beett-í-si = ho.
child-GEN.M.MOD[GEN]-3SG.M.POSS=NPC.PRED.UMD.M}
'This house is (a) the smart boy's/(b) his son's.'

### 2.7. Use vs. non-use of the definite suffix *-nni* between a genitive masculine common noun and the noun-phrase clitic *=wa*

Sidaama has another noun-phrase clitic, which literally means 'place'. One use of this clitic is to attach to a noun phrase referring to an object (rather than a location) to make it express a location or goal where the object is located ('at/to the place of the object'). When this clitic attaches to an Unmodified masculine common noun, the definite suffix *-nni* is obligatorily used between the genitive form of the noun and the clitic, as in (15). On the other hand, when this clitic attaches to a Modified masculine common noun, the definite suffix *-nni* may or may not occur between the genitive form of the noun and the clitic, as in (16a) and (16b).[6]

(15) ise t'arap'ees-ú-nni = wa had-d-ino.
3SG.F.NOM table-GEN.M.UMD[GEN]-DEF=place go-3SG.F-PERF.3
'She went to the table.'

(16) ise
3SG.F.NOM
{(a) insá t'arap'ees-í(-nni) = wa
3PL.GEN[GEN] table-GEN.M.MOD[GEN](-DEF)=place
(b) t'arap'ees-í-nsa(-nni) = wa
table-GEN.M.MOD[GEN]-3PL.POSS(-DEF)=place}
had-d-ino.
go-3SG.F-PERF.3
(a)&(b): 'She went to their table.'

[6] When this clitic is used with a feminine common noun, it attaches to its genitive form either directly or with the definite suffix *-nni* intervening between them, regardless of whether it is Unmodified (e.g. *hakk'iččo-te = wa/hakk'iččo-nni = wa* 'at/to the tree') or Modified (e.g. *hatté hakk'iččo = wa/hatté hakk'iččo-nni = wa* 'at/to that tree').



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

So far, we have described the seven cases where Sidaama makes the distinction between Unmodified and Modified common nouns. However, there are three cases where Sidaama makes a distinction in terms of (syntactic) modification in its ordinary sense, as well as (morpho-syntactic) Modification.

First, the accusative-oblique case on syntactically unmodified common nouns is marked with a suprafix, which occurs as high pitch on the final vowel segment, as in (17a) and (17b), whereas that on syntactically modified common nouns that are not accompanied by the possessive pronominal suffix has no marking, as in (18a) and (18b) (though, as in (18a), the suprafix occurs on the adnominal modifying the accusative-oblique noun). However, the accusative-oblique suprafix occurs on syntactically modified common nouns with the possessive pronominal suffix, as in (17c).

(17)

| | | |
|---|---|---|
| ani | (a) beettó<br>child[ACC] | la'-o-mm-o. |
| 1SG.NOM | (b) beettó-se<br>child[ACC]-3SG.F.POSS | see-PERF.1-1SG-M |
| | (c) seedá beettó-se<br>tall[ACC] child[ACC]-3SG.F.POSS | |

'I (MASC) saw (a) the child/(b) her child/(c) her tall child.'

(18)

| | | |
|---|---|---|
| ani | (a) seedá beetto<br>tall[ACC] child(ACC) | la'-o-mm-o. |
| 1SG.NOM | (b) isé beetto<br>3SG.F.GEN[GEN] child(ACC) | see-PERF.1-1SG-M |

'I (MASC) saw (a) the tall child/(b) her child.'

Second, similar to the accusative-oblique case suprafix, the genitive case suprafix is used for syntactically unmodified common nouns, but is not used for nouns accompanied by a syntactic modifier nor by the possessive pronominal suffix. For example, in (3), the genitive nouns, which are unmodified, are marked with the suprafix (*beettó-te, min-ú*).[7] Also in (5), the genitive nouns, which are

[7]High pitch also occurs on the final vowel segment of a noun stem (the final vowel of either a basic or genitive stem) when accompanied by that case suffix allomorph which is added to the stem (specifically, the dative-locative suffix *-te* (UMD.FEM)/*-ho* (UMD.MASC)/*-ra* (MOD, PROP), the allative suffix *-ra*, which is used for Modified masculine common nouns and masculine proper nouns, and the instrumental suffix *-nni*), rather than replacing the final vowel of the stem. When the allomorph of the genitive suffix for an Unmodified feminine common noun *-te* is used, it is not clear whether high pitch on the vowel immediately preceding it is due to the use of high pitch on the stem-final noun with an adding suffix, to the genitive case marking on the unmodified noun, or to their co-occurrence. Nevertheless, the present study assumes that high pitch comes from the genitive case marking (e.g. *beettó-te* in (3)). When a common noun in the genitive case is modified by a syntactic modifier, the genitive suprafix does not occur on the head noun, but when it is followed by an adding suffix, high pitch occurs on the final vowel segment of its stem (e.g. *t'aw-í-ra* in (10a)). High pitch that does not contain the accusative-oblique or genitive suprafix is not indicated in the present study (e.g. *saada-te* and *t'awo-ho* in (6)).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

accompanied by the possessive pronominal suffixes but are not modified by any syntactic modifier, are marked with the suprafix (*beettó-se, min-í-nsa*). On the other hand, in (4), the genitive nouns, which are modified by the adnominal demonstrative or the genitive pronoun, are not marked with the suprafix (*hatté beetto, insá min-i*). However, the genitive suprafix occurs on syntactically modified common nouns with the possessive pronominal suffix (e.g. *beettó-se* in *hatté beettó-se uddano min-ú giddo no.* 'The clothes belonging to that daughter of hers are in the house.')

Third, Sidaama makes a distinction between Unmodified nouns, unmodified but Modified nouns (unmodified nouns with the possessive pronominal suffix), and modified nouns (either with or without the possessive pronominal suffix) in regard to the use of the noun-phrase clitic starting in *t* (FEM)/*h* (MASC) between a relative clause and its head. If the head noun of a relative clause is Unmodified (in other words, if the noun is only modified/Modified by the relative clause), the head noun has to follow the relative clause immediately, as in (19). If the head noun of a relative clause is accompanied by the possessive pronominal suffix and is (syntactically) unmodified (in other words, if the noun is only Modified by the relative clause and the possessive pronominal suffix), the noun-phrase clitic (FEM: *=ti*/MASC: *=hu* when it is in the nominative case or when the head is a predicate; FEM: *=ta*/MASC: *=ha* when in the accusative case; FEM: *=te*/MASC: *=hu* when in the genitive case), which agrees in case and gender with the head noun, can optionally occur between the relative clause and the head noun, as in (20). If the head noun of a relative clause is (syntactically) modified (in other words, modified by a modifier other than the relative clause), the noun-phrase clitic is required between the relative clause and the head noun, as in (21).

(19) ise isi seekk-ø-ino midaano
3SG.F.NOM 3SG.M.NOM repair-3SG.M-PERF.3 clay.container(ACC)
hiikk'-i-t-ino.
break-EP-3SG.F-PERF.3
'She broke the clay container that he repaired.'

(20) ise isi seekk-ø-ino(=ta)
3SG.F.NOM 3SG.M.NOM repair-3SG.M-PERF.3(=NPC.F.ACC)
midaanó-nsa hiikk'-i-t-ino.
clay.container[ACC]-3PL.POSS break-EP-3SG.F-PERF.3
'She broke their clay container that he repaired.'

(21) ise isi seekk-ø-ino=ta
3SG.F.NOM 3SG.M.NOM repair-3SG.M-PERF.3=NPC.F.ACC

| | | |
|---|---|---|
| (a) insá midaano | | |
| 3PL.GEN[GEN] clay.container(ACC) | | |
| (b) dančá midaano | | hiikk'-i-t-ino. |
| good[ACC] clay.container(ACC) | | break-EP-3SG.F-PERF.3 |
| (c) dančá midaanó-nsa | | |
| good[ACC] clay.container[ACC]-3PL.POSS | | |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(a) 'She broke their clay container that he repaired.'
(b) 'She broke the good clay container that he repaired.'
(c) 'She broke their good clay container that he repaired.'

Therefore, even within Sidaama, the notion of Modification is not exclusively the criterion for the distinction made in a noun phrase. It makes the Modification distinction in the first seven cases outlined above, while it makes the distinction in terms of both Modification and modification in the last three cases.

## 3. Differences from Constructions in Other Languages

There are two grammatical phenomena in other languages to which the modification of a common noun seems to be relevant. One is the construct state (status constructus) in Semitic languages, which are, though distantly, related to Sidaama, and the other is the Ezafe construction in Iranian languages. This section examines whether any of these constructions makes a distinction similar to the one made by Sidaama noun phrases. Notice that the question asked here is not what level of a grammatical model (e.g. in, prior to, or subsequent to the syntax) these phenomena should be analyzed as occurring, as is the focus of interest to many investigators of them (e.g. Borer 1988, 1996, Ghomesi 1997), but rather whether the modification within a noun phrase that is relevant to any of the phenomena is purely syntactic, or morphological as well as syntactic.

### 3.1. Construct state in Semitic languages (e.g. Borer 1988, 1996, Benmamoun 2005)

The construct state, which is a nominal complex found in Semitic languages, is a syntactic phrase, though it constitutes a prosodic unit and behaves as a phonological word. It shows some properties concerning syntactic modification, but the Modification distinction in Sidaama is relevant to none of them. For example, the construct state in Arabic exhibits characteristics such as the following (e.g. Benmamoun 2005). First, the (in)definiteness of the noun phrase is only marked by its last genitive noun, but is not marked by any other noun in it, as in (22a) and (22b).

(22) *Arabic*

| | | | | |
|---|---|---|---|---|
| kitāb-u | bn-i | 'amm-i | ṣadīq-i | (a) ṭ-ṭālib-i DEF-student-GEN |
| book-NOM | son-GEN | uncle-GEN | friend-GEN | (b) ṭālib-in student-GEN.INDEF |

(a) 'the book of the son of the uncle of the friend of the student'
(b) 'a book of a son of an uncle of a friend of a student' (Benmamoun 2005:478)

Thus, when a construct state noun phrase is made up of only two nouns, it has (in)definiteness marking on its second noun, but not on its first noun. Second, an adjective modifying one of the nouns in a construct state noun phrase has to occur



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

after the last noun regardless of which noun it modifies, as in(23a) and(23b). (Note that the adjective has to agree with the noun that it modifies in case, number, gender, and definiteness.)

(23) *Arabic*
(a) kitāb-u ṭ-ṭālib-i l-jadīd-u
book-NOM DEF-student-GEN DEF-new-NOM
'the new book of the student'
(b) ġilāf-u kitāb-i ṭ-ṭālib-i l-jadīd-i
cover-NOM book-GEN DEF-student-GEN DEF-new-GEN
'the cover of the new student's book' (Benmamoun 2005:478)

Thus, the modification relevant to the construct state in Arabic is syntactic, and it has nothing to do with Modification. (See also e.g. Borer 1988, 1996 for a description of the construct state in Hebrew, which also concerns modification rather than Modification.)

### 3.2. Ezafe construction in Iranian languages (e.g. Ghomesi 1997, 2006, Samvelian 1983, 2007)

In the Ezafe construction in Persian, modification is marked with the Ezafe enclitic *-(y)e* on the head noun (or modified noun) and all modifiers other than the last one, as in (24a)-(24c). Here, modifiers of a noun include post-nominal modifiers such as attributive nouns, adjectival phrases, prepositional phrases, and possessor noun phrases, but do not include any pre-nominal modifier (specifically, demonstratives, quantifiers, numerals, and superlative adjectives), relative clauses, or the possessive pronominal enclitic.

(24) *Persian*
(a) lebâs-e zibâ
dress-EZ beautiful
'beautiful dress'
(b) lebâs-e maryam
dress-EZ Maryam
'Maryam's dress'
(c) lebâs-e arusi-e zibâ-ye bi âstin-e maryam
dress-EZ wedding-EZ beautiful-EZ without sleeve-EZ Maryam
'Maryam's beautiful wedding dress without sleeves' (Samvelian 2007:608)

Because the possessive pronominal enclitic does not count as a noun modifier, when it attaches to a noun without any modifier, the Ezafe marking does not occur, as in(25a)[8]. When the possessive pronominal enclitic is used for a modified noun, it attaches to the final modifier, and the Ezafe enclitic occurs on the head noun and all modifiers except the final modifier, as in(25b) and(25c).

[8] When the possessor is expressed with an independent pronoun, the Ezafe marking occurs on the head noun and all other modifiers (Ghomeshi 2006:722) (e.g. *ketâb-e mam* [book-EZ 1SG] 'my book').



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(25) *Persian*

(a) ketâb-am
book-1SG.POSS
'my book'

(b) lebâs-e sefid-e bi âstin-am
dress-EZ white-EZ without sleeve-1SG.POSS
'my white dress without sleeves' (Samvelian 2007:621)

(c) ketâb-e barâdar-e dust-e xâhar-am
book-EZ brother-EZ friend-EZ sister-1SG.POSS
'the book of the brother of the friend of my sister' (Samvelian 1983:59)

Thus, the modification distinction made in the Persian Ezafe construction is also syntactic.

## 4. Conclusion

As shown in section 3, in Sidaama, a distinction within a noun phrase is made in terms of Modification in seven cases. On the other hand, there are also three cases where the distinction is both syntactic and morphological. Therefore, the notion of Modification/modification is not always consistent even in Sidaama.

There does not seem to be any other language that makes a Modification distinction like Sidaama. As seen in section 4, both the construct state in Semitic languages and the Ezafe construction in Iranian languages are sensitive to the modification of a noun, but they are syntactically defined, and do not include affixation.

One might be tempted to resort to the notion of headedness, rather than Modification, to describe the Modification distinction in Sidaama, but this also creates some fundamental problems. First of all, the notion of headedness is also usually used for syntactic dependency. For example, Nichols (1986), who conducted cross-linguistic studies of morphological marking of syntactic relations, explicitly states that "syntactic relations are absolutely independent of the morphology (or other means) that signal them" (p.57).[9] Second, the notion of the heads of noun phrases is controversial, as pointed out by Dryer (2004).

In conclusion, the notion of modification is not universal as traditionally assumed, and needs to be expanded to include morphological affixation in addi-

[9] In Nichols's analysis, most of the phenomena in Sidaama involving Modification would be treated as instances of double-marking. On one hand, the dependent bears some marking in most cases. Adnominals such as adjectives, numerals, adnominal demonstratives, and adnominal interrogatives agree with the head noun in case and gender, as in (2a), (4), (7), (13), and (14a). Genitive NPs mark possession with the genitive suffix on themselves, as in (4), (16a), and (16b). Relativization is formed by means of gapping or pronominal retention, either of which can be treated as dependent-marking. On the other hand, the head noun is marked as having a dependent whenever it is modified by a syntactic modifier, as in (i)-(vii). Thus, these can be regarded as double-marking examples. However, all the Sidaama phenomena involving Modification cannot be double-marking of syntactic relations in the following respects. First, marking of possession with the possessive pronominal suffix is not dependent-marking. Second, (viii) does not show any head-marking; relativization can be formed by gapping, which is an instance of dependent-marking, but the existence of a dependent of the head noun other than the relative clause is also marked on the dependent, specifically on the verb at the end of the relative clause.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



tion to syntactic phenomena in order to account for the distinction made by common nouns at least in Sidaama by means of this term.

**References**

Benmamoun, Elabbas. 2005. The Construct State. In K. Versteegh, ed., *Encyclopedia of Arabic Language and Linguistics*, 477-482. Leiden, the Netherlands: Brill.

Borer, Hagit. 1988. On the Parallelism between Compounds and Constructs. *Yearbook of Morphology*, 1:45-66.

Borer, Hagit. 1996. The Construct in Review. In I. Lecarme, J. Lowenstamm and U. Shlonsky, eds. *Studies in Afroasiatic Grammar: Papers from the Second Conference on Afroasiatic Languages, Sophia Antipolis, 1994*, 30-61. The Hague: Holland Academic Graphics.

Dryer, Matthew S. 2004. Noun Phrases without Nouns. *Functions of Language*, 11(1):43-76.

Dryer, Matthew S. 2007. Noun Phrase Structure. In T. Shopen, ed., *Language Typology and Syntactic Description, Volume 2: Complex Constructions, Second Edition*, 151-205. Cambridge University Press.

Ghomesi, Jila. 1997. Non-Projecting Nouns and the Ezafe Construction in Persian. *Natural Language and Linguistic Theory*, 15:729-788.

Ghomeshi, Jila. 2006. NP-Anaphora and Focused Possessors in Parallel Architecture. *Linguistics*, 44(4):721-748.

Kawachi, Kazuhiro. 2007. A Grammar of Sidaama (Sidamo), a Cushitic Language of Ethiopia. Ph.D. diss., University at Buffalo, State University of New York.

Nichols, Johanna. 1986. Head-marking and Dependent-marking Grammar. *Language*, 62(1):56-119.

Rubin, Edward J. 1994. Modification: a Syntactic Analysis and its Consequences. Ph.D. diss., Cornell University.

Samvelian, Pollet. 1983. Origins of Phrasal Categories in Persian: an X-bar Analysis. Ph.D. diss., University of California, Los Angeles.

Samvelian, Pollet. 2007. A (Phrasal) Affix Analysis of the Persian Ezafe. *Journal of Linguistics*, 43:605-645.

Stowell, Timothy Angus. 1981. Origins of Phrase Structure. Ph.D. diss., Massachusetts Institute of Technology.

Kazuhiro Kawachi
Research Institute for Languages and Cultures of Asia and Africa,
Tokyo University of Foreign Studies
3-11-1 Asahi-cho, Fuchu-shi, Tokyo 183-8534

Meiji Gakuin University
1518 Kamikurata-cho,
Totsuka-ku, Yokohama-shi
Kanagawa 244-8539 Japan

kazuhirokawachi@gmail.com, kazuhirokawachi@hotmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# A Cognitive Approach to the Acquisition of Passives in Korean

MEESOOK KIM
*Sangji University*

## 0. Introduction

Previous studies on the acquisition of passives have shown that English-speaking children do not produce full passive sentences in their spontaneous speech until 4 or 5 years of age, although they occasionally produce truncated passives that omit an overt agent (*by*-phrase) somewhat earlier (deVilliers and deVilliers 1985; Israel, Johnson, and Brooks 2000; Maratsos, Fox, Becker, and Chalkley 1985). On the other hand, there has been a debate among previous researchers whether some sentence types seem to be more difficult than others in terms of passives. For instance, Maratsos et al. (1985) found that 4-5 year-old English children have more difficulties in the comprehension and production of non-actional passives (e.g. with the verbs *see*, *hear*) than with actional passives (e.g. with the verbs *hit*, *touch*). In contrast with findings from earlier research, Pinker et al. (1987) showed that in spontaneous speech 3-year-old English children produce passive sentences with an eventive interpretation that is usually associated with verbal passives. Using elicitation and act-out tasks, they found that 4-year-old English children were able to produce and comprehend passive sentences involving novel actional and non-actional verbs, but they often failed to produce the *by*-phrase.

In contrast to the substantial literature on English-speaking children's comprehension and production of passives, relatively few studies have investigated the acquisition of passives in children acquiring other languages. More specifically, it has been reported that children acquiring languages like Inuktitut, Sesotho, and Zulu produced both truncated and full passives quite regularly at the age of 2 to 3 (Allen and Crago 1996 for Inuktitut; Demuth 1989, 1990 for Sesotho, Suzman 1985 for Zulu). In contrast, Hebrew-speaking children demonstrated productive use of passives much later, around 8 years of age (Berman 1985).

In spite of the fact that there is variability in the age of acquisition of the passive, a common finding from child data across languages is that children acquire active sentences much earlier than passive sentences. Meanwhile, we might raise a question of when speakers make a decision of using the passive construction. One possibility is that speakers use passives to focus attention on the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



patient of a transitive action event and what happened to it, by defocusing on the agent in the process (Shibitanin 1985). For instance, in the full passive sentence like *The rabbit was chased by the tiger*, the focus is on the rabbit and what happened to it, rather than on the tiger's act of chasing as in the active description of this event. Similarly, speakers may choose passives to topicalize the patient in an event, by promoting it to syntactic subject, which is reflected in accounts of the passive sentence construction (Dik 1989, Langacker 1990). Accordingly, if we could manipulate speakers' attention on the patient, then they would be able to use passives sentences frequently. This possibility has been empirically tested by Tomlin, using the fish film in an on-line production task (Tomlin 1995, 1997). More specifically, he set up an experimental paradigm of attention manipulation, which focuses on subject assignment in English and its accompanying voice alternation (active vs. passive sentences). This experimental paradigm predicted that if English native speakers paid attention to a particular referent, the referent would be encoded as the syntactic subject of the sentence. He found a one-to-one mapping between referents currently in the focus of attention of the speaker and the syntactic subject, suggesting that the language-independent cognitive factor of focal attention plays a direct role in subject assignment.

If the experimental manipulation of focal attention affects subject assignment in voice alternation, in particular in the case of adults, it would be interesting to see if data from language acquisition could also confirm it. Therefore, this study extends Tomlin's (1995, 1997) experimental paradigm of attention manipulation to language acquisition, by testing Korean children aged 4 to 5 to investigate how the development of passives and the development of attention correspond to each other. In addition to the on-line production task, this study examines the extent to which Korean children understand active and passive sentences, using a sentence-picture matching comprehension task. In pursuing the goal, this study begins by reviewing Tomlin's experimental framework and some background on Korean passives. Next, two experimental studies are presented. Finally, the results and some implications are discussed.

## 1. Tomlin's (1995, 1997) Experimental Framework and Korean Passives

Focal attention or attention detection is a cognitive system that has been described over and over for more than a century (see Tomlin and Villa 1994 for more details). More specifically, Tomlin (1995, 1997) has claimed that the general cognitive process of focal attention or attention detection has a direct role in the grammatical formulation of speech utterances, on the base of an experimental paradigm of attention manipulation. In terms of subject assignment in English and its accompanying voice alternation, he set up the experimental paradigm to investigate a causal relationship between a pragmatic function and grammatical form by explaining why a particular referent is encoded as the subject in English. More specifically, the paradigm predicts that if English native speakers pay attention to a particular referent, the referent will be encoded as a subject of the sentence that represents the event perceived. Accordingly, the paradigm suggests



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



that the role of a syntactic subject in English is encoding focal attention, which can be also referred to attention detection.

The experimental framework Tomlin designed uses a computer animated film to elicit on-line discourse. The film consisted of a set of 32 trials that show the simple transitive event of one fish eating another. The fish are identical in shape and size, differing only in color. The two fish in each event approach each other from opposite sides of the video display, moving at equal speeds. At the center of the screen, one fish swallows the other. During each event, the participant's attention is directed to one particular fish by means of flashing arrow over the fish. The arrow flashes twice and then disappears approximately 75 milliseconds before the eating event occurs.

Tomlin (1995, 1997) predicted that in cases where the arrow focuses on the agent, English speakers will produce active sentences in which the focused referent is the subject. On the other hand, in cases where the arrow focuses on the patient, passive sentences will be produced in which the focused fish is also in subject position. He tested 12 English native speakers to find out whether the cued referent would be assigned to a syntactic subject on every trial, as predicted. What he found from the experiment is that 10 out of 12 speakers performed as predicted. More specifically, the participants produced the active sentence when the agent was focused by the arrow, whereas they produced the passive sentence when the patient was focused by the arrow. In other words, the results imply that the agency of the cued referent determined the voiced of the sentence. Therefore, Tomlin suggests that the assignment of the attentionally detected referent to be syntactic subject and the concomitant alternation of voice seem to occur automatically in L1 discourse production.

In the present study I investigate how the development of passives and the development of attention correspond to each other, by testing Korean-speaking children aged 4 to 5. Before presenting two experimental studies, let me briefly review the literature on Korean passives.

One characteristics of the Korean passive is that Korean uses voice suffixes *i, hi, li, ki,* which are attached to verb stem, as shown in (1b). Note that in Korean voice suffixes are used both for the passive and causative constructions.

(1) a. ppalkan mwulkoki-ka pharan mwulkoki-lul (cap-a)-mek-ess-ta.
Red fish-Nom blue fish-Acc eat-Past-Dec
'The red fish ate the blue fish.' (active sentence)
b. pharan mwulkoki-ka ppalkan mwulkoki-eykey (cap-a)-mek-hi-ess-ta.
Blue fish-Nom red fish-by eat-Pass-Past
'The blue fish was eaten by the red fish.' (passive sentence)

It is a well-known fact that the active form in Korean is a much more common way of expressing transitive relations in everyday speech and is mastered early in life, whereas the passive form appears less frequently in language input. In particular, a recent study by Song (2002) suggests that Korean is more agent-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

dominant than Japanese is (see Song 2002 for more details). Given that the passives in Korean are not productive in the input, we may expect that Korean children may not use the passives frequently. Unfortunately, few studies have been reported on Korean children's acquisition of passives. Therefore, the present study could provide us with developmental pattern of comprehension and production of passives in Korean.

## 2. Experiment

In the present study, I asked two questions about young children's acquisition of the Korean passive. First, I wanted to know if young children aged 4 to 5 could take advantage of visual focal attention when making choices between active and passive sentences. My second question concerned the extent to which young children could understand active and passive sentences.

### 2.1. Participants

Thirty Korean monolingual children who live in Korea participated in this experiment. The children were divided into two groups on the basis of age. The first group (the four-year-olds) included 15 children with an average age of 4:6 (range=4;2-5;0) The second group (the five-year-olds) included 15 children with an average age of 5:8 (range=5;4-6;0). In addition, 15 adult speakers of Korean as a control group participated in this experiment.

### 2.2. Materials

Each child was asked to do two tests: (1) the fish film on-line production test and (2) the sentence-picture matching comprehension test. First, the experimental materials used in the production test were the same as those designed by Tomlin (1995, 1997), except for the several modifications. For instance, I used the modified version of fish film, by enlarging the size of fish and using 6 color terms instead of 8 color terms.

The experimental framework in this study consists of a production test where subjects are to produce on-line descriptions of a sequence of 20 events. It shows two computer-animated fish swimming towards each other until they meet and one of them eats the other and swims off the screen. The colors of each pair of fish and the outcome of each eating event are randomly determined. The direction of the agent, either from the right or from the left is counterbalanced. More importantly, the film used two flashing arrows to attract subjects' attention to one of the two fish. Half of times the agent is primed by the arrow, and half of times the patient is primed by the arrow. The arrow flashes twice and then disappears before the eating event occurs.

In addition to the fish film production test, I used a sentence-picture matching test for the comprehension task. Each comprehension item consisted of two picture cards which contain two pictures, and a sentence that described one of them. One picture card contained two fish, and the other picture card contained two eating event by two fish. The participants were asked to point to or choose



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



which picture the experimenter described. Each sentence was presented orally by the experimenter, along with a corresponding pair of pictures. There were a total of 10 comprehension items. Half of the sentences contained transitive constructions in the active voice, and half of them in the passive voice.

### 2.3. Procedure

All participants were tested individually in a separate room. The children were administrated two tests in the following order: (1) the fish film production test (2) the sentence-picture matching comprehension test. This order was preserved for all children because I did not want to give children examples of a lot of passives in the comprehension task before I asked them to produce examples in the production task.

First, in the fish film on-line procedure, participants were asked to report each event that they perceive in the film where the eating event is repeated 20 times. Participants were asked to pay attention to the fish to which the arrow was pointing and to tell the experimenter about each event in the film in which the eating event was repeated 20 times. The flash arrow was manipulated randomly in order to attract subjects' attention on the agent fish in half of the 20 trials and on the patient fish in the other trials.

Prior to the main experimental task, the children were given a short vocabulary test to make sure that they knew the color terms, the noun (fish), and the verb (eat) which were used in this task. All of the children who participated in the experiment passed the vocabulary test. In addition, four eating events were used as a filter.

After the on-line production task, the children were asked to point to or choose the picture that corresponds to a sentence described by the experimenter. Each comprehension item consisted of two picture cards. The first picture card was used to introduce two fish to the participants, whereas the second picture card was used to be described one of them by the experimenter. For instance, after showing the first picture card to the participants, the experimenter said, “Look at these pictures. There are yellow fish and blue fish.” After showing the second picture card to the participants, the experimenter said, “Can you point to or choose which picture I'm telling you? The yellow fish was eaten by the blue fish.”

### 2.4. Results

Table 1 shows the number and percentage of sentences that were produced following either active or passive primes. Overall, children were much more likely to produce active sentences in describing the fish film of transitive actions, regardless whether either the agent or the patient was primed. More specifically, the four-year-old children and the five-year-old children produced active sentences almost 100% of the time even when the patient was primed. In contrast with the children, the adult speakers of Korean produced active sentences 100% of the time when the agent was primed, whereas they produced passive sentences 81.22% of the time when the patient was primed.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Table 1 Number and Percentage of Responses on the Production Task

| | Agent-Primed(AP) | | Patient-Primed(PP) | |
|---|---|---|---|---|
| | Active | Passive | Active | Passive |
| 4-year olds | 150(100%) | 0(0%) | 150(100%) | 0(0%) |
| 5-year olds | 150(100%) | 0(0%) | 147(98%) | 3(2%) |
| Adults | 150(100%) | 0(0%) | 28(18.67%) | 122(81.33%) |

As shown in Table 1, like English native speakers, the Korean adults were affected by focal attention when they assigned syntactic subject. However, the Korean children did not produce passive sentences even when the patient was focally primed, showing that they were not sensitive to focal attention when assigning syntactic subject.

Next, let us take a look at the results of the children's responses on the comprehension test. Table 2 summarizes the number and percentage of correct responses on the sentence-picture matching test. Overall, children understood active sentences better than passive sentences. The four-year-old children understood active sentences 77% of the time, whereas they understood passive sentences 48% of the time. This finding indicates that the four-year-old children still have trouble in understanding passive sentences. In contrast with the four-year-old children, the five-year-old children understood active sentences 97% of the time, whereas they understood passive sentences 80% of the time, as shown in Table 2.

Table 2 Number and Percentage of Correct Responses on the Comprehension Task

| | Active Sentence | | Passive Sentence | |
|---|---|---|---|---|
| | Number (%) | SD | Number (%) | SD |
| 4-year olds | 58/75(77%) | 0.9904 | 36/75(48%) | 1.1212 |
| 5-year olds | 73/75(97%) | 0.3519 | 60/75(80%) | 0.8452 |
| Adults | 75/75(100%) | 0 | 75/75(100%) | 0 |

I carried out a statistical comparison of the number of correct responses on the comprehension task in the two conditions (active and passive). The analyses of variance (ANOVA) show that there was a significant difference between age groups in both conditions: a significant difference between age groups in the active condition ($F(2, 44) = 15.62$, $p < .01$), and a significant difference between age groups in the passive condition ($F(2, 44) = 39.26$, $p < .01$). More specifically, the post-hoc comparison shows that there was a significant difference between the four-year-old children and the five-year-old children in both conditions ($p = .000$ for both active and passive conditions), whereas there was no significant difference between the five-year-old children and the adults in the active condition ($p = .82$).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



## 3. Discussion and Conclusions

Previous studies conducted by the fish film on-line production task have shown that the cognitive manipulation of focal attention affects subject assignment in voice alternation (Tomlin 1995, 1997). For instance, adult speakers produced active sentences when the agent was primed, they produced passive sentences when the patient was primed. However, the results from the current production study show that Korean-speaking children age 4 to 5 were not capable of assigning a focally attended referent to syntactic subject. Specifically, both the four-year-old children and the five-year-old children produced active sentences almost 100% of the time even when the patient was primed. In other words, they produced only active sentences, regardless of whether the agent or the patient was primed. These findings are consistent with the well-known fact that English-speaking children do not produce the full passive form of the transitive construction until the age of 4 or 5.

In addition to the on-line production task, the current study included the sentence-picture matching comprehension task. The results from the comprehension task show that overall Korean children, in particular the four-year-olds, were much better in understanding active sentences than in understanding passive sentences. The 4-year-old children understood passive sentences 48% of the time, whereas the 5-year-old children understood them 80% of the time. It also indicates that there is a dramatic development in understanding of passive sentences. In addition, it was found that both the younger children and the older children were better in understanding passive sentences than in producing them. In particular, whereas the five-year-old children did not produce passive sentences even when patient was primed, whereas they understood them 80% of the time. It indicates that Korean-speaking children's understanding of passive sentences appears early, compared to their production, suggesting that children's comprehension usually precedes their production in development.

A remaining question is why the 5-year-olds were not capable of using visual focal attention in subject assignment, even though they understood passive sentences. One possibility is that the experimental design primed by the flashing arrow might not be enough for young children aged 5 to use the focal attention when making syntactic choices. Similarly, a previous on-line study by Trueswell et al. (1999) has reported that English-speaking children aged 4 to 5 were not capable of using relevant contextual factors like discourse/pragmatic information when they resolved temporary syntactic ambiguous sentences, whereas adults showed sensitivity to these discourse constraints at the earliest possible stages of processing. Accordingly, their finding seems to be similar to the present finding that five-year-old Korean children did not take account into the focally attended referent to syntactic subject. However, further research needs to investigate when children are ultimately able to use extra-linguistic cues like focal attention or discourse focus.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

**References**

Allen, Shanley, and Martha Crago. 1996. Early Passive Acquisition in Inuktitut. *Journal of Child Language 23*:129-156.

Berman, Ruth A. 1985. The Acquisition of Hebrew. In D. Slobin, ed., *The Crosslinguistic Study of Language Acquisition,* Vol. 1, 255-372. Hillsdale, NJ: Erlaum.

Border, Hagit, and Kenneth Wexler. 1987. The Maturation of Syntax. In T. Roeper and E. Williams, eds., *Parameter-setting and Language Acquisition.* Dordrecht, The Netherlands: Reidel.

Demuth, Katherine. 1989. Maturation, Continuity and the Acquisition of Sesotho Passive. *Language* 65:56-80.

Demuth, Katherine. 1990. Subject, Topic, and Sesotho Passive. *Journal of Child Language* 64:56-80.

deVilliers, Jill G., and Peter A. deVilliers. 1985. The Acquisition of English. In D. Slobin, ed., *The Crosslinguistic Study of Language Acquisition,* Vol. 1, 27-140. Hillsdale, NJ: Erlaum.

Dik, Simon. 1989. Perspectivizing the State of Affairs: Subject and Object Assignment. In *The Theory of Functional Grammar: Part I: The Structure of the Clause. Functional Grammar Series*, Vol. 9, 207-228. Dordrecht: Foris Publications.

Gordon, Peter, and Jill Chafetz. 1990. Verb-based Versus Class-based Accounts of Actionality Effects in Children's Comprehension of Passives. *Cognition* 36:227-254.

Horgan, Dianne. 1978. The Development of the Full Passive. *Journal of Child Language* 5:65-80.

Israel, Michael, Christopher Johnson, and Patricia Brooks. 2000. From States to Events: The Acquisition of English Passive Participles. *Cognitive Linguistics* 11:103-129.

Langacker, Ronald. 1990. Foundations of Cognitive Grammar, Vol. 2. Stanford, CA: Stanford University Press.

Maratsos, Michael, Dana Fox, Judith Becker, and Mary Anne Chalkley. 1985. Semantic Restrictions on Children's Passives. *Cognition* 19:167-191.

Pinker, Steven, David Lebeauz, and Loren Frost. 1987. Productivity and Constrains in the Acquisition of the Passive. *Cognition* 26:195-267.

Shibitanin, Masayoshi. 1985. Passives and Related Constructions: A Prototype Analysis. *Language* 12:455-470.

Song, Nam Sung. 2002. Comparative Study of Japanese and Korean Passive. *Eoneohag* 32:165-196.

Suzman, Susan. 1985. Learning the Passive in Zulu. *Papers and Reports on Child Language Development* 24:131-137.

Tomlin, Russell. 1997. Mapping Conceptual Representations into Linguistic Representations: The Role of Attention in Grammar. In J. Nyuts and E.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Pederson, eds., *Language and conceptualization*, 162-189. Cambridge: Cambridge University Press.
Tomlin, Russell. 1995. Focal Attention, Voice, and Word Order: An Experimental, Cross-linguistic Study. In P. Downing and M. Noonan, eds., *Word Order in Discourse*, 521-558. Philadelphia: John Benjamins.
Tomlin, Russell and Victor Villa. 1994. Attention in Cognitive Science and Second Language Acquisition. *Studies in second language acquisition* 16:183-203.
Trueswell, John, Irina Sekerina, Nicole M. Hill, and Marian L. Logrip. 1999. The Kindergarden-path Effect: Studying On-line Sentence Processing in Young Children. *Cognition* 73:89-134.

Meesook Kim
Department of English Language & Literature
Sangji University
Gangwondo, Korea

meesook@sangji.ac.kr



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Perceptual Similarity in Korean Vowel Epenthesis

SEUNG KYUNG KIM
*Stanford University*

## 0. Introduction

In studies of loanword adaptation, vowel epenthesis has been phonologically motivated by appealing to constraints on syllable structure of the borrowing language (e.g. Jacobs and Gussenhoven 2000, LaCharité and Paradis 2005; but see Peperkamp and Dupoux 2002, 2003 for a phonetics-based account). For example, when a consonant cluster is adapted into a language that bars consonant clusters, an epenthetic vowel is inserted between consonants, breaking the cluster. This explanation is simple, in fact, as I will argue, too simple.

I present variable patterns of vowel epenthesis in English-to-Korean loanwords and show that the standard phonological approach is insufficient to account for Korean vowel epenthesis. Vowel epenthesis is specific to loanwords, not a general property of the language. But then, it is not clear why vowel epenthesis is assumed instead of other possible ways to satisfy the same set of syllable constraints. Following the lead of Steriade (2001), Kenstowicz (2003), and in particular Kang (2003), I argue that perception plays a significant role in loanword adaptation and show that the immediate motivation for Korean vowel epenthesis is to increase perceptual similarity between the English source forms and the Korean adapted forms.

Specifically, the results from a perceptual discrimination test show that Korean speakers perceive certain English CVC words as similar to epenthetic Korean CVCV forms, while, crucially, other English CVC words are perceived as similar to non-epenthetic CVC forms. This asymmetry is dependent on the perceptual cues of the final English consonant such as frication, voicing, and release. The results imply that vowel epenthesis in Korean is closely related to borrowers' judgments on perceptual similarity between the source and adapted forms. Contrary to previous assumptions, Korean vowel epenthesis occurs, not merely as a repair for illegal syllable structures, but because epenthesis ensures a higher degree of perceptual similarity between the perceived English input and the adapted Korean output.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Seung Kyung Kim

## 1. Korean Vowel Epenthesis

### 1.1. Loanword Specific Vowel Epenthesis

Korean vowel epenthesis occurs in two environments of loanword adaptation: in consonant clusters and after certain simple coda consonants. Although the main focus of the paper is vowel epenthesis after simple codas, let us briefly consider both cases to understand the broader picture of Korean vowel epenthesis.

Korean syllable structure does not allow complex margins.[1] When Korean adapts an English consonant cluster, the cluster must be simplified to meet this constraint. Vowel epenthesis can repair the syllable structure, as in (1):

(1) Vowel Epenthesis Breaking Consonant Clusters in Loanwords
- a. feminism /fɛmɪnɪzm/ → [pʰɛ.mi.ni.ʧɨm]
- b. camp /kæmp/ → [kʰæm.pʰɨ]

In native words, the same constraint on syllable structure—No Complex Margins—is satisfied differently. Consonant clusters are simplified by deleting one of the two consonants, shown in (2):

(2) Consonant Deletion Simplifying Consonant Clusters in Native Words
- a. /kɑps/ → [kɑpˀ] 'price'
- b. /tɑlk/ → [tɑkˀ] 'chicken'

Korean syllable structure also imposes a restriction on consonants which may occur in coda position. Of the nineteen consonants in Korean, only the sonorants and the plain stops may occupy coda position and they must be unreleased:

(3) Korean Consonant Inventory[2]
/p, pʰ, p', t, tʰ, t', k, kʰ, k', ʧ, ʧʰ, ʧ', s, s', h, m, n, ŋ, l/

(4) Korean Coda Condition
Only [p, t, k, m, n, ŋ, l] are allowed in coda position.
All codas must be unreleased.

For all other consonants, coda neutralization occurs to satisfy the Coda Condition in native words: aspirated, tense, affricate, and fricative obstruents become unreleased stops. (5a) shows neutralization of stops; (5b) shows neutralization of fricative and affricate codas.

[1] It is usually assumed that Korean syllable structure can maximally be CGVC (G is a glide) and consonant clusters are obligatorily simplified. There is some evidence, though, that cluster simplification is incomplete and optional (e.g. Cho 1999).

[2] This is the standard inventory widely assumed in the literature. However, instead of having three-way voiceless contrasts, there is an alternative view claiming that the Korean plain stop is in fact phonologically voiced (e.g. Kim and Duanmu 2004).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(5) Coda Neutralization in Native Words

| | | | | |
|---|---|---|---|---|
| a. | /pɑp/ | → | [pɑp˺] | 'rice' |
| | /pɑtʰ/ | → | [pɑt˺] | 'field' |
| | /pɑk'/ | → | [pɑk˺] | 'outside' |
| b. | /pis/ | → | [pit˺] | 'comb' |
| | /pic/ | → | [pit˺] | 'debt' |
| | /picʰ/ | → | [pit˺] | 'light' |

In loanwords, however, vowel epenthesis replaces neutralization:

(6) Vowel Epenthesis in Loanwords

| | | | |
|---|---|---|---|
| a. | bus /bʌs/ | → | [pʌ.s'**ɨ**] |
| b. | peak /pik/ | → | [pʰi.kʰ**ɨ**] |

As demonstrated, one of the most important aspects of Korean vowel epenthesis is that vowel epenthesis is specific to loanword adaptation. To repair complex margins and disallowed codas, vowel epenthesis occurs in loanwords, while other processes including consonant deletion and neutralization occur in native words. This discrepancy is not explained by the standard phonological approach, because with other resolutions available, but unused, vowel epenthesis cannot be solely motivated by constraints on syllable structure.

### 1.2. Vowel Epenthesis after English Simple Codas

Korean has several patterns of vowel epenthesis after English simple coda consonants. I present these patterns using data drawn from the body of loanwords collected by the National Academy of the Korean Language (NAKL) in 1991.[3]

After a sonorant coda, vowel epenthesis hardly ever applies. Out of 952 words ending with a postvocalic sonorant /m, n, ŋ, l, r/, 949 were adapted without vowel epenthesis.[4] Representative examples are given in (7):

(7) Sonorant: No Epenthesis

| | | | |
|---|---|---|---|
| a. | team /tim/ | → | [tʰim] |
| b. | can /kæn/ | → | [kʰæn] |
| c. | king /kɪŋ/ | → | [kʰiŋ] |
| d. | bell /bɛl/ | → | [pɛl] |
| e. | bar /bɑr/ | → | [pɑ] |

[3] This is the same collection of loanwords from which Kang (2003) draws her data. Note that the 1991 NAKL list is by no means an exhaustive list of loanwords. It contains loanwords that appeared in certain newspapers and magazines published in 1990.

[4] The three words adapted with epenthesis were all *–r* ending words: *tar, ether,* and *polyester.*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The original codas are preserved except in words ending in postvocalic /r/, which mostly gets deleted.[5]

After a fricative coda consonant, on the other hand, vowel epenthesis always applies. All of 191 words ending with a postvocalic fricative /s, z, f, v/ are adapted with vowel epenthesis, exemplified in (8):

(8) Fricative: Epenthesis

| | | | |
|---|---|---|---|
| a. | bus /bʌs/ | → | [pʌ.sʼɨ] |
| b. | jazz /ʤæz/ | → | [cʼæ.cɨ] |
| c. | puff /pʌf/ | → | [$p^h$ʌ.$p^h$ɨ] |
| d. | love /lʌv/ | → | [rʌ.bɨ][6] |

If epenthesis does not occur, the original fricative coda /s/ and /z/, adapted as /s/ and /c/ in Korean, must be neutralized to [t˺] due to Coda Condition. Similarly, the original fricative /f/ and /v/, adapted as /$p^h$/ and /p/ in Korean, must be neutralized to [p˺] if no epenthesis applies.

Unlike the all-or-none application of vowel epenthesis after fricative or sonorant codas, patterns of vowel epenthesis after stop codas vary. Kang (2003) reports that, out of 447 words with a postvocalic word-final stop in the NAKL list, 225 words (50%) were adapted with vowel epenthesis, 195 words (44%) without vowel epenthesis, and 27 words (6%) with optional epenthesis. This variation within stops is mostly due to split patterns of vowel epenthesis following a voiceless stop rather than more or less uniform vowel epenthesis following a voiced stop. Out of 102 words with postvocalic word-final voiced stops /b, d, g/, 90 words were adapted with vowel epenthesis and 10 words without epenthesis. On the other hand, out of 335 words ending with postvocalic word-final voiceless stops /p, t, k/, 185 words were adapted without epenthesis and 125 words with epenthesis.

(9) Voiced Stop: Epenthesis (Mostly)

a. Epenthesis 88%

| | | |
|---|---|---|
| bed /bɛd/ | → | [pe.dɨ] |
| gag /gæg/ | → | [kæ.gɨ] |

b. No Epenthesis 10%

| | | |
|---|---|---|
| jab /ʤæb/ | → | [cæp˺] |
| bag /bæg/ | → | [pæk˺] |

c. Optional Epenthesis 2%

pyramid /pɪrəmɪd/ → [$p^h$i.rɑ.mit˺] [$p^h$i.rɑ.mi.dɨ]

[5] English /Vr/ has been observed to be realized as a single [r]-colored or rhoticized vowel (e.g. Ladefoged 2001), which can explain the deletion of postvocalic /r/.

[6] Although Korean lacks voiced stops in its phoneme inventory, the plain voiceless stop becomes voiced in inter-sonorant environments. This is why [b], not [p], is realized in this example. Additionally, Korean liquid /l/ is realized as [r] in the onset position.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(10) Voiceless Stop: Variation

a. Epenthesis 39%

mat /mæt/ → [mæ.t$^{h}$ɨ]

peak /pik/ → [p$^{h}$i.k$^{h}$˺]

b. No Epenthesis 54%

cap /kæp/ → [k$^{h}$æp˺]

book /bʊk/ → [puk˺]

c. Optional Epenthesis 7%

cut /kʌt/ → [k$^{h}$ʌt˺] [k$^{h}$ʌ.t$^{h}$ɨ]

Kang (2003) proposes that stop release is a crucial conditioner of the variation. English released stops are acoustically similar to the sequence of Korean stop + [ɨ] (e.g. Jun and Beckman 1994). Moreover, a positive correlation between stop release and vowel epenthesis has been observed (e.g. Jun 2002).

In the experiment described in Section 2, the effects of stop voicing and stop release on the perception of stop codas are examined. The results show that a given stop coda is perceived similar to an epenthetic form than a non-epenthetic form, when the coda is released and voiced.

### 1.3. Limitations of the Standard Phonological Approach

The standard phonological approach to loanword adaptation assumes that adaptation is a phoneme-based process, where source forms are adapted via phoneme to phoneme mapping. Thus, subphonemic information is considered irrelevant to the adaptation process. This approach also assumes that the grammar of the borrowing language determines the adaptation process. For example, *bus* /bʌs/ is first mapped to /pʌs/ because the phonologically closest phoneme to /b/ available in the Korean consonant inventory is /p/, differing in voicing. The form /pʌs/, however, is still unacceptable because it contains an illegal fricative coda /s/. A phonologically unmarked vowel /ɨ/ is inserted, resulting in the legal /pʌsɨ/.

While the standard phonological approach correctly assumes that constraints on syllable structures guide the adaptation process, it nevertheless falls short in accounting for the variable patterns that actually occur in Korean. As discussed earlier, a discrepancy exists between native and loanword strategies. To satisfy No Complex Margin, loanwords employ vowel epenthesis while native words undergo consonant deletion. To satisfy Coda Condition, loanwords again employ vowel epenthesis while native words undergo coda neutralization. If the grammar of the borrowing language that operates on native words is also responsible for the adaptation process, as assumed in the standard phonological approach, we would not expect different repair strategies for native words and loanwords. When ill-formed input forms enter the adaptation process, constraints on syllable structures require repair, but it seems that the native Korean grammar does not dictate how to repair them. Therefore, an independent reason, outside the native grammar, must motivate vowel epenthesis instead of native processes.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The standard phonological approach also does not provide a prediction concerning the decision between equally possible adapted forms to one input. Let us assume, for instance, that the grammar requires a repair of a $C_1C_2V_1$ form to satisfy No Complex Margin. There are multiple possible repaired forms, including $C_1V_1C_2V_1$, $V_2C_1C_2V_1$, $C_1V_2C_2V_1$, $C_1V_3C_2V_1$, and so forth. The phonological approach cannot choose one over the others, because, structurally speaking, all of them are equally approximate to the input form, involving one structural change—one deletion or one insertion of a segment. This "too many solutions" problem is a major drawback of the phonological account, often criticized by proponents of the perceptual similarity account (Steriade 2001).

Additionally, the within-phoneme variation associated with epenthesis is incompatible with a simple phoneme-to-phoneme mapping system. The standard phonological approach predicts that all instances of the same phoneme in English map to the same corresponding Korean phoneme and thus behave the same with respect to vowel epenthesis. This, however, is not the case, as exemplified by English voiceless stops, which show variation within a single phoneme.

Finally, Korean vowel epenthesis exhibits phonologically unnecessary epenthesis, where an epenthetic vowel is inserted even when no structural reason requires it. English /bɛd/ phonemically maps to Korean /pɛt/, and since /t/ is a legal coda consonant in Korean, no phonological reason exists to apply vowel epenthesis to repair bad syllable structure. Nevertheless, vowel epenthesis still applies, resulting in /pɛt̚i/, which is realized as [pɛ.di̚]. In a similar vein, if vowel epenthesis after a stop coda is in fact sensitive to stop release (which will be shown to be the case in the following experiment), the standard phonological approach cannot accommodate this conditioning, because subphonemic phonetic details such as stop release are considered irrelevant to the adaptation process.

## 2. Experiment

I have argued that vowel epenthesis in Korean cannot be entirely motivated by constraints on syllable structure. With vowel epenthesis after a simple coda, in particular, there must be an independent explanation for why loanwords exhibit vowel epenthesis instead of coda neutralization, and why the application of vowel epenthesis widely varies after stop codas. I hypothesize that the motivation of vowel epenthesis in English-to-Korean loanwords is to produce forms that are perceptually maximally similar to the source forms while respecting the structural constraints of Korean. The claim that perceptual similarity plays a significant role in Korean vowel epenthesis has been argued for by several researchers (notably Kang 2003), but no studies have directly shown that English words adapted with epenthesis are actually perceptually more similar to epenthesis forms than to non-epenthesis forms, and vice versa. The goal of the present experiment is to directly test the perceptual similarity hypothesis. The perception test results show that perceptual similarity successfully predicts the actual patterns of vowel epenthesis after a simple coda, supporting the crucial role of perception in motivating vowel epenthesis in Korean.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

When an English [CVC] is adapted into Korean, there are three possible adapted forms: non-epenthesis form [CVC], epenthesis form [CVCV] and deletion form [CV]. Note that non-epenthesis forms may require neutralization if the coda is illegal. Examples are given in (11):

(11) Examples of three possible adaptations of English CVCs to Korean

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| a. | [CVm] | may be adapted to | [CVm] | or | [CVm$_{\text{ɨ}}$] | or | [CV] |
| b. | [CVs] | | [CVt$^{\neg}$] | | [CVs$_{\text{ɨ}}$] | | [CV] |
| c. | [CVt] | | [CVt$^{\neg}$] | | [CVt$^{h}_{\text{ɨ}}$] | | [CV] |

Of the three possible forms, a perceptual similarity hypothesis predicts that English codas adapted with vowel epenthesis are perceptually more similar to epenthesis [CVCV] forms than the other forms. Also, English codas adapted without epenthesis should be perceptually more similar to non-epenthesis [CVC] forms than the other forms.

## 2.1. Methods

### 2.1.1. Participants

Eighteen native Korean speakers (m=3, f=15) participated. All were university students in Seoul, Korea whose ages ranged from 19-25. They had English as a foreign language since secondary school, but none had lived in an English-speaking country for more than a year. They self-reported their English proficiency as intermediate, averaging 5.0 on a nine point scale. No hearing loss was reported.

### 2.1.2. Stimuli and Procedure

Twenty English CVC forms differing only in coda sound were recorded by a female native American English speaker: [p$^{h}$ɛC] with C being one of (i) four sonorants [m, n, l, r], (ii) four fricatives [s, z, f, v], (iii) six released stops [p, t, k, b, d, g], or (iv) six unreleased stops [p$^{\neg}$, t$^{\neg}$, k$^{\neg}$, b$^{\neg}$, d$^{\neg}$, g$^{\neg}$].[7] Additionally, corresponding Korean CVC, CVCV forms and a CV form—[p$^{h}$ɛC], [p$^{h}$ɛC$_{\text{ɨ}}$], and [p$^{h}$ɛ]—were recorded by a female native Korean speaker.[8] Speakers were recorded in Praat, using a condenser microphone Shure 849. The input was low-pass filtered at 4 kHz and digitized at a sampling rate of 10 kHz.

The test forms were then sequenced in an ABX format: X was an English CVC form; A and B were two out of the three corresponding Korean forms. A .7 second pause was inserted between forms. For a given English CVC form, the following three ABX conditions were formulated:

[7] The words recorded were *pem, pen, pell, pear, pess, pez, peff, pev, pep, pet, peck, peb, ped,* and *peg.* Some of these are not real words in English.

[8] CVC form were [p$^{h}$ɛm], [p$^{h}$ɛn], [p$^{h}$ɛl], [p$^{h}$ɛp$^{\neg}$], [p$^{h}$ɛt$^{\neg}$], and [p$^{h}$ɛk$^{\neg}$]; CVCV forms were [p$^{h}$ɛ.m$_{\text{ɨ}}$], [p$^{h}$ɛ.n$_{\text{ɨ}}$], [p$^{h}$ɛl.l$_{\text{ɨ}}$], [p$^{h}$ɛ.s$_{\text{ɨ}}$], [p$^{h}$ɛ.c$_{\text{ɨ}}$], [p$^{h}$ɛ.p$^{h}_{\text{ɨ}}$], [p$^{h}$ɛ.t$^{h}_{\text{ɨ}}$], [p$^{h}$ɛ.k$^{h}_{\text{ɨ}}$], [p$^{h}$ɛ.b$_{\text{ɨ}}$], [p$^{h}$ɛ.d$_{\text{ɨ}}$], and [p$^{h}$ɛ.g$_{\text{ɨ}}$].



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(12) Three ABX conditions

| | | | |
|---|---|---|---|
| a. | [CVC] | [CVCV] | Eng.[CVC] |
| b. | [CVC] | [CV] | Eng.[CVC] |
| c. | [CVCV] | [CV] | Eng.[CVC] |

A total of 60 ABX sequences were formulated (20 English CVC forms * 3 conditions) and randomly presented to listeners four times (240 ABX sequences in total). The relative order of A and B was counterbalanced. A 2.5 second silence was inserted between sequences.

The subjects listened to the 240 ABX sequences in one session. They were told that they were going to listen to three meaningless words in a row, two Korean words followed by an English word. They were asked to decide whether the last English form (X) sounded more similar to the first Korean form (A) or to the second Korean form (B). Before the actual test, each subject listened to five practice sequences to familiarize themselves to the pace and the stimuli of the test. The test took about twenty-five minutes.

### 2.2. Results

Table (13) shows the mean percentage of epenthetic CVCV responses as opposed to non-epenthetic CVC:

(13) Mean percentage of CVCV responses (as opposed to CVC) by Manner (left) and by Stop Release and Voicing (right)

| CVCV vs. CVC | Manner | | | Stop Release and Stop Voicing | | | |
|---|---|---|---|---|---|---|---|
| | Frica-tive | Stop | Sonorn t | Releas d | Unrel. | Voiced | Vceles s |
| Mean % CVCV | 83.7 | 65.6 | 17.0 | 81.0 | 50.2 | 73.6 | 57.6 |
| St. deviation | 27.2 | 34.2 | 24.8 | 26.2 | 34.4 | 31.7 | 35.0 |

There was a significant effect of manner on the percentage of CVCV responses [$F(2, 357) = 92.45$, $p < .0005$]. A post-hoc test revealed that fricative codas received more CVCV responses than stops, which received more CVCV responses than sonorants. T-tests also showed that fricative and stop codas received more CVCV responses than CVC responses [$p < .0005$], whereas sonorant codas received more CVC responses than CVCV responses [$p < .0005$]. A large variation within stop codas (from 33% of [tˀ] to 90% of [d]), however, forced us to examine stop codas in more detail.

There were also significant effects of stop release and stop voicing on CVCV responses [stop release, $F(1, 204) = 61.38$, $p < .0005$; stop voicing, $F(1, 204) = 16.52$, $p < .0005$]. Released stop codas received more CVCV responses than unreleased stop codas; voiced stop codas received more CVCV responses than voiceless stops. T-tests showed that released stops and voiced stops received more

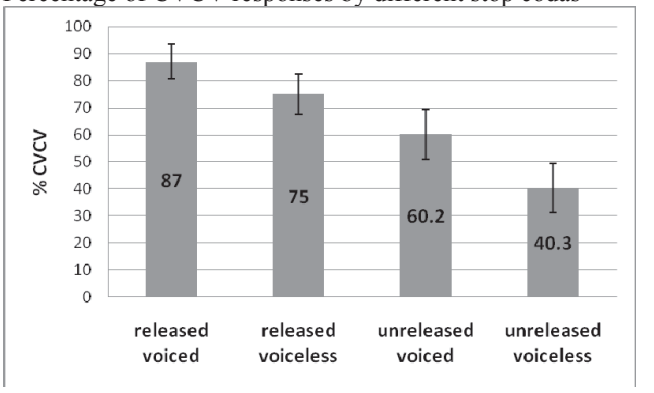


In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

CVCV responses than CVC responses [p < .0005]; voiceless stops received CVC responses significantly more than CVCV responses [p =.03]; and notably, unreleased stops received neither responses significantly more than the other [p = .9].

Stop release and stop voicing did not interact [F(1, 204) = 1.00, p = .32]. As the graph (14) shows, the percentage of CVCV responses is 87% for released voiced stops, and it gradually decreases to 75%, 60% and to 40%. T-tests confirmed that only unreleased voiceless stops were perceived as more similar to CVC [p < .03], and all other stops were perceived as more similar to CVCV [released voiced, released voiceless, p <.0005; unreleased voiced, p < .03].

(14) Percentage of CVCV responses by different stop codas




Although there was no main effect of stop place [F(2, 204) = 1.91, p = .15], an interaction was found between stop place and stop voicing [F(2, 204) = 3.13, p < .05]. Labial stops, unlike coronal or velar stops, did not show the voice effect: voiced labial stop /b/ does not differ from /p/ in terms of its CVCV responses. A post-hoc analysis on stop codas also shows a similar result. Unreleased voiced labial stop [b˺] was grouped together with the unreleased voiceless stops, whereas other unreleased voiced stops and all released stops all show high CVCV responses. That [b˺] received lower CVCV responses may be due to the fact that the [b˺] token in the test showed the shortest voicing into closure (.022 vs. .027 for [d˺]; .059 for [g˺]) and the shortest vowel duration (.116 vs. .145 for [d˺]; .147 for [g˺]), which suggests the voicing of [b˺] may not be as strong as the other voiced stops.[9]

Finally, results of the conditions involving CV forms are summarized below:

(15) Mean percentage of CV responses by Manner and by Stop Release and Voicing, as opposed to CVCV (top) and CVC (bottom)

[9] Since there was only one token, this observation cannot be readily generalized to all voiced labial stops. But it is intriguing to find that /b/ in fact is adapted with vowel epenthesis not as much as the other voiced stop codas. In the NAKL list, only 44.5% of the postvocalic word-final /b/ is adapted with vowel epenthesis, while 75% and 98.5% of word-final /d/ and /g/ are adapted with vowel epenthesis, respectively.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

| CV vs. CVCV | Manner | | Stop Release and Stop Voicing | | | |
|---|---|---|---|---|---|---|
| | Fricative | Sonorant | +R +V | +R -V | -R +V | -R –V |
| Mean % CV | **11.1** | 42.4 | **6.0** | **15.2** | **27.3** | **38.0** |
| St. deviation | **20.1** | 34.5 | **13.7** | **25.4** | **33.0** | **35.3** |

| CV vs. CVC | Manner | | Stop Release and Stop Voicing | | | |
|---|---|---|---|---|---|---|
| | Fricative | Sonorant | +R +V | +R -V | -R +V | -R –V |
| Mean % CV | 53.1 | **10.4** | 48.2 | **22.7** | **35.7** | **20.4** |
| St. deviation | 33.9 | **19.1** | 18.6 | **26.3** | **33.2** | **21.8** |

Cells that received significantly [$p < .02$] less CV responses than its competitor CVCV or CVC are bolded. No cell received significantly more CV responses than its competitor. Crucially, whenever a coda received more CVCV responses than CVC responses (i.e. fricative, released voiced/voiceless, and unreleased voiced codas), it also received more CVCV responses than CV responses; whenever a coda received more CVC responses than CVCV responses (i.e. sonorant and unreleased voiceless codas), it also received more CVC responses than CV responses. This means that a given English CVC is perceived most similar either to a non-epenthesis CVC or to an epenthesis CVCV, but never to a deletion CV form.

### 2.3. Discussion

The results show that a given English CVC form is perceptually more similar to having a following vowel [ɨ] in Korean, when: (i) the coda is a fricative rather than a stop, (ii) the coda is a stop rather than a sonorant, (iii) the coda is a released stop rather than an unreleased stop, and (iv) the coda is a voiced stop rather than a voiceless stop. The results also show that given English CVC forms are perceptually most similar to a Korean epenthesis form [CVCV], when the codas are fricatives, released stops, or voiced stops. But given English CVC forms are perceptually most similar to a non-epenthesis form [CVC], when the codas are sonorants or unreleased voiceless stops.

The perceptual similarity of fricative codas to epenthetic CVCV forms shows that vowel epenthesis creates higher perceptual similarity to the English forms than coda neutralization does. Recall that if there was no following epenthetic vowel, the fricative coda has to be neutralized to unreleased stop. Thus, the fricative coda in English [$p^h$ɛs] will be either neutralized, losing its frication, as in Korean [$p^h$ɛt$^{\neg}$] or be followed by an epenthetic vowel, surviving in the onset position, as in Korean [$p^h$ɛ.sɨ]. In terms of meeting Coda Condition, either neutralization or vowel epenthesis would do, but what we see here is that neutralization costs more than vowel epenthesis in terms of perceptual similarity. For sonorant codas, on the other hand, inserting an epenthetic vowel perceptually costs more than not inserting it. Since sonorants are allowed in coda position, a sonorant coda in English [$p^h$ɛm] will survive in the Korean non-epenthesis form [$p^h$ɛm]. The



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



non-epenthesis form is already maximally similar to the English form; therefore, inserting an epenthetic vowel as in [pʰɛ.mɨ] would instead decrease the perceptual similarity by unnecessarily making the coda an onset.

In the case of voiced stop codas, having a following [ɨ] creates an intervocalic environment in which the stop can preserve its voicing. Recall, in Korean, stops can be voiced only in inter-sonorant positions. Thus, the voiced stop in English [pʰɛd] will remain voiced in the epenthesis form [pʰɛ.dɨ], but, without epenthesis, it will have to be neutralized to [pʰɛt˺], losing its voicing. Stop release effect shows the similar effect. Without epenthesis, a released stop coda in English [pʰɛt] will have to be neutralized to [pʰɛt˺], losing its release, but epenthesis preserves the release in [pʰɛ.tʰɨ].

The foregoing results demonstrate that perceptual similarity is a good indicator that correctly predicts the actual vowel epenthesis patterns found in English-to-Korean loanwords. The perception test results clearly reflect the observed patterns of vowel epenthesis as summarized below:

(16) Comparison between vowel epenthesis patterns and perception test results

| | | Observed Patterns | Perception Test Results |
|---|---|---|---|
| Sonorants | | No Epenthesis | CVC |
| Fricatives | | Epenthesis | CVCV |
| Stops | Voiced | Epenthesis (Mostly) | Released CVCV<br>Unreleased CVCV |
| | Voiceless | Variation | Released CVCV<br>Unreleased CVC |

When the coda is perceived to be more similar to non-epenthesis CVC forms, epenthesis does not apply. When the coda is perceived to be more similar to epenthesis CVCV forms, epenthesis applies. When the coda is perceived to be more equally similar to both forms, the pattern varies depending on the presence or absence of stop release. Thus, the perceptual similarity hypothesis holds: Korean vowel epenthesis applies to increase perceptual similarity between English source forms and Korean adapted forms.

## 3. Conclusion

This study has argued that the standard phonological approach to loanword adaptation is insufficient to motivate Korean vowel epenthesis and, instead, has supported the perceptual similarity account by showing that vowel epenthesis occurs only when epenthetic forms are perceptually most similar to the source forms. The results suggest that some loanword adaptation processes are not only phonological repairs but also active strategies utilized by borrowers to achieve a higher degree of similarity to the source. To fully account for loanword adaptation, therefore, any phonological approach should incorporate perceptual factors.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



**References**

Cho, Taehong. 1999. Intra-Dialectal Variation in Korean Consonant Cluster Simplification: A Stochastic Approach. *Proceedings of the 35th Annual Meeting of the Chicago Linguistics Society,* 43-57.

Jacobs, Haike, and Carlos Gussenhoven. 2000. Loan Phonology: Perception, Salience, the Lexicon, and OT. In J. Dekkers, et al. eds., *Optimality Theory: Phonology, Syntax, and Acquisition,* 193-209. Oxford: Oxford University Press.

Jun, Eun. 2002. An Experimental Study of the Effect of Release of English Syllable Final Stops on Vowel Epenthesis in English Loanwords. *Studies in Phonetics, Phonology, and Morphology* 8:117-134.

Jun, Sun-Ah, and Mary Beckman. 1994. Distribution of Devoiced High Vowels in Korean. *Proceedings of the 1994 International Conference on Spoken Language Processing,* 479-482. Yokohama: Acoustic Society of Japan.

Kang, Yoonjung. 2003. Perceptual Similarity in Loanword Adaptation: English Postvocalic Word-Final Stops in Korean. *Phonology* 20(2):219-273.

Kenstowicz, Michael. 2003. The Role of Perception in Loanword Phonology. *Studies in African Linguistics* 32:95-112.

Kim, Mi-Ryoung and San Duanmu. 2004. "Tense" and "Lax" Stops in Korean. *Journal of East Asian Linguistics* 13(1):59-104.

Kwuklipkwukeyenkwuwen [The National Academy of the Korean Langauge]. 1991. Oylaye sayong silthay cosa: 1990 nyendo [Survey of the state of loanword usage: 1990]. Seoul: Kwuklipkwukeyenkwuwen.

LaCharité, Darlene, and Carole Paradis. 2005. Category Preservation and Proximity versus Phonetic Approximation in Loanword Adaptation. *Linguistic Inquiry* 36(2):223-258.

Ladefoged, Peter. 2001. *A Course in Phonetics*. Boston: Heinle & Heinle.

Peperkamp, Sharon, and Emmanuel Dupoux. 2002. Loanword Adaptations: Three Problems for Phonology (and a Psycholinguistic Solution). Paper presented at the North American Phonology Conference, Concordia University, Montreal.

Peperkamp, Sharon, and Emmanuel Dupoux. 2003. Reinterpreting Loanword Adaptations: The Role of Perception. *Proceedings of the 15th International Congress of Phonetics Sciences,* 367-370.

Steriade, Donca. 2001. The Phonology of Perceptibility Effect: The P-map and Its Consequences for Constraint Organization. Ms., University of California, Los Angeles.

Seung Kyung Kim
Linguistics Department
Margaret Jackson Hall, Building 460
Stanford, CA 94305-2150

skim2@stanford.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Relations between the Conative and *Out-at* Constructions: An Extended Semantic Map Approach[1]

YONG-TAEK KIM
*University of Oregon*

## 0. Introduction

This paper presents a theory of syntax-semantic mapping—an extended semantic map model (Kim 2008). It incorporates Talmy's (2000) model of the attentional system as universal criteria of the semantic map model (Croft 2001, Haspelmath 2003). It addresses two unsolved problems regarding the English conative construction (verb-***at*** construction, e.g. *hit **at** the fierce dog*): 1) which verb types can and cannot occur in the conative construction; and 2) why *verb-**out*** constructions (e.g. *hit **out** blindly*) cannot occur with transitive constructions (e.g. **hit out the dog*[2]) but can with the conative construction (e.g. *hit **out at** the dog*). The new semantic map model explains them by mapping the three constructions (conative, *out* and *out-at* constructions) onto a conceptual space, with the analysis of BNC[3] data.

My argument will take the following form. Section 1 poses research questions by pointing out the problems of previous studies. Section 2 introduces data and methodology. Section 3 outlines the semantic map approach (Croft 2001, Haspelmath 2003), and explores an extended semantic map model by integrating the attentional system. Section 4 discusses the results of the corpus analysis, and section 5 provides the semantic map of the verb-***at***, verb-***out*** and verb-***out-at*** constructions, and its theoretical implications.

## 1. Previous Studies

A large number of theoretical frameworks have been applied to the problem of the conative construction. Pinker (1989) and Levin (1993) address the conative construction in terms of lexical semantics; van der Leek (1996) and Dixon (2005),

[1] I would like to thank the members of cognitive linguistics workshop at the University of Oregon, particularly Professor Eric Pederson for their valuable and insightful comments during the preliminary presentation of this work.

[2] It can be interpreted as a resultative construction (=*hit the dog out*).

[3] British National Corpus



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



in terms of a compositional approach; Goldberg (1995), in terms of Construction Grammar; Broccias (2003), in terms of Cognitive Grammar. This section briefly outlines them.

### 1.1. Lexical Semantic Approach

#### 1.1.1. Pinker (1989)

Pinker (1989:105) argues that the verbs participating in the conative construction must signify a type of motion resulting in a type of contact.[4] The argument is based on the assumption that verbs of hitting (*hit, beat, elbow, kick, punch, poke, rap, slap, strike,* etc.) and verbs of cutting (*cut, slash, chop, hack, chip,* etc.), both of which signify motion and contact, enter into the conative alternation; whereas verbs of touching (*touch, kiss, hug, stroke, contact,* etc.), signifying contact alone, and verbs of breaking (*break, shatter, crack, split, crumble,* etc.), signifying neither motion nor contact, fail to enter into it.

There are two main problems with Pinker's argument. First, *touch* can have a stative, hence non-motion meaning as in (1a); but it can also signify both motion and contact, as shown by (1b). The verb *touch* in Pinker's (1989) example (1c) presumably would denote both motion and contact as shown in (1c).

(1) a. John touched the wall (for two days, since his murderer had propped his lifeless body against it). (Pinker 1989:51)
b. *Nancy$_i$ touched the wall, but she$_i$ did not move at all.
c. *Nancy touched **at** the cat. (Pinker 1989:104)

In other words, there are many verbs which do signify motion and contact cannot participate in the conative construction, for example *spank, carve, sculpt,* etc. as shown below.

(2) *She spanked **at** his bottom.
(3) *He carved **at** the roast.
(4) *He sculpted **at** the statue.

Second, the motion and contact hypothesis gives only a description—and not even a sufficient one—of some semantic properties of the verbs participating in the conative construction. It offers no explanation for why the verbs signifying motion and contact and not others should fit into that slot.

In sum, it is impossible to produce only and all grammatical sentences that include conative constructions, if the account is based only on the verbal semantic constraints of contact and motion.

#### 1.1.2. Levin (1993)

Levin (1993:41-2) lists ten classes of verbs as potential candidates for the cona-

[4] Pinker (1989) does not specify the type of motion.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

tive alternation. Her list is summarized as below:[5]

(5) **Classes of Verbs that Participate in the Conative Alternation**

| | | |
|---|---|---|
| Verbs of Contact by Impact | HIT verbs | *bang*, *bash*, *hit*, *kick*, *lash*, *strike*, etc. |
| | SWAT verbs | *bite*, *claw*, *paw*, *peck*, *punch*, etc. |
| | *SPANK verbs | *belt*, *brain*, *clobber*, *knife*, *spank*, etc. |
| Poke verbs | | *dig*, *jab*, *poke*, *stick* |
| Verbs of Cutting | CUT verbs | *chip*, *cut*, *hack*, *saw*, etc. |
| | *CARVE verbs | *bore*, *bruise*, *carve*, *chip* (potatoes), etc. |
| Spray/load verbs | | *dab*, *rub*, *splash*, *spray*, *squirt*, *swab* |
| *Alternating verbs of Change of State | *BREAK verbs | *break*, *chip*, *crack*, *fracture*, *snap*, etc. |
| | *BEND verbs | *bend*, *crease*, *crumple*, *fold*, etc. |
| *Touch verbs | | *kiss*, *pat*, *pinch*, *stroke*, *touch*, etc. |
| Push/Pull verbs | | *heave*, *jerk*, *pull*, *push*, *yank*, etc. |
| *Destroy verbs | | *annihilate*, *destroy*, *exterminate*, etc. |
| Verbs of Ingesting | EAT verbs | *drink*, *eat* |
| | CHEW verbs | *chew*, *gnaw*, *lick*, *nibble*, *pick*, *sip*, etc. |
| | *GOBBLE verbs | *gobble*, *gulp*, *swallow*, *wolf*, etc. |
| | *DEVOUR verbs | *consume*, *devour*, *imbibe*, *ingest*, *swill* |
| *Verbs of Sending and Carrying | *SEND verbs | *airmail*, *deliver*, *hand*, *post*, *send*, etc. |
| | *SLIDE verbs | *bounce*, *float*, *move*, *roll*, *slide* |

Levin classifies verbs of Contact by Impact into HIT, SWAT, and SPANK verbs, but does not explain why HIT and SWAT verbs are acceptable in the conative construction whereas SPANK verbs are not.

(6) He hit **at** the boys.
(7) He swatted **at** the boys.
(8) *He spanked **at** the boys.

Similarly, Levin sub-classifies CUT and CARVE verbs under verbs of Cutting without any explanation of why CUT verbs are acceptable in the conative construction whereas CARVE verbs are not.

(9) *Margaret carved **at** the roast.
(10) Margaret cut **at** the roast.

In the same way, Levin classifies verbs of Ingesting into EAT, CHEW, GOBBLE, and DEVOUR verbs, but does not explain why EAT and CHEW verbs

[5] The non-participating verb classes are indicated as "*", and a partial listing of the verb class as "etc."



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



are acceptable in the conative construction, whereas GOBBLE and DEVOUR verbs are not.

(11) She rolls her fries in ketchup and nibbles **at** them vaguely. (BNC: ACP)
(12) *The mouse devoured **at** a piece of cheese.

After her list of verbs, Levin (1993:42) argues that the conative alternation appears to be found with verbs whose meaning includes both contact and motion. As with Pinker (1989), this is a broad description rather than an explanation.

### 1.2. Compositional Approach

#### 1.2.1. Dixon (2005)

Dixon (2005:298-9) argues that a preposition can be inserted before the Object NP of a transitive verb to indicate that the emphasis is not on the effect of the activity on some specific Object (the normal situation) but rather on the subject's engaging in the activity. For example, (13) could be used to focus on the fact that he was angry and just kicking out in fury, with what the kicks made contact with being of secondary importance.

(13) He kicked at the door.

This compositional approach is very insightful, but it is also limited to a description of the conative construction. It does not offer any explanation of why the inclusion of a preposition leads to the shift of emphasis from the effect on the Object (without *at*) to subject's activity (with *at*).

#### 1.2.2. Van der Leek (1996)

Van der Leek (1996) argues that the meaning of the conative construction is compositional. The skeletal meaning of the verb (i.e. the semantics that a verb brings in, given a minimally necessary context (van der Leek 1996:372), is merged with that of the *at*-phrase, which designates a point of contact without signaling a path. Van der Leek also argues that *at* in the conative construction signals either estimated-point-of-contact with verbs designating forceful motion as in (14), or point-of-contact with verbs implying a bit-by-bit process as in (15).

(14) Sam kicked **at** the glass.
(15) The mouse nibbled **at** a piece of cheese.

This analysis provides more detailed description of the conative construction than Dixon (2005), however, there is no explanation of why *at* signals estimated-point-of-contact in the conative construction containing verbs designating forceful motion whereas *at* signifies point-of-contact in the conative construction containing verbs designating a bit-by-bit process. Furthermore, van der Leek does not offer an explanation of why verbs designating forceful motion or implying a bit-by-bit process, but not others, participate in the conative construction.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Above all, the compositional account cannot explain where the iterative interpretation of the verbal activity in (16b) and (17b) comes from. Iterative meaning is not derivable from *knock* in (16a) and *pull* in (17a) or *at* in (16b) and (17b).

(16) a. She knocked the door down.
b. She knocked **at** the door and waited outside. (BNC: A0R)

(17) a. You can grab and pull the front guard hand.
b. If the front guard hand is too far forward, then you can grab and pull **at** it. (BNC: A0M)

### 1.3. Construction Grammar Approach: Goldberg (1995)

Goldberg (1995) argues that constructions carry meaning, independently of the specific words in the sentence. Goldberg defines the syntactic structure of the conative construction as V <subject, oblique *at*>, and its semantic structure as 'Agent DIRECTS ACTION AT Theme,' in which the argument roles of Agent and Theme are represented as subject and oblique *at*-complements syntactically. She further argues that a verb is related to the conative construction by the intended-result relation (i.e. a verb in the conative construction should designate the **intended result** of the activity denoted by the construction).

However, Goldberg also assumes that a verb in the conative construction must be [+motion, +contact]. It indicates that her argument cannot also explain why many verbs (e.g. *spank, carve, sculpt,* etc.) which do signify motion and contact cannot participate in it, as in (2), (3) and (4) above, and why the verbs signifying motion and contact and not others should occur with it.

Thus, Goldberg's account does not determine in a principled way which verbs fit in the conative construction and which verbs do not. This suggests that a fine-tuned constructional approach is necessary.

### 1.4. Cognitive Grammar Approach: Broccias (2003)

Broccias (2003) postulates three schemas: allative schema (translational motion toward a target with possible but not necessary contact, e.g. *kick at*), ablative schema (continuous actions accompanying an ablative movement from a target or a change of state of a target, necessary contact without translational motion, e.g. *pull at*), and allative/ablative schema (translational motion with necessary contact, e.g. *nudge at*).

This classification is also very stimulating. However, the classification into the three schemas is not always clear. For example, Broccias classifies the verb *stroke* into an ablative schema by arguing that it codifies the emission of a perceptual state - sensation. However, sensation is not necessarily entailed in the verb *stroke*.

(18) his fingers stroking at the base of her neck, sending delightful shivers, signals of desire, up and down her spine. (BNC: HGT 4112) [sensation felt by entity referred to by *her*]

This classification is limited to description of the conative construction rather



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



than an explanation of its syntactic and semantic functions.

With the description of the conative construction alone by these previous studies, it would seem that none provide a fully consistent explanation for why (19a), (20a), (21a), (21b) and (21d) are acceptable whereas (19b), (20b), and (21c) are not, which is the research question of this paper:

(19) a. Fernando **patted at** the beads of vapor at her brow. (BNC: JY4)
b. *Fernando **touched at** the beads of vapor at her brow.
(20) a. I told ye to **hit at** it, I didna' tell ye to hit it. (BNC: CBC)
b. *I told ye to **spank at** it, I didna' tell ye to spank it.
(21) a. I was hurting, so I **hit you**.
b. I was hurting, so I **hit out** (blindly).
c. *I was hurting, so I **hit out** you.
d. I was hurting, so I **hit out at** you. (BNC: JXV)

Furthermore, they lack an explication of the relationships between the conative (coding a volitional activity without successful affectedness, e.g. *hit at the dog*), *out* (coding uncontrolled activity, e.g. *hit out wildly*), and *out at* (indicating uncontrolled conative activity, e.g. *hit out at the dog*) constructions.

Lastly, these previous studies except for Broccias (2003) depend on authors' intuition rather than analysis of natural data.

## 2. Data and Method

This paper analyzes the conative, *out-at*, and *out* constructions from BNC.[6] The data will be analyzed in terms of 1) verbal aspect (perfective vs. imperfective), 2) tense (past vs. non-past), 3) Object individuation (definite vs. indefinite), and 4) the distribution of manner adverbials.

This method is based on the hypothesis that Object individuation, completeness of an event, and modification of an event by adverbials are crucial factors which reflect speaker's construal of an event.[7]

## 3. Semantic Map Approach

### 3.1. Semantic Map Model (Croft 2001, Haspelmath 2003)

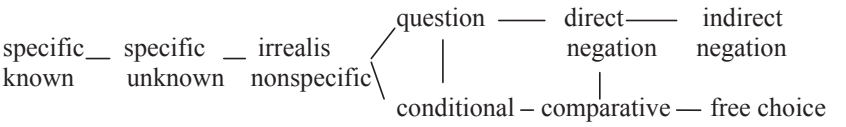
A recent linguistic model that can explain the patterns of multifunctionality of constructions is the semantic map model. According to the semantic map model, distributional patterns of constructions can be mapped onto a conceptual space - a graphical representation of structure of semantic functions, much of whose structure is hypothesized to be universal. For example, Haspelmath (2003) argues that the functions of indefinite pronouns should be arranged on a conceptual space as below:

[6] All constructions are non-metaphorical clauses. The 79 verbs which undergo the conative alternation and 147 verbs which do not in Levin (1993) are mainly analyzed in BNC.
[7] Object individuation and completeness of the action are discussed in Lazard (2002).



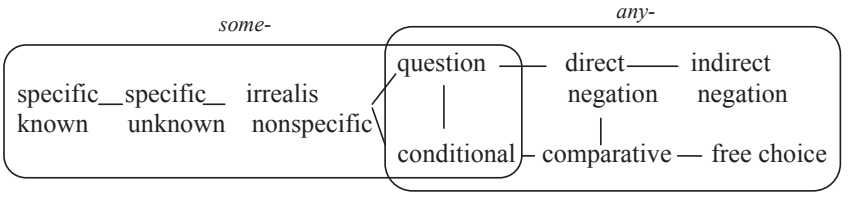
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(22) **A Semantic Map for Indefinite Pronoun Functions** (Haspelmath 2003)




The indefinite pronoun categories of each language can be mapped onto this conceptual space typologically. For example, the English indefinite pronouns, *some* and *any* can be mapped on as follows:

(23) **The Boundaries of English *Some*-Indefinites and *Any*-Indefinites** (Haspelmath 2003)




The semantic map model shows the relationships between the various semantic functions of a multifunctional construction both language-internally as well as cross-linguistically.

However, it has some theoretical limitations. First, it lacks universal criteria with which to specify the arrangement of the geometry of semantic functions and the distance between them. Second, a conceptual space makes little reference to cognitive operations like construal, which indicates that this model leaves out the role of the speaker.

### 3.2. Conceptual Space with Attentional System

An extended semantic map model integrates Talmy's (2000) model of the attentional system into the traditional semantic map model as its universal criteria. Two main patterns governing the distribution of attention in Talmy's attentional system are **window of attention** on an event and **focus of attention** on participants.

Window of attention is a pattern in which one or more (discontinuous) regions within a referent scene are allocated greater attention, while the remainder of the scene receives less attention. Focus of attention is a center-periphery pattern in which greater attentional strength is placed in a central region and less attentional strength is placed in a surrounding region (Talmy 2000:76). In other words, window of attention takes place with respect to an event along **temporal phases** - time domain, whereas focus of attention is placed on **participants** and **their relationship** in a referent scene - space domain.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The window of attention is the X-axis and the focus of attention is the Y-axis of the extended semantic map, presented in Kim (2008) (cf. (28) in section 5). Any constructions can be mapped onto this two-dimensional conceptual space. However, this study mainly concerns verb-*out*, verb-*out*-*at*, verb-*at* constructions.

The X-axis consists of sub-events: Volition, Activity, Causation[8] and Change. Continuous or discontinuous subsets of them can be windowed. For example, an English example like *He touched the window on purpose* refers to the initiatory agent, "He," and to Activity, "He moved his hand forward," and indicates that the agent had Volition to move his hand and made a contact with the window by doing so. The agent's scope of intention embraces Volition and Activity rather than Causation and Change. This type of construction will be categorized as an [Activity]-windowing construction.[9]

On the other hand, an example like *He broke the window on purpose* refers to the agent's Volition to do some Activity, Causation, "energy was transmitted from *He* to *the window*," and Change, "the window broke," but the agent's real Activity (= his bodily motion to break the window) is not windowed. The agent's scope of intention embraces Volition, Causation and Change rather than Activity. This type of construction will be categorized as a [Change]-windowing construction.[10]

The Y-axis indicates a speaker's focus of attention on the participants and construal of the relationship between them; whether their participant roles are construed as Agent-Location (LOC), as in *He shouted at the lighthouse* or Agent-Theme, as in *He broke the window*. It is based on the Case theory that the major, typologically well-attested patterns of case marking of core arguments can be explained in terms of a simple set of the three case roles, Agent, Theme and LOC (DeLancey 2000). However, the differential configuration of Agent-LOC and Agent-Theme results from a speaker's construal of the secondary participant as LOC in [Activity]-windowing events, or Theme in an [Change]-windowing events.[11]

Since the X-axis indicates windowing of attention on an event, it correlates with verbal aspect (e.g. perfective vs. imperfective) and tense (e.g. past vs. non-past), whereas Y-axis correlates with agentivity and Object individuation, such as referentiality (e.g. definite vs. indefinite) since the Y-axis indicates focus of attention on participants.

I argue that there is a statistical relation between the windowing of attention on an event (X-axis) and the focus of attention on participants (Y-axis). Participants who control an event are more likely to have the speaker's focus of attention in [Activity]-windowing events, so that these controllers are prototypically construed as Agents in Agent-LOC and Agent-Theme configuration, and repre-

[8] Causation is defined as transmission of energy.
[9] [Volition-Activity] is not used because Volition is typically included in this type of event.
[10] [Causation-Change] is not used because Change presupposes Causation.
[11] Please refer to Fillmore (1970) for the difference between LOC and Theme in English.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

sented as S (Subject of intransitive verb) or A (Subject of transitive verb). On the other hand, participants who undergo change are more likely to have the focus of attention in [Change]-windowing events, so that these undergoers are prototypically construed as Themes in Agent-Theme configuration, and represented as O (Object of transitive verb).

I also argue that [Activity]-windowing constructions do not entail the Change of a Theme, and are more likely to occur with imperfective aspect, non-past tense, indefinite Object, or manner adverbials. On the other hand, [Change]-windowing constructions entail the Change of a Theme, and are more likely to occur with perfective aspect, past tense, definite Object.[12]

The *out* construction is an [Activity]-windowing construction; 1) Volition and Activity are windowed, and furthermore it can encode one-participant (=Agent) event as in *He hit out wildly*, 2) it is likely to occur with imperfective aspect, non-past tense, indefinite Objects, or manner adverbials.

The *out-at* and conative construction are also [Activity (-Causation)[13]]-windowing constructions; 1) it does not entail the Change of a Theme, in other words, it windows Volition, Activity (and Causation), but not Change; 2) it is likely to occur with imperfective aspect, non-past tense, or indefinite Objects.

The *out*, *out-at* and conative constructions are [Activity]-windowing constructions in that the Change of a Theme is not entailed. However, I hypothesize that the *out* construction is most [Activity]-windowing and the conative construction is least [Activity]-windowing construction because the *out* construction encodes one-participant event, involving no Theme, and the Change of a Theme is more likely in the conative construction than the *out-at* construction because the latter encodes uncontrolled activity.

## 4. Results of the Corpus Analysis

The *out*, *out-at* and conative constructions are analyzed in terms of 1) verbal aspect (imperfective), 2) tense (non-past), 3) Object individuation (indefinite Theme), and 4) manner adverbials.

The result shows that the non-past tense occurs with the *out* construction most frequently and with the conative construction least frequently. The *out-at* construction occurs with indefinite Themes more frequently than the conative construction. In addition, manner adverbials occur with the *out* construction most frequently. This would suggest that the *out* construction is the most [Activity]-windowing construction, and the conative construction is the least [Activity]-windowing construction as shown in (28) in section 5.[14]

The result of the corpus analysis is summarized below: [15]

[12] The close relation of Subjects of transitive constructions (A) to imperfective aspect and non-past tense are discussed in Song (2001:174).

[13] The parenthesis indicates that Causation is implied but not entailed.

[14] More data of the *out* and *out-at* constructions will be analyzed in my dissertation to support this argument.

[15] The number of types indicates that the conative construction is the most productive. The *out*



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(24) **Results of the Corpus Analysis of Verb-*out*, Verb-*out at*, and Verb-*at***

| | verb-*out* (155 tokens, 7 types) | verb-*out at* (119 tokens, 10 types) | verb-*at* (1144 tokens, 55 types) |
|---|---|---|---|
| imperfective aspect | 0 (=0%) | 1 (=0.65%) | 40 (=3.5%) |
| non-past tense | 20 (=17.4%) | 18 (=15%) | 86 (=7.5%) |
| indefinite Object | N/A (one-participant event) | 25 (=21%) | 12 (=10.9%) |
| manner adverbials | 71 (=45.8%) | 15 (12.6%) | 224 (=19.6%) |

## 5. Semantic Map of the Conative, *Out* and *Out-at* Constructions

The conative construction is less likely to occur with *touch* as in (25b) and *spank* as in (26b) because the *touch* does not imply Causation (energy transmission) let alone a Change of the Theme, and the *spank* is [Change]-windowing since it typically expresses the Change (=affectedness) of a Theme (a sore bottom) as punishment. On the other hand, the conative construction is more likely to occur with *pat* as in (25a) and *hit* as in (26a), both of which are [Activity-Causation]-windowing.

(25) a. Fernando **patted at** the beads of vapor at her brow. (BNC: JY4)
b. *Fernando **touched at** the beads of vapor at her brow.

(26) a. I told ye to **hit at** it, I didna' tell ye to hit it. (BNC: CBC)
b. *I told ye to **spank at** it, I didna' tell ye to spank it.

The [Activity]-windowing intransitive *out* construction, (27b), is less likely to occur with the [Activity-Causation]-windowing transitive *hit* construction, (27a), as in (27c). However, it is likely to combine with the [Activity (-Causation)]-windowing intransitive conative construction because both of them are [Activity]-windowing intransitive constructions, indicating closeness on a conceptual space.

(27) a. I was hurting, so I **hit you**.
b. I was hurting, so I **hit out** (blindly).
c. *I was hurting, so I **hit out** you.
d. I was hurting, so I **hit out at** you. (BNC: JXV)

The extended Semantic Map Model shows the closeness between the [Activity]-windowing *out* construction and the [Activity (-Causation)]-windowing *out-at* and conative construction, and the distance between 1) the transitive [Activity-Causation]-windowing *hit* construction and the most [Activity]-windowing *out*

and *out at* constructions are limited mainly to *hit* type verbs, such as *hit*, *lash*, *strike*, *kick*, etc.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

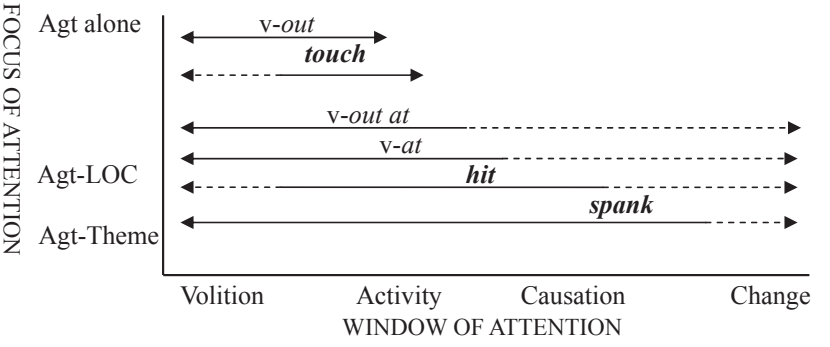
Job Name: -- /337544t



construction and between 2) the [Activity (-Causation)]-windowing conative construction and the [Change]-windowing *spank* construction on a conceptual space. In other words, the closer constructions are on a conceptual space, the more easily they combine. Therefore, the conative construction is more likely to combine with constructions which are located between [Activity] (e.g. v-*out* construction) and [Activity-Causation]-windowing constructions (e.g. transitive *hit* construction) on a conceptual space rather than with [Change]-windowing constructions (e.g. *spank, carve, devour, break, etc.*).

The extended semantic map of these constructions maps onto a conceptual space as follows:[16]

(28) **An Extended Semantic Map**




This extended semantic map model sheds light on the syntax-semantics interface of language-internal and cross-linguistic constructions, such as constructional coercion, transitivity, and voice phenomena, etc.

## References

Broccias, Cristiano. 2003. *The English Change Network: Focusing Changes into Schemas*. Berlin: Mouton de Gruyter.

Croft, William. 2001. *Radical Construction Grammar: Syntactic Theory in Typological Perspective*. Oxford: Oxford University Press.

DeLancey, Scott. 2000. The Universal Basis of Case. *Logos and Language* 1(2): 1-15.

Dixon, R.M.W. 2005. *A Semantic Approach to English Grammar*. Oxford: Oxford University Press.

Fillmore, Charles. 1970. The Grammar of *Hitting* and *Breaking*. In R. Jacobs and

[16] The dotted arrow to the left indicates a typical implication of Volition, and the dotted arrow to the right, implication of the realization of the event schemas (Pederson 2007).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



P. Rosenbaum, eds., *Readings in English Transformational Grammar*, 120-133. Waltham, MA, and London: Ginn.

Goldberg, Adele. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.

Haspelmath, Martin. 2003. The Geometry of Grammatical Meaning: Semantic Maps and Cross-Linguistic Comparison. In Michael Tomasello, ed., *The new Psychology of Language*, *Vol. 2*. Mahwah, NJ: Lawrence Erlbaum.

Lazard, Gilbert. 2002. Transitivity Revisited as an Example of a More Strict Approach in Typological Research. *Folia Linguistica* 30: 141–190.

Levin, Beth. 1993. *English Verb Classes and Alternations: A Preliminary Investigation*. Chicago: University of Chicago Press.

Pederson, Eric. 2007. Event Realization in Tamil. In M. Bowerman and P. Brown, eds., *Crosslinguistic Perspectives on Argument Structure: Implications for Learnability*. Mahwah, NJ: Lawrence Erlbaum.

Pinker, Steven. 1989. *Learnability and Cognition: The Acquisition of Argument Structure*. Cambridge, Massachusetts: MIT Press.

Song, Jae Jung. 2001. *Linguistic Typology: Morphology and Syntax*. Harlow and London: Pearson Education.

Talmy, Leonard. 2000. *Toward a Cognitive Semantics*, *Volume 1: Concept Structuring Systems*. Cambridge, MA: MIT Press.

Van der Leek, Frederike. 1996. The English Conative Construction: A Compositional Account. *Papers from the Regional Meeting of the Chicago Linguistic Society* 32: 363-378.

Department of Linguistics
1290 University of Oregon
Eugene, OR 97403-1290

muchak@gmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Supplemental Relative Clauses and Syntactic Generality

RUSSELL LEE-GOLDMAN
*University of California, Berkeley*

## 0. Introduction

It is generally assumed in research on non-restrictive relative structures (Ross 1984, Espinal 1991, Potts 2002a, Arnold 2007) that sentences like those in (1) are ungrammatical due to a general constraint of the form "nonrestrictive relative clauses must … follow their antecedents" (Espinal 1991:752). The presence of such a linearization constraint seems reasonable enough given the fact that restrictive relative clauses also cannot left-adjoin (**a who I met child*).

(1) a. * Which I said earlier, there are some minor problems
b. * Who plays the piano, my father(,) knows a thing or two about music.

The reasonableness stems from the intuition that modifiers of the same class (relative clause) will be linearized similarly with respect to their heads. However appealing, this intuition is misguided, at least with respect to relative clauses. I argue that linearization of relative clauses and their heads is determined by the category of the modified head as well as that of the modifier. Further, despite indications to the contrary, non-restrictive relative clauses can left-adjoin, though the possibility for it is severely restricted (Sections 3 and 4).

The left-adjunction restriction is one of several differences adduced by Potts (2002b, 2002a) in favor of analyzing parenthetical *as*-clauses (*As you know, this is difficult*) as PPs despite their superficial similarity to which-relatives. With the left-adjunction restriction removed, however, there is a question of what differences remain that prevent bringing *as* into the fold of relativizers. In Section 5 I examine the putative evidence against analyzing *as* (in this usage) as a relative pro-sentence, finding that none of arguments presented bear on a relativizer/non-relativizer analysis. In fact, we will see that it is *as*-clauses which have utterly predictable properties and *which*-relatives that require special pleading. Ultimately, it will be seen that linearization possibilities of a relative clause become more restricted only when information about what the relative clause adjoins to is specified. That is, the category "relative clause" defines more the internal structure of a particular type of clause, saying rather little about its external distribution.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Russell Lee-Goldman

## 1. Terminological Preliminaries

I follow Huddleston and Pullum (2002; CGEL) in splitting relative constructions into integrated and supplemental variants, rather than restrictive and non-restrictive. For relative clauses the difference is purely terminological—supplemental relatives are non-restrictive, and integrated relatives are restrictive. But the relabeling draws a useful parallel between supplemental relative clauses and other supplements, such as parenthetical sentential adverbs (*unfortunately*, *frankly*). Rather than a modifying a head, a supplement is said to have an anchor: that part of the main clause which the supplement is semantically connected to. In the simple case of nominal apposition (*the perpetrator, Jones, is right over there*) an identificational relation is set up between the anchor, *the perpetrator*, and the supplement, *Jones*. I also follow Jackendoff (1977), Sag (1997), and Arnold (2007) in treating relativizers in supplemental clauses as pronominal, coindexed with their antecedent, parallel to personal pronouns (though the reference resolution process is more tightly constrained for relative pronouns). Throughout the paper I avail myself of the term *antecedent* (of a relativizer) to indicate that noun, clause, etc., which is modified by a particular relative clause.

## 2. Supplemental Relative Clauses

Adnominal relative clauses are subject to the same linearization constraints whether they are integrated or supplemental:

(2) a. Kim, who I went to school with, is now a doctor.
b. The boy who I went to school with is now a doctor

(3) a. * Who I went to school with, Kim(,) is now a doctor.
b. * (the) Who I went to school with (the) boy is now a doctor.

In the (2a) the supplement follows the anchor, and in (2b) the modifier follows the head; reversing the order (3a,b) is ungrammatical. Though anchors and heads are distinct grammatical functions, presumably we are dealing with the same or at least very similar constraints in both cases. At first blush supplemental relative clauses with verbal (4a) or clausal (4b) anchors follow this linearization pattern as well. For present purposes I ignore any differences between the two, and I use the term *sentential* for both. (5) illustrates the ungrammaticality of reversing the order.

(4) a. You can get it from the library if you care to request it, which I have.
b. The book is twenty years old, which I discovered when I got there.

(5) a. * Which I have, you can request the book.
b. * Which I discovered when I got there, the book is twenty years old.

Integrated and supplemental relative clauses have identical internal syntactic properties, project structures of the same category (clause), and hold similar functions (modifier and supplement, respectively). This constitutes a good motivation for treating their external syntax as identical, with a single principle of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



relativizer linearization. Though tempting, this would not be the right approach. Before revealing the crucial data for relative clauses, it is helpful to consider the heterogeneity of adverbs. Pullum and Huddleston (2002a), following Jackendoff (1972) split adverbs into two broad categories, clause-oriented and verb-oriented. Within each of these categories there are several types of adverbs (manner, purpose, speech-act, epistemic, etc.), and each type is associated with a set of linearization possibilities and tendencies. It should then come as no surprise that some relative clauses must be ordered in one way with respect to their heads, and others, with different types of heads, ordered in another way entirely.

## 3. Left-Adjunction of *Which*

In certain very restricted environments a supplemental *which* relative clause may appear to the left of its anchor (relative clauses are italicized, and anchors are in boldface; unless otherwise noted, sentences are from the British National Corpus):

(6) a. Their apparently similar, sharply segmented body plan either arose more than once or—*which is also more than possible*—**it is very primitive**.[1]

b. Independent companies allow their directors to do away entirely with actors, and (*which is the only sensible way to manufacture movies at all*) **pick types and faces off the streets**."

c. Either they were performing this public duty in giving the protection asked for … or, *which no one suggests*, **they were at the request of an individual doing something which it was not their duty to do**….

The existence of left-adjoined relative clauses (LARCs) is noted briefly in the CGEL (ch 13): "[a] supplementary relative with a coordinated clause as antecedent can precede it, following the coordinator" (p.1066). Breaking this down, it means that in order to license a LARC, (ia) the antecedent must be a clause, (ib) the relative clause must have the role Supplement (not Modifier), (iia) the relative clause must directly follow a conjuction, and (iib) the relative clause must have a conjunct as an antecedent.

The first two constraints are not independent of each other: (ia) entails (ib). There are no integrated relative clauses with clausal antecedents. Given that, all that need be stated is that *which*-clauses may have as anchors state-of-affairs- or proposition-denoting phrases. The only syntactic category that suffices for this is the clause. This is exactly parallel to constraining, e.g. *who* to pick out people, thus constraining it to have a nominal head. Again, these are necessary conditions for grammaticality. Even introducing conjunction in the proper configuration will not save LARCs with non-clausal antecedents: **You could talk to Sandy, or, who might also be willing to help you, Mitchell*.

The supplement-only constraint on sentential relatives is not limited to

[1] Tudge, Colin. 2002. *The Variety of Life.* Oxford: Oxford University Press, p. 200.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

*which*—as the next sections show, other relativizers enter into anaphoric relations with clauses, and they too must be supplements. This generalization can be stated by arranging relativizers into a hierarchy, and state at the level of "sentential relative clause" (a constructional level) that they must appear in a structure with the role Supplement.[2] Such a constraint is parallel to the restriction on relativizer *that* against appearing in supplemental relative clauses (Hudson 1991, Sag 1997). We thus see that a simple combination of restrictions on words and phrases yields the first two constraints on LARCs. These types of restrictions are seen elsewhere in the grammar. The only difference here is that they are relevant for linearization.

The latter two constraints, regarding conjunction, are also related: the LARC must follow a conjunction word, and what follows (its anchor) must be a conjunct:

(7) a. * It either arose twice, *which is also more than possible*, or **it is very primitive**. [relative precedes conjunction]
b. * It may have arisen twice, *which is also possible*, **arisen three times**, or simply be very primitive. [no conjunction]

There do exist in English constructions that call for conjunctions. Several elliptical constructions, including right-node raising and gapping, require the phrases containing elided material to be conjuncts. Some lexical items might be argued to select for conjunction words: *either*/*neither* are followed by *or*/*nor*, and predicates of obligation such as *must* and *have (got) to* interact idiosyncratically with *or*-clauses: in *I gotta leave or (else) my dad will have a fit*, the *or*-conjunct expresses the negative consequences of not fulfilling the obligation, rather than an alternative (or additional) possibility. This, however, is lexical selection of a coordinate (or subordinate) clause. It would be inappropriate to characterize a relative clause as "selecting" a conjunction in this manner.

A flexible enough grammar might be able to constrain a LARC to appear following a conjunction, but there is a possibility that it need not be so heavy-handed: there may be semantic or pragmatic properties of left-adjoined relative clauses that make their post-conjunction position extremely likely. In particular, if one considers the entire range of left-adjoined *which* relative clauses that appears in the BNC, a clear semantic pattern emerges: most of the *which* LARCs involve a notion of scalar or nonscalar comparison of, or alternation between, two states of affairs. Most (11 of 14) are much like (6a): they include comparative phrases, nearly all as the main predicator, and nearly all preceded by *or* rather than *and*. Even of those predicates without overt comparison, one involves negation (*which no one suggests*) and one contains *surprise* (*which had surprised me in the last few years*), both of which are evocative of the alternative (non-surprising, non-negated) states of affairs which were mentioned in the previous conjunct.

[2] The relativizer is not the head of the relative clause (Sag 1997 and others), and so in a head-driven grammar, some special mechanism would be necessary if instead one wished to place the supplemental-only restriction on the relativizer, rather than the clause it appears in.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Clearly something else is going on besides a simple linearization restriction. Space limitations preclude full development of this idea,[3] but one hint that semantic or pragmatic forces are crucially involved comes from (8), which does involve a comparison: it is embedded in a context in which the antecedent is framed as personal experience, in contrast to the lengthy, scientific explanation of "crashing" from Ritalin which preceded. Despite not occurring in the environment of conjunction, it does follow the alternative/contrast-expressing tendency of LARCs, and seems to me perfectly acceptable (with the caveat that the linguistic background of online writers is hard to confirm).

(8) Now it seems that (*which I know from experience*) when 'the crash' begins within 2 hours, this is when the plasma concentration …[4]

This section has demonstrated the possibility for left-adjunction of relative clauses. Such a structure was shown to have several constraints, including most unusually obligatory post-conjunction position. An argument was made that some or all of these constraints are the result of a semantic/pragmatic restriction on LARCs. The next section shows that not all LARCs require *which*—some allow relativizer *what*.

## 4. Left-Adjunction of *What*

*What* is not a relativizer in standard varieties of English, but it does appear in what appear to be LARCs. Representative examples are shown in (9).

(9) a. In other words, at these two points the crystal is pretty well broken away. *What is even more important*, the dislocation turns out to be movable.
b. Near-empty streets … were no longer silent, but filled with curious brawls, or outbursts of squealing or, *what he had just heard*, the sound of terrified retching.
c. The segregation of people and vehicles, *what is more*, has led to new and unforeseen problems.

Aside from its peculiar linearization, these clauses act just like canonical relative clauses, with a clause-initial relativizer in a long-distance dependency with a gap in the clause: *What I {am sure he considers / *met someone who considers} even more important, the dislocation turns out to be movable.*

[3] One promising possibility may comes from considering LARCs to be complex discourse connectives, and thus evocative of the types of discourse coherence proposed by Kehler (2000) and Asher and Lascarides (2003). The relations **parallel**, **contrast**, and **alternative** seem most relevant, and indeed most of these involve conjunction. See Kehler (2000) for indications that comparison falls into the same (resemblance-based) class as **parallel** and **contrast**.

[4] http://mb.rxlist.com/rxboard/ritalin.pl?noframes;read=526, accessed 2008.05.01



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Of the 32 examples extracted from the BNC,[5] 25 are subject relatives with comparative predicators (e.g. (9a)) and four involve *same* (e.g. *what amounts to the same thing*). Comparison is clearly an integral part, just as for *which*. In fact, removing indications of comparison (*more*, *also*) results in unacceptability: *Someone who climbed over a fence instead of using the official entrance (or, what is *(more/also) likely, exit) was deemed disorderly.*

In general, then, the same constraints seen on *which*-LARCs hold as well for *what*, with a few exceptions: Although *what*-LARCs often follow conjunctions, they need not (10a). The antecedent is also almost always clausal, but sometimes it is not (10b).[6] This points to *what*-LARCs following a tendency similar but not identical to that of *which*. What exactly that difference is (and it seems likely to be pragmatic rather than syntactic) is left as a mystery.

Finally, there is an idiomatic form, *what **be** more*, which has a much wider distribution—in fact, essentially the same distribution described in the CGEL for sentential supplemental adverbs (*frankly*, *surprisingly*), what Ross (1984) described as being "niched":

(10) a. [W]e can hardly fail to notice the sympathy …a sympathy, *what is more*, that nowadays would often be slapped down as a sentimental, modern, postwar "permissive" fad.
b. How had that fancily-named high-hab brat come to be here at the garrison block? Mingling, *what's more*, with Dorcas gang members, or so it seemed?
c. I was rude," he declared, "and very unreasonable, *what's more*.

What this demonstrates is that the label "LARC" is actually a bit misleading when applied to *what **be** more*. To the extent that this phrase has the normal distribution for a sentence-level supplement, it is not particularly notable that it can appear to the left or right of anything, let alone some constituent that it appears to modify. In fact it is more appropriate to say that because it modifies the sentence, it may appear anywhere within that sentence, subject only to the general constraints on supplements. This is a crucial generalization, one which will be returned to in discussion of *as*. The non-idiomatic versions of *what*-relatives, on the other hand, may be more appropriately be called LARCs. A relative clause like *what is more interesting* is importantly limited to either post-conjunction or sentence-initial position (except, of course, as a free relative, in which case its distribution closely

[5] Only punctuation-preceded tokens have been extracted. The 32 examples do not include the form *what **be** more*, of which there are 57 tokens.

[6] In some cases it seems as though *which* has a nominal antecedent: *The starting point can be either a known position such as a radio beacon over which the aircraft has flown or,* which is more likely in the case of an accident*, the crash position*. The anchor here is the NP *the crash position*, but I argue that here we are dealing with a type of metonymy, in which case the antecedent is in fact some state-of-affairs in which *the crash position* holds a role, namely "being the starting point."



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



matches that of NPs). In either case, what it is modifying (and more on this below) follows it, and so we may speak of a "left-adjunction" as a property holding of the construction.

## 5. Supplemental Relativizer *As*

Just as was the case for *which*, supplemental *as*-clauses may be grouped into two types: those with a predicate gap and those with a clause gap (again I use *sentential-as* as a cover term.

(11) a. Art is not, *as the metaphysicians say* __, the manifestation of some Idea of beauty or God
b. There are a number of options available to the publisher who is stuck, *as most of us are* __, with the A4 page.
a'. * Art is not, as I met a metaphysician who said __, the manifestation…
b'. * He was stuck with the A4 page, as he had read a manual that told him publishers often are __.

The similarities with relative clauses include: a "functional" word preceding a finite gapped clause, the gap being either predicative or clausal, corresponding to modification of a predicative or clausal or antecedent. The gap is, further, in a long-distance dependency with something outside the finite clause and thus island effects can be observed (11a',b'; see Potts (2002a,b) and citations within for extensive discussion). Finally, the semantic content of that gap is filled by main-clause material adjacent to the as-clause: in (11a) what metaphysicians say is that "art is not the manifestation of…God," and what "most of us are" in (11b) is "stuck with the A4 page.

The *as*-clause, as I will call any gapped finite clause with an initial *as*, has several properties of a relative clause, especially supplemental *which* relatives. This section argues that treating *as* as a relativizer is indeed the preferred approach. This is by no means a new claim—it is in fact the traditional analysis (see the OED's entry), assumed by Kayne (1984) and Postal (1994, 2004), and hinted at by Ross (1984)—but it has recently been argued against by Potts (2002a,b) and the CGEL (chapter 13). Here my purpose is not to present particular arguments in favor of relativization, but rather to defuse the variety of putative arguments against it (see Lee-Goldman in prep. for positive arguments).

Potts (2002a) gives two reasons for not treating *as* as the extracted element, favoring a null operator approach. He posits two *as* lexical items, one for predicate-modifying uses and one for clause-modifying uses. Their denotations and location in the tree proposed are given in 12 and 13. *As* is a preposition that selects a CP with a phonologically-null operator merged at the cite of the gap. Semantic composition at the level at which the PP attaches to the anchor guarantees that the anchor's semantics will fill in the missing material in the *as*-clause. This is opposed to the relativizer account proposed here, in which the *as* itself enters into a long-distance dependency with the gap, and thus the *as*-clause is a clause rather



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

than a PP and semantic composition is handled by coindexation (Sag 1997).

(12) a. [[CP-*as*]] = λQ ∈ $D_{<<st,t>,t>}$ [λp ∈ $D_{<st>}$ : Q(p) is true [p]]
b. [$_{anchor}$ Dan swims] [$_{PP}$ as [$_{CP}$ OP C you know <OP>]]

(13) a. [[Pred-*as*]] = λF ∈ $D_{<<s,et>,t>}$ [λf ∈ $D_{<s,et>}$ : F(f) is true [f]]
b. Dan [$_{anchor}$ swims] [$_{PP}$ as [$_{CP}$ OP C my sister used to <OP>]]

### 5.1. Two Non-Arguments

Potts (2002b) presents two arguments against relativization. The first is that *as* is blocked from appearing in its "base" position, unlike other pro-sentential words like *so*: *I hoped so* and *so I hoped* are both fine, but *as we all hoped* is paired with **we all hoped as*. Though this is true, it does not thus rule out a relativizer analysis, as relative pronouns do not ever appear *in situ* (**the child you met whom*). Even if one counts *wh-in-situ* question words as somehow fulfilling this extracted/*in situ* alternation test, there is still relativizer *that* and the question word *how come*, which never appear in their "base" position, though they are almost surely extracted elements. The non-occurrence of post-verbal *as* is thus equally well predicted under both styles of analysis.[7]

Potts's second argument comes from cross-linguistic comparison of *as*-like constructions. He finds that the analogous word in Thai is *yaaŋ,* which is derived from the question word for 'how.' This is illustrated in (14), from Potts's (2002b) sentence (35):

(14) t$^{h}$uʔ.rian ʔa.roy yaaŋ t$^{h}$ii k$^{h}$on ee.c$^{h}$ian laai k$^{h}$on ruu
durians delicious as C Asian many class know
'Durians are delicious, as many Asians know.'

The argument goes as follows. The problem with analyzing *yaaŋ* as extracted is that Thai is a *wh-in-situ* language, and so one would be required to posit for this particular construction an exception to the rule that operators may not be extracted. This problem does not arise if *yaaŋ* is a preposition. A severe problem exists with this solution, however, and that is the fact that the subordinate clause still contains a gap, even in Thai, which is still unexpected for a *wh-in-situ* language. This must be accomplished somehow, presumably by a phonologically-null constituent that moves to a higher position during the derivation. What this does, however, is require whatever it is that prevents operators from undergoing extraction to recognize when a particular lexical item will be phonologically exponed and block movement. Or, if one says that this particular operator does not move until semantic interpretation occurs, then one must somehow constrain the operator to appearing in *yaaŋ*-clauses. Either of these might be accomplished with some sort of diacritic

[7] The impossibility of pied-piping with *as* is similarly unproblematic under a relativization analysis, as pied-piping already requires a particular type of relative pronoun (Hudson 1991), and *as* may simply not be in that category.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



on the operator, but the facts could just as well be accounted for with a special diacritic **allowing** movement. The Thai facts do not seem to come down on one side or the other.

### 5.2. Some Inconsequential Differences

Potts (2002a), building on observations by Ross (1984) and Postal (1998), picks out five differences between *which* and *as*: (1) *As*-clause gaps are non-nominal, while *which*-clause gaps are nominal, (2) only *as*-clauses may be "niched," (3) only *as*-clause gaps are sensitive to negative and *wh*-islands, (4) only *which*-clause gaps may be the subjects of "CP-equatives," and (5) *as*-clauses may, depending on their position, "ignore" main-clause negation and modality when determining the semantic content of their gap; *which*-clauses may not. Two further differences are cited by Pullum and Huddleston (2002b): (6) *as*-clauses, but not *which*-clauses, present backgrounded information, and (7) *as*-clauses have several properties of comparatives not present in *which* relative clauses, including the possibility for subject-auxiliary inversion and the various types of reduction associated with comparative clauses.

A full treatment of all of these differences is given in Lee-Goldman (in prep). Most of these are not syntactic but semantic or pragmatic: Potts (2002a) argues this for (3) and (4); (6) is already a pragmatic difference, and (5) is related to niching, Here I concentrate on the (non)-nominal nature of the gap, niching restrictions, and comparative properties of *as*, determining ultimately that these differences do not impact the relativizer/non-relativizer analysis.

At least as far back as Stowell (1987) (which I have not seen), but also in Postal (1994) and Potts (2002b), it has been observed that the gaps in *as*-clauses are not nominal, while those in sentential *which* relative clauses are. One piece of evidence (Potts goes through several) is that *aware*, which may take either a clausal or prepositional complement, shows different valences with *as* and *which*:

(15) a. He is doing fine, as I'm sure you're aware (*of).
b. He is doing fine, which I'm sure you're aware *(of).

Because *of* is incompatible with the non-nominal valence (**aware of that he was okay*), it is incompatible with *as*-clauses.

This first difference between the two words does not have any bearing on the relativizer/non-relativizer question. There is no *a priori* reason to exclude a non-nominal relativizer from the lexicon (just as there would be no reason to exclude whatever variety of null operators must be posited for the structures in (12) and (13)). The nominal/non-nominal distinction is an important one, however, and will figure in the discussion of linearization.

The first few sections of this paper showed that linearization with respect to relative clauses and their antecedents is anything but cut and dried. The exact ordering possibilities depend on the type of relativizer in addition to the syntactic (and possibly pragmatic) category of the anchor and antecedent. Nevertheless, one



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

might be concerned at the sheer number of possible locations that *as*-clauses can appear in—is it not highly unusual for a relative clause? A schematic indication of where it may appear is in (16). In each place indicated with a "^" a clause like *as I said* is possible. A subscripted "*", "?", etc., indicate varying degrees of acceptability (according to my own intuitions).

(16) ^ He ^ has ^ been ^ too ? willing ^ to ^ help ? students * of * literature ^

Ross (1984) noted this possibility for niching and characterized the linearization possibilities as "roughly the same . . . as any other sentence adverb would" (p.261). The question is then whether we can reasonably expect *as*-clauses to have such a range of linearization possibilities, and I think the answer must be that we can. As we have seen, the real set of linearization criteria includes the syntactic category of both the modifier and the anchor/head, so it should come as no surprise that *as*-clauses, as modifiers of clauses, can appear exactly where other, lexical, modifiers of such structures do. Linearization is not a "problem" for a relativizer analysis, because the determination that a particular structure is a relative clause reveals little about its linearization possibilities. It is only when we learn that it is supplemental or integrated, and further whether it is adnominal or sentential that the linear ordering becomes more fixed.

From this perspective, what requires investigation is the comparatively limited distribution of supplemental *which*-clauses, which appear never to interrupt their anchors. Given that they modify sentences just as much as *as*-clauses do, should they not have an equally flexible distribution?

The answer to this question may lie in the observation made by Postal (1994) and later reinforced by Potts (2002a) that gaps in *which*-clauses are truly nominal. Potts (2002a) took this one step further and demonstrated that clause's anchor (i.e. the main clause) must also be nominalized. It then becomes very relevant that adnominal relative clauses must follow their anchors, while sentential *which* supplements often follow, but at least must be adjacent to their anchors. Though this is tentative, there is some sense in which the fact that their pre-anchor position is so pragmatically limited indicates that *which* clauses are still holding on to (or have a special affinity with) their adnominal roots: they must be adjacent to their anchors. The flexibility they do have is perhaps the beginning of a shift to a wider distribution more in accordance with their status as sentential modifiers.

Such retention of vestigial constructional features is not limited to which clauses. As noted above, supplemental *as*-clauses with predicative gaps allow subject-auxiliary inversion (*as have I*). This too is likely a "vestigial" feature, due to affinity with historically related but now separate constructions. Further examples of this sort of vestigial feature can be found in other places in the grammar, for instance non-inversion in *how-come* questions, quasi-auxiliary properties of *dare* and *better*, and complementizer-like properties of relativizer *that*.

A final argument for treating linearization as non-diagnostic of relativizer status



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

comes from another supplemental use of *as*, what I will call Name-*as*. It too precedes a finite clause with a gap, but in this case the gap is a "name" of some sort.

(17) a. The best thing is my ability to "vague out", *as I call it*.
b. This is the account I attribute to, *as I call him*, 'Sartre-Two'.[8]
c. * Trish has been working too hard, *as I call her for short*.

If linearization is determined by what sort of clause the modifier is, then we should expect Name-*as* clauses to have the same distribution as sentential *as*-clauses. This is predicted by the CGEL, which attributes the niching properties of *as* to the fact that is a self-selecting, or ungoverned adjunct (p.1147). Name-*as* is ungoverned in their sense, yet it is just as limited as *which* and *what*: it may appear following the name it modifies (17a), or preceding it (17b), but nowhere else. The reason for this is of course that as a modifier of names, Name-*as* must appear local to that modified head. To reiterate, the distribution of a relative clause is not determined strictly by the category of the modifier; what it modifies matters as well. Sentential *as* has more liberty to move around because it simply has to appear within the sentence it modifies, like any well-behaved sentential supplement.

## 6. Conclusion

Table 1 summarizes the properties of the constructions examined so far. Each row indicates for a given construction whether it may appear after its anchor, before it, and whether it can be niched.

**Table 1: Relative Clause Linearization Possibilities**

| clause type | Post-anchor | Pre-anchor | Niching |
|---|---|---|---|
| *Which* | Yes | Limited[a] | No |
| *What* | Yes | Yes | Limited[b] |
| Adnominal | Yes | No | No |
| Name-*as* | Yes | Yes | No |
| Sentential-*as* | Yes | Yes | Yes |
| Sentential adverb | Yes | Yes | Yes |

[a] Only following a conjunction
[b] Only when in the idiomatic form *what **be** more*

What this reveals is tremendous diversity among relative clauses. Adnominal relative clauses have all the expected properties, but interestingly no other construction in the table has exactly those properties. Both *which* and *what* are more flexible, though with some strong constraints on that flexibility. *As* relatives also vary according to their anchor's category, with sentential *as* patterning with sentential adverbs. What this shows is that, even among a class unified by their

[8] Young, Julian. 2003. *The Death of God and the Meaning of Life*. London: Routledge, p. 142



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



internal syntactic properties, individual members may have rather different external syntactic (linearization) properties.

**References**

Arnold, Doug. 2007. Non-Restrictive Relatives Are Not Orphans. *Journal of Linguistics* 43:271–309.

Espinal, Maria Teresa. 1991. The Representation of Disjunct Constituents. *Language* 67:726–762.

Huddleston, Rodney, and Geoffrey K. Pullum. 2002. *The Cambridge Grammar of the English Language*. Cambridge: Cambridge University Press.

Hudson, Richard. A. 1991. *English Word Grammar*. Oxford: Blackwell.

Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar*. Cambridge: MIT Press.

Jackendoff, Ray. 1977. *X-bar Syntax*. Cambridge: MIT Press.

Kayne, Richard. S. 1984. *Connectedness and Binary Branching*. Dordrecht: Foris Publishers.

Lee-Goldman, Russell. In preparation. *The Unity and Diversity of Supplemental Sentential Relative Clauses*. Ms. University of California, Berkeley.

Postal, Paul. M. 1994. Parasitic and Pseudo-Parasitic Gaps. *Linguistic Inquiry* 25:63–117.

Postal, Paul. M. 1998. *Three Investigations of Extraction*. Cambridge, Massachusetts: The MIT Press.

Postal, P. M. 2004. A Paradox in English Syntax. In *Skeptical Linguistics Essays*, 15–82. Oxford: Oxford University Press.

Potts, Christopher. 2002a. The Lexical Semantics of Parenthetical-*As* and Appositive-*Which*. *Syntax* 5:55–88.

Potts, Christopher. 2002b. The Syntax and Semantics of *As*-Parentheticals. *Natural Language and Linguistic Theory* 20:623–689.

Ross, John R. 1984. Inner Islands. In C. Brugman & M. Macaulay, eds., *Proceedings of the 10th Annual Meeting of the Berkeley Linguistics Society*, 258-273. Berkeley: Berkeley Linguistics Society.

Sag, Ivan. A. 1997. English Relative Clause Constructions. *Journal of Linguistics* 33:431–483.

Russell Lee-Goldman
University of California, Berkeley
Department of Linguistics
1203 Dwinelle Hall
Berkeley, CA 94720-2650

rleegold@berkeley.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Focus on Embedded Adverbials

RAINER LUDWIG, FABIENNE SALFNER, and MATHIAS SCHENNER
Zentrum für Allgemeine Sprachwissenschaft (ZAS) *Berlin*

## 1. Introduction

Focus serves to highlight certain parts of an utterance. It turns out, though, that not just any arbitrary constituent can bear focus. In particular, not all classes of adverbials are suitable for focus. Interestingly, the ability of an adverbial to bear focus is connected to its ability to occur in embedded clauses. This paper aims to identify the cases where adverbials may or may not be focused and/or embedded in German, and sketches a semantically based account of the distribution observed.

We start out with a survey of different types of adverbials in section 2, building mostly on previous work by Frey (2003), Frey and Pittner (1998). Section 3 then examines the possibilities of focusing the different adverbial types in main clauses. It will be necessary to distinguish informational focus from contrastive focus (3.1.) before looking at the actual data (3.2.). We then present a straightforward analysis, following Geurts and van der Sandt (2004), for these cases (3.3.). Finally, section 4 discusses the capability of the adverbial classes to a) appear and b) bear informational/contrastive focus inside embedded clauses (4.1.). The analysis presented in section 3.3 is then extended to the embedded cases (4.2.).

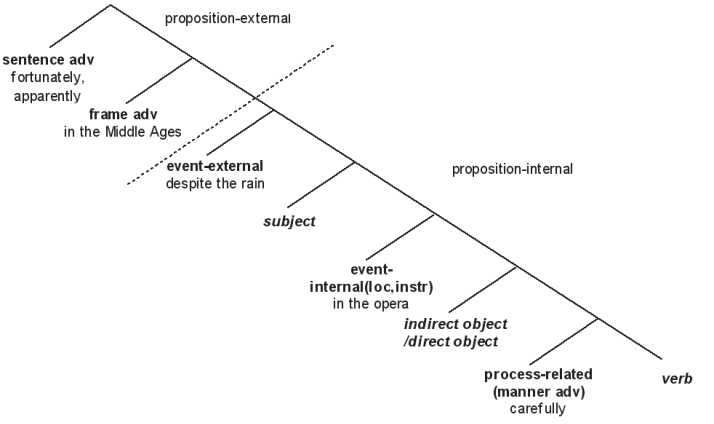
## 2. Classes of Adverbials

Frey (2003) distinguishes the following five types of adverbials, depending on their syntactic base positions: (A1) process-related (e.g. manner adverbials), (A2) event-internal (e.g. local), (A3) event-external (e.g. temporal), (A4) frame adverbials and (A5) sentence adverbials. Additionally, we consider (A6) speech act adverbials, which remain unconsidered in Frey (2003). In Frey and Pittner (1998), a previous version, speech-act adverbials are explicitly excluded and treated as parenthetical expressions. The tree in (1) illustrates the base positions of the various types of adverbials according to Frey (2003).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(1) Base positions of adverbials according to Frey (2003)




Frey (2003) localizes the process-related adverbials (A1) very close to the verb. The process-related adverbials minimally c-command the base-position of the main predicate.

(2) dass Bea das Buch *sorgfältig* gelesen hat.
that Bea the book diligently read has
'that Bea has read the book diligently'

The base-position of event-internal (e.g. instrumental, locative) adverbials (A2) is minimally c-commanded by the highest ranked argument, usually the subject.

(3) dass Bea *mit einem Hammer* ein Fenster zerschlagen hat.
that Bea with a hammer a window battered has
'that Bea has battered a window by using a hammer.'

Event-external (e.g. temporal) adverbials (A3) c-command the base position of the highest ranked argument.

(4) dass *heute* niemand abreist.
that today nobody leaves

Frame adverbials (A4) c-command the base positions of all arguments and the other adverbials except for the sentence-adverbials.

(5) dass Bea *ökologisch betrachtet* einen Fehler gemacht hat.
that Bea environmentally a mistake made has
'that from an environmental point of view, Bea has made a mistake.'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Sentence adverbials (A5) c-command the base positions of all other adverbials, the finite verb and of all arguments.

(6) dass Bea *klugerweise* das Buch gelesen hat.
that Bea wisely the book read has

According to Frey and Pittner (1998) sentence adverbials relate to propositions, whereas speech-act adverbials relate to utterances. We will see evidence for this conclusion soon, but unlike Frey and Pittner we do not exclude speech-act adverbials (A6) from the discussion for this reason.

(7) dass *ehrlich gesagt* Bea das Buch gelesen hat
that honestly Bea the book read has

In the following sections we will show that the syntactic base position of an adverbial correlates with its ability to bear informational focus or contrastive focus and with its embeddability.

## 3. Focus on Adverbials

### 3.1. Informational Focus Versus Contrastive Focus

É. Kiss (1998) proposes a clear-cut distinction between informational focus (IF) and contrastive focus (CF) (in her terms "identificational focus"). A crucial difference between the two types of foci is that CF is interpreted exhaustively. This means that when some predicate can possibly hold of some contextually given set of elements, a constituent bearing a CF is marked as the only element or subset of this set for which the predicate actually holds. An IF, on the other hand, merely marks a constituent as non-presupposed. According to É. Kiss, in English a CF is always rendered by a cleft construction, whereas IF can be assigned in situ. The situation is different in German, where the distinction is not always easy to make, since a focused constituent in situ can also express CF. For our concerns however, the crucial question will be whether a given adverbial in a given configuration *can* bear IF or CF. We will test this as follows: a *wh*-question is always answered by a sentence with IF.

In order to test whether a given focus in a given sentence can be an IF, we use it as a response to a *wh*-question asking for the focused constituent, as in (8).

(8) What did Bea batter?
Bea hat [das FENster]$_{IF}$ zerschlagen.
Bea has the window battered

On the other hand, a sentence *correcting* a previous utterance always has CF. In this way, we test whether a given focus can be CF (9):



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(9) Bea battered the vase.
Nein, Bea hat [das FENster]$_{CF}$ zerschlagen.
no Bea has the window battered

The adverbial classes discussed in Section 2 differ with respect to their ability to bear either IF or CF. In the following section, we will present data illustrating this.

### 3.2. Data

As example (10) shows, our classes A1-A3 allow for IF as well as CF.

(10) How closely/where/when did Bea read the book?
Bea hat das Buch [*SORGfältig/im GARten/HEUte*]$_{IF}$ gelesen.
Bea has the book diligently/in the garden/today read
'Bea read the book diligently.'

Bea read the book sloppily/in the attic/yesterday.
Nein, Bea hat das Buch [*SORGfältig/im GARten/HEUte*]$_{CF}$ gelesen.
no Bea has the book diligently/in the garden/today read
'No, it was diligently that Bea read the book.'

Classes A4 and A5 cannot have IF, but CF is possible:

(11) How did Bea read the book?/What is your opinion of Bea's reading the book?
# Bea hat [*LEIder*]$_{IF}$ das Buch gelesen.
Bea has unfortunately the book read
'Unfortunately, Bea read the book.'

Fortunately, Bea has read the book.
Nein, Bea hat [*LEIder*]$_{CF}$ das Buch gelesen.
no Bea has unfortunately the book Read
'No, it's unfortunately that Bea has read the book.'

(12) How/From what a perspective has Bea committed a crime?
#[*ÖkoLOgisch betrachtet*]$_{IF}$ hat Bea ein Verbrechen begangen.
from an environmental perspective has Bea a crime committed
'From an environmental point of view, Bea has committed a crime.'

From an environmental point of view, Bea has committed a crime.
Nein, [*moRALisch*]$_{CF}$ hat Bea ein Verbrechen begangen
no ethically has Bea a crime committed
'No, it's from an ethical perspective that Bea has committed a crime.'

Finally, class A6 may neither bear IF nor CF:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(13) How has Bea committed a crime?/How serious are you in saying that Bea has committed a crime?
# [*EHRlich gesagt*]$_{IF}$ hat Bea ein Verbrechen begangen.
to be honest has Bea a crime committed
'To be honest, Bea has committed a crime.'

To exaggerate a bit, Bea has committed a crime.
#Nein, [*EHRlich gesagt*]$_{CF}$ hat Bea ein Verbrechen begangen.
no to be honest has Bea a crime committed
'No, it's to be honest that Bea has committed a crime.'

We summarize our results in Table (14):

(14) Focus on Adverbials

| class | type | IF possible | CF possible |
|---|---|---|---|
| A1 | process-related | + | + |
| A2 | event-internal | + | + |
| A3 | event-external | + | + |
| A4 | frame adverbials | – | + |
| A5 | sentence adverbials | – | + |
| A6 | speech act adverbials | – | – |

### 3.3. Analysis

Focusing divides the content of an utterance into two parts: focus and background. Geurts and van der Sandt (2004) propose the following principle to account for the interpretation of focus:

(15) The Background-Presupposition Rule (BPR)
Whenever focusing gives rise to a background λx.φ(x),
there is a presupposition to the effect that λx.φ(x) holds of some individual.

For example, (16a) contains a focus feature on 'Barbara', dividing the content of an utterance of the sentence into two parts, focus and background, as indicated in (16b). The background can be thought of as a set of alternatives, and what the BPR does is to introduce a presupposition to the effect that one of these alternatives is true, i.e. for some individual x it holds that Anna visited x yesterday.

(16) a. Anna visited [BARbara]$_{IF}$ yesterday
b. Focus: Barbara
Background: λx. Anna visited x yesterday
c. Presupposition (via BPR): ∃x. Anna visited x yesterday

In the case of contrastive focus (CF), we assume the BPR is operative in the same way, but additionally an exhaustiveness condition is triggered that requires the background to be false of all contextual alternatives to the focus.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(17) a. Anna visited [BARbara]$_{CF}$ yesterday
b. Focus: Barbara
Background: λx . Anna visited x yesterday
c. Presupposition (via BPR): ∃x . Anna visited x yesterday
d. Exhaustiveness: ∀x∈ALT(Barbara) . ¬(Anna visited x yesterday)

In order to account for the semantic effects of focus on expressions that do not denote individuals, such as adverbials, we assume that the BPR existentially binds every lambda bound variable of a given background, not only individual variables. This is illustrated in (18), where the temporal adverbial *heute* 'today' is analyzed as a predicate of events.

(18) a. Bea hat das Buch [*HEUte*]$_{IF}$ gelesen
Bea has the book today read
Bea read the book today
b. Focus: λe . today(e)
Background: λP$^{temp}$ . ∃e (Bea read the book in e and P$^{temp}$(e))
c. Presupposition: ∃P$^{temp}$ . ∃e (Bea read the book in e and P$^{temp}$(e))

In Section 3.2 we have argued that A1-A3 adverbials can bear IF or CF, A4-A5 adverbials can only bear CF and A6 adverbials cannot bear focus at all. The focus facts thus group the six adverbial classes into three categories:

(19) Grouping of Adverbial Classes

| | A1, A2, A3 | A4, A5 | A6 |
|---|---|---|---|
| proposition-internal | + | – | – |
| illocutionary | – | – | + |
| focusability | IF, CF | *IF, CF | *IF, *CF |

At this point, two questions arise: (i) Why can't there be any kind of focus on A6 adverbials? (ii) Why can't there be IF on A4-A5 adverbials?

Assuming that focusing divides the *content* of an utterance in two parts, the answer to (i) is quite straightforward: A6 adverbials do not contribute to the content of an utterance, but operate on the illocutionary level. Since focus cannot operate on this level, A6 adverbials cannot bear any kind of focus.

The second question is harder to answer since the semantic status of A4-A5 adverbials is controversial (and probably not homogeneous). Some of them form part of the propositional content, some of them seem to have illocutionary effects (cf. Ifantidou (2001) for English sentence adverbials). For now we assume that they are neither proposition-internal (e.g. they cannot be questioned, in the sense that they cannot be answers to wh-questions) nor illocutionary. In many cases they seem to convey an additional proposition (maybe a conventional implicature) in addition to the main proposition expressed (cf. Potts (2005) for a treatment of higher adverbials along these lines).

So why can't there be IF on A4-A5 adverbials? If an A4-A5 adverbial



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



bears IF, the BPR predicts that the complete proposition (below the adverbial) is presupposed, hence there would be nothing left to be asserted. We assume that this rules out IF. However, CF is possible on A4-A5 adverbials, because CF triggers the assertion of an additional exhaustiveness condition.

The low A1-A3 adverbials pose no special problems: they allow for both IF and CF, since these adverbials are clearly part of the proposition expressed. Both IF and CF on these adverbials can split the propositional content.

## 4. Embeddability

### 4.1. Data

In Section 3.2 we have argued that IF and CF are restricted to certain kinds of adverbials. Now we want to combine these findings with embeddability properties of adverbials. We are confronted with three questions: (i) Which adverbials can occur in embedded contexts? (ii) Which adverbials can bear IF in embedded contexts? (iii) Which adverbials can bear CF in embedded contexts?

If we restrict ourselves to complement clauses as a prototypical case of embedded contexts, we find that A1-A4 adverbials can be embedded under any complement-taking predicate, whereas A6 adverbials cannot be embedded at all. The embeddability of A5 adverbials depends on a combination of factors including the type of embedding predicate and properties of the adverbial itself (cf. Sec. 4.2 for more details). For example, *klugerweise* 'wisely' can be embedded under *glauben* 'think' (cf. (20a)), but not under *bezweifeln* 'doubt' (cf. (20b)).

(20) a. Alex glaubt dass Bea *klugerweise* das Buch gelesen hat
b. * Alex bezweifelt dass Bea *klugerweise* das Buch gelesen hat
Alex doubts that Bea wisely the book read has

If an adverbial can be embedded, its embedded occurrences can bear IF/CF if and only if its root occurrences can bear IF/CF. For example, embedded occurrences of A1-A3 adverbials can bear both IF and CF (cf. (21)-(23)), whereas embedded occurrences of A4-A5 adverbials can only bear CF focus (cf. (24)-(25)).

(21) Alex glaubt dass Bea das Buch [*SORGfältig*]$_F$ gelesen hat
Alex thinks that Bea the book diligently read has

(22) Alex glaubt dass Bea das Bild [*GERN*]$_F$ /[*im HOF*]$_F$ /[*mit ÖL*]$_F$ gemalt hat
Alex thinks that Bea the picture gladly / in the yard / with oil painted has

(23) Alex glaubt dass Bea [*HEUte*]$_F$ / [*wegen der HITze*]$_F$ abreist
Alex thinks that Bea today / due to the heat leaves

(24) Alex glaubt, dass Bea [*moRAlisch*]$_F$ ein Verbrechen begangen hat
Alex thinks that Bea ethically a crime committed has



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(25) Alex glaubt dass Bea [*LEIder*]$_F$ das Buch gelesen hat
Alex thinks that Bea unfortunately the book read has

A6 adverbials cannot be embedded at all (cf. 26), nor can they bear any kind of focus (cf. Sec. 3.1). The table in (27) summarizes our findings.

(26) * Alex glaubt dass *ehrlich gesagt* Bea das Buch gelesen hat
Alex thinks that honestly Bea the book read has

(27) Focusability and Embeddability of Adverbials

| class | type | [+IF] | [+CF] | [+emb] | [+IF +emb] | [+CF +emb] |
|---|---|---|---|---|---|---|
| A1 | process-related | + | + | + | + | + |
| A2 | event-internal | + | + | + | + | + |
| A3 | event-external | + | + | + | + | + |
| A4 | frame advbs | – | + | + | – | + |
| A5 | sentence advbs | – | + | (+) | – | (+) |
| A6 | speech act advbs | – | – | – | – | – |

### 4.2. Analysis

Our analysis of focused adverbials in embedded contexts rests on the presupposition theory of focus introduced in Section 3.2. Crucially we assume that the BPR is operative at every CP level, not only at the root level. Embedded occurrences of IF or CF locally trigger a focus presupposition whose fate is determined by independent principles of presupposition projection. More specifically, we adopt the binding theory of presupposition (van der Sandt (1992); Geurts (1999)), framed in (presuppositional) Discourse Representation Theory (DRT). The basic idea is that presuppositions are looking for antecedents in the previous discourse, quite similar to anaphoric elements.

In presuppositional DRT, the interpretation of a sentence involves several steps. First, a so-called "preliminary discourse representation structure (DRS)" is constructed in which all presuppositions of the sentence are represented at their triggering position. Second, the presuppositions are "resolved", which means: if there is an accessible antecedent in the previous discourse, they are bound to it; otherwise they are accommodated as high as possible (without violating certain constraints, e.g. consistency). Third, the resulting final (presupposition-free) DRS is given a model-theoretic interpretation along the usual lines.

At first glance, presuppositions in complements of propositional attitude predicates seem to come in double packages: it can be argued that uttering a sentence like (28a) with the presupposition trigger *her cat* in the embedded clause gives rise to both presuppositions in (28b). Notice that there is an asymmetry between belief and other attitudes: whatever propositional attitude is chosen as the matrix predicate in (28a), the i-presupposition in (28b) will always be about a belief relation.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(28) a. Anna believes/hopes/doubts that her cat is sleeping
b. e(xternal)-presupposition: Anna has a cat
i(nternal)-presupposition: Anna believes that she has a cat

In the literature, there is no consensus yet regarding the question which of these two presuppositions is more basic. While Karttunen (1974) and Heim (1992) start with the i-presupposition and derive the e-presupposition, we will side with Geurts (1999) in this respect and treat the e-presupposition as more basic. The impression of additional i-presuppositions can then be explained via an independently motivated context-dependent plausibility principle.

Let's see how the analysis works for focus on embedded adverbials, as in (29). Using the BPR (generalized to embedded clauses) we derive (29b) as the preliminary DRS prior to presupposition resolution. The backgrounded material in the complement in (29a) introduces a presuppositional DRS (underlined in (29b)). Since the presupposition cannot be bound in this context, it will be accommodated as high as possible, in this case in the global DRS. The resulting final DRS in (29c) exactly reflects the actual reading of (29a): Bea is leaving and Alex believes that this is happening today.

(29) a. Alex glaubt / bezweifelt dass Bea $[HEUte]_F$ abreist
Alex thinks / doubts that Bea today leaves
b. [a: Alex(a), think(a,[b e: today(e), Bea(b), e:leave(b)])]
c. [a b e: Alex(a), Bea(b), e:leave(b), think(a,[:today(e)])]

By contrast, in (30) the whole VP *Bea heute abreist* 'Bea today leaves' is in focus, hence not presupposed, which means that the conditions 'Bea(b)' and 'e:leave(b)' are directly generated in their local DRS without escape potential. The resulting reading is exactly as desired, lacking the presupposition that Bea is leaving.

(30) Alex glaubt / bezweifelt dass $[Bea\ heute\ ABreist]_F$
Alex thinks / doubts that Bea today leaves

In this example we have been using the A3 adverbial *heute* 'today', but the mechanism works in exactly the same way for A1 and A2 adverbials, i.e. for all proposition-internal adverbials. A6 adverbials cannot bear any kind of focus, since they exclusively operate at the illocutionary level (cf. Sec. 3.2). Hence we are left with A4 and A5 adverbials which demand special attention. In the following we will concentrate on A5 adverbials, leaving a closer analysis of A4 adverbials for a future occasion.

A5 adverbials form quite a heterogeneous group, comprised of three more basic categories: evaluative (e.g. *leider* 'unfortunately'), epistemic (e.g. *vermutlich* 'presumably') and evidential adverbials (e.g. *angeblich* 'allegedly'). While syntactic evidence suggests a common base position (cf. Frey (2003)), semantically they behave less uniformly. This is reflected in their embeddability properties, summarized in table (31).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(31) Embeddability of Sentence Adverbials

| | **evaluative** | **epistemic** | **evidential** |
|---|---|---|---|
| *sagen* 'to say' | + | + | + |
| *glauben* 'to think' | + | + | – (?) |
| *wissen* 'to know' | + | + | + |
| *bezweifeln* 'to doubt' | – | + | + |
| *bestreiten* 'to deny' | – | + | + |
| *hoffen* 'to hope' | – | – | – |

Let's consider evaluative adverbials first. Evaluative adverbials can be embedded under utterance and belief predicates, but not under doubt, denial or desire predicates, as illustrated in (32).

(32) Anna sagt / glaubt / weiß / *bezweifelt / *bestreitet / *hofft, dass Bea *leider* krank ist
'Anna says / thinks / knows / *doubts / *denies / *hopes that Bea *unfortunately* is sick.'

We take this distribution to follow from the factivity of evaluative adverbials: *leider*(*p*) presupposes that *p*. It is intuitively clear that *leider* is not a relation between a subject and a proposition, but rather a relation between a subject and a fact (only facts, not propositions themselves, can be unfortunate). Embedded occurrences of *leider* are both speaker and subject oriented, which renders both (33a) and (33b) infelicitous in usual ("emotionally normal") contexts. The double orientation of *leider* not only affects its assertive contribution (which may be analyzed as a conventional implicature in the sense of Potts (2005) or as a higher-level explicature in the sense of Ifantidou (2001)), but also its factive presupposition: using *leider*(*p*) in an embedded clause, (i) ascribes to the sentential subject the belief that *p* and (ii) (at least weakly) commits the speaker to *p*. Hence (34) is infelicitous because the first conjunct contradicts the speaker commitment introduced by embedded *leider* in the second clause.

(33) a. #Anna freut sich, dass Bea *leider* krank ist.
'Anna is glad that Bea is *unfortunately* sick.'
b. #Anna bedauert, dass ich *leider* gesund bin
'Anna regrets that I am *unfortunately* well.'

(34) # Ich weiß dass Peter kerngesund ist, aber Anna glaubt
I know that Peter perfectly.well is but Anna thinks
dass Peter leider krank ist.
that Peter unfortunately sick is

Assuming that embedded *leider* presupposes that the sentential subject takes the embedded proposition to be true, it immediately follows that *leider* cannot be embedded under doubt or denial predicates, since this would automatically lead to a contradiction. Similarly, the factive character of *leider* is



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



incompatible with future-oriented desire predicates like *hoffen* 'to hope'.

Epistemic adverbials differ from evaluative ones in various respects. First, they typically contribute to the main proposition expressed. Second, they are not factive. Third, they can occur in complement clauses of a wider range of embedding predicates, including doubt and denial predicates, partly due to the fact that they form part of the embedded proposition.

(35) Anna sagt/glaubt/weiß/bezweifelt/bestreitet dass Bea *vermutlich* in Berlin ist
'Anna says/thinks/knows/doubts/denies that Bea is *probably* in Berlin.'

Evidential adverbials like *angeblich* 'allegedly' show a more complex behavior, because embedded occurrences allow for at least two distinct readings. In complement clauses of *wissen* 'to know' an assertive reading results (cf. 36a), where *angeblich* contributes to the truth conditions (similar to 'it is said that'), whereas in complement clauses of *bezweifeln* 'to doubt' or *bestreiten* 'to deny' (cf. 36b) a global, seemingly non-truthconditional reading is preferred (similar to the parenthetical 'as it is alleged'). In complement clauses of *sagen* 'to say' both readings are systematically available. These findings are in line with the readings of other reportative constructions in German (cf. Schenner (2008) on embedded occurrences of the reportative modal *sollen* 'should').

(36) a. Anna weiß dass Bea *angeblich* in Berlin ist
'Anna knows that it is said that Bea is in Berlin.'
b. Anna bestreitet dass sie *angeblich* jemanden umgebracht hat
'Anna denies that she killed someone (as it is alleged).'

To sum up, we have argued that sentence adverbials (A5) do not form a semantically homogeneous class (cf. Ifantidou (2001) for a similar conclusion) and that this explains the variation with respect to their embeddability in clausal complements (e.g. evaluative A5 adverbials, due to their factivity, cannot be embedded under doubt or denial predicates, unlike epistemic and evidential adverbials).

The overall picture is that we have to distinguish three major classes of adverbials with respect to embeddability and focusability. First, A1-A3 adverbials which can bear IF/CF and be embedded. Second, A6 adverbials which can neither bear IF/CF nor be embedded. Third, A4-A5 adverbials which can be embedded (with certain restrictions, see above) and bear CF, but not IF.

**References**

É. Kiss, Katalin. 1998. Identificational Focus Versus Information Focus. *Language* 74(2):245-273.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Frey, Werner and Karin Pittner. 1998. Zur Positionierung der Adverbiale im deutschen Mittelfeld. *Linguistische Berichte* 176:489-534.

Frey, Werner. 2003. Syntactic conditions on adjunct classes. In E. Lang, C. Maienborn and C. Fabricius-Hansen, eds., *Modifying Adjuncts*, 163-209. Berlin/New York: de Gruyter.

Geurts, Bart. 1999. *Presuppositions and Pronouns*. Amsterdam: Elsevier.

Geurts, Bart and Rob van der Sandt. 2004. Interpreting Focus. *Theoretical Linguistics*, 30(1):1-44.

Heim, Irene. 1992. Presupposition Projection and the Semantics of Attitude Verbs. *Journal of Semantics* 9:183-221.

Ifantidou, Elly. 2001. *Evidentials and Relevance.* Amsterdam: Benjamins.

Karttunen, Lauri. 1974. Presuppositions and Linguistic Context. *Theoretical Linguistics* 1:181-194.

Potts, Chris. 2005. *The Logic of Conventional Implicatures.* Oxford: Oxford University Press.

van der Sandt, Rob. 1992. Presupposition Projection as Anaphora Resolution. *Journal of Semantics* 9:333-377.

Schenner, Mathias. 2008. Double face evidentials in German: Reportative 'sollen' and 'wollen' in embedded contexts. In A. Grønn, ed., *Proceedings of Sinn und Bedeutung* 12, 552-566. Oslo: University of Oslo.

Zentrum für Allgemeine Sprachwissenschaft (ZAS)
Schützenstraße 18
10117 Berlin
Germany

ludwig@zas.gwz-berlin.de
salfner@zas.gwz-berlin.de
schenner@zas.gwz-berlin.de



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Acoustic Correlates of Prosodic Prominence for Naïve Listeners of American English

YOONSOOK MO
*University of Illinois, Urbana-Champaign*

## 0. Introduction

This study examines the acoustic correlates of prosodic prominence as perceived by a large number of native listeners of American English who are naïve to the phonetics and phonology of prosody. In English, as in other stress languages, speech utterances are chunked into smaller prosodic phrases, and within a prosodic phrase some words are assigned phrasal stress, which typically marks a word or a phrase as having a focus or as introducing new information into the discourse. We refer to phrasal stress here as *prosodic prominence.* Speakers convey the information structure of an utterance through prosodic prominence, and listeners must decode the prosodic structure to recover the speaker's intended meaning in the course of comprehension.

Prosodic structures are phonetically implemented in patterns of pitch (a perceptual attribute of fundamental frequency, F0), duration, loudness (a perceptual attribute of the intensity of sound pressure), and spectral modulations including formants. Pitch as a perceptual correlate of F0 is traditionally described as a primary cue for prominence in many languages, including American English (Beckman 1986, Pierrehumbert 1980). Many studies have investigated F0 as a primary cue for prominence in many languages. Terken (1991, 1994) tested the relative importance of the magnitude of F0 changes or F0 maxima in the perception of prominence in Dutch and these properties of F0 worked together in a complex way to cue prominence. Gussenhoven and Rietveld (1988) and Gussenhoven et al. (1997) also examined the relation between F0 maxima and minima and prominence perception in Dutch and showed that the relative distance between pitch peaks as well as the degree of declination of the baseline is important in the perception of prominence.

The role of F0 as a primary cue for prominence is, however, still controversial. Other acoustic measures have also been investigated as correlates of prominence, although the definition of prominence varies across studies. For instance, Cooper et al. (1985) showed that prominent words (contrastively accented) have elongat-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

ed durations as well as high F0, with F0 drastically declining after the focused word in an utterance. Turk and Sawusch (1996) studied the effects of duration and intensity in prominence judgments and showed that duration and intensity are perceived integrally, but duration was a more important cue to prominence judgments in their study, and intensity was not found to play an independent role in the perception of prominence. Silipo and Greenberg (1999, 2000) claimed that average F0 level and F0 range play only a minor role in identification of prosodic stress. But the amplitude and duration of vocalic nuclei of stressed syllables are two important parameters in the assignment of three different levels of stress in American English.

The structures of resonant frequencies reflecting the configuration of the vocal tract are also shaped by lexical stress or sentence-level prominence. In a series of studies regarding the effects of spectral measures, Slujiter and Heuven (1996a, 1996b, 1997) claimed that frequency band-filtered intensity over 500 Hz is a reliable cue to linguistic stress (lexical stress and focal accent) and has a comparable effect on the perception of linguistic stress as does duration in Dutch. However, overall intensity (RMS) is a poor cue to cue for linguistic stress. Heldner (2001, 2003) also tested the reliability of overall intensity and frequency band-filtered intensity (spectral emphasis) as acoustic correlates of focal accents in Swedish. He found that both overall intensity and spectral emphasis increased in focally accented words but spectral emphasis was a more reliable predictor of the focally accented words. Kochanski et al. (2005) also evaluated acoustic correlates of perceived prominence in varieties of British English, using a prominent/non-prominent judgment classifier. The results showed that prominence is coded by loudness and duration but various types of F0-related measurements play only a minor role.

Among these prior studies, some are based on analyses of controlled laboratory speech, with materials chosen by the experimenter to elicit prosodic prominence. Others use speech from pre-existing corpora, and use one or a small number of trained, expert transcribers to label the speech for the location of prosodic prominences. Using this method, transcribers are aided by visual display of speech and allowed to hear the recorded utterance as many times as needed to determine the best transcription.

A different approach to the study of prosodic prominence is adopted here. I examine acoustic correlates of prosodic prominence in American English in a corpus analysis that is transcribed for prosodic prominence (and phrase boundaries) by a large number of ordinary listeners. The measurements I have taken in this study are F0, duration, overall intensity, bandpass-filtered intensity in four different frequency regions, three formants (F1, F2, and F3), spectral tilt and pause. In this paper I report the results of acoustic duration, overall intensity and spectral emphases in four different frequency resgions as correlates of perceived prominence. This study complements prior studies in that 1) the materials for the assignment of prosodic prominence were extracted from spontaneous speech samples of American English (Buckeye corpus: Pitt et al. 2007); 2) the assign-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



ment of prosodic prominence was done by multiple listeners, naïve to the task of prosodic analysis; 3) the task was performed in real time without any aid from the visual speech display.

## 1. Methodology

### 1.1. Materials and Transcription Task

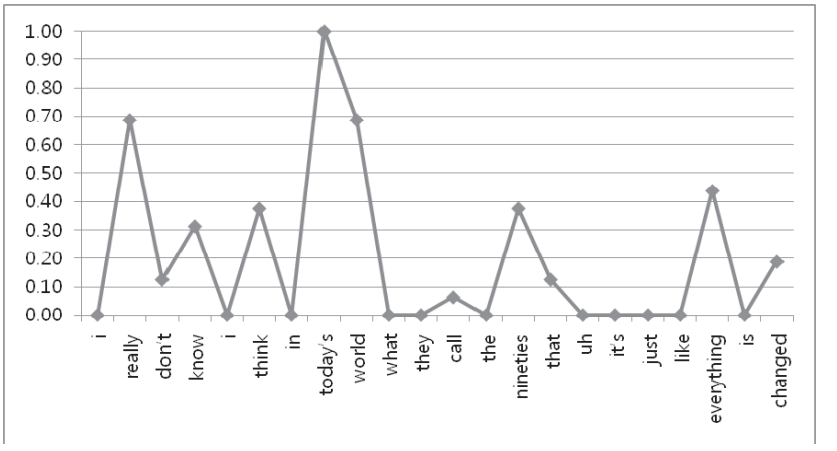
A total of 36 speech excerpts, two from each of 18 speakers, were extracted from the Buckeye corpus of spontaneous speech of American English (Pitt et al. 2007). Each speech excerpt was about 20 second long. 74 listeners were recruited from undergraduate linguistics courses at the University of Illinois at Urbana-Champaign to participate in a transcription task.

The transcription experiment was run in a computer lab with each participant seated at a separate computer, equipped with individual headphones. In the transcription experiment, listeners are provided a 5-minute introduction in which they are told the goal of the study and are administered informed consent. Participants also complete a language survey form before starting the transcription. Listeners are then provided a printed orthographic transcription of the speech excerpts without any punctuation or capitalization, and are instructed to mark their transcript by underlining words they hear as "prominent" and by marking a vertical bar between words that belong to different "chunks" of the utterance, while listening to the speech excerpts played in real time. A prominent word is defined as a word that is "highlighted for the listener, and stands out from other non-prominent words," while a chunk is defined as a grouping of words "that helps the listener interpret the utterance," and chunking is "especially important when the speaker produces long stretches of continuous speech." Listeners could not stop or restart the recordings, but were allowed to listen to each speech excerpt twice in real time. Each excerpt was transcribed by 15 – 22 naïve listeners in a separate task of prominence labeling. Transcriptions were pooled together and each word in the transcript is assigned a probabilistic P(rominence)-score as shown in (1).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(1) Graph of P-scores for each word in a small portion of one excerpt from speaker 2




### 1.2. Reliability Tests

The reliability and the validity of naïve listeners' transcription tasks were evaluated using Fleiss' kappa coefficient and z-statistics. Fleiss' kappa provides a single agreement coefficient across all listeners and the z-normalized scores are used to test whether Fleiss' multi-rater kappa coefficients were significantly consistent across all listeners or not. The following table summarizes Fleiss' kappa coefficients for prominence and their corresponding z-scores. Fleiss' multi-rater agreement coefficients ranged from 0.373 to 0.421, all of which were significantly high with a 99% confidence interval. In other words, agreement among naïve listeners on the perception of prominence was much above chance with 99% confidence interval, confirming that the perception of prominence on each word was highly consistent across all listeners.

(2) Results of multi-transcriber agreement in the marking of prominence and boundary. The table shows Fleiss' multi-rater kappa coefficients and their corresponding z-scores (99% confidence interval) for four groups of transcribers marking the same set of speech excerpts.

| z=2.32, α=0.01 | | Exp.1 | | Exp. 2 | |
|---|---|---|---|---|---|
| | | Grp.1 | Grp.2 | Grp.3 | Grp.4 |
| prominence | Kappa | 0.373 | 0.421 | 0.394 | 0.407 |
| | Z | 19.43 | 20.48 | 18.15 | 18.31 |
| boundary | Kappa | 0.612 | 0.544 | 0.621 | 0.575 |
| | Z | 27.62 | 21.87 | 25.05 | 26.22 |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 1.3. Acoustic Measurements

The waveforms for each excerpt were aligned with word and phone transcriptions. The stressed vowels of each word (primary and secondary) were identified based on a reference dictionary (Hasegawa-Johnson and Fleck 2007). Acoustic measures were taken only from stressed vowels, to avoid any effects from un-stressed vowel reduction.

Measures of duration (ms), overall RMS intensity (dB), and bandpass filtered RMS intensities in four different frequency regions (0-0.5, 0.5-1, 1-2, and 2-4 kHz) were taken from each stressed vowel. All the measures taken in this study were z-normalized within vowel phoneme, using data pooled from all speakers. Normalization was done to minimize effects due to vowel quality. The following table shows the distribution of stressed vowels in the excerpts used in this study.

(3) The number of tokens of each stressed vowels in the full set of speech excerpts

| Vowel | ɑ | æ | ʌ | ɔ | aʊ | aɪ | ɛ |
|---|---|---|---|---|---|---|---|
| Freq. | 81 | 129 | 211 | 58 | 28 | 140 | 187 |
| Vowel | ɝ | eɪ | ɪ | i | oʊ | ʊ | u |
| Freq. | 66 | 114 | 209 | 156 | 103 | 41 | 94 |

## 2. Results

Pearson's correlation coefficients (*r)* were calculated between each acoustic measure and P-scores of all the stressed vowels and statistical significance was evaluated with a one-tailed 95% confidence interval. The statistical results are summarized in (4) and show that all the acoustic measures from stressed vowels are significantly correlated with the P-scores of the words they are extracted from. In order to examine the correlations between each acoustic measure and P-scores from each vowel separately, Pearson's bivariate correlation tests were performed for each vowel individually, as shown in the following two sections.

(4) Results of Pearson's correlation tests between various acoustic measures and P-scores for all vowels, combined

| | duration | RMS intensity | SB (0-500 Hz) |
|---|---|---|---|
| Pearson's *r* | .204 | .180 | .139 |
| significance | <.001 | <.001 | <.001 |
| | Spectral balance (0.5-1 kHz) | Spectral balance (1-2 kHz) | Spectral balance (2-4 kHz) |
| Pearson's *r* | .205 | .145 | .145 |
| significance | <.001 | <.001 | <.001 |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 2.1. Durational Effects by Vowel

The following table summarizes the results of Pearson's bivariate correlation tests between normalized duration of each vowel and P-scores. As shown, 9 out of the 14 stressed vowels showed a significant correlation between vowel duration and P-scores. Pearson's bivariate coefficients ranged from -0.128 to 0.491. More specifically, durations of two vowels (oʊ and ʊ) were inversely correlated with P-scores while durations of other 12 vowels were positively correlated with P-scores. That is, for the majority of vowels durations were longer as P-scores increased, consistent with findings from many prior studies.

(5) Pearson's *r* coefficients for correlations between vowel duration and P-scores for each vowel and the corresponding significance values. Each gray cell represents a correlation that is significant with a 95% confidence interval.

| Vowels | ɑ | æ | ʌ | ɔ | aʊ | aɪ | ɛ |
|---|---|---|---|---|---|---|---|
| Duration (sig.) | .033 (.382) | .301 (<.001) | .198 (.002) | .224 (.049) | .491 (.004) | .419 (<.001) | .237 (<.001) |
| Vowels | ɝ | eɪ | ɪ | i | oʊ | ʊ | u |
| Duration (sig.) | .160 (.095) | .302 (<.001) | .244 (<.001) | .266 (<.001) | -.128 (.094) | -.042 (.397) | .141 (.085) |

### 2.2. Spectral Effects by Vowel

The following table summarizes the results of correlation analyses between 5 different spectral measures and P-scores. 7 vowels showed significant correlations between P-scores and overall RMS intensity, and between P-scores and spectral emphasis (RMS intensity) above 1 kHz. There were 6 vowels with significant correlations between P-scores and spectral emphasis in the 0 – 0.5 kHz frequency band, and 8 vowels showed significant correlations with spectral emphasis in the 0.5 – 1 kHz band.

The correlation coefficients for overall RMS intensity and P-scores ranged from 0.002 to 0.308. In other words, overall RMS intensities increased as P-scores increased for all vowels. The correlation between RMS intensities in all 4 frequency bands and P-scores are mostly positive, confirming that overall RMS intensity and RMS intensities in 4 frequency bands is proportional to P-scores in most frequency bands, for all 14 vowels.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(6) Pearson's *r* coefficients for correlations between 5 spectral measures and P-scores for each vowel and the corresponding significance values. Each gray cell represents a correlation between normalized vowel durations and P-scores that is significant with a 95% confidence interval.

| Vowels | ɑ | æ | ʌ | ɔ | aʊ | aɪ | ɛ |
|---|---|---|---|---|---|---|---|
| RMS INT | .308 | .140 | .144 | .017 | .132 | .195 | .223 |
| (sig.) | (.002) | (.055) | (.017) | (.451) | (.251) | (.010) | (.001) |
| SB (0-0.5 kHz) | .168 | .077 | .070 | -.049 | .080 | .159 | .134 |
| (sig.) | (.065) | (.191) | (.153) | (.359) | (.343) | (.030) | (.030) |
| SB (0.5-1 kHz) | .349 | .158 | .254 | .117 | .145 | .223 | .285 |
| (sig.) | (.001) | (.035) | (<.001) | (.195) | (.231) | (.004) | (<.001) |
| SB (1-2 kHz) | .339 | .213 | .257 | -.073 | .217 | .226 | .266 |
| (sig.) | (.001) | (.007) | (<.001) | (.296) | (.134) | (.003) | (<.001) |
| SB (2-4 kHz) | .179 | .229 | .147 | .044 | .067 | .145 | .256 |
| (sig.) | (.053) | (.004) | (.015) | (.375) | (.368) | (.043) | (<.001) |
| Vowels | ɝ | eɪ | ɪ | i | oʊ | ʊ | u |
| RMS INT | .284 | .105 | .205 | .139 | .154 | .187 | .002 |
| (sig.) | (.009) | (.127) | (.001) | (.042) | (.057) | (.121) | (.491) |
| SB (0-0.5 kHz) | .238 | .103 | .185 | .141 | .161 | .163 | .002 |
| (sig.) | (.024) | (.133) | (.004) | (.039) | (.049) | (.154) | (.494) |
| SB (0.5-1 kHz) | .338 | .065 | .211 | .130 | .163 | .225 | .039 |
| (sig.) | (.002) | (.242) | (.001) | (.052) | (.047) | (.078) | (.351) |
| SB (1-2 kHz) | .341 | -.010 | .258 | -.018 | -.025 | .216 | -.012 |
| (sig.) | (.002) | (.459) | (<.001) | (.414) | (.401) | (.088) | (.452) |
| SB (2-4 kHz) | .033 | .172 | .186 | .141 | .031 | .090 | -.071 |
| (sig.) | (.393) | (.031) | (.003) | (.040) | (.376) | (.288) | (.245) |

## 3. Discussion

The results from Pearson's bivariate correlation analyses over all stressed vowels revealed that duration and all spectral measures are significantly correlated with perceived prominence by ordinary listeners. When ordinary listeners hear a word as prominent, the word has longer duration, higher overall RMS intensity, and higher peaks of intensity in each of four frequency bands. Looking more closely, the acoustic measures most strongly correlated with perceived prominence are duration ($r$=.204) and spectral balance in 500-1000 Hz ($r$=.205), which is consistent with the findings from prior studies by Kochanski et al. (2005) for duration in British English and Slujiter and van Heuven (1996a, 1996b), Heldner (2001, 2003), and Tamburini (2003) for spectral measures in the mid-frequency region in Dutch and in Swedish, respectively.

The effects of prosodic prominence by vowel were also evaluated, showing that the acoustic correlates of perceived prominence vary across vowel phonemes. 9 out of 14 stressed vowels showed significant correlations between durations and



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

perceived prominence. As to spectral correlates of prominence, some or all of spectral measures were significantly correlated with perceived prominence in 10 stressed vowels as total. Looking at each spectral measure separately, no more than 8 vowels demonstrated significant correlations between spectral measures and P-scores. Among spectral measures, bandpass RMS intensity in 500 – 1000 Hz showed a strong linear correlation with perceived prominence for the greatest number of stressed vowels (8 out of 14). These results are consistent with those from correlation analyses across all vowels discussed above.

As to the effects of prominence on the acoustic measures according to the phonemic types of vowels, the 14 vowels can be categorized into 5 different groups on the basis of the results from Pearson's correlation analyses. 3 vowels (aɪ, ɛ and ɪ) showed significant correlations between all acoustic measures taken in this study and P-scores. 4 vowels (æ, ʌ, eɪ and i) show significant correlations between perceived prominence and some (but not all) spectral measures and between perceived prominence and durational measures. 3 vowels (ɑ, ɝ and oʊ) showed significant correlations between P-scores and only some of the spectral measures. 2 vowels (ɔ and aʊ) showed a significant correlation only between P-scores and duration, while the two high back vowels (ʊ and u) did not reveal any correlations between acoustic measures and perceived prominence. These vowels with the fewest acoustic cues (aʊ, ɔ and ʊ) are also infrequent relative to other vowels, so it's possible that with more data these vowels will also show a more robust set of acoustic cues to prominence.

These findings suggest that acoustic correlates of prominence cue the locations of prominence for ordinary listeners. The results also indicate that there is, however, no single acoustic cue, nor a specific combination of acoustic correlates that cues prominence for all vowels. In some vowels, elongated duration by itself signals a prominent word while for other vowels the enhancement of overall intensity or spectral emphasis in the mid-frequency range serve as single cues to prominence. And, there are a few vowels for which a combination of acoustic correlates cues prominence.

The variation we observe in the number and strength of acoustic cues to prominence across vowel phonemes can be considered in light of the distribution of the vowels in lexical items. For instance, the three vowels that have the largest cue set, /aɪ, ɛ/ and /ɪ/ are distinguished from other vowels in their distributional patterns as well. The vowel /aɪ/ is a high-frequency vowel, but it actually occurs in a small number of high-frequency words and its occurrence in only three such words account for about 70% of the tokens of /aɪ/. The vowel /ɛ/, is also a high-frequency vowel, but tokens of /ɛ/, are distributed over a large set of lexical items, and its occurrence in the three most frequent lexical items account for only 20% of its tokens. Finally, the vowel /ɪ/ is distinguished as the vowel that has the lowest mean P-score, occurring in many reduced forms, such as function words. These three vowels have strikingly different patterns of distribution, but in each case, their distributional properties may contribute to the relatively robust acoustic cue set for prominence. For instance, vowels like /aɪ/ that occur frequently in



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



function words may require a robust cue set to convey prominence. Similarly, a vowel like /ɪ/, which occurs frequently in reduced words, may also require strong cues to be perceived as prominent. It is possible that speakers implement stronger cues or more cues to convey prominence in words that listeners may otherwise expect to be non-prominent. It is somewhat less clear how the pattern of lexical distribution influences a strong cue set for /ɛ/; perhaps the dense lexical neighborhood for this vowel is responsible for the larger cue set, consistent with patterns of hyperarticulation observed as an effect of neighborhood density by e.g., Munson (2007).

There is a difference between the present study and Heldner (2003) concerning the value of spectral emphasis in the mid frequency region as a cue to prominence. This study finds that mid-frequency spectral emphasis is not a reliable cue to prominence for all vowel phonemes, while Heldner finds it a robust and reliable cue. One reason for this difference between the two studies may have to do with the measurement method. As pointed out by Heldner (2003), overall intensity is positively correlated with fundamental frequency. In other words, overall intensity increases when F0 increases while overall intensity decreases as F0 decreases. It is common to observe a downtrend of F0 over the course of an utterance. There may be thus an influence of the location of a word in an utterance on its overall intensity and spectral emphasis. To minimize the effects of F0 change on spectral measures, Heldner established cut-off frequencies for a low-pass filter at 1.5 times of the mean F0 for each utterance, and in an even more accurate method, established cut-off frequencies that are dynamically set over the course of F0 contour. It is possible that using these methods would have allowed me to obtain more accurate measures of spectral emphasis which may then show a closer relationship to perceived prominence in a greater number of vowels.

This study is a part of an ongoing project investigating the acoustic correlates of prominence as perceived by ordinary listeners, and though the acoustic measures examined here do not exhaust the set of potential acoustic correlates of prominence, the present study contributes several important findings. First, untrained listeners who are not aided by the visual speech display detect prominence with consistency that is well above chance levels based on acoustic duration and spectral emphasis, which are the same measures that are reported as primary correlates of prominence in other studies that use read speech and/or expert transcribers. Second, increased duration and loudness and enhanced spectral emphasis are fairly reliable acoustic cues to prominence for this corpus of spontaneous speech, similar to findings from studies using read speech and/or expert transcribers. Third, although ordinary listeners are sensitive to these acoustic cues to prominence in a real time transcription task, the strength of each acoustic correlate as a cue to prominence varies by vowel phoneme, implying that acoustic parameters are differently weighted to signal prominence in each vowel. Fourth, various acoustic parameters interact with one another to signal prominence to ordinary listeners. Further research is required to explore the effects of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



prominence on other acoustic properties, including measures of F0 and formant structures.

**References**

Beckman, Mary. 1986. *Stress and Non-Stress.* Dordrecht, The Netherlands: Foris Publications.

Cooper, William, Stephen Eady, and Pamela Mueller. 1985. Acoustical Aspects of Contrastive Stress in Question-Answer Contexts. *Journal of the Acoustical Society of America* 77(6):2142-2156.

Fant, Gunnar, Anita Kruckenberg, Johan Liljencrants, and Stellan Hertegård. 2000. Acoustic-Phonetic Studies of Prominence in Swedish. *TMH-QPSR* 41(2-3):1-51.

Gussenhoven, Carlos, and Toni Rietveld. 1988. Fundamental Frequency Declination in Dutch: Testing Three Hypotheses. *Journal of Phonetics* 16:355-369.

Gussenhoven, Carlos, Bruno H. Repp, Toni Rietveld, Hans H. Rump, and Jacques Terken. 1997. The Perceptual Prominence of Fundamental Frequency Peaks. *Journal of the Acoustical Society of America* 102(5):3009-3022.

Hasegawa-Johnson, Mark, and Margaret Fleck. 2007. ISLE Dictionary Version 0.2.0, http://www.isle.uiuc.edu/dict/index.html (accessed October 19, 2007).

Heldner, Mattias. 2001. Spectral Emphasis as a Perceptual Cue to Prominence. *TMH-QPSR* 42(1):51-57.

Heldner, Mattias. 2003. On the Reliability of Overall Intensity and Spectral Emphasis as Acoustic Correlates of Focal Accents in Swedish. *Journal of Phonetics* 31:39-62.

Kochanski, Greg, Esther Grabe, John Coleman, and Burton S. Rosner. 2005. Loudness Predicts Prominence: Fundamental Frequency Lends Little. *Journal of the Acoustical Society of America* 118(2):1038-1054.

Munson, Benjamin. 2007. Lexical Access, Lexical Representation, and Vowel Production. In J. Cole and J. S. Haulde, eds., *Laboratory Phonology IX,* 201-228. New York: Mouton de Gruyter.

Pierrehumbert, Janet. 1980. The Phonology and Phonetics of English Intonation. Ph.D. diss., Massachusetts Institute of Technology.

Pitt, Mark A., Laura Dilley, Keith Johnson, Scott Kiesling, William Raymond, Elizabeth Hume, and Eric Fosler-Lussier. 2007. *Buckeye Corpus of Conversational Speech* (2nd Release) [www.buckeyecorpus.osu.edu]. Columbus, OH: Department of Psychology, Ohio State University (Distributor).

Silipo, Rosaria, and Steven Greenberg. 1999. Automatic Transcription of Prosodic Stress for Spontaneous English Discourse. *Proceedings of the 14th International Congress of Phonetic Sciences, San Francisco*, 2351-2354.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Silipo, Rosaria, and Steven Greenberg. 2000. Prosodic Stress Revisited: Reassessing the Role of Fundamental Frequency. *Proceedings of the NIST Speech Transcription Workshop, College Park (MD)*.

Sluijter, Agaath M. C., and Vincent J. van Heuven. 1996a. Acoustic Correlates of Linguistic Stress and Accent in Dutch and American English. *Proceedings of ICSLP '96*, 630-633.

Sluijter, Agaath M. C., and Vincent J. van Heuven. 1996b. Spectral Balance as an Acoustic Correlate of Linguistic Stress. *Journal of the Acoustical Society of America* 100(4):2471-2485.

Sluijter, Agaath M. C., and Vincent J. van Heuven. 1996c. Supralaryngeal Resonance and Glottal Pulse Shape as Correlates of Stress and Accent in American English. Ms., Stockholm University.

Sluijter, Agaath M. C., Vincent J. van Heuven, and Jos J. A. Pacilly. 1997. Spectral Balance as a Cue in the Perception of Linguistics Stress. *Journal of the Acoustical Society of America* 101(1):503-513.

Tamburini, Fabio. 2003. Automatic Prosodic Prominence Detection in Speech Using Acoustic Features: An Unsupervised System. *Proceedings of Eurospeech 2003, Geneva*, 129-132.

Terken, Jacques. 1991. Fundamental Frequency and Perceived Prominence of Accented Syllables. *Journal of the Acoustical Society of America* 89(4):1768-1776.

Terken, Jacques. 1994. Fundamental Frequency and Perceived Prominence of Accented Syllables. II. Nonfinal Accents. *Journal of the Acoustical Society of America* 95(6):3662-3665.

Turk, Alice E., and James R. Sawusch. 1996. The Processing of Duration and Intensity Cues to Prominence. *Journal of the Acoustical Society of America* 99(6):3782-3790.

Yoonsook Mo
UIUC Linguistics Department
4080 Foreign Language Building
707 S Mathews Avenue, MC-168
Urbana, IL 61801

ymo@uiuc.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Sluicing in Bahasa Indonesia, P-Stranding, and Interface Repair[1]

YOSUKE SATO
*University of Arizona, Tucson*

## 0. Introduction

This paper provides evidence that the P-stranding pattern in Bahasa Indonesia (BI) poses a counterexample to the P-Stranding Generalization proposed by Merchant (2001) in favor of his analysis of sluicing as the product of *wh*-movement followed by TP deletion at PF. I first provide two arguments, based on the distribution of the question marker *-kah* (Fortin 2007) and the lack of the complementizer *yang* with *wh*-questions with non-nominal fronted *wh*-words that sluicing in BI is derived by regular *wh*-movement, as in English *wh*-questions. I propose that the three-way contrast between English, French, and BI with respect to P-stranding under *wh*-questions and sluicing is naturally derived from independently motivated assumptions concerning the percolation of the [+wh] feature of the DP onto the PP (Chomsky 1972), D-to-P incorporation (Law 1998, van Riemsdijk 1998), and the recent idea of interface repair (Merchant 2001, Lasnik 1999, 2001, 2005, 2007, Fox and Lasnik 2003, Boeckx and Lasnik 2006).

## 1. Merchant's (2001) Theory of Sluicing and the P-Stranding Generalization

Drawing on the data and analysis presented in Ross (1969), Merchant (2001) proposes that the sluicing construction as in (1a) is derived by the regular *wh*-movement of the *wh*-remnant followed by TP deletion, as shown in (1b).

(1) a. Somebody just left. — Guess who.
b. Somebody just left. — Guess [$_{CP}$ who$_i$ ... ~~[$_{TP}$ $t_i$ just left]~~]

[1] This paper is based on the third chapter of my dissertation (Sato 2008). Earlier versions of this paper were presented at the Thirty-Third Annual Meeting of the Berkeley Linguistic Society and at the University of Arizona. I thank Heidi Harley, Andy Barss, Andrew Carnie, Cati Fortin, Mosa Hulden, Simin Karimi, and David Medeiros for valuable discussions on earlier drafts of this paper. Special thanks to Dwi Hesti Yuliani for sharing her knowledge of Bahasa Indonesia with me. The following abbreviations are used in this paper: Dem = Demonstrative, Foc = Focus, Neg = Negation, and Q = Question.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Merchant adduces a wide variety of syntactic and morphological effects such as case-matching, number agreement, and so on, many of them mentioned in Ross (1969), to support this movement plus TP deletion analysis. One of the most convincing arguments for this analysis comes from what he calls the P-Stranding Generalization (PSG) stated as in (2).

(2) Preposition-Stranding Generalization/PSG (Merchant 2001:92)
A language *L* will allow preposition stranding under sluicing iff *L* allows preposition stranding under regular wh-movement.

The logic behind this generalization is clear. Under Merchant's analysis, sluicing is derived by regular *wh*-movement plus TP deletion. Thus, the availability of P-stranding under sluicing means that the same option should be independently available under regular *wh*-movement. Merchant surveys the P-stranding pattern both under *wh*-movement and sluicing in 24 languages to show that this generalization holds crosslinguistically, As is well known, English allows P-stranding both under *wh*-movement and sluicing, as shown in (3a, c). Note that the same preposition can also be pied-piped along into [Spec, CP], as shown in (3b).

(3) a. Who was he talking with?
b. With whom was he talking?
c. Peter was talking with someone, but I don't know (with) who.
(Merchant 2001:92)

This pattern falls out from Merchant's analysis because the P-less sluice in (3c) is derived when the preposition *with* is stranded within the TP, as in (3a). On the other hand, Romance languages such as French are non-P-stranding languages, as shown by the contrast between (4a) and (4b). Thus, French does not allow omission of the preposition under sluicing, as shown in (4c).

(4) a.* Qui est-ce qu' elle l'a offert à?
who Q she it-has offered to
'Who has she offered it to?'
b. À qui l'a-t-elle offert?
to whom it-has-she offered
'To whom has she offered it?'
c. Anne l'a offert à quelqu'um, mais je ne sais pas *(à) qui.
Anne it-has offered to someone but I Neg know not to whom
'Anne has offered it to someone, but I don't know (to) whom.'
((4a, c) are from Merchant 2001:98)

The type of language that is not predicted by the PSG, therefore, has syntactic *wh*-movement, disallows P-stranding under this context, but nonetheless allows P-stranding under sluicing. I argue that BI is precisely of this type, as shown in (5).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(5) a. * Siapa yang kamu berdansa dengan?
who that you dance with
'Who did you dance with?'

b. Dengan siapa kamu berdansa?
with who you dance
'With whom did you dance?'

c. Saya ingat Iwan berdansa dengan seseorang, tapi saya tidak tahu (dengan) siapa.
I remember Iwan dance with someone but I Neg know with who
'I remember Iwan danced with someone, but I don't know (with) who.'

In the next section, I provide evidence that the P-stranding pattern observed in (5a-c) provides a genuine counterexample to the PSG.

## 2. The Syntax of Sluicing in Bahasa Indonesia

Several languages have been reported in the literature that superficially contradict the PSG. They include Brazilian Portuguese (Almeida and Yoshida 2007; Rodriguez et al. 2007), Polish (Szczegielniak 2006), Malagasy (Potsdam 2003), Chinese (Wang 2006), and Serbo-Croatian (Stepanović 2008). These languages, however, have been shown to have alternative sources for sluicing, such as clefting, resumption, and P-omission at PF, hence do not necessarily undermine the PSG. See Fortin (2007) and Sato (2008:ch.3) for evidence against extending these analyses to BI sluicing.[2] I argue, based on the distribution of the question morpheme *-kah* and the lack of the complementizer *yang* in *wh*-questions with fronted PPs, that the source for BI sluicing is *wh*-movement, as in English.

The first argument that BI sluicing is derived by regular *wh*-movement concerns the distribution of the question morpheme *-kah* in BI. Fortin (2007) observes that this particle can co-occur with the *wh*-pivot of the cleft but not with the *wh*-remnant of the sluice. This contrast is illustrated in (6a, b).

(6) Ada seseorang yang menelpon tadi...
exist someone that phone just now
'Someone just called....'

a. Coba tebak siapa(**-kah**) itu! (cleft)
try guess who-Q Dem
'Try to guess who it was!'

[2] Merchant (2001) develops several diagnostics to distinguish between genuine sluicing (derived by *wh*-movement followed by TP deletion) and pseudosluicing (derived by *wh*-movement followed by deletion of the copula and expletive subject). I am not going to discuss many important issues these diagnostics bring to bear on the nature of BI sluicing for reasons of space. See Fortin (2007), who provides results of applying those tests to BI clefts and sluicing. See Sato (2008:ch.3) for a critical discussion of whether these tests are applicable to BI to differentiate clefts from sluices.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. Coba tebak siapa(-***kah**)! (sluicing)
try guess who-Q
'Try to guess who!'

c. Coba tebak siapa(-***kah**) yang menelpon tadi! (*wh*-question)
try guess who-Q that phone just now
'Try to guess who just called now!'

(Fortin 2007:207, 208)

The contrast between (6a) and (6b) would not be accounted for by a cleft analysis of BI *wh*-questions. Thus, Cheng (1991) proposes the Clausal-Typing Hypothesis that the interrogative force of a statement must be marked either as a Q-particle in the scopal C or via the movement of a *wh*-operator into the specifier of the same C at S-Structure. When combined with the Economy of Derivation (Chomsky 1995), this hypothesis predicts that if a language has a Q-particle in its lexical inventory, that language should use it for all types of *wh*-questions, thereby excluding the need for a *wh*-phrase to undergo movement into the specifier of the CP and yielding the in-situ option across the board. Since BI allows both *wh*-in-situ and overt *wh*-movement, Cheng argues that what appears to be an overt *wh*-movement in this language is a reduced cleft where the expletive subject and copular are missing. Thus, examples as in (7a) would have the structure in (7b).

(7) a. Apa$_i$ yang kamu beli $t_i$?
what that you buy
'What did you buy?'

b. [$_{CP1}$ apa$_i$ [$_{CP2}$ Op$_i$ yang [$_{TP}$ kamu beli $t_i$]]]

In (7b), the *wh*-phrase *apa* 'what' is base-generated in the specifier of CP1. The null operator undergoes movement from the object of the verb into the specifier of CP2. This analysis makes an incorrect prediction regarding the distribution of the Q-particle *–kah*. If (6b) were derived by the cleft construction in (6a), then (6b) should also be able to allow the particle to occur with the *wh*-phrase *siapa* 'who'. This pattern, however, follows straightforwardly if BI has true *wh*-movement of the English type. Cheng's cleft analysis would need some extra stipulations to capture the distribution of *-kah* illustrated in (6a-c). Based on this consideration, I conclude that BI has true *wh*-movement, as in English.

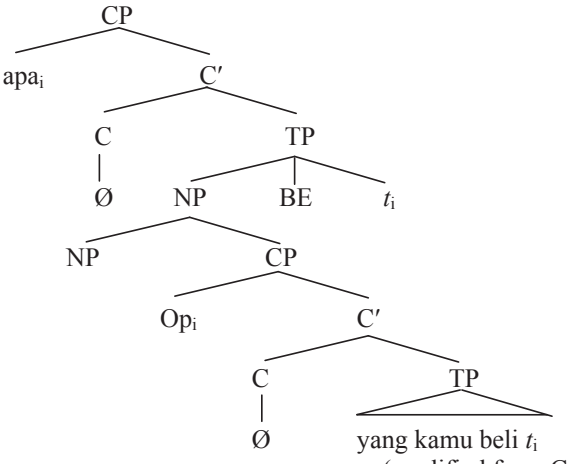
The second argument that BI sluicing involves *wh*-movement concerns the obligatory lack of the complementizer *yang* in questions with fronted non-nominal elements. Cole et al. (to appear) propose that *wh*-questions with *yang* and those without have two different derivations; the former involve short focus movement of the *wh*-phrase from the post-copula position to the specifier of the matrix CP whereas the latter involve successive cyclic movement of the *wh*-phrase from its base position to the specifier of CP as in English *wh*-questions. Their analysis is illustrated in (8b) for the example in (8a) (=7a).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(8) a. Apa$_i$ yang kamu beli $t_i$?
what that you buy
'What did you buy?'

b.




(modified from Cole et al. to appear:4)

In this derivation, there is movement of the null interrogative operator from the TP-internal position to the specifier of the embedded CP. *apa* 'what' undergoes focus movement from the position following the null copula (BE) to the specifier of the matrix CP. Cole et al.'s primary argument for this headless relative clause analysis of *wh*-questions with *yang* comes from the categorial restriction on interrogative elements that can be fronted in this type of question. Consider (9) and (10).

(9) a. **Apa** yang diperbaiki Ali?
what that fixed Ali
'What was fixed by Ali?'

b. **Siapa** yang melihatkamu?
who that see you
'Who saw you?'

c.??**Di mana** yang kamu tinggal?
at where that you live
'Where do you live?'

d.??**Bagaimana** yang Ali memperbaiki mobil itu?
how that Ali fix car that
'How did Ali fix that car?'

e.??**Kenapa** yang Ali dipecat?
why that Ali fired
'Why is it that Ali was fired?'

(BI: modeled after the Malay examples from Cole et al. to appear:6, 7)



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(10) a. Yang aku makan **nasi** **goreng**.
that I eat rice fried-Foc
'Fried rice is what I am eating.'
b. Yang kamu lihat **Siti**.
that you see Siti-Foc
'Siti is what you see.'
c.?? Yang aku tinggal **di Kendal.**
that I stay at Kendal
'The place that I live is in Kendal.'
d.?? Yang Ali memperbaiki mobil itu **dengan** **alat-nya**.
that Ali fix car that with tool-his
'The way that Ali fixed that car is with his tool.'
e.?? Yang Ali dipecat **karena** **dia** **ceroboh.**
that Ali fired because he careless
'Why Ali was fired is because he was careless.'
(BI: modeled after the Malay examples from Cole et al. to appear:9)

It is clear from (9) that, when *wh*-questions are formed with *yang*, only questions with nominal *wh*-phrases such as *apa* 'what' and *siapa* 'who' are well-formed. This categorial restriction would remain mysterious under the common analysis of *wh*-questions in languages like English as fronting of an interrogative phrase into the specifier of the matrix CP, since no such restriction would be imposed on the kind of elements to be fronted. This observation, by contrast, directly follows if the underlying structure of *yang*-questions is a headless relative clause, because the same restriction is independently observed in (10a-e).

As Cole et al. note, however, their headless relative clause analysis would only work for *wh*-questions with nominal *wh*-phrases. This point is emphasized by their conclusion (Cole et al. to appear: 26) that "questions without *yang* involve potentially long distance movement of the WH word itself." Consider (11).

(11) a. Kapan$_i$ (***yang**) Maryam kira [Ali akan datang ke sini $t_i$]?
when that Maryam think Ali will come to here
'When does Miriam think that Ali will come here?'
b. Kenapa$_i$ (***yang**) Siti bilang [Fatimah membeli ikan itu $t_i$]?
why that Siti say Fatimah buy fish that
'Why does Siti say that Fatimah bought that fish?'
(BI: modeled after the Malay examples from Cole et al. to appear:27)

(11) shows that *wh*-questions with non-nominal *wh*-elements such as *kapan* 'when' and *kenapa* 'why' do not co-occur with *yang*. For Cole et al., the lack of *yang* means that the questions are derived by regular *wh*-movement of an interrogative phrase into the specifier of CP. Then, the obligatory absence of this complementizer in (9c) indicates that the *wh*-question with the fronted PP cannot



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

be analyzed as the headless relative clause because there is an independent restriction that the head of such a clause must be nominal *wh*-phrases such as *apa* 'what' and *siapa* 'who'. Thus, at least the PP *wh*-question in BI is derived by regular *wh*-movement, as in English.

With the two arguments above in mind, consider again the examples in (5). I have shown above that the BI sluicing (with PP remnants) is derived by regular *wh*-movement of the remnant followed by TP deletion. Therefore, the P-stranding pattern in BI presents *the first genuine counterexample* to the PSG.

## 3. P-Stranding under Sluicing and Interface Repair

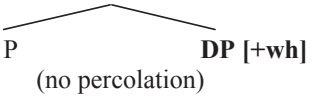
### 3.1. Feature Percolation, D-to-P Incorporation, and Interface Repair

The analysis proposed below draws on three independently motivated assumptions. Let us quickly review each of them before we move onto the analysis in section 3.2.

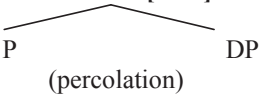
First, I claim that there is percolation of the [+wh] feature of the DP onto the PP. This idea was proposed by Chomsky (1972) to answer a criticism raised by Postal (1972). Postal observes that, if movement is successive-cyclic, it would predict that the preposition should be able to be stranded in any one of the specifiers of intermediate CPs. The ungrammatical examples in (12d, e) show that this prediction is incorrect.

(12) a. I believe Mary thinks Joan talked to someone.
b. **Who** do you believe Mary thinks Joan talked **to**?
c. **To whom** do you believe Mary thinks Joan talked?
d.* **Who/Whom** do you believe **to** Mary thinks Joan talked?
e. * **Who/Whom** do you believe Mary thinks **to** Joan talked?
(Postal 1972:213)

The relevant generalization here is that prepositions in English must either be stranded in situ or pied-piped into the specifier of the matrix CP. Chomsky argues that this generalization falls out if the [+wh] feature of the *wh*-word can optionally percolate onto its dominating PP in English, in the manner seen in (13a, b).

(13) a.


(no percolation)

b.


(percolation)

When the [+wh] feature remains in situ, as in (13a), the closest element from the perspective of the interrogative C is the DP. This option yields the stranded P-structure in (12b). When the same feature percolates, as in (13b), it is the PP now marked with that feature that is attracted by the interrogative C. This option yields the pied-piping structure in (12c). Notice that, under this feature-based analysis, there is no way in which the preposition can be stranded in intermediate sites



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

because the decision as to whether the relevant feature is percolated or not is made when the derivation constructs the PP, as shown in (13a, b).

The second assumption concerns D-to-P incorporation. It is well known that, in Romance languages such as French, a preposition sometimes coalesces with the following determiner element into a suppletive form, as in (14).

(14) Jean a parlé **du** sujet le plus difficile. (French)
Jean have talked about-the subject the most difficult
'Jean talked about the most difficult subject.'

In (14), the preposition *de* coalesces with its following determiner *le* to yield a suppletive form *du*. Law (1998) (see also Beerman 1990 and van Riemsdijk 1998 for German) propose that there is a syntactic constraint on suppletion, as defined in (15).

(15) Syntactic Constraint on Suppletion (Law 1998:22)
Elements undergoing suppletive rules must form a syntactic unit $X^0$.

This constraint states that determiners must incorporate onto their governing prepositions to be reanalyzed in the post-syntactic component as a suppletive element. Of course, there are cases (e.g. *de la* in French) where D-P coalescence does not occur, but it is not likely that general syntactic operations such as incorporation should be constrained by this type of unpredictable morpholexical gap. Rather, a more plausible analysis would be one in which D-to-P incorporation occurs across the board in French, whether or not its effects are morphophonologically realized in the form of D-P coalescence.

The final and most important idea I pursue in this paper is that of interface repair. This idea has been circulated since the late 1960s, when Ross (1969) observed that the sluicing transformation ameliorates island-violations that would otherwise yield ungrammatical sentences. Following Chomsky (1972), Merchant (2001) proposes a revision of Ross' idea by arguing that sluicing ameliorates certain island violations because they essentially constitute islands only at the PF interface. Further elaborating on this point, Boeckx and Lasnik (2006) claim that both derivational and representational constraints must be admitted into the theory of grammar on the grounds that *wh*-island effects can be repaired whereas superiority violations cannot. This notion of interface repairs plays a crucial role in the analysis proposed below.

### 3.2. Towards an Etiology of the Typology of P-Stranding

I propose a parametric analysis of the typology of P-stranding at the Syntax-Phonology Interface that draws on the three independently motivated assumptions introduced in the previous subsection, summarized in (16).[3]

[3] Many thanks to Heidi Harley (personal communication, April 2008) for suggesting the analysis



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



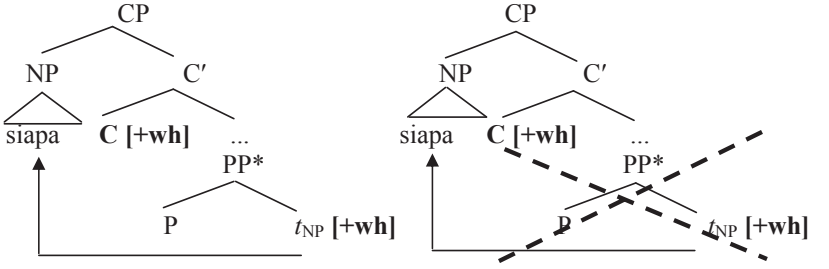
(16) Table 1: The Parametric Theory of P-Stranding at the S-P Interface

| Parameters / Languages | [+wh] feature percolation from the D to PP | D-to-P incorporation in the syntax |
|---|---|---|
| English | OPTIONAL | NO |
| BI | OBLIGATORY | NO |
| French | OBLIGATORY | YES |

Consider first why English allows P-stranding both under *wh*-movement and sluicing. English allows P-stranding under *wh*-questions because this language has the option of not percolating the [+wh] feature of the nominal complement of P onto the PP. When this option is chosen, the interrogative C attracts the *wh*-phrase, onto its specifier, deriving the P-stranding configuration. When the [+wh] feature is percolated, the pied-piped counterpart results. English allows P-stranding under sluicing because the preposition left behind within the PP is elided by deletion of the TP that contains this constituent.

How about BI? This language does not allow P-stranding under *wh*-questions because the [+wh] feature of the nominal complement of P must percolate onto the PP. As a result, the PP is attracted to the specifier of CP. The question is, then, why P-stranding does not yield ungrammaticality under sluicing. It is at this point that the role of the syntax-external phonological system plays a critical role in remedying imperfections created by syntactic computation. Consider the derivations in (17a, b) for the grammatical P-less sluice in (5c).

(17)a.S-P Interface (No Repair) b. S-P Interface (Repair)




I propose that a) a failure of the [+wh] feature to percolate is repaired at the syntax-phonology interface and that b) a representational constraint to verify percolation rules out the offending PP at the interface. If the offending PP remains at PF, the representational constraint is violated, as shown in (17a). If the offending PP is deleted at the interface, as shown in (17b), the representational constraint has nothing to apply to. This derivation, thus, can still converge at the interface.

---

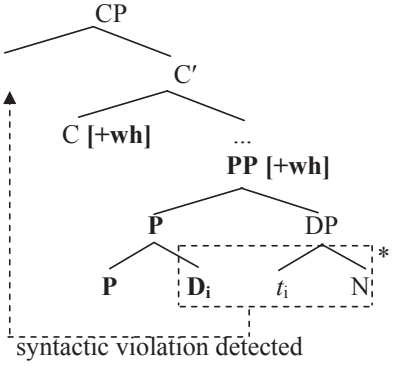
presented in this subsection and very helpful follow-up discussion on issues related to the analysis.



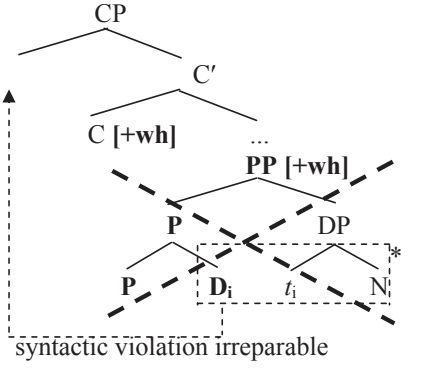
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Let us finally consider the French P-stranding pattern. French does not permit P-stranding under *wh*-movement as in BI because the [+wh] feature obligatorily percolates onto the PP that dominates the *wh*-phrase. As shown in (4c), French also does not allow P-less sluices. What is crucial here is that languages like French have D-to-P incorporation, as we saw earlier in section 3.1. Consider the derivations in (18a, b) for the ungrammatical P-less sluice in (4c).

(18) a. Syntax




b. Syntax-Phonology Interface




In (18a), the D head undergoes syntactic incorporation into the P in accordance with Law's constraint given in (15). The [+wh] feature of the moved D head percolates onto the dominating PP. This derivation crashes because, when the C with the [+wh] feature attracts the element with the matching feature, the DP is no longer a syntactic constituent, hence cannot be attracted by C. Notice that the P-less sluice could still be derived if the D head underwent incorporation to be attracted by the C head. However, this possibility is blocked since this excorporation would cause the Empty Category Principle-like violation; the trace of the excorporating element cannot be properly licensed. The point here is that whatever derivation could possibly yield the P-stranding sluice in French crashes because of the interaction of purely syntactic/derivational constraints on D-to-P incorporation. Therefore, when (18a) reaches the interface, as illustrated in (18b), it is simply too late to repair violations associated with D-to-P incorporation because the violations incurred are strictly syntactic. More specifically, once the preposition with the unvalued feature (e.g. D-feature) is introduced into the derivation, it must start probing and attract the matching goal with the D-feature since that is the driving force for syntactic derivation: this mechanical computation is hard-wired into the definition of Agree, Match, and Move. Thus, the violation of D-to-P incorporation is simply impossible in the minimalist vision of syntactic derivation. This is different from the failure of feature percolation, which is an interface violation whose severity could vary from language to language, and can be undone by deletion at the PF interface. Thus, syntactic representations that involve this violation can still converge, as we saw in BI.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



## 4. Concluding Remarks

This paper has proposed that the notion of interface repair by way of deletion plays a crucial role in the proposed account of the three-way contrast between English, BI, and French with respect to P-stranding. The most important theoretical claim of the proposed analysis is that the phonological component can repair certain illicit configurations created by failure of [+wh] feature percolation by deleting them. However, interfaces are neither omniscient nor omnipotent; it cannot undo "mistakes" concerning D-P coalescence that are syntactically/derivationally conditioned, since the syntax is so constructed to be unable to produce such violations in the first place. The proposed analysis, therefore, provides support for the general idea that interface components can conduct domain-specific operations to repair certain imperfections but only within the curve parametrically defined by universal syntactic mechanisms. See Sato (2008) for further extensions of this view of linguistic interfaces, as applied to semantics (*wh*-in-situ) and morphology (reduplication).

## References

Almeida, Diogo, and Masaya Yoshida. 2007. A Problem for the Preposition Stranding Generalization. *Linguistic Inquiry* 38(2): 349-362.

Beerman, Dorothee. 1990. Semantic and Syntactic Constraints on German Determiner Movement within the Prepositional Phrase. Master's Thesis, University of Texas, El Paso.

Boeckx, Cedric, and Howard Lasnik. 2006. Intervention and Repair. *Linguistic Inquiry* 37 (1): 150-155.

Cheng, Lisa. 1991. On the Typology of *Wh*-Questions. Ph.D.diss., MIT.

Chomsky, Noam. 1972. Some Empirical Issues in the Theory of Transformational Grammar. In S. Peters, ed., *Goals of Linguistic Theory*, 63-130. Winston: Englewood Cliffs.

Chomsky, Noam. 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.

Cole, Peter, Gabriella Hermon, and Norhaida Aman. To appear. Clefted Questions in Malay. In D. Gil, ed., *Malay/Indonesian Linguistics*. London: Curzon.

Fortin, Catherine. 2007. Indonesian Sluicing and Verb Phrase Ellipsis: Description and Explanation in a Minimalist Framework. Ph.D.diss., U. of Michigan.

Fox, Danny, and Howard Lasnik. 2003. Successive-Cyclic movement and Island Repair: The Difference between Sluicing and VP-Ellipsis. *Linguistic Inquiry* 34(1): 143-154.

Lasnik, Howard. 1999. On Feature Strength: Three Minimalist Approaches to Overt Movement. *Linguistic Inquiry* 30 (2): 197-217.

Lasnik, Howard. 2001. When Can You Save a Structure by Destroying it? In M.-J. Kim and U. Strauss, eds., *Proceedings of North East Linguistic Society* 31, 301-320. University of Massachusetts, Amherst: Graduate Linguistic Student Association (GLSA).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Lasnik, Howard. 2005. Speculations on P-Stranding. Class lecture handout, Linguistic Society of America, MIT/Harvard University. July 18-August 3 [http://www.ling.umd.edu/~lasnik/LSA%20course/Lasnik%20LSA%20HO%20Sect%202%20Appendix%20P-stranding.pdf]

Lasnik, Howard. 2007. On Ellipsis: The PF Approach to Missing Constituents. In A. Conroy, C. Jing, C. Nakao, and E. Takahashi, eds., *University of Maryland Working Papers in Linguistics* 15, 143-153. College Park: UM Linguistics.

Law, Paul. 1998. A Unified Analysis of P-Stranding in Romance and Germanic. In P. Tamanji and K. Kusumoto, eds., *Proceedings of North East Linguistic Society 28*, 219-234. University of Massachusetts, Amherst: GLSA.

Merchant, Jason. 2001. *The Syntax of Silence: Sluicing, Islands, and the Theory of Ellipsis*. Oxford: Oxford University Press.

Postal, Paul. 1972. On Some Rules that are not Successive Cyclic. *Linguistic Inquiry* 3(2): 211-222.

Potsdam, Eric. 2003. Evidence for Semantic Identity under Ellipsis from Malagasy. In M. Kadowaki and S. Kawahara, eds., *Proceedings of North East Linguistic Society* 33, 285-302. University of Massachusetts, Amherst: GLSA.

Rodrigues, Cilene, Andrew Nevins, and Luis Vicente. 2007. Cleaving the Interactions between Sluicing and Preposition Stranding. Ms., Unicamp, Harvard, and University of California, Santa Cruz. [To appear in *Proceedings of Going Romance* 20, Vrije Universiteit.]

Ross, John. 1969. Guess Who. In R. Binnick, A. Davison, G. Green, and J. Morgan, eds., *Papers from the 5th Regional Meeting of the Chicago Linguistic Society*, 252-286. Chicago: Chicago Linguistic Society.

Sato, Yosuke. 2008. Minimalist Interfaces: Selected Issues in Indonesian and Javanese. Ph.D.diss., University of Arizona, Tucson.

Stepanović, Sandra. 2008. P-Stranding under Sluicing in a Non-P-Stranding Language? *Linguistic Inquiry* 39 (1): 179-190.

Szczegielniak, Adam. 2006. All Sluices up, but no Alleviation in Sight. Ms., Harvard University.

van Riemsdijk, Henk. 1998. Head Movement and Adjacency. *Natural Language and Linguistic Theory* 16(3): 633-678.

Wang, Chyan-An. 2006. Sluicing and Resumption. Paper presented at the 18th Annual Meeting of the Northeast Linguistic Society. [To appear in *Proceedings of North East Linguistic Society* 37, University of Massachusetts, Amherst, GLSA]

Department of Linguistics
Douglass 200E,
University of Arizona
Tucson, AZ 85721-0028

yosukes@email.arizona.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# The Comparative Morpheme in Modern Japanese

OSAMU SAWADA*
*University of Chicago*

## 0. Introduction

Japanese differs from languages like English in that it (usually) has no overt comparative morphology like the English *–er/more*, as shown in (1):

(1) a. Tokyo-wa Sapporo-**yori** (-mo) atatakai.
Tokyo-TOP Sapporo-than-MO warm
'It is warmer in Tokyo than in Sapporo.'
b. Taro-wa Hanako-ga kaita (-no)-**yori** (-mo) nagai ronbun-o kaita.
Taro-TOP Hanako-NOM wrote-NM-than-MO long paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote.' (NM=Nominalizer)

*Yori* in (1) is a marker of standard. Structurally, (1a) is 'phrasal' and (1b) is 'clausal.' However, in Modern Japanese *yori* is used in limited environments as the equivalent of the English comparative morpheme *more*, as shown in (2):

(2) a. **Yori** ooku-no nihon-jin-ga Denver-**yori-**(mo) New York
More many-Gen Japan-people-NOM Denver-than-MO New York
-ni sun-deiru.
-LOC live-STATIVE
'More Japanese people are living in New York than in Denver.'
b. Taro-wa **yori** anzenna tokoro-ni hikkoshi-ta.
Taro-TOP more safe place-DAT move-PAST
'Taro moved to a safer place.'

Although many studies have focused on the syntax and semantics of Japanese comparatives like that in (1) (e.g. Kikuchi 1987, Ishii 1991, Ueyama 2004, Beck

* I am very grateful to Chris Kennedy and Salikoko Mufwene for their valuable discussions about this material. Thanks are also due to Peter Alrenga, Anastasia Giannakidou, Tommy Grano, Yaron McNabb, Jason Merchant, Harumi Sawada, Jun Sawada, Suwon Yoon, Alan Yu, and the audiences at BLS 34 and the Research Seminar at the University of Chicago for their helpful feedback and suggestions.

et al. 2004, Hayashishita in press, Kennedy 2007, in press, Bhatt and Takahashi 2008), to the best of my knowledge, little attention has been paid to cases like (2). This may be because the comparative morpheme *yori* only occurs in special environments. The purpose of this paper is to investigate the syntax and semantics of the comparative morpheme *yori* in Modern Japanese from synchronic and diachronic perspectives and try to capture the asymmetrical relationship between (1) and (2) in a unified way. More specifically, we will consider the following questions: (i) In what environment does the comparative morpheme *yori* arise? (ii) Why is the comparative morpheme *yori* necessary in this environment, and what role does it play in the grammar of comparison? (iii) How did the standard marker *yori* 'than' develop into the comparative morpheme *yori* 'more'?

As to question (i), I argue that the comparative morpheme *yori* is used only if a given sentence cannot otherwise express comparison. I will verify this generalization using two corpuses: Google Japanese and the Asahi newspaper database. As to question (ii), the comparative morpheme **selects** (Kennedy 2007) a comparative phrase/clause (elided or not) and makes it scope over a gradable predicate at the LF so that the sentence can be interpreted as a 'native' Japanese comparative. Regarding question (iii), I argue that both language contact and reanalysis are relevant to the development of the comparative morpheme *yori*.

This paper shows that the directionality of the development from the marker of standard *yori* to the comparative morpheme *yori* can support Kennedy's (2007) idea that the marker of standard, rather than comparative morphology, expresses the meaning of comparison (i.e. 'greater than').

## 1. The Comparative Morpheme *Yori* vs. the Marker of Standard *Yori*

*Yori* in (1) is a marker of standard whereas the underlined *yori* in (2) is a comparative morpheme. In terms of syntactic category, *yori* in (1) is a postposition whereas the underlined *yori* in (2) is an adverb. Three pieces of empirical evidence support the idea that they are categorically different. The first piece of evidence is concerned with deletion. We cannot analyze the underlined *yori* in (2) as a postposition whose complement is elided, because although Japanese allows the use of a 'null pronoun', the postposition/case marker must be dropped along with the NP. Thus, if the complement of *–ni* is not deleted along with the NP, the sentence becomes ungrammatical:

(3) Taro mo [$_{PP}$ _ (*-ni)] i-tta.
Taro also _ -DAT go-PAST
'Taro also went to a contextually given place.'

If the underlined *yori* in (2) is a postposition, the sentences are predicted to be ungrammatical but they are natural. This suggests that the underlined *yori* is not a postposition. The second piece of evidence is the fact that the particle *mo* can attach to the standard marker *yori*, but not to the comparative morpheme (Martin 1975). Therefore, the following sentence is ungrammatical:

(4) *Taro-wa **yori-mo** anzenna tokoro-ni hikkoshi-ta.
Taro-TOP more-MO safe place-DAT move-PAST
'Intended. Taro moved to a safer place.'

Third, the comparative morpheme *yori* and the marker of standard *yori* are phonologically different. Although the marker of standard *yori* does not have an accent, in the case of the comparative morpheme *yori, yo* is stressed (Martin 1975).

As Martin (1975), Hida (2002) and many Japanese dictionaries point out, Modern Japanese developed a new comparative morpheme usage of *yori*, meaning 'more', under the influence of translations from European languages. However, this does not mean that the comparative morpheme can be freely used in Japanese comparatives. The examples in (1) do not use the comparative morpheme, but the examples in (2) do. Why is the comparative morpheme *yori* used in some instances but not in others?

## 2. Generalization on the Use of the Comparative Morpheme *Yori*

I would like to propose the following (descriptive) generalization:

(5) **Generalization on the use of the comparative morpheme *yori***: Insert the comparative morpheme *yori* only if a given sentence cannot otherwise express comparison.

Let us apply this descriptive generalization to (1) and (2). Contrary to the examples in (1), the following sentences sound odd because we can express comparison without the comparative morpheme *yori*:

(6) a. ?? Tokyo-wa Sapporo-yori-(mo) **yori** atatakai.
Tokyo-TOP Sapporo-than-MO more warm
'It is warmer in Tokyo than in Sapporo.'
b. ?? Taro-wa [Hanako-ga kaita (-no)]-yori-(mo) **yori** nagai.
Taro-TOP Hanako-NOM wrote -NM]-than-MO more long
ronbun-o kaita.
paper-ACC wrote
'Taro wrote a longer paper than Hanako wrote.'

On the other hand, the comparative morpheme *yori* is obligatory in (2). If we delete it from (2a), the resulting sentence must be interpreted as a sentence with the expression 'rather than', as shown in (7):[1]

[1] See Giannakidou and Stavrou (in press) for a discussion of 'rather than'.

(7) Ooku- no nihon-jin-ga Denver-**yori** New York-ni
many-Gen Japan-people-NOM Denver-rather than New York-LOC
sun-deiru.
Live-STATE
'Many Japanese people are living in New York **rather than** in Denver.'

In (7) the target and the standard are both expressed inside the domain of the predicate, and in this environment we cannot express comparison without the comparative morpheme *yori*.[2]

Furthermore, if we delete the comparative morpheme in (2b), the resulting sentence must be interpreted as a simple sentence with a bare adjective:

(8) Taro-wa anzenna tokoro-ni hikkoshi-ta.
Taro-TOP safe place-ACC move-PAST
'Taro moved to a safe place.'

The fact that the comparative morpheme *yori* cannot appear in a differential comparative sentence also supports the generalization in (5):

(9) Kono sao-wa (*yori) 10 senchi nagai.
This rod-TOP more 10 cm long
'This rod is 10cm longer.' (*This rod is 10 cm long.)

As Snyder et al. (1995) and Schwarzschild (2005) point out, Japanese does not allow measure phrases to combine directly with an adjective. Therefore, (9) without *yori* can only mean 'This rod is 10cm longer.' We do not need the comparative morpheme *yori* since the sentence can express comparison without it.

## 3. Corpus study

In this section, we will test whether the proposed generalization on the comparative morpheme *yori* is valid by using two online corpuses: Google Japanese and the *Asahi* newspaper database *Kikuzoo*. I made the following minimal pairs:

(10) a. x-wa y-[yori-mo ADJ]
x-TOP y- than-MO ADJ
b. x-wa y-[yori-mo **yori** ADJ]
x-TOP y- than-MO more ADJ

---

[2] Note that in (7), '*Denver yori New York-ni'* forms a 'fixed constituent.' If we change the word order, the sentence sounds odd:
(i) ?? [Denver-yori] ooku- no nihon-jin-ga [New York-ni] sun-deiru.
Denver-rather than many-Gen Japan-people-NOM New York-LOC live-STATE
The standard marker *yori* (=1) doe not have this syntactic property. For example, in (1a) '*Sapporo-yori*' can move to the sentence-initial position. Therefore, it is safe to assume that the standard marker *yori* and the 'rather than' *yori* (=7) are lexically different.

According to my generalization, (10b) should be bad because it can express comparison without using the comparative morpheme, although this is not true of (10a). I searched for the strings [*yori-mo* ADJ] and [*yori-mo yori* ADJ] in the corpuses. The particle *mo* is attached so that the first *yori* must be interpreted as a marker of standard.[3] Table (11) shows the frequency of the minimal pair:

(11) Frequency of *yori* (Surveyed online, May 11, 2008)

| | Asahi Newspaper | Google Japanese |
|---|---|---|
| 1a. __ yori-mo tanoshii<br>than-MO fun | 131 hits<br>(100 %) | 55, 600 hits<br>(99.4 %) |
| 1b. __ yori –mo yori tanoshii<br>than-MO more fun | 0 hit<br>(0 %) | 343 hits<br>(0.6 %) |
| 2a. __ yori-mo atatakai<br>than-MO warm | 21 hits<br>(100 %) | 27,100 hits<br>(99.97%) |
| 2b. __ yori-mo yori atatakai<br>than-MO more warm | 0 hits<br>(0 %) | 7 hits<br>(0.03 %) |
| 3a. __ yori-mo samui<br>than-MO cold | 20 hits<br>(100 %) | 33, 900 hits<br>(99.991%) |
| 3b. __ yori-mo yori samui<br>than-MO more cold | 0 hits<br>(0 %) | 3 hits<br>(0.009 %) |
| 4a. __ yori-mo chiisai<br>than-MO small | 164 hits<br>(100 %) | 591, 000 hits<br>(99.53%) |
| 4b. __ yori-mo yori chiisai<br>than-MO more small | 0 hits<br>(0 %) | 2, 800 hits<br>(0.47 %) |
| 5a. __ yori-mo kawai-teiru<br>than-MO dry-STATE | 0 hits | 647 hits<br>(100%) |
| 5b. __ yori-mo yori kawa-iteiru<br>than-MO more dry-STATE | 0 hits | 0 hits<br>(0%) |
| 6a. __ yori-mo hirai-teiru<br>than-MO open-STATE | 0 hits | 6, 060 hits<br>(99.97 %) |
| 6b. __ yori-mo yori hirai-teiru<br>than-MO more open-STATE | 0 hits | 2 hits<br>(0.03 %) |

We can observe the following points. First, examples of type (b) are far less common than those of type (a). Second, the proportion of examples of type (b) is close to zero. The judgment between (a) and (b) is (almost) categorical.[4] We can observe this tendency more clearly in the Asahi newspaper than in Google Japanese. The above results show that the generalization in (5) is empirically correct.

## 4. The Job of the Comparative Morpheme in Modern Japanese

[3] I used brackets for the Google Japanese so as to get examples in which the string forms a phrase. If the brackets are omitted, we find many cases in which each lexical element appears separately in non-adjacent positions. I also chose the option 'search Japanese websites.'

[4] It may be possible to argue that some people treat the comparative morpheme *yori* as an 'intensifier' like *motto*:

(i) Taro-wa Hanako-yori-mo motto kasikoi.
Taro-TOP Hanako-than-MO MOTTO intelligent
'Taro is even more intelligent than Hanako.'

(i) implies that both Taro and Hanako are intelligent (e.g. Okumura 1995, Beck et al. 2004).

### 4.1. Semantics of 'Native' Japanese Comparatives

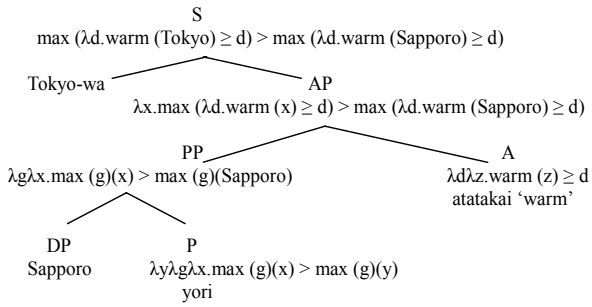
Let us rethinks the generalization we have stated more theoretically. The examples in (1) may be called 'native' Japanese comparatives because they lack any explicit comparative morphology. There are several approaches for the semantics in (1). One approach is to consider that the relation 'greater than' is expressed by MORE (e.g. Von Stechow 1984: 8). Another approach is to consider that comparative morpheme *–er* forms a semantic constituent with the *than* clause at the semantic structure (e.g. Cresswell 1976; Heim 1985). These views lead us to consider that there is a null comparative morpheme for (1) (e.g. Beck et al. 2004).

Kennedy (2007) proposes an alternative approach in which the marker, not MORE, denotes the relational meaning 'greater than'. As he argues, this approach seems natural if we consider the fact that many languages do not have an overt comparative morphology (Ultan 1972).[5] This approach also seems to be simpler because we do not need to posit a null comparative morpheme for (1). This paper adopts Kennedy' (2007) view. I will also assume, following Kennedy (in press), that *yori* is an 'individual comparison.' That is, the comparative clause/phrase in Japanese denotes type <e>. The denotation of the standard marker *yori* and *attakai* 'warm' are shown in (12) and the LF of (1a) is shown in (13):

(12) a. $[\![\text{yori}_{\text{standard}}]\!] = \lambda y \lambda g \lambda x.\max(g)(x) > \max(g)(y)$

b. $[\![\text{atatakai}]\!] = \lambda d \lambda z.\text{warm}(z) \geq d$

(13)




### 4.2. A sentence with the comparative morpheme *yori*

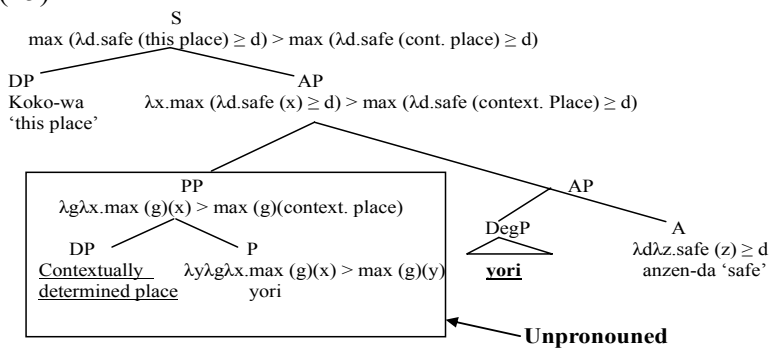
#### 4.2.1. Case 1: elided comparative clause/phrase)

Thanks to the emergence of the comparative morpheme *yori*, Japanese can express elliptical comparison. The LF structure of (14) can be represented as (15):

(14) Koko-wa **yori** anzen-da.
Here-TOP more safe-PRED
'This place is safer.'

[5] Ultan (1972) states that 32 of 108 languages he surveyed do not have overt comparative morphology.

(15)




The square box shows the elided part. The comparative morpheme *yori* signals that there is a hidden comparative phrase that scopes over the gradable predicate.

### 4.2.2. Case 2: Use of Two *Yori*s

(16a) can be paraphrased by (16b), which is a native Japanese comparison:

(16) a. **Yori** ooku- no nihon-jin-ga Denver-**yori-**(mo) New York
More many-Gen Japan-people-NOM Denver -than-MO New York
-ni sun-deiru.
-LOC live-STATIVE
'More Japanese people are living in New York than in Denver.'

b. New York-ni -wa Denve-**yori**-(mo) ooku-no nihon-jin
New York-LOC -TOP Denver-than-MO many-GEN Japanese-people
-ga sun-deiru.
-NOM live-STATIVE
'More Japanese people are living in New York than in Denver.'

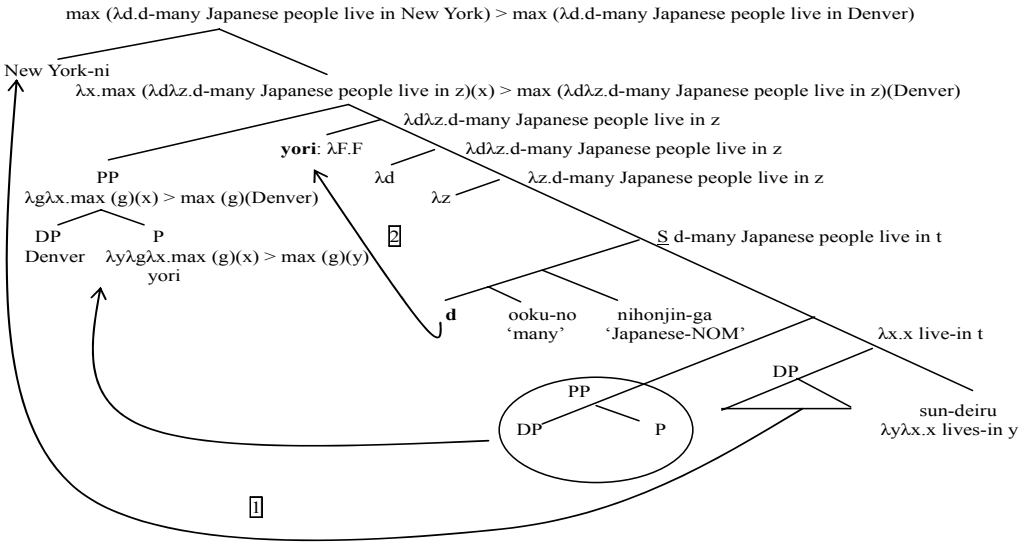
In (16a) there is a comparative morpheme, but in (16b), there is no comparative morpheme. In (16a) the target of comparison and the standard of comparison are both inside the predicate.[6] I assume here that the second *yori* in (16a) is a marker of standard.[7] Kennedy (2007) argues that English sentences like '*more people live in New York than Chicago*' have a complicated LF, which involves a 'parasitic scope' (Heim 1985, Barker in press, Bhatt and Takahashi 2007). As we can see from the following figure, we must assume that such a complicated LF exists in example (16a):

---

[6] Note that the standard of comparison can also be clausal (Sawada 2008):
(i) Taro-wa [Ofisu-ni iru toki]-yori [ie-ni iru toki] **yori** takusan ochya-o nomu.
Taro-TOP Office-LOC be when-than home-LOC be when more many tea-ACC drink
'As for Taro, he drinks more tea when he is at home than when he is at the office.'

[7] There is also a possibility that the second *yori* in (16a) is the 'rather than' *yori* (Sawada 2008). Recall that if we delete the first *yori* in (16a), the second *yori* is interpreted as 'rather than.'

(17)




There are several steps involved in the above LF. First, the DP is raised to scope over the entire sentence. Second, the comparative morpheme *yori* is raised for interpretability to a position above 'λz' and binds a degree variable in its base position. Note that the comparative morpheme *yori* is semantically vacuous. Since the operation of the second movement depends on the first movement, we can say that the scope relation is 'parasitic.' Finally, the comparative morpheme *yori* selects the comparative phrase *Denver-yori* 'than Denver' and makes it scope over the gradable predicate (*yori ooku-no Nihon jin ga sundeiru*). At the end of the day, the logical structure of (16a) is like that of 'native Japanese' comparatives (i.e. (16b)), where no comparative morpheme *yori* is used. We can summarize Section 4 as follows:

(18) The comparative morpheme *selects* (Kennedy 2007) a comparative phrase/clause (elided or not) and makes it scope over a gradable predicate at the LF so that the sentence can be interpreted as a native Japanese comparative.[8]

## 5. Historical Syntax of *Yori*

[8] As Kennedy (in press, 2007) argues, example (i) involves 'parasitic scope' configuration:

(i) Taro-wa Hanako-yori nagai kasa-o katta.
Taro-TOP Hanako-than long umbrella-ACC bought
'Taro bought a longer umbrella than Hanako (bought).'

The reason why (i) does not need the comparative morpheme *yori* is because its surface structure is that of a native Japanese comparatives. This suggests that a parasitic scope configuration can be posited even if there is no comparative morpheme *yori*. (i) must posit a parasitic scope configuration in order to avoid an unnatural interpretation in which *Hanako yori nagai kasa* forms a constituent (Kennedy in press).

### 5.1. Language Contact

Hida (2002) points out that *yori* was used to translate the comparative form of Dutch adjectives in the grammar book *Oranda gohoo kai* (1805), the first Dutch grammar in Japanese. It must be the case that before the emergence of the comparative morpheme *yori*, Japanese grammar could not generate a comparative sentence where both the target and the standard are inside the domain of the predicate, nor could it produce a comparative sentence whose comparative clause is elided.

According to Heath (1978:115), "only those morphemes have actually been diffused which contribute something to the borrowing language which was previously lacking... morphemic borrowing is viewed in its therapeutic aspects. Borrowings are interpreted as devices to fill functional gaps." Although the notion of filling structural gaps is controversial and not all scholars support it (e.g. Brody 1987), this approach fits the emergence of the Japanese comparative morpheme. However, even if we accept the gap-filling view, we still cannot explain why Japanese decided to recycle the existing word *yori* for a comparative morpheme.

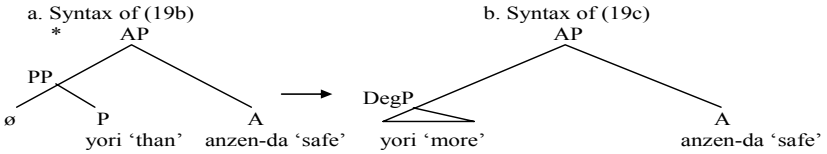
### 5.2. Change of bracketing through 'reanalysis'

The following stages explain the development of the comparative morpheme *yori*:

(19) (a) NP-wa $[\text{NP-yori}]_{PP}$ ADJ (b)* NP-wa $[\ \_\text{-yori}]_{PP}$ ADJ → (c) NP-wa $[\text{yori ADJ}]_{AP/DegP}$
NP-TOP NP-than ADJ NP-TOP _-than ADJ NP-TOP more ADJ

In (19a) the standard marker *yori* combines with its complement. However, if the complement of *yori* is unpronounced, the sentence becomes ungrammatical, as in (19b). Therefore, we can say that the facts that (19b) is ungrammatical, and that unlike in English, the comparative clause/phrase in Japanese precedes a gradable predicate, both contributed to the development of the comparative morpheme *yori*. The following figure shows the reanalysis from (19b) to (19c):

(20) Reanalysis from the marker of standard to the degree modifier




However, there is a question as to whether the analysis in (19) can be regarded as a 'real' reanalysis. Many researchers argue that reanalysis depends upon surface ambiguity or the possibility of more than one analysis (Langacker 1977, Harris and Campbell 1995). Although it is clear that (20) involves a change of (i) constituency, (ii) hierarchical structure and (iii) category labels, this is not an 'independent' process, because the fundamental motivation for the reanalysis is the necessity of translation, not a structural ambiguity. According to Harris and Campbell (1995), there are three mechanisms of syntactic change *reanalysis*, *extension*, and *borrowing*. I would like to suggest that both reanalysis and borrowing were

involved in the development of the comparative morpheme *yori* and neither was sufficient on its own.

### 5.3. Comparison with Pipil

Campbell (1987) argues that the Pipil comparative construction was borrowed directly from the Spanish '*más… que*': [9]

(21) ne siwa:-t **mas** galána **ke** taha. (Pipil)
the woman more pretty than you
'That woman is prettier than you are.' (cf. esa mujer es **más** linda **que** tú)

Pipil had several different comparative expressions before its contact with Spanish, but these have been eliminated and replaced by this borrowed comparative construction (Cambell 1987, Harris and Campbell 1995).

Modern Japanese comparatives differ from Pipil comparatives in the following ways. First, while Japanese recycled an existing lexical item *yori* for the new grammatical morpheme, Pipil directly borrowed the comparative morpheme *mas* as well as the marker of standard *que* from Spanish. This means that in Japanese both language-internal factors and language-external factors are involved, whereas in Pipil, only language-external factors are involved. Second, while the comparative morpheme *yori* appears only in limited environments, the use of the borrowed construction is obligatory for Pipil comparatives. These differences suggest that the Japanese language is conservative in that it tries to maintain a 'native' grammar as much as possible.

## 6. Conclusion

This paper investigated the syntax and semantics of the comparative morpheme *yori* in Modern Japanese from synchronic and diachronic perspectives. I proposed that the comparative morpheme *yori* is used only when a given sentence cannot otherwise express comparison. I argued that the comparative morpheme *selects* (Kennedy 2007) a comparative phrase/clause (elided or not) and makes it scope over a gradable predicate at the LF so that the sentence can be interpreted as a native Japanese comparative. As for the development of the comparative morpheme *yori*, I argued that both borrowing and reanalysis played an important role.

What will this paper contribute to the semantic theory of comparatives in general? Researchers have argued that the 'greater than' meaning is expressed by comparative morphology (e.g. von Stechow 1984) or that the comparative morpheme *–er* forms a semantic constituent with the *than* clause at the level of semantic structure (e.g. Cresswell 1976, Heim 1985). These views lead us to consider that there is a null comparative morpheme (1) (e.g. Beck et al. 2004).

Kennedy (2007), on the other hand, argues that markers of standard, not comparative morphemes have the meaning of comparison (i.e. 'greater than'). This

[9] Pipil is an indigenous language spoken in El Salvador.

paper suggests that Kennedy's approach is more plausible for the following reasons. First, Kennedy's idea fits naturally with the 'directionality' of the syntactic change, from the marker of standard *yori* to the comparative morpheme *yori*. Semantically, we can say that this is a process of semantic bleaching. The marker of standard *yori*, which has a semantic content of 'greater than', developed the comparative morpheme whose meaning is null. Second, Kennedy's idea allows us to avoid a situation in which Modern Japanese has two comparative morphemes: the null comparative morpheme MORE and the comparative morpheme *yori*. If, on the other hand, we take the view that the null comparative morpheme MORE can contribute to the semantics of comparison in Japanese, we must stipulate a division of labor between the comparative morpheme *yori* and the null morpheme MORE, which is not natural typologically. Typologically, it seems that lexical diversity is observed in the position of the marker of standard, rather than the comparative morpheme (e.g. Greek *apo* and *apoti*; Merchant 2006)). I hope this paper will shed new light on the interface between formal semantic theory and historical linguistics.

## References

Barker, Chris. In press. Parasitic Scope. *Linguistics and Philosophy*.

Beck, Sigrid, Toshiko Oda and Koji Sugisaki. 2004. Parametric Variation in the Semantics of Comparison: Japanese vs. English. *Journal of East Asian Linguistics* 13:289-344.

Bhatt, Rajesh and Shoichi Takahashi. In press. Direct Comparisons: Resurrecting the Direct Analysis of Phrasal Comparatives. In *Proceedings of SALT 17*. Ithaca, NY: CLC Publications.

Bhatt, Rajesh and Shoichi Takahashi. 2008. When to Reduce and When Not to: Crosslinguistic Variation in Phrasal Comparatives. Handout of GLOW XXXI.

Brody, Jill. 1987. Particles Borrowed from Spanish as Discourse Markers in Mayan Languages. *Anthropological Linguistics* 29:507-521.

Campbell, Lyle. 1987. Syntactic Change in Pipil. *International Journal of American Linguistics* 53:253-280.

Cresswell, M.J. 1976. The Semantics of Degree. In B. H., Partee, ed., *Montague Grammar*, 261-292. New York: Academic Press.

Giannakidou, Anastasia and Melita Stavrou. In press. On Metalinguistic Comparatives and Negation in Greek. *MIT Working Paper in Linguistics*.

Harris, Alice C. and Lyle Campbell. 1995. *Historical Syntax in Cross-linguistics Perspective*. Cambridge: Cambridge University Press.

Hayashishita, J-R. In press. *Yori*-comparative. *Proceedings of Asian Glow 5*.

Heath, Jeffrey. 1978. *Linguistic Diffusion in Arnhem Land*. Canberra: Australian Institute of Aboriginal Studies.

Heim, Irene. 1985. Notes on Comparatives and Related matters. Ms. University of Texas, Austin, TX.

Hida, Yoshifumi. 2002. Gendai nihongo no kigen (The Origin of Modern Japanese). In Y. Hida and T. Sato, eds., *Gendai Nihongo Kooza* Vol. 4 (Lectures on Modern Japanese), 70-103. Tokyo: Meiji Syoin.

Ishii, Yasuo. 1991. Operators and Empty Categories in Japanese. Ph.D. diss., University of Connecticut.

Kennedy, Christopher. In press. Modes of Comparison. *Papers from the 43rd Annual Meeting of the Chicago Linguistic Society.*

Kennedy, Christopher. 2007. Standards of Comparison. Handout of Colloque de Syntaxe et Sémantique à Paris.

Kikuchi, Akira. 1989. Comparative Deletion in Japanese. Ms., Yamagata University.

Langacker, Ronald W. 1977. Syntactic Reanalysis. In C. N. Li, ed., *Mechanisms of Syntactic Change*, 59-139. Austin: University of Texas Press.

Martin, Samuel. 1975. *A Reference Grammar of Japanese.* New Haven and London: Yale University Press.

Merchant, Jason. 2006. Phrasal and Clausal Comparatives in Greek and the Abstractness of Syntax. Ms., University of Chicago.

Okumura, Taishi. 1995. *Motto* ni tsuite no koosatsu (On the Usage of *Motto*). *Nihongo Kyōiku* (Journal of Japanese Language Teaching):91-102.

Sawada, Osamu. 2008. The Historical Syntax of Japanese Comparatives. Ms., University of Chicago.

Schwarzschild, Roger. 2005. Measure Phrases as Modifiers of Adjectives. *Recherches linguistiques de Vincennes* 34:207-228.

Snyder, William, Wexler, Kenneth and Das Dolon. 1995. The Syntactic Representation of Degree and Quantity: Perspectives from Japanese and Child English. In: Aranovich, R., Byrne, W., Preuss, S. and Senturia M. eds., *The Proceedings of the Thirteenth West Coast Conference on Formal Linguistics*, 581-596. Stanford, CA: CSLI.

Ueyama, Ayumi. 2004. Nihongo no hikakukoubun ni tuite no ichi-koosatsu. (Notes on the Syntactic/Semantic Properties of Comparative Constructions in Japanese), *Bungaku kenkyuu* 101:45-67. Kyushu University.

Ultan, Russell. 1972. Some Features of Basic Comparative Construction. *Working Papers on Language Universals* 9:117-162.

Von Stechow, Arnim. 1984. Comparing Semantic Theories of Comparison. *Journal of Semantics* 3:1-77.

Osamu Sawada
University of Chicago
Department of Linguistics
1010 E 59th Street
Chicago, IL 60637

sawadao@uchicago.edu

# The Japanese Contrastive *Wa*: A Mirror Image of EVEN[1]

OSAMU SAWADA
*University of Chicago*

## 0. Introduction

Many studies have been made of the Japanese contrastive *wa* (Kuno 1973a, b, Teramura 1991, Noda 1996, Nakanishi 2001, Hara 2006, Oshima to appear, among others). However, they have analyzed the semantics/pragmatics of contrastive *wa* without considering (i) the scalar value and (ii) the possibility that contrastive *wa* has **multiple** meanings (conventional implicatures).

The purpose of this paper is to argue that there are two types of contrastive *wa*— scalar contrastive *wa* and polarity contrastive *wa*— and that the scalar type has conventional implicatures that are a 'mirror image' of those of *sae/mo* 'even'. (1) is an example of the scalar type and (2) is an example of the polarity type:

(1) (Do you have a vehicle?)
Jitensya-***wa*** mot-tei-masu.
Bicycle-CONT have-STATE-POLITE
'I have [a bicycle]$_{Cont.}$'
→I don't have more expensive vehicles than a bicycle (e.g. motorcycle)

(2) (Have all of the members (e.g. Taro, Hanako, Ziro) arrived at Chicago?)
Taro-***wa*** tuki -masi-ta.
Taro-CONT arrive -POLITE-PERFECT
'[Taro]$_{Cont}$ has arrived.'
→There is someone other than Taro who has not arrived at Chicago.

This paper proposes the following points: (a) The conventional implicatures/presuppositions (Karttunen and Peters 1979) of contrastive *wa* can be a '**mirror image**' of those of *sae/mo*. This fact naturally explains why contras-

[1]I would like to thank Anastasia Giannakidou, Chris Kennedy, Jerry Sadock, and Keiko Yoshimura for valuable discussion on this material. I would also like to thank Amy Dahlstrom, Michael Ellsworth, Michael Yoshitaka Erlewine, Paul Kay, Russel Lee-Goldman, Dmitry Levinson, Harumi Sawada, Jun Sawada, Suwon Yoon, and the audience of BLS 33 for their helpful comments.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

tive *wa*, but not *sae*/*mo*, can induce a conventional quantity (scalar) implicature. (b) There is, however, a case in which contrastive *wa* seems not to induce a conventional Q implicature. In contrast to the case of *sae*, the scalar presupposition is 'optional' for contrastive *wa*, and this optionality induces a different type of implicature, a 'polarity reversed conventional implicature/ presupposition' (Lee 2006, Oshima to appear). The quantificational force of the implicature in polarity contrastive *wa* can be pragmatically **strengthened** to become universal (∀) in some contexts, while in other cases it can be epistemically **weakened** to become existential (∃) with a possibility operator (◊). (c) The precise mirror image of contrastive *wa* is expressed by *mo*, which is semantically ambiguous between 'even' and 'also.' (d) If we posit the existence of two types of contrastive *wa*, we can unify two seemingly incompatible approaches to this particle: the 'reversed polarity approach' (Kuno 1973a, b, Teramura 1991, Noda 1996, Oshima to appear) and the 'scalar alternative approach' (Hara 2006, to appear).

## 1. Background: Thematic *Wa* vs. Contrastive *Wa*

It is well known that the particle *wa* in Japanese has two kinds of uses, **thematic** and **contrastive** (Kuno 1973a, b, Teramura 1991, Noda 1996, Nakanishi 2001, Oshima to appear, among many others).

(3) Taro-***wa*** hasi-ttei-ru.
Taro run -PROG-PRES
a. Thematic wa: 'Speaking of Taro, he is running.'
b. Contrastive wa: 'Taro is running (but Hanako is not running.)'
(Kuno 1973a: 207)

In (3a), *wa* marks a constituent that stands for a theme, as opposed to a comment. According to Kuno (1973a, b), such themes must be either **generic or anaphoric** (i.e. previously mentioned). By contrast, in (3b), *wa* marks the contrasted element of the sentence, and conventionally implies that there is an element that is alternative to it. Notice that the element marked by contrastive *wa* can be **generic, anaphoric or neither** (Kuno 1973a, b). That is, the element does not always have to be topical.[2] We should also notice that thematic *wa* is phonologically different from contrastive *wa* (Nakanishi 2001, Oshima to appear). If we put a stress on *wa*, it is interpreted as contrastive. This paper focuses solely on contrastive *wa*.

## 2. Previous Analyses of Contrastive *Wa*

In languages like Japanese and Korean, contrast is marked **morphologically**, while in a language like English it is marked **phonologically**. Two theories have

[2] Since contrastive *wa* always posits an alternative element or elements other than the one it marks and induces an 'anti-additive' implicature, it is safe to consider it a kind of focus-sensitive operator (Oshima to appear). Notice, however, that the element marked by contrastive *wa* can be either given or new information. This suggests that the concept of contrastiveness is independent from the distinction between given and new information.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

been proposed to explain the **implicature** of contrastive *wa*; these may be termed the *reversed polarity* approach and the *scalar alternative* approach. The reversed polarity approach says that the implicature induced by contrastive *wa* has an meaning opposite to the stated one: 'X *wa*…' implies 'but it **not** the case that y *wa*…)' (Kuno 1973a, b, Teramura 1991, Noda 1996, Oshima to appear, among others). Some researchers call this the 'polarity reversed conventional implicature/ presupposition' (Lee 2006, Oshima to appear).

The *scalar alternative approach*, on the other hand, says that contrastive *wa* **always** induces a conventional scalar implicature (Hara 2006, to appear). Hara (2006, to appear) claims that "a contrastive topic presupposes a particular set of scalar alternatives, namely stronger propositions than the asserted one and the implicature induced by the contrastive *wa* is a conventional Q implicature." Notice that Hara (2006, to appear) does not say that the contrastive *wa* has a **scalar value**. I will argue that the 'scalar type' of contrastive *wa* has a scalar value that is a mirror image of *sae*/*mo* 'even'.

Both approaches consider an implicature induced by contrastive *wa* **conventional,** but not conversational**.** Applying the detachability test, we find that the implicature in (4a) is detachable because (4b), which has the same semantic content as (4a), does not normally induce the implicature:

(4) [Detachability test: detachable]
   a. Hanako-wa jitensya-***wa*** mot-tei-ru.
      Hanako-TOP bicycle-CONT have-STATE-PRES
      'Hanako has [a bicycle] $_{cont.}$'
      →Hanako doesn't have more expensive vehicles than a bicycle.
   b. Hanako-wa jitensya-o mot-tei-ru.
      Hanako-TOP bicycle-ACC have-STATE-PRES
      'Hanako has a bicycle.' (The implicature is not obligatory)

According the cancelability test, the implicature is not cancelable:

(5) [Cancelability test: non-cancelable]
      #Hanako-wa jitensya-***wa*** mo- ttei - ru-si, ootobai
      Hanako-TOP bicycle-CONT have-STATE-PRES-and motorcycle
      -mo mot- tei-ru.
      also/even have-STATE-PRES
      'Hanako has [a bicycle]$_{cont}$ and she {also/even} has a motorcycle.'

Both the reversed polarity approach and the scalar alternative approach consider the implicature induced by contrastive *wa* **conventional, but not conversational**. However, their explanations of this fact are different. The reversed polarity approach does not posit a scale, while the scalar alternative approach does. Can we unify these accounts?



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

I will argue that there are two kinds of contrastive *wa*, scalar contrastive *wa* and polarity contrastive *wa.* This theory makes it possible to unify the two seemingly different approaches.

## 3. Scalar Contrastive *Wa*: A Mirror Image of EVEN

### 3.1. Positive Case

Let us observe the following examples: (Context: Taro participated in an unofficial tennis tournament (=round robin). He competed with an amateur, a semi-professional and a professional.)

(6) Taro-wa sirooto -ni {***-wa*** / ??***-sae***} ka- tta.
Taro-TOP amateur-DAT -CONT / -even win-past
'Taro beat the [amateur]$_{cont.}$ /??Taro even beat the amateur.'

(7) Taro-wa puro -ni {??***-wa*** /***-sae***} ka -tta.
Taro-TOP professional-DAT -CONT /-even win-past
'??Taro beat the [professional]$_{cont}$ / Taro beat even the professional.'

There is a clear difference in acceptability between contrastive *wa* and *sae* in each of above sentences. The conventional implicatures of (6) with contrastive *wa* are as follows:

(8) Scalar contrastive *wa* (positive):
a. $\exists x$ [C(x) $\wedge$ x $\neq$ the amateur $\wedge$ $\neg$ beat (Taro, x)]
b. $\forall x$[C(x) $\wedge$ x $\neq$ the amateur $\rightarrow$ unlikelihood (Taro beat x) > unlikelihood (Taro beat the amateur)]

The combination of (8a) and (8b) produces the **conventional** quantity implicature that 'Taro could not beat a tennis player who is stronger than an amateur.'[3] On the other hand, in (7) *sae* has a positive existential presupposition and forces us to construe the proposition as **high** on this scale, as shown in (9b):

(9) *Sae 'even'* (positive):
a. $\exists x$ [C(x) $\wedge$ x $\neq$ the professional $\wedge$ beat (Taro, x )]
b. $\forall x$ [C(x) $\wedge$ x $\neq$ the professional $\rightarrow$ unlikelihood (Taro beat the professional) > unlikelihood (Taro beat x)]

Note that (7) with *sae* does not induce a conventional quantity implicature.

[3] If 'semi-professional' is substituted here, the sentences with contrastive *wa* and *sae* both become acceptable. This is because the element can be construed as 'low' relative to a professional but 'high' relative to an amateur (See also Kay 1990). In these cases, it seems that the speaker is assuming that there is only one alternative element other than the 'semi-professional.'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 3.2. Negative Case

Contrastive *wa* and *sae* can also appear in a negative environment, where the scalar values are reversed: (Context: Taro competed with an amateur, a semi-professional and a professional.)

(10) Taro-wa sirooto -ni {??-***wa*** / -***sae***} kata-na-katta. (cf. (6))
Taro-TOP amateur-DAT -CONT / -even win-NEG-PAST
'??Taro didn't beat the [amateur]$_{cont.}$/Taro didn't even beat the amateur.'

(11) Taro- wa puro -ni {-***wa*** / ??-***sae***} kata-na-katta. (cf. (7))
Taro- TOP professional-DAT -CONT / -even win-NEG-PAST
'Taro didn't beat the [professional]$_{cont.}$/ ??Taro didn't even beat the professional.'

When contrastive *wa* is used in a negative context, the proposition **without a negative operator** is construed as **high** on the scale of 'unlikelihood', whereas with *sae*, the proposition without a negative operator is construed as **low** on this scale. The conventional implicatures of (10) with *sae* and (11) with contrastive *wa* can be represented as (12) and (13), respectively:[4]

(12) *Sae* (neg):
a. $\exists x$ [C(x) $\wedge$ x $\neq$ the amateur $\wedge$ $\neg$ beat (Taro, x )]
b. $\forall x$ [C(x) $\wedge$ x $\neq$ the amateur$\rightarrow$ unlikelihood (Taro beat x)> unlikelihood (Taro beat the amateur)]

(13) Scalar contrastive *wa* (neg):
a. $\exists x$ [C(x) $\wedge$ x $\neq$ the professional $\wedge$ beat (Taro, x)]
b. $\forall x$ [C(x) $\wedge$ x $\neq$ the professional$\rightarrow$ unlikelihood (Taro beat the professional) > unlikelihood (Taro beat x)]

### 3.3. Scope Inversion

In Japanese, there is a phenomenon of scope inversion using contrastive marking (Hara to appear, Oshima to appear, Lee 2000).

(14) a. John-wa zen-in -o tasuke-na-katta.
John-TOP everyone -ACC help- NEG-PAST
'John didn't help anyone.' ($\forall>\neg$)
'?? It is not the case that John helped everyone.' ($\neg>\forall$)
b. John-wa zen-nin -***wa*** tasuke-na-katta.
John-TOP everyone -CONT help- NEG-PAST
'*John didn't help anyone.' ($\forall>\neg$)
'It is not the case that John helped everyone.' ($\neg>\forall$)

[4] The conventional implicatures of the negative sentences with contrastive *wa* and *sae* are represented based on the framework of polarity theory (Rooth 1985, Rullmann 1997, Giannakidou 2007, Yoshimura (to appear)). There is also a framework of scope theory (Karttunen and Peters 1979).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The reading of (∀>¬) in (14b) is not acceptable because it does not satisfy the existential presupposition of contrastive *wa*. In the negative context, contrastive *wa* has to have a **positive existential** conventional implicature, as in (15):

(15) Scalar contrastive *wa* (neg): (QP=quantifier phrase)
   a. ∃QP [C(QP) ∧ QP ≠ everyone ∧ helped (John, QP)]
   b. ∀QP [C(QP) ∧ QP ≠ everyone→ unlikelihood (John helped everyone)> unlikelihood (John helped QP)]

The reading of (¬>∀) in (14b) is acceptable because the sentence has a positive existential presupposition.

## 4. Additional Empirical Evidence for the Existence of Scalar Type

Teramura (1991: 40) and Noda (1996: 224) point out that contrastive *wa* is interpreted as *sukunaku-tomo* 'at least', if combined with numerals. Does this use of contrastive *wa* only occur with numerals? The answer is no. I argue that scalar contrastive *wa* is not an ad hoc usage. It 'inherently' has a scalar value that **forces** the addressee to interpret the proposition as **low** on the scale of unlikelihood in the positive case and **high** on this scale in the negative case.

### 4.1. Comparative *Yori* plus Contrastive *Wa*

If contrastive *wa* is attached to *yori*, the standard of comparison is construed as low on a given scale, as shown in (16b):

(16) a. Taro-wa Ziro-yori se- ga takai.
   Taro-TOP Ziro-than height- NOM tall
   'Taro is taller than Ziro.'
   b. Taro-wa Ziro *yori-**wa*** se -ga takai.
   Taro-TOP Ziro than-CONT height-NOM tall
   'Compared to Ziro, Taro is tall.'
   →Ziro is short. (Implicature from the standard of comparison)
   →Taro is not definitely tall. (Implicature from the main clause)

Notice that there is another implication as well: that 'Taro is not definitely tall' (Sawada 2007).

### 4.2. Predicate with Contrastive *Wa*

A scalar value also arises when contrastive *wa* is attached to the predicate of a sentence (i.e. adjective, verb):

(17) Ame- wa furi-***wa*** si-ta.
   Rain- TOP fall-CONT do-PAST
   'It [rained]$_{cont}$.'
   → (Implicature): It didn't rain a lot. (low amount)



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 4.3. Polar Question (Negative Bias)

Positive questions with minimizers can express a negative bias (Borkin 1971, Ladusaw 1979, Giannakidou 2007, among others):

(18) Did Tom *lift a finger* to help?
(Bias: No, he didn't.)

Contrastive *wa* can also be used in a positive question with a negative bias.

(19) X daigaku- ni- *wa* ukari-masi-ta-ka.(X University is easy to enter.)
X university-DAT-CONT pass-POLITE-PAST-Q
'Were you accepted by [X university]$_{cont}$?
(Bias: No you weren't.)

This fact supports the idea that scalar contrastive *wa* has a low scalar value.

## 5. The Mirror Image in Rullmann's Typology of *Even*-Items

Rullmann (2006) proposes a four-way typology of *even*-items, which is analogous to Israel's (1996) typology of polarity items. Israel (1996) proposes two kinds of parameters for the typology of polarity items:

(20) Quantitative Value (Q): **high** or **low** relative to norm
Informative Value (I): **understating** or **emphatic** relative to norm

Based on these parameters, Rullmann (2006) proposes the following typology of *even*-items:

(21) Rullmann's four-way typology of *even:*

| | | **Emphatic** | **Understating** |
|---|---|---|---|
| Unlikelihood | Positive P: **high** | 1 *even* (PPI) | 3 ? ? (NPI) |
| | Positive P: **low** | 2 *even* (NPI) | 4 *at least* (PPI) |

Rullmann (2006) assumes that there may be no items that would fit into the 'top, understating' zone in his four-way typology of *even*-items. This study, however, shows that the Japanese contrastive *wa* does fit into that zone:

(22) Mirror image of *sae* and scalar contrastive *wa:*

| | | **Emphatic** | **Understating** |
|---|---|---|---|
| Unlikelihood | Positive P: **high** | *sae* (PPI) | scalar contrastive *wa* (NPI) |
| | Positive P: **low** | *sae* (NPI) | scalar contrastive *wa* (PPI) |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The Japanese scalar contrastive *wa* supports Rullmann's (2006) typology of *even* items. Giannakidou (2007) proposes a different typology of *even* items, which is compatible with Rullmann's typology. Her typology has two parameters: scalar value (high/low) on the likelihood scale and the presence or absence of the negative operator in the existential presupposition/conventional implicature. One of the advantages of this typology is that it can capture the fact that *sae* (NPI) and contrastive *wa* (PPI) have the same kind of existential conventional implicature.

## 6. Polarity Contrastive *Wa*

Let us now turn our attention to the polarity type of contrastive *wa*:

(23) Taro-***wa*** ki-ta.
Taro-CONT come-past
'[Taro] $_{cont}$ came.'
→ There is someone other than Taro who didn't come.

(24) Watasi-*wa* moku-yoobi-***wa*** ai-teiru.
I -TOP Thursday -CONT free-TEIRU.STATE
'I am free on [Thursday] $_{cont}$.'
→ There are some days other than Thursday that I am not free.

The implicatures in (23) and (24) do not posit a scale. Contrary to Hara's (2006, to appear) claim, it seems that contrastive *wa* does not **always** induce a Q implicature. If contrastive *wa* is attached to non-scalar nouns or predicates, it is **difficult**, though not impossible, to posit an (un)likelihood scale. Oshima (to appear) argues that the semantic contribution of a contrastive morpheme is antonymous to that of the additive particle 'also.'

## 7. The Difference between the Polarity Type and the Scalar Type

Given the above analysis, how can we account for the difference between the polarity and scalar types of contrastive *wa*? I argue that the difference can be explained by the **optionality** of the scalar presupposition. The conventional implicature of polarity contrastive *wa* in (23) is shown in (25a):

(25) a. $\exists x\,[C(x) \wedge x \neq \text{Taro} \wedge \neg \text{ came } (x)]$
b. $\forall x\,[C(x) \wedge x \neq \text{Taro} \rightarrow \text{unlikelihood (x came)} > \text{unlikelihood (Taro came)}]$ (optional)

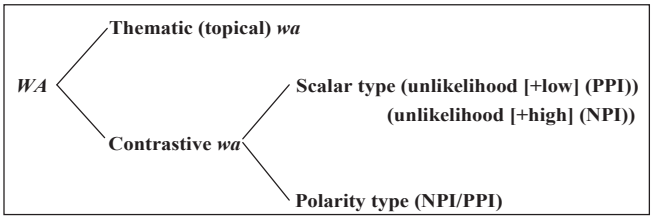
If there is not enough information to posit a scale, one can ignore the scalar presupposition and construe contrastive *wa* as polarity contrastive *wa*.[5] The following figure shows the landscape of *wa*:

[5] Another approach is to consider that contrastive *wa* is lexically ambiguous between scalar contrastive *wa* and polarity contrastive *wa*. Notice, however, that this ambiguity is not like the ambiguity between *bank* meaning 'a financial institute' and *bank* meaning 'the side of a river.'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(26) **The landscape of *WA***




## 8. Ambiguity Between the Scalar and the Polarity Types

The instance of contrastive *wa* in the following sentence is ambiguous; it could be read as either scalar contrastive *wa* or polarity contrastive *wa*:

(27) Watasi-wa ju-kiro-no hako- ***wa*** mot-eru.
I -TOP 10-kilo-GEN box -CONT lift-can
'I can lift the [10 kilo box]$_{cont.}$'

(28) → (scalar): I cannot lift boxes that are heavier than 10 kilos.
→ (polar): There are some boxes other than the 10 kilo box that I cannot lift (e.g., there are dangerous chemicals inside the boxes).

## 9. *Mo* as the Precise Mirror Image of Contrastive *Wa*

The particle *mo* is semantically ambiguous between a scalar additive meaning 'even' and a simple inclusive meaning 'also', as in (29). This ambiguity can also be accounted for in a unified way, based on the concept of the **optionality** of the scalar presupposition, as in (30b).

(29) Ziro ***-mo*** siken-ni uka-ta.
Ziro -also/even exam-to pass-past
'Even Ziro passed the exam. /Ziro also passed the exam.'

(30) Conventional implicature of *mo*
a. $\exists x\,[C(x) \wedge x \neq \text{Ziro} \wedge \text{passed}\,(x, \text{the exam})]$
b. $\forall x[C(x) \wedge x \neq \text{Ziro} \rightarrow \text{unlikelihood}\,(\text{Ziro passed the exam}) > \text{unlikelihood}\,(x \text{ passed the exam})]$ ←optional

This suggests that the semantics of *mo* and contrastive *wa* are **precise** mirror opposites.

## 10. The Quantificational Variability of Contrastive *Wa*

In some contexts, the quantificational force of the existential presupposition in contrastive *wa* can be (pragmatically) **strengthened** to become universal (∀), but in other contexts, it can be epistemically **weakened** to become an existential (∃) force with a possibility operator (◊). Let us consider an example of polarity contrastive *wa*:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(31) A: Did Taro, Hanako and Ziro come to the party?
B: Taro-wa ki-ta.
Taro -CONT come-past
'[Taro]$_{cont}$ came.'

There are at least three possible implicatures here, according to the context:

(32) **Context A**: Speaker B knows that Taro came to the party and Hanako didn't come, but does not know whether or not Ziro came.

In this context (31B) implies that 'there is someone other than Taro who didn't come.' This implicature has existential force.

(33) **Context B**: Speaker B knows that Taro came to the party, and that Hanako and Ziro didn't.

In this context, (31B) implies that 'no one other than Taro came to the party.' This implicature has universal force. That is to say, the existential presupposition of contrastive *wa* is pragmatically strengthened. Context B is a situation in which *only* is used.[6]

(34) **Context C**: Speaker B knows that Taro came to the party but is not sure whether Hanako or Ziro came.

In this context, (31B) implies that 'it is possible that there is someone other than Taro who didn't come.' The possibility operator is attached to the existential presupposition in this case.

The implicature generated by scalar contrastive *wa* also has quantificational variability. Thus, the conventional scalar implicature that 'a stronger proposition is not true' may become the weaker implicature that 'a stronger proposition may not be true.'

[6] There is still a semantic difference between *dake* 'only' and contrastive *wa* in context B, as regards contrastiveness:

(i) Taro-wa ki-ta. Sikasi Hanako-to Ziro-wa ko-naka-ta.
Taro-CONT come-PAST but Hanako-and Ziro-CONT come-NEG-PAST
'[Taro]$_{Cont}$ came but [Hanako and Ziro]$_{Cont}$ didn't.'

(ii) #Taro-dake ki-ta. Sikasi Hanako- to Ziro-wa ko-naka-ta.
Taro-only come-PAST but Hanao- and Ziro-CONT come-NEG-PAST
'#Only Taro came but [Hanako and Ziro]$_{cont}$ didn't.'

Sentence (i) with contrastive *wa* can explicitly contrast Taro with partygoers Hanako and Ziro, but sentence (ii) cannot make this contrast explicitly.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 11. Conclusion

This paper has argued that there are two types of contrastive *wa*, a scalar type and a polarity type. The conventional implicatures of scalar contrastive *wa* are a mirror image of those generated by *sae* 'even', whereas the conventional implicature of polarity contrastive *wa* appears because of the optionality of the scalar presupposition in scalar contrastive *wa*. Positing the existence of two types of contrastive *wa* reconciles seemingly incompatible approaches, the reversed polarity approach and the scalar alternative approach. I hope this paper sheds new light on the study of contrastiveness. It may be possible to consider that the same analyses can apply to the Korean contrastive marker *-nun*.

In a future study, I would like to consider the semantic/pragmatic difference between scalar contrastive *wa* and adverbs such as *sukunaku-tomo* '(lit) little-even if' and *saitei-demo* '(lit) the least-even if':

(35) {*Sukunaku-tomo/ saitei-*(*demo*)} hito-ri ki- ta.
Little CONC/ lowest CONC one-CL (person) come-past
'At least one person came.' (No negative implicature.)

(36) Hito-ri *-wa* ki-ta.
One-CL (person) -CONT come-PAST
'[One people]$_{Cont}$ came.'
(Implicature: I am not sure whether more than one person came.)

It seems that s*ukunaku-tomo* and *saitei(-demo)* block a Q implicature but scalar contrastive *wa* does not.

## References


Borkin, Ann. 1971. Polarity Items in Questions. *Papers from the Seventh Regional Meeting of the Chicago Linguistic Society* 7, 53-62.

Giannakidou, Anastasia. 2007. The Landscape of EVEN. *Natural Language and Linguistic Theory* 25:39-81.

Hara, Yurie. 2006. Implicature Unsuspendable: Japanese Contrastive *wa*. *Proceedings of the 2004 Texas Linguistic Society Conference: Issues at the Semantics-Pragmatics Interface*, 35-45.

Hara, Yurie. To appear. Scope Inversion in Japanese: Contrastive Topic Requires Scalar Implicatures. *Japanese/Korean Linguistics* 13. Stanford, CA: CSLI.

Israel, Michael. 1996. Polarity Sensitivity as Lexical Semantics. *Linguistics and Philosophy* 19:619-666.

Karttunen, Lauri, and Stanley Peters. 1979. Conventional Implicature. In C. K. Oh and D. A. Dinneen, eds., *Syntax and Semantics*. *Vol. 11. Presupposition*, 1-56. New York: Academic Press.

Kay, Paul. 1990. Even. *Linguistics and Philosophy* 13:59-111.




In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Kuno, Susumu. 1973a. Nihon Bunpoo Kenkyuu (The study of Japanese Grammar). Toyko: Taisyuukan.

Kuno, Susumu. 1973b. *The Structure of Japanese Language*. Cambridge, MA: MIT Press.

Ladusaw, William. A. 1980. *Polarity Sensitivity as Inherent Scope Relations*. New York & London: Garland Publishing.

Lee, Chungmin. 2000. Contrastive Predicates and Conventional Scales. In A. Okrent and J. Boyle, eds., *Papers from the 36th Annual Meeting of the Chicago Linguistic Society*, 243-257.

Lee, Chungmin. 2006. Contrastive Topic/Focus and Polarity in Discourse. In K. von Heusinger and K. Turner, eds., *Where Semantics Meets Pragmatics*, 381-420. New York: Elsevier.

Nakanishi, Kimiko. 2001. Prosody and Information Structure in Japanese: A Case Study of Topic Marker *wa*. In N. Akatsuka and S. Strauss, eds., *Japanese/Korean linguistics* 10, 434-447. Stanford, CA: CSLI.

Noda, Hisashi. 1996. *Wa to Ga* (Wa and ga). Tokyo: Kuroshio.

Oshima, David. To appear. Morphological vs. Phonological Contrastive Topic Marking. *Papers from the 41st Meeting of the Chicago Linguistic Society.*

Rooth, Mats. 1985. Association with Focus. Ph.D. diss., University of Massachusetts at Amherst.

Rullmann, Hotze. 1997. *Even*, Polarity, and Scope. In M. Gibson, G. Wiebe, and G. Libben, eds., *Papers in Experimental and Theoretical Linguistics* Vol.4, 40-64. Edmonton: University of Alberta.

Rullmann, Hotze. 2006. Does *Even* Even Have Scope? Handout of Linguistics Colloquium at University of Chicago.

Sawada, Osamu. 2007. Pragmatic Aspects of Implicit Comparison. Paper Presented at the 81st Annual Meeting of the Linguistic Society of America. Anaheim, CA. January 6.

Teramura, Hideo. 1991. Nihongo no Sintakusu to Imi III (Syntax and Semantics of Japanese III). Tokyo: Kuroshio.

Yoshimura, Keiko. To appear. Scope Theory vs. Polarity Theory: Analysis of Japanese Focus Particle *–Sae*. *Papers from the 40th Annual Meeting of the Chicago Linguistic Society*.

Osamu Sawada
University of Chicago
Department of Linguistics
1010 East 59th street
Chicago IL 60637, USA

sawadao@uchicago.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# A Typological Approach to the Split Scope Readings of Negative Indefinites[1]

MICHELLE ST-AMOUR
*University of Toronto*

## 1. Introduction

It has been well documented in the literature that the German determiner *kein* 'no', and its Dutch counterpart *geen* give rise to several ambiguities when they appear in constructions with other scope-bearing elements (SBE). These ambiguities arise when the negative indefinites (NIs) such as *kein* interact with other quantifiers or are embedded under intensional verbs, as can be seen in (1) and (2), respectively:

(1) Alle Ärtze haben kein Auto (Jacobs 1980)
all doctors have no car
a. 'All doctors are such that they have no car' (∀>¬>∃)
b. #'No car is such that all doctors have it' (¬>∃>∀)
c. 'Not all doctors have a car' (¬>∀>∃)

(2) Du musst keine Krawatte anziehen (de Swart 2000)
you must no tie wear
a. 'It must be the case that you wear no tie' (must>¬>∃)
b. ?'There is no tie such that you must wear it' (¬> ∃ >must)
c. 'It is not the case that you must wear a tie' (¬>must>∃)

The universal quantifier and the intensional verb can either scope above the negative indefinite (1a and 2a) or below the negative indefinite (1b and 2b). The so-called 'split-scope' reading occurs when another scope-bearing element appears in between the two operators of the negative indefinite. In such construc-

[1] Many thanks to Michela Ippolito and the 2007-2008 Forum students at the University of Toronto for many discussions and comments. Thanks to Andrea Gualmini for comments on an earlier version of this paper. A special thanks to my German informants: Eva Dobler, Cornelia Loos and Maire Noonan. This work was partially supported by a Standard Research Grant from the Social Sciences & Humanities Research Council of Canada (SSHRC) to Andrea Gualmini.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

tions the negative operator has split away from the existential quantifier (1c and 2c).

In this paper, I present two previous analyses that aim to account for these split-scope readings. I then highlight why the previous proposals cannot account for new data, namely fronting data from German. In section 4, I propose an alternative approach to negative indefinites. Section 5 presents and discusses another characteristic of the split-scope data: it is absent from negative concord languages. Section 6 concludes the paper.

## 2. Previous Approaches

Many theories have been put forth in an attempt to explain this phenomenon, arguing whether or not negative indefinites undergo 'lexical decomposition'. Lexical decomposition is the process that decomposes a complex lexeme into its component parts; these smaller elements then occupy two separate nodes in a syntactic representation and are completely syntactically autonomous.

De Swart (2000), among others, has proposed that lexical decomposition must be avoided in order to maintain lexical integrity. As an alternative, de Swart (2000) accounts for the data by appealing to a complex notion of higher-order quantification such as quantification over properties (de Swart, 2000).

Other theories, such as Penka and Zeijlstra (2005), argue that in order to have a split-scope reading, the negative indefinites must undergo lexical decomposition; thus, the two operators ($Op_{\neg}$ and $\exists$) occupy separate syntactic nodes.

### 2.1. Non-Lexical Decomposition: de Swart (2000)

De Swart (2000) argues against lexical decomposition, an approach to split-scope readings first proposed by Jacobs (1980), which states that negative indefinites such as *kein* undergo decomposition in the syntax and thus each operator (negative and existential) occupy separate nodes in a syntax. Since the operators are different nodes in the tree, they are syntactically independent, and thus are able to take scope independently of each other in order to yield split-scope readings.

De Swart (2000) argues against this approach, stating that if one appeals to lexical decomposition for *kein* based on data such as (3) and (4), then one should also appeal to lexical decomposition for other monotone decreasing quantifiers such as *at most two* and *few* because a split reading also arises in such contexts:

(3) Tom needs at most two blankets
  a. 'What Tom needs to have is at most two blankets' (need>¬>$\exists_{>2}$)
  b. 'There are at most two blankets such that Tom needs to have them' (¬>$\exists_{>2}$>need)
  c. 'It is not the case that Tom needs to have more than two blankets' (¬>need>$\exists_{>2}$)

(4) Ze hoeven wenig verpleegkundigen te ontslaan [Dutch]
  They need few nurses to fire



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

a. #'It is necessary for them to fire few nurses' (need>¬>$\exists_{>small\#}$)
b. 'For a group consisting of few nurses, it is the case that they must fire the group' (¬>$\exists_{>small\#}$>need)
c. 'It is not necessary for them to fire more than a small number of nurses' (¬>need>$\exists_{>small\#}$)

If we take the split reading of (1) and (2) as evidence that *kein* can be decomposed into *Op*¬ and $\exists$ (following de Swart, 2000) then we should conclude that the split-scope reading in (3) suggests that *at most two* can be decomposed into *Op*¬ and *more than two*.

Similarly, the split-scope reading in (4) suggests that *few* should be decomposed into *Op*¬ and *more than a small number of*. De Swart argues that such an approach should be abandoned because it leads to a "proliferation of decomposition rules".[2]

De Swart (2000) proposes an alternative account for the split-scope readings that avoids lexical decomposition and instead involves quantification over individuals and quantification over properties:

(5) Hanna sucht kein Buch [German]
H. seeks no book
a. 'What Hanna seeks is no book' (seek>¬>$\exists$)
Seek(h,$^\wedge\lambda x\neg$Book($x$))
b. 'There exists no book such that Hanna seeks it' (¬>$\exists$>seek)
$\neg\exists x$(Book($x$) $\wedge$ Seek(h,$x$))

For a sentence such as (5), the narrow and wide scope negative indefinite readings can be accounted for if we quantify over individuals. (5a) expresses that Hanna is a not-book seeker, in other words, she seeks things that are not books. The weak NP in predicative position expresses quantification over the individual and this gives rise to the *de dicto* reading. Wide scope quantification over individuals in (5b) yields the *de re* reading, which expresses that there is not book such that Hanna seeks it. The split reading can be accounted for if we quantify over the property of book-seeking, as in (6):

(6) Hanna sucht kein Buch [German]
H. seeks no book (¬>seek>$\exists$)

a. no book
= $\lambda P\neg\exists$P(P = $^\wedge\lambda$y(Book(y)) $\wedge^\vee$ $P$ (P))

[2] De Swart (2000) also argues against the lexical decomposition approach based on monotone increasing quantifier, such as *at least two*, which do not exhibit split-scope readings. The lexical decomposition approach, according to de Swart (2000), cannot capture this dichotomy between monotone decreasing and monotone increasing quantifiers. For reasons of space, I will not discuss this issue here.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. no book (seek)
= λ$x$¬∃P(P = ^λy(Book(y)) ∧ Seek($x$,P))
c. no book (seek)(hanna)
= ¬∃P(P = ^λy(Book(y)) ∧ Seek(h,P))
d. ¬Seek(h, ^λy(Book(y))

Because intensional verbs such as *seek* are denoted as a relation between individuals and properties, *seek* is of the right type to be an argument of a higher-order quantifier. The derivation in (6) expresses that there is no property that is identified with the book property, and is such that Hanna seeks it. This generates the appropriate split-scope reading.

Therefore, according to de Swart (2000), all weak NPs in predicative position have three possible derivations: a wide scope interpretation in terms of quantification over individuals, a narrow scope interpretation in terms of quantification over a property and a wide scope interpretation in terms of quantification over properties.

### 2.2. Lexical Decomposition: Penka and Zeijlstra (2005)

Penka and Zeijlstra (2005) argue against de Swart (2000) in favour of a lexical decomposition approach to negative indefinites based on idiomatic data, among other things. They argue that the non-lexical decomposition approaches such as de Swart (2000) cannot account for the split-scope reading that arises in idioms containing *kein*, such as (7):

(7) Mir kannst du keinen Bären aufbinden
me.DAT can you no bear up-tie
'You can't fool me'

De Swart (2000), according to Penka and Zeijlstra, cannot account for the split reading of (7) because in order for higher-order quantification to apply, the negative indefinite must undergo Quantifier Raising (QR), which is not permitted for idioms. It is necessary for the idiom to be interpreted 'en bloc' at LF, which de Swart's (2000) account will not permit. The only way that de Swart (2000) can generate the split reading is to apply higher-order quantification, which would force the existential to be interpreted outside of the idiomatic expression.

As a solution to the split-scope reading of idioms, Penka and Zeijlstra (2005) argue for lexical decomposition of negative indefinites, in which the *Op*¬ and the ∃ occupy different nodes on the tree. The lexical item *kein*, as Penka and Zeijlstra (2005) argue, is a complex structure that is already "prefabricated in the lexicon" (Penka and Zeijlstra 2005:5), as in (8):



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(8)




By assuming that *kein* is a complex lexical item that enters the derivation as a unit and contains two syntactically autonomous nodes, it will allow Penka and Zeijlstra to account for the data in (1) – (2) and the idioms in (7). In order to generate the narrow scope reading, the *Op*¬ and ∃ will be interpreted in the scope of the modal at LF:

(9) $[_{IP}$ du $[_{I'}$ $[_{VP}$ mir [Op¬ einen Bären] aufbinden] kannst] (can > ¬ > ∃)

The complex negative indefinite *kein* may QR to adjoin to IP in order to account for the other two readings. Once the negative indefinite has undergone QR, the two distinct nodes, *Op*¬ and ∃, can be interpreted either high or low. To yield the wide scope negative indefinite reading, both the *Op*¬ and ∃ are interpreted high, as in (10):

(10) $[_{IP}$ [Op¬ einen Bären] $[_{IP}$ du $[_{I'}$ $[_{VP}$ mir [~~Op¬ einen Bären~~] aufbinden] kannst]] (¬ > ∃ > can)

The split reading can now be easily accounted for because the *Op*¬ and the ∃ need not be interpreted in the same copy. The *Op*¬ may be interpreted high, while the ∃ is interpreted low[3]:

(11) $[_{IP}$ [Op¬ ~~einen Bären~~] $[_{IP}$ du $[_{I'}$ $[_{VP}$ mir [~~Op¬~~ einen Bären] aufbinden] kannst]]

The same approach can be used to account for the non-idiomatic expressions, such as (2), repeated here:

(12) Du musst keine Krawatte anziehen (de Swart 2000)
you must no tie wear
a. 'It must be the case that you wear no tie' (must>¬>∃)
b. ?'There is no tie such that you must wear it' (¬> ∃ >must)
c. 'It is not the case that you must wear a tie' (¬>must>∃)

The same as for the idiomatic expressions, the narrow scope NI reading is the result of interpreting the NI in its base-generated position (13). The wide scope NI reading is obtained by QR (14). The split-scope reading is the result of QR, then

[3] The unavailability of an existential wide scope with a negative narrow scope reading is ruled out on independent grounds, as proposed by Beck (1996).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

interpreting the negation in the higher copy and the existential in the lower copy (15):

(13) [$_{IP}$ [$_{I}$ [$_{VP}$ du [Op$_{\neg}$ eine Krawatte] anziehen] musst]] (must > ¬ > ∃)

(14) [$_{IP}$ [Op$_{\neg}$ eine Krawatte] [$_{I}$ [$_{IP}$ du [~~Op$_{\neg}$ eine Krawatte~~] anziehen] musst]]
(¬ > ∃ > must)

(15) [$_{IP}$ [Op$_{\neg}$ ~~eine Krawatte~~] [$_{I}$ [$_{IP}$ du [~~Op$_{\neg}$~~ eine Krawatte] anziehen] musst]]
(¬ > must > ∃)

In the next subsection, I highlight some problems for de Swart (2000) and Penka and Zeijlstra's (2005) theory of negative indefinites when considering fronting data from German. In section 4, I propose a new approach to account for the split-scope readings and the problematic fronting data.

## 3. Problematic Data: Fronting

While Penka and Zeijklstra's (2005) analysis is able to account for the split-scope reading of negative indefinites and idioms, it faces problems in light of other data, namely fronting. The problem lies in the fact that the phrase *ein Buch* ('a book') can move to the front of the structure. Therefore, the existential *ein* and the noun *Buch* should form a constituent that excludes negation, so they are able to undergo fronting together while stranding negation as in (18) (from den Besten and Webelhuth (1990) with modifications):

(16) Hans will kein Buch lesen
H. want no book read
'It is not the case that Hans wants to read a book' (¬>want>∃)

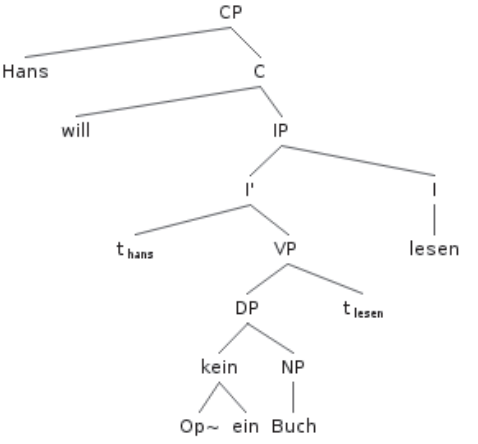
(17) Ein Buch will Hans nicht lesen
a book want H. not read
'It is not the case that Hans wants to read a book' (¬>want>∃)

However, if the negative indefinite *kein* is one complex lexeme that enters the derivation 'as a unit', as Penka and Zeijlstra (2005) argue, then the existential and the noun will never form a constituent without also including the negation, as illustrated in (18), which is required for the fronting data found in (17):



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(18)




If Penka and Zeijlstra's approach is correct, there is no way to account for the construction in (17) because the DP *ein Buch* is not a constituent, and thus, will not be able to front.

The same problems arise with de Swart's (2000) higher-order quantification approach. Although she does not explicitly illustrate how NIs is merged into the structure, it is clear that her analysis would require the negative indefinite *kein* to be one lexical item. De Swart (2000) argues against the idea of lexical decomposition, in which the lexical item occupies more than one node in the syntax, but would assume, like Penka and Zeijlstra (2005), that *kein* is one lexical item that contains a negation and an existential. If this is the case, we are once again unable to account for the fronting data. If *kein* is one lexical item, then the existential from the negative indefinite will never form a constituent with the noun, while excluding the negation, which is required for the fronting data found in (17).

Therefore, in order to account for the fronting structures presented here, we must propose an alternative approach to negative indefinites. The aim of section 4 is to present a possible solution to this problem, although some details of the new account are left for further research.

## 4. An Alternative Account for Split-Scope Readings

As we saw in sections 2 and 3, previous analyses of negative indefinites are able to capture the split-scope readings that arise when these lexemes appear in constructions with other scope bearing elements, yet they are unable to account for other data, such as idioms in the case of de Swart (2000) and fronting in the case of both de Swart (2000) and Penka and Zeijlstra (2005). In this section, I propose an alternative approach that will seek to avoid these problems.

Instead of assuming that negative indefinites are complex lexical items that enter the derivation with internal structure, à la Penka and Zeijlstra (2005), I



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

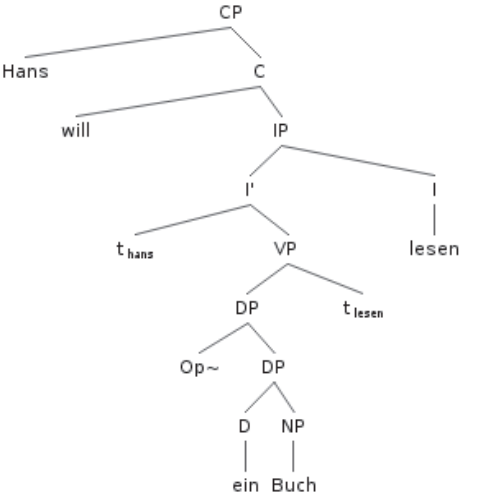
propose here that each operator is merged into the structure independently. If the negative operator and the existential are adjacent at PF, a fusion rule applies in order to yield *kein* in German and *geen* in Dutch:

(19) **PF Representation:**
[$_{CP}$ Hans [$_{C}$ musst [$_{IP}$ $t_{Hans}$ [$_{VP}$ [$_{DP}$ **Op¬** [$_{DP}$ **ein Buch**]] lessen] $t_{musst}$]]]
↓
**kein**

This approach affords us at least two advantages: it can account for the fronting data found in (17) and the idiomatic data found in (7).

If the negative operator and the existential of the negative indefinite enter into the derivation separately, the negation can be a DP adjunct, ensuring that the existential *ein* and the noun phrase *Buch* are a constituent[4]:

(20)




It is now possible to derive the fronted structure in (17) above, repeated here as (21), which caused problems for de Swart (2000) and Penka and Zeijlstra (2005):

(21) Ein Buch will Hans nicht lesen
a book want H. not read
'It is not the case that Hans wants to read a book' (¬>want>∃)

[4] This follows previous proposals which argue that constituent negation is an adjunct (Newell 2005, among others).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



As for idioms, I argue that a copy theory of movement and partial spell-out will be able account for the split-scope readings of idioms with negative indefinites, much like Penka and Zeijlstra (2005). For reasons of space, I ommitt the details of this here. It suffices to say that a proposal for idioms such as Penka and Zeijlstra's (2005) with the small modifications outlined above, namely that negative indefinites are a result of two separately merged operators as opposed to a complex lexeme that undergoes lexical decomposition, will account for the idiomatic data by avoiding the flaws of de Swart's (2000) account, as detailed by Penka and Zeijlstra (2005), while also accounting for the fronting data.

Lastly, the approach I propose here avoids the complex higher-order quantification over properties that is required for de Swart (2000) and the internal structure in the lexicon required for Penka and Zeijlstra's (2005) representation of negative indefinites as a complex lexeme. By abandoning these complex notions in favour of the approach I have proposed here, we find ourselves left with a simpler system, which is a welcome result.

## 5. The Absence of Split-Scope Readings in NC Languages

As we have seen above, n-words in double negation (DN) languages, where two (or more) negative elements cancel each other out to yield a positive reading, as in (22), exhibit split-scope readings (de Swart 2000), as in (23):

(22) Alle Ärtze nicht haben kein Auto [German]
all doctors not have no car
'All doctors do not have no car'
= 'All doctors have a car' (DN)

(23) Alle Ärtze haben kein Auto
all doctors have no car
'Not all doctors have a car' (¬>∀>∃)

However, this reading is absent from negative concord (NC) languages, where two or more negative elements yield a negative reading:

(24) Jean a pas vu personne [Québécois French]
J. did not see nobody
'Jean didn't see anybody' (NC)

(25) Tu dois parler à personne [Québécois French]
you must talk to no one
'It must be the case that you talk to no one' (must>¬>∃)
*'It is not the case that you must talk to someone' *(¬>must>∃)



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(26) Tu dois rien manger
you must nothing eat
'It must be the case that you eat nothing' (must>¬>∃)
*'It is not the case that you must eat something' *(¬>must>∃)

This fact is often over-looked in theories of split-scope readings and research on negative constituents (n-words) in negative concord languages. The absence of split-scope readings in languages such as Québécois French raises several important questions, including: what is responsible for this typological patter? In what follows, I begin to explore these issues and tease apart the difference between the two systems of multiple negation and the behaviour of n-words with respect to split-scope readings; yet some questions will be left for further research.

On one hand, double negation languages allow split-scope readings because each n-word is an instance of a negative operator that is a DP adjunct, as argued above. Therefore, this operator is independent from the existential and free to take widest scope in order to give rise to split-scope readings.

On the other hand, negative concord languages do not allow split-scope readings. But why are these readings not generated in NC languages? Is it a special property of the negative operator? Are n-words different in NC than they are in DN? What does the absence of split-scope readings tell us about negative operators and negative indefinites in NC languages? What mechanism is present in double negation languages that generates split-scope readings and is absent from negative concord languages?

Following Zeijlstra (2004), I assume that n-words in negative concord languages are inherently non-negative and thus lack a negative operator. They are syntactically marked for negation and carry a [uNEG] feature that must be checked against an [iNEG] feature:

(27) Nessuno ha telefonato [Italian]
nobody has called
'Nobody called'
[*Op*¬$_{[iNEG]}$ [Nessuno$_{[\sout{uNEG}]}$ [$_{vP}$ ha telefonato]]]

(28) Non ha telefonato a nessuno
neg has called to nobody
'He hasn't called anybody'
[$_{NegP}$ [non$_{[iNEG]}$ [$_{vP}$ ha telefonato a nessuno$_{[\sout{uNEG}]}$]]]

In (27), a null negative operator licenses the non-negative n-word pre-verbally. In the case of (28), the sentential negation *non* licenses the post-verbal n-word *nessuno* 'nobody'. As can be seen by the [uNEG] feature on the n-words in (27) – (28), each negative indefinite in negative concord languages are inherently non-negative, and thus, does not contain a negative operator. Instead, the negative reading, according to Penka and Zeijlstra (2005), comes from one instance of a



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

negative operator, which licenses the n-words with its [iNEG] feature. This [iNEG] cannot take scope independently, similar other licensing operators, otherwise an intervention affect arises (Chierchia 1995):

(29) Every student didn't come to the party (¬∀)

(30) Every student didn't do anything (∀¬∃), *(¬∀∃)

Whatever mechanism allows the negation to take wide scope in (29) is blocked when it is acting as an NPI-licensor, as in (30), which can only license the NPI locally (Chierchia 1995). If another SBE intervenes at LF between the NPI and the licensor, a Beck Effect arises, thus that reading is not available (Beck 1996).

Returning to NIs and the absence of split-scope readings in NC languages, we can apply the same type of reasoning used for licensors and locality conditions in order to account for the lack of split-scope readings. Since n-words in NC languages carry [uNEG] and must be properly licensed, they are similar to NPIs and thus are sensitive to Beck Effects. Therefore, the licensing negative operator cannot take scope above another SBE, while the n-word takes scope below, because the [uNEG] feature will not be properly locally licensed. As a result, split-scope readings of negative indefinites, which are the preferred reading in double negation languages, do not arise in negative concord languages.

## 6. Conclusion

In this paper, I have argued that previous proposals of split-scope readings of negative indefinites, such as de Swart (2000) and Penka and Zeijlstra (2005), cannot account for fronting in German. As a result, I proposed an alternative account in which NIs are not one lexical item, as previous analyses assume, but are the result of a PF fusion of two separately merged operators.

We are now equipped to answer some of the questions raised in the previous section regarding the typological pattern of split-scope readings and systems of multiple negation. The typological pattern of split-scope readings can be boiled down to the properties of the negative operator and the negative indefinites, along with the relationship that exists between them. More specifically, n-words in NC languages are inherently non-negative and must be checked by a negative operator; meanwhile, n-words in DN languages are the result of a PF fusion rule and are inherently negative. Therefore, when a negative indefinite in NC appears in a construction with negation, a negative reading arises because there is only one instance of a negative operator. This relationship requires local licensing and thus prohibits split-scope readings. When a NI in DN appears in a construction with another negation, on the other hand, a positive reading arises because the negative operator from the sentential negation and the operator from the NI cancel each other out, as in classical logic.

In closing, it is no longer a question of what mechanism is present in DN but absent in NC, but rather what condition is in place in NC yet absent in DN. It is



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



not the case that some mechanism allows the negative operator of an NI to take independent scope in DN and that that mechanism is not available in NC languages. Rather, it is the locality condition, in which the negative operator must locally license the [uNEG] feature of the NI in NC, that is absent from DN.

There are a few question, however, that remain. How would the proposal for split-scope readings presented here account for the fact that degree phrases, such as *at most two* and *few*, also exhibit split-scope readings, as noted in de Swart (2000)? Furthermore, can this proposal make the proper predictions with respect to monotone decreasing quantifiers, which never exhibit split-scope readings? These questions are left for further research.

**References**

Beck, Sigrid. 1996. Quantified Structures as Barriers for LF Movement. *Natural Language Semantics* 4:1-56.

den Besten, Hans, and Gerth Webelhuth. 1990. Stranding. In G. Grewendorf and W. Sternefeld, eds., *Scrambling and Barriers*, 77-92. Amsterdam: John Benjamins Publishing Company.

Chierchia, Gennaro. 1995. Individual-Level Predicates as Inherent Generics. In G. Carlson and F. Pelletier, eds., *The Generic Book*. Chicago: University of Chicago Press.

Jacobs, Joachim. 1980. Lexical Decomposition in Montague Grammar. *Theoretical Linguistics* 7:121-136.

Link, Godehard. 1976. *Intensionale semantik.* Müchen: Fink.

Newell, Heather. 2005. Bracketing Paradoxes and Particle Verbs: A Late adjunction analysis. In S. Blaho, L. Vicente and E. Schoorlemmer, eds., *Proceedings of ConSOLE XIII*, 249-272.

Penka, Doris & Hedde Zeijlstra. 2005. Negative Indefinites in Dutch and German. http://ling.auf.net/lingbuzz/000192

de Swart, Henriëtte. 2000. Scope Ambiguities with Negative Quantifiers. In K. von Heusinger and U. Egli, eds., *Reference and Anaphoric Relations*, 109-132. Dordrecht: Kluwer Academic Publishers.

Michelle St-Amour
University of Toronto
Department of Linguistics
130 St. George Street, room 6076
Toronto, Ontario
M5S 3H1, Canada

michelle.stamour@utoronto.ca



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Using Social Information in Language Processing

LAURA STAUM CASASANTO
*Stanford University*

## 0. Introduction

Since its inception, the study of sociolinguistic variation has been primarily the study of sociolinguistically conditioned variable *production* (Labov 1966, 1972; Rickford 1987). The variationist project has been documenting and describing the way different groups of people produce language, studying the factors that condition variation at all levels of linguistic description, from phonetics to discourse patterns. More recently, sociolinguists have begun to analyze the social hierarchies and relationships that underpin this variable production (Eckert 1989). However, very little is known about the *comprehension* of this variable linguistic behavior – what do listeners do with all this structure observed in socially conditioned variable production? If listeners monitor this information, how do they use the knowledge they accumulate?

One study of the effects of the sociolinguistic variable ING (e.g. *walkin'* vs. *walking*) on listeners' attitudes suggests that listeners do make use of linguistic variation to make judgments about speakers. In the matched guise paradigm (Lambert, Hodgson, Gardner, and Fillenbaum 1960), only the critical feature is manipulated between speech samples, which are then evaluated by naïve listeners. Manipulating the realization of the final nasals in ING influenced listeners' judgments about the person who used it – the alveolar nasal (n) makes speech sound more casual and less educated/intelligent, while the velar nasal (ng) makes speakers sound more formal and more educated/intelligent (Campbell-Kibler 2006). Listeners use the realization of ING to make attitude judgments about speakers, and they have explicit and implicit beliefs about who uses this variable and what it means about them. But what about the other way around – do people use information about speakers to make judgments about speech?

Listeners use information about speakers in making metalinguistic judgments. Strand (1999) showed that seeing a picture of a man or a woman affects how people categorize ambiguous stimuli between sibilants *s* and *esh* and between the back vowels in *hood* and *hud*, and more stereotypical men and women elicit stronger effects than less stereotypical men and women. Because these variables are associated with gender through vocal tract characteristics, it's unclear to what



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



extent the effect relates to sociolinguistic knowledge. The social meaning of fricative frequency and back vowel formant frequencies is not something well-understood – we don't know to what extent speakers use them as sociolinguistic resources and how variation in these domains is structured.

More importantly, because phone categorization is not a part of normal language comprehension, this study leaves open the question of whether people use information about speakers when they're not just making a metalinguistic judgment, but actually trying to understand a speaker in real time. Is social information one of the clues listeners use when figuring out the puzzle of spontaneous speech?

The ideal sociolinguistic variable for a study of language comprehension is one that has been well-studied from the point of view of production. Consonant cluster reduction (a.k.a. *t/d* deletion) is a phonetic variable in English in which final coronal stops in consonant clusters may be deleted in some environments. This variable makes a good test case because "…over the past thirty-five years, this phenomenon has been studied in more detail than probably any other variable phonological phenomenon" (Coetzee 2004).

In addition, consonant cluster reduction has a very convenient property, which is that the deletion can sometimes cause ambiguity between two words. For example, the word *mast* produced without its final consonant becomes ambiguous with the word *mass*. This situation provides a good opportunity to see the effects of contextual information on the resolution of this ambiguity.

This reduction is conditioned by several aspects of the linguistic environment, including features of the segment before the stop (as in *last night* vs. *hard night*), features of the segment following the stop (*fast car* vs. *fast action*), and the morphological status of the stop (*past resolution* vs. *passed resolution*) (Labov et al. 1968, Fasold 1972). The possible realizations of the final consonant vary along a continuum from an aspirated *t* with a strong release burst to a completely deleted *t* which leaves few signs that it ever existed in the acoustic signal. While there is some evidence that many different realizations of this variable may be socially meaningful in various ways (Podesva 2006), the standard taxonomy of consonant cluster reduction distinguishes only between two variants: the deleted and non-deleted variants. It is these two categories of consonant realization that have been studied extensively from the perspective of production, and so that is the distinction I consider in the experiments presented in this paper.

Consonant cluster reduction is also conditioned by many stylistic and social factors, and this conditioning has been studied extensively in a variety of social groups. The deleted variant is less formal than the non-deleted variant, younger people use the deleted variant more than older people do, men use the deleted variant more than women do, and African Americans use the deleted variant more than Anglo Americans do (Wolfram 1969). Because ethnicity is a very robust conditioning factor, and because it is possible to manipulate the purported ethnicity of a speaker by showing pictures, it is the relationship between ethnicity and consonant cluster reduction that I examine.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Although there is copious information available about what kinds of speakers use the deleted and non-deleted variants and in what circumstances, very little is known about how listeners interpret them. Campbell-Kibler's (2005) dissertation includes a pilot study comparing listeners' reactions to release vs. non-release of /t/, which may be related to the way listeners interpret *t/d* deletion; the results of this study suggested that released /t/ influenced how smart, casual, formal, and relaxed listeners believed a speaker to be, but not how educated and wealthy. Because these are both non-deleted *t*'s, it is not clear how well these findings correspond to deleted vs. non-deleted *t/d*, and they don't provide much information about the stereotypes listeners have about who uses what variants of *t/d* overall.

While many social factors correlate with *t/d* deletion, the fact that linguists can attend to and measure rates of *t/d* deletion and find correlations with social factors does not mean that listeners regularly do this. Campbell-Kibler (2005) provided some of the first evidence that listeners find changes in single variants meaningful; however, in the case of each variant or variable, the burden of proof is on the linguist to demonstrate that these correlations have some psychological reality for the listener. Thus, before addressing the question of whether listeners use information about social characteristics of the speaker to resolve ambiguities caused by sociolinguistic variation, it is necessary to establish that they have some way of linking speaker social characteristics to linguistic behavior.

In principle, listeners could attend to and store information about all the relationships that exist in the world between social characteristics and linguistic variation. This may in fact be the case; however, it is also possible that listeners are insensitive to much of this variation. Which variables they attend to and store information about could be constrained by a variety of factors. Perhaps listeners attend only to variation that is above a certain threshold of linguistic salience. They might attend only to variation that is relevant to their social lives in certain ways. Listeners might attend only to linguistic variables that they themselves use. The possible constraints on this attention are nearly limitless.

Because it is impossible to consider all sources of socially meaningful variation at once, a fruitful way to pursue the question of how sociolinguistic variation affects the listener is to frame empirical questions in limited domains. The results of experimental investigations of individual variables can be combined to construct a larger understanding of how listeners map the landscape of sociolinguistic variation, and how this information is incorporated into the mechanisms of language understanding.

Two experiments investigated relationships between ethnicity and *t/d* deletion in comprehenders of American English. Experiment 1 investigated whether listeners have implicit knowledge of the relationship between ethnicity and *t/d* deletion, and Experiment 2 determined whether listeners make use of this knowledge to resolve ambiguity.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 1. Experiment 1

Experiment 1 was designed to determine whether listeners have knowledge about the relationship between *t/d* deletion and ethnicity. If listeners keep track of the distribution of deleted final consonants in the input in some way, they should associate deleted final stops more with African Americans than with white speakers. This is an important prerequisite for Experiment 2 – if listeners have knowledge about the distribution of the variants with respect to ethnicity, then it will be possible to find out if they use this information in processing language. If listeners do not appear to keep track of which types of speakers produce the different variants, then they have no way to link social characteristics of the current speaker to probabilities of hearing specific variants. If they cannot make this link, then they cannot use this information to help them understand language.

Experiment 1 is designed as a modified Matched Guise study (Lambert et al. 1965, Lambert 1967), in which minimal pairs of utterances are constructed to create "guises" that differ only in the feature relevant to the study. If listeners have unconscious associations between deleted *t/d* tokens and African American speakers, they will more often rate sentences with deleted tokens likely to have come from African Americans than sentences with non-deleted tokens.

### 1.1. Participants

111 Stanford University undergraduates received course credit in an introductory psychology class for their participation in this study. Participants were of both genders and a mixture of ethnicities.

### 1.2. Materials

24 sentences were constructed so that each included a word with a consonant cluster that could be subject to *t/d* deletion (e.g. *mast, least, wind*). These consonants were primarily in phonological environments that promote consonant cluster reduction, such as following a fricative or a nasal and preceding a stop or a glide. Each sentence appeared in two versions, the standard version and the deleted version. In the standard version, this word was presented with its normal orthography. In the deleted version, this word appeared with its final stop replaced by an apostrophe, indicating a *t/d* deletion.

Participants received one of two questionnaires. Questionnaire A contained twelve target items, all presented in normal orthography (standard version), and twelve similar sentences presented in normal orthography as filler items. Questionnaire B contained twelve target items, all written with an apostrophe (deleted version). Questionnaire B also contained an equal number of fillers (twelve), all of which contained another nonstandardism (such as *coffee* spelled *cawfee*). Underneath each nonstandardism in Questionnaire B, participants saw a 'translation' of the nonstandardism to help them understand what it was intended to mean. In the case of *t/d* deleted items, this consisted of the same word written in standard orthography. Because the standard versions of the sentences appeared only in Questionnaire A and the deleted versions appeared only in Questionnaire



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



B, the difference between standard and deleted versions was a between-subjects comparison. Items were counterbalanced across versions of each questionnaire so that all twenty-four items were seen in both standard and deleted versions.

Pictures of potential speakers were taken from a database of University of Pennsylvania ID photos (Killgore et al. 2000), and included the shoulders and head of college-aged individuals, on a white or neutral background. Four black and four white male individuals were used for both the target and the filler items, with a variety of pairings of black and white individuals instantiated.

### 1.3. Procedure

58 participants filled out Questionnaire A, which had the following instructions:

> Below each pair of pictures is a sentence. For each pair, please circle the person you think is more likely to have said the sentence.

The remaining 53 participants filled out Questionnaire B, which contained the nonstandard items, and had the following instructions:

> The sentences below are transcribed from natural speech. Some of the words speakers used are non-standard. 'Translations' for these words are given in parentheses. Try to imagine how they might have sounded in your mind's ear. For each sentence, decide which person pictured above it is more likely to have said it.

In both cases, participants' task was to circle the picture in the pair above the sentence of the person they think is more likely to have said the sentence. Each sentence had one picture of an African American and one picture of an Anglo American above it. Using written stimuli allows this experiment to address the influence of *t/d* deletion without the influence of auditory cues to ethnicity. Because participants' knowledge of the relationship between *t/d* deletion and ethnicity might not be conscious, participants were not made aware that consonant cluster reduction or ethnicity were of interest. Because other nonstandardisms were present in the fillers, *t/d* deletion was not particularly salient; however, because all pairs of faces contained one white and one black face, participants may have realized that ethnicity was of interest in the experiment.

### 1.4. Results and Discussion

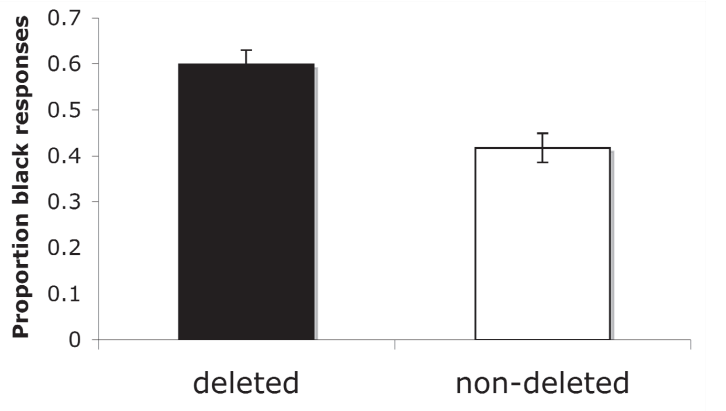
Participants attributed 60% of the 'deleted' sentences, represented with apostrophes, to the African American person pictured, and the remaining 40% to the Anglo American person pictured. By contrast, they attributed only 42% of the non-deleted sentences, with normal orthography, to the African American, attributing the remaining 58% to the Anglo American. This pairwise difference between proportions was significant ($t(1,109)=4.86$, $p<.001$) (see (1) below), indicating that participants associate *t/d* deletion more with African American speakers than with white speakers.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

While the absolute frequency with which participants associated *t/d* deletion with black and white speakers may be specific to the types of sentences the deletions occurred in, the fact that participants showed the same association between *t/d* deletion and ethnicity that occurs in production strongly suggests that they track probabilities related to social factors during language comprehension.

(1) Participants selected the African American from the pair of pictures 60% of the time when they saw the deleted versions of the sentences, but selected the African American only 42% of the time when they saw the non-deleted (standard) versions of the sentences. Error bars represent s.e.m.




### 1.5. Summary

Experiment 1 demonstrated that listeners associate *t/d* deletion more strongly with African Americans than they associate this variant with whites, which is consistent with the facts about production of this variable. While this experiment confirms that listeners have access to statistical relationships between *t/d* deletion and ethnicity, they leave an important question unanswered: do listeners use this knowledge when understanding language?

## 2. Experiment 2

Experiment 2 investigated whether listeners use the linguistic stereotypes identified in Experiment 1 automatically in language processing tasks, using pairs of sentences that can be temporarily ambiguous when spoken aloud. The source of the ambiguity between the two sentences in each pair is the deletion of the final *t* or *d* segment of a word (*t/d* deletion), such that, for example, the word *mast* becomes confusable with the word *mass*. Each pair contains one word (the *t*-word) that has a final coronal stop (*t* or *d*) and one word (the non-*t*-word) that contains the same string of phones as the first word, but without the final coronal stop. When the *t*-word (*mast*, below) is pronounced, the final coronal stop may be



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

deleted, yielding a phone string that is identical to that of the standard pronunciation of the non-*t*-word (*mass*, below). The sentences will remain ambiguous between the meanings of these two words for several words, and then be disambiguated by later words in the sentence:

(2a) [The mast probably lasted] through the storm.
(2b) [The mass probably lasted] an hour on Sunday.

In the above example, a listener cannot tell whether the word they heard was *mass* or *mast* until they get the information *through the storm* or *an hour on Sunday*, at which point they can tell from this context which lexical item was intended by the speaker.

If listeners use their knowledge of sociolinguistic variation when they understand sentences, then they will be more likely to predict a consonant cluster reduction when they believe the speaker is black than when he is white. Thus, they should reach the *mast* interpretation faster when they believe the speaker is black than when they believe he is white, because reaching this interpretation involves inferring a deleted stop. By contrast, they will reach the *mass* interpretation faster when they believe the speaker is white than when they believe he is black, because reaching this interpretation involves rejecting the alternative with a deleted stop.

### 2.1. Participants

40 American native English speakers from the Stanford University community participated in this study in exchange for payment.

### 2.2. Materials

24 pairs of sentences were constructed which were identical for the first few words (the section underlined in (3a) and (3b) below) except for a critical word (italicized). The critical words in each pair of sentences were identical except for the presence or absence of a stop at the end of a final consonant cluster:

(3a) The *mast* probably lasted through the storm.
(3b) The *mass* probably lasted an hour on Sunday.

These nearly identical sections (underlined above) would be ambiguous when spoken aloud if a speaker used the deleted variant of a word like *mast*. Because the deleted variant is a possibility, a listener would not be able to tell whether the word *mass* or *mast* was intended at this point in the sentence. The pairs of sentences, however, are all disambiguated by the endings of the sentences, which are only consistent with one of the interpretations of the beginning. For example, *through the storm* is only consistent with the *mast* interpretation of the beginning, and *an hour on Sunday* is only consistent with the *mass* interpretation of the beginning.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



24 filler pairs were created that also contained an ambiguity that was resolved later in the sentences:

(4a) While Bill hunted the deer ran into the woods.
(4b) While Bill hunted the deer we made the fire.

None of these ambiguities were related to *t/d* deletion. While some of these temporary ambiguities could be disambiguated by prosody, care was taken to select recordings in which the prosody would be appropriate for both readings of the ambiguous portion. These ambiguous fillers masked the experimental sentences; when a subject encountered a temporarily ambiguous sentence, it was only an experimental sentence half the time. This prevented the experimental sentences from standing out from the fillers, as well as preventing them from exclusively constituting the most difficult sentences to understand and respond to.

In addition, 48 unambiguous filler sentences were constructed of similar length and complexity. Thus the full set of stimuli includes 24 pairs of experimental stimuli, 24 pairs of ambiguous fillers, and 48 unambiguous fillers which were unpaired. The total number of sentences used in the experiment was 144; however, because each subject only heard one sentence from each pair, this resulted in 96 total sentences presented to each subject, half of which were ambiguous. The ratio of fillers to target stimuli was 3 to 1.

I recorded approximately 25 Stanford undergraduates, both male and female, of various ethnicities, reading all 144 of these sentences aloud. Each sentence was preceded by a context sentence to make the participants' reading of the experimental and filler sentences more natural:

(5a) I went to a new church last week that has very short services. (context)
The mass probably lasted an hour on Sunday. (target)

(5b) I hope my old boat wasn't damaged by the wind last night. (context)
The mast probably lasted through the storm. (target)

Most of these speakers were recruited from the Stanford University Linguistics Department subject pool; because the subject pool did not contain many African American participants, additional speakers were recruited via email and paid ten dollars for their time. Recordings were digital, made in a sound-proof booth. Sentences were displayed to the subjects using the experimental software PsyScope (Cohen, MacWhinney, Flatt, and Provost 1993) on a Macintosh computer.

Recordings of white and African American males were used for the target stimuli. The targets were restricted to males for two reasons: First, only one gender could be used because mixing genders would likely create implausible pairings between pictures and voices. Second, males were chosen over females because they tend to have higher rates of *t/d* deletion overall than females. Using



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



males for the stimuli decreased the likelihood of encountering a floor effect in listener responses, which would result if listeners did not predict the deleted word in any of the cases, because they found it too unlikely.

Each target item was recorded once by a black speaker, and once by a white speaker. The actual ethnicity of the speaker who recorded the sentence was counterbalanced across items, so that the pairing of voice and face was equally felicitous across conditions, on average.

The speaker pictures from Experiment 1 (4 black males and 4 white males) were used for the critical trials and one third of the fillers (24 targets and 24 fillers), while 8 females of various ethnicities were displayed with the other two thirds of the fillers (48). This resulted in each subject seeing a female face in half the trials and a male face in the other half of the trials. Within each subject, each face was paired with only one voice, to maximize the plausibility of the premise that the pictures represented the speakers. The face/voice pairings were counterbalanced across subjects.

Because all subjects saw a mix of genders and ethnicities in the experiment, they were unlikely to be able to deduce that the experiment concerned only white and African American males. Thus, unlike in Experiments 1 and 2, neither *t/d* deletion nor black and white ethnicities were salient in this experiment.

### 2.3. Procedure

Participants were instructed to listen to a short sound clip while looking at a picture of a face, which they were told represented the speaker of the clip. They heard the ambiguous portion of one of the sentence pairs, which contained no final stops. Although both sentences in each pair were recorded by the readers, the sound files used in this experiment were only excerpted from recordings of the version of each sentence that never contained a final stop (e.g. the *mass* version). Participants never heard any version of the experimental sentences that contained an underlying *t/d*, so that there are no cues in the speech stream indicating the presence of a deleted stop.

Participants then saw one of the sentence endings appear below the picture of the speaker. For example, in one trial, participants heard:

(6) The [mas] probably lasted

After this clip, one of the following endings appeared on the screen:

(7a) …through the storm.
(7b) …an hour on Sunday.

In half the cases participants saw a continuation that made sense if the ambiguous word had no final stop (e.g. *an hour on Sunday*, which makes most sense if the word was *mass*), and in the other half of cases they saw the other continuation, which made sense if the ambiguous word did have a final stop that had been



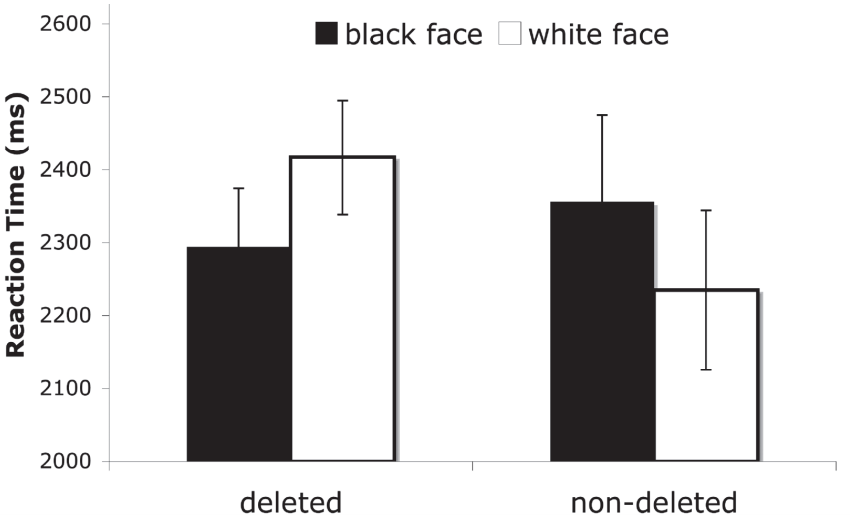
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

deleted (e.g. *through the storm*, which makes most sense if the word was *mast*). Participants' job was to assess whether the ending created a sensible sentence in combination with the beginning they had heard, and response times were measured from the time the continuation appeared on the screen.

### 2.4. Results and Discussion

As predicted, participants responded marginally faster to the continuation that was compatible with the word whose underlying phonemic form has a *t* (the *mast* interpretation) when they saw a black face (t1(1,39)=1.21, p=.11, t2(1,23)=1.8, p=.04). However, also as predicted, they responded faster to the continuation that was compatible with the word whose underlying phonemic form does not have a *t* (the *mass* interpretation) when they saw a white face (t1(1,39)=1.75, p=.04, t2(1,23)=1.81, p=.04). This difference of differences yields the predicted ethnicity by *t/d* deletion interaction (F1(1,39)=5.64, p=.02, F2(1,23)=9.23, p=.006) (see (8) below).

(8) Participants responded faster to the continuation that was consistent with the deleted interpretation (e.g. *mast*) when they saw a black face representing the speaker, but they responded faster to the continuation that was consistent with the non-deleted interpretation (e.g. *mass*) when they saw a white face representing the speaker. Error bars indicate s.e.m.




### 2.5. Summary

Experiments 1 and 2 provide evidence that listeners combine their knowledge of sociolinguistic variation, social information from the scene, and auditory information from the speech stream to construct an interpretation of the speech they



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



have heard. The results of Experiment 1 addressed the issue of knowledge – listeners have acquired, though we do not know through what means, implicit knowledge of the relationship between ethnicity and likelihood of *t/d* deletion. This, however, is not sufficient to determine that the social characteristics of speakers will influence language comprehension. Listeners would also need to have access to social information about the speaker and interpret it in real time, while they are using all kinds of other information, in order for this knowledge to be of any use to them in comprehension. The results of Experiment 2 indicate that they in fact do this. When social information about the speaker is available to listeners, they integrate this information with information from the speech stream and use their sociolinguistic knowledge about probabilistic relationships between social information and language to understand language. This suggests that information that is not represented linguistically can be integrated into language comprehension, as long as listeners have probabilistic knowledge that coordinates this type of information with linguistic representations.

## References

Campbell-Kibler, Kathryn. 2005. Listener Perceptions of Sociolinguistic Variables: The Case of (ING). Ph.D. diss., Stanford University.

Coetzee, Andries W. 2004. What it Means to be a Loser: Non-Optimal Candidates in Optimality Theory. Ph.D. diss., University of Massachusetts, Amherst.

Cohen, Jonathan D., Brian MacWhinney, Matthew Flatt, and Jefferson Provost. 1993. PsyScope: A New Graphic Interactive Environment for Designing Psychology Experiments. *Behavioral Research Methods, Instruments, and Computers* 25(2):257-271.

Eckert, Penelope. 1989. *Jocks and Burnouts: Social Categories and Identity in the High School*. New York: Teachers College Press.

Fasold, Ralph. 1972. *Tense Marking in Black English: A Linguistic and Social Analysis.* Arlington, Va: Center for Applied Linguistics.

Killgore, William, Daniel Casasanto, Deborah Yurgelun-Todd, Joseph Maldjian, and John Detre. 2000. Functional Activation of the Left Amygdala and Hippocampus During Associative Encoding. *NeuroReport* 11:2259-2263.

Labov, William, Paul Cohen, Clarence Robins, and John Lewis. 1968. *A Study of the Non-Standard English of Negro and Puerto Rican Speakers in New York City*. Final report, Cooperative Research Project 3288. Vols. I and II.

Labov, William. 1966. *The Social Stratification of English in New York City.* Washington, D.C.: Center for Applied Linguistics.

Labov, William. 1972. *Language in the Inner City*. Philadelphia: University of Pennsylvania Press.

Lambert, Wallace E., Richard C. Hodgson, Robert C. Gardner, and Samuel Fillenbaum. 1960. Evaluational Reactions to Spoken Language. *Journal of Abnormal and Social Psychology* 60:44-51.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



McGurk, Harry, and John MacDonald. 1976. Hearing Lips and Seeing Voices. *Nature* 264:746-748.

Nygaard, Lynne C., and Erin R. Lunders. 2002. Resolution of Lexical Ambiguity by Emotional Tone of Voice. *Memory & Cognition* 30(4):583-593.

Podesva, Robert J. 2006. Phonetic Detail in Sociolinguistic Variation: Its Linguistic Significance and Role in the Construction of Social Meaning. Ph.D. diss., Stanford University.

Rickford, John R. 1987. *Dimensions of a Creole Continuum*. Stanford: Stanford University Press.

Strand, Elizabeth A. 1999. Uncovering the Roles of Gender Stereotypes in Speech Perception. *Journal of Language and Social Psychology* 18(1):86-100.

Tanenhaus, Michael K., Michael J. Spivey-Knowlton, Kathleen Eberhard, and Julie C. Sedivy. 1995. Integration of Visual and Linguistic Information in Spoken Language Comprehension. *Science*, 268:1632-1634.

Trueswell, John C., Irina Sekerina, Nicole M. Hill, and Marian L. Logrip. 1999. The Kindergarten-Path Effect: Studying On-Line Sentence Processing in Young Children. *Cognition* 73:89-134.

Van Berkum, Jos J. A., Danielle van den Brink, Cathelijne Tesink, Miriam Kos, and Peter Hagoort. 2008. The Neural Integration of Speaker and Message. *Journal of Cognitive Neuroscience* 20(4):580-591.

Wolfram, Walter A. 1969. *A Sociolinguistic Description of Detroit Negro Speech*. Washington, DC: Center for Applied Linguistics.

Laura Staum Casasanto
Stanford University
Department of Linguistics
Margaret Jacks Hall
Stanford, CA 94305

lstaum@stanford.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Production and Perception of Pitch Accent in Japanese[1]

YUKIKO SUGIYAMA
*University at Buffalo, The State University of New York*

## 0. Introduction

Word prosody of Tokyo Japanese (simply Japanese hereafter) is often labeled as pitch accent, characterized by a steep $F_0$ fall from the accented mora to the following one (e.g. McCawley 1968). For example, /hana/ with a low-high (LH) tone sequence means 'flower' when the final mora is accented but 'nose' when there is no accent. The most notable difference between the two accent types is manifested in the following particle, when there is one. It has a low pitch after a final-accented word (thus, /hana^ ga/ LH L 'flower NOMINATIVE', '^' indicates accent on the preceding mora) whereas it has a high pitch after an unaccented word (/hana ga/ LH H 'nose NOMINATIVE'). According to the traditional account of Japanese pitch accent, the tone difference on the following particle is the only difference between the two accent types (Kindaichi 1947). However, results from more recent experimental studies suggest that this may not be the only difference. At the same time, since they focused on a very few minimal pears of final-accented and unaccented words, their results are not totally inconsistent. It is still unresolved what exactly the difference is between final-accented and unaccented words, whether the contrast between the two accent types appears even when words are produced in isolation, and what perceptual cues distinguish the two accent types. The present study was designed to address these issues. First, a database of Japanese words was used to thoroughly search for minimal pairs (such as /hana^/ 'flower' and /hana/ 'nose') that exist in Japanese. Then, using these minimal pairs, production and perception experiments were conducted to establish general properties of Japanese pitch accent. Since word familiarity is known to influence word production and recognition (Amano, Kondo, and Kato 1999, Wright 1997), only familiar words were used.

[1] I would like to thank Karin Michelson for valuable discussions and comments on this paper. I am also thankful to Jim Sawusch for fruitful discussions. I am obliged to Haruo Kubozono for his assistance in designing the production experiment, Doug Roland for his assistance with Perl scripts, and Mitsu Shimojo for helping me recruit subjects.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 1. Past Work

For words produced in isolation, results from previous studies are not consistent (Han 1962, Poser 1984, Sugito 1979, Vance 1995). Sugito (1979) analyzed the minimal pair /hana^/ 'flower' and /hana/ 'nose' produced by 14 males in isolation and found that two talkers produced the two words significantly differently. This was confirmed by a higher $F_0$ peak value on the second mora and a greater $F_0$ rise value from the first to the second mora. Poser (1984) measured the $F_0$ peaks of the same words produced by a single male talker, but no significant difference was found. For words produced in a sentence, contrary to the traditional account, experimental studies have consistently found that final-accented and unaccented words are different even within words in addition to the $F_0$ fall difference into the following particle (Poser 1984, Sugito 1979, Vance 1995). Specifically, final-accented words have a higher $F_0$ peak on the second mora than unaccented words. In addition, Sugito and Vance (1995) found that $F_0$ rise was greater for final-accented words than unaccented words. However, while Sugito seems to hold that the $F_0$ rise is important for distinguishing the two accent types, in Vance's data the two accent types were distinguished more clearly in terms of $F_0$ peak than $F_0$ rise. Since only one minimal pair was used in earlier studies, it is possible that inconsistent results were due to not having enough minimal pairs.

Studies that examined the perception of final-accented and unaccented words produced in isolation found that listeners' word identification was not very accurate overall (e.g. Neustupný 1978, Sugito 1979, Vance 1995). While Neustupný used two minimal pairs, the others used only one. They found that some tokens recorded by certain individuals had accuracy above chance, but others did not. The results suggest that listeners' performance was dependent not only on the listener's ability to identify words but also on whether or not the individual who recorded the stimuli maintained a clear distinction between the two accent types. Interestingly, most studies report that listeners had a tendency to respond that they heard final-accented words rather than unaccented words. Studies that examined the perception of lexical accent in a sentential context found that listeners' judgment was dependent on the size of $F_0$ fall (e.g. Hasegawa and Hata 1992, Kitahara 2001). Listeners perceived accent when a mora was followed by a relatively steep $F_0$ fall. However, since the presence or absence of accent was not the only property varied in most of the test items, they do not show if listeners can identify words based solely on the accent information. It also has to be noted that (re)synthesized speech was used in these studies. Thus, the stimuli that listeners heard may not necessarily correspond to what typically occurs in natural speech.

In short, previous studies on Japanese pitch accent used very limited numbers of minimal pairs. The research question in the present study was whether or not findings from previous studies on Japanese pitch accent could be extended to a larger set of words. This, in terms of production, was to examine if talkers consistently produce differences between the two accent types. In terms of perception, the question was whether or not listeners can use the acoustic information to



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

distinguish the two accent types, if any. While past research on Japanese pitch accent tended to study production and perception separately, given the communicative function of speech, it is important to understand the relation between them.

## 2. Production Experiment

### 2.1. Method

*Speakers:* The data were collected from ten native speakers of Tokyo Japanese (five male, five female, ages 28-33 years old) at the University at Buffalo.

*Materials:* Twenty pairs of bimoraic words that differed only in accent were selected using the database developed by Amano and Kondo (1999). Bimoraic words were necessary because they allow measuring the $F_0$ difference between the first and second moras. Trimoraic and longer words could not be used because minimal pairs comprising final-accented and unaccented words are extremely limited (Kitahara 2001). In selecting bimoraic minimal pairs, first, only words that were unambiguously final-accented or unaccented were selected. In the database, some words were indicated as having more than one possible accent type. Since it was important that the tone sequence was LH for all of the words, words with more than one possible accent type were left out, resulting in 55 minimal pairs. Then, since word familiarity has been found to have an effect on word recognition and recall in Japanese (e.g. Amano, Kondo, and Kato 1999), familiarity of the 55 pairs was checked using the database. In the database, the familiarity of each word was listed on a 7-point scale, with 7 indicating the highest familiarity. Out of the 55 pairs, 19 pairs that had a familiarity rating of 5.0 or higher were selected. To these pairs, one pair was added for comparison with previous studies. Thus, a total of 20 pairs were selected.

*Procedure:* The talkers were asked to produce the 40 words in three environments: 1) in isolation, 2) in the focus frame, and 3) in the non-focus frame. In the focus frame, target words were produced as focus of the sentence. In the non-focus frame, some other word was the focus of the sentences. Two types of carrier sentences were prepared because words under focus are known to have greater $F_0$ movement than words that are not under focus (Pierrehumbert and Beckman 1998). All the words were recorded twice in each environment. The total number of tokens measured was:

40 (words)×3 (environments)×2 (repetitions)×10 (speakers)–1 (missing)=2399.

*Measurements:* The values for three parameters were obtained for the words produced in a sentence: 1) $F_0$ maximum on the second mora, 2) $F_0$ rise from the first to second mora, which was obtained by subtracting the $F_0$ minimum on the first mora from the $F_0$ minimum on the second mora, and 3) $F_0$ fall from the second mora into the following particle, which was obtained by subtracting the $F_0$ minimum on the particle from the $F_0$ maximum on the second mora. For the words produced in isolation, only the values for the first two parameters were obtained. All acoustic analyses were done with Praat (Boersma and Weenink 2005). Once each of the talkers' mean $F_0$ peak, $F_0$ rise, and $F_0$ fall were obtained



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

for each word produced in each environment, the data for all the talkers were combined and submitted to statistical analyses.

### 2.2. Results & Discussion

Three-way analyses of variance (ANOVAs) were performed on $F_0$ peak, $F_0$ rise, and $F_0$ fall, with either talkers (*F1*) or final accented and unaccented words (*F2*) as the repeated measures. The between-subjects factor was sex (male vs. female). The within-subjects factors were environment (isolation, focus frame, non-focus frame) and accent (final-accent vs. no accent). In the following, the complete statistical results will be presented to show the exact nature of the data. However, due to limitations of space, the discussions will be made with reference to mainly the effect of accent (whether or not final-accented and unaccented words showed any difference) and in which environment (isolation and sentence) the difference between the two accent types appeared. The effects of sentence type (focus and non-focus frames) and sex will not be specifically discussed.[2] Readers are referred to Sugiyama (2008) for the thorough presentation and discussion of the data.

#### 2.2.1. $F_0$ Rise

A three-way ANOVA on $F_0$ rise revealed significant effects of accent, $F1(1,8) = 36.581$, $p = .0003$; $F2(1,31) = 46.841$, $p < .0001$, and sex, $F1(1,8) = 33.192$, $p = .0004$; $F2(1,31) = 41.092$, $p < .0001$. The main effect of environment was reliable by words, $F2(2,62) = 19.954$, $p < .0001$, but only marginal by talkers, $F1(2,16) = 3.093$, $p = .0732$. The two-way interactions between accent and environment, and accent and sex were significant both by talkers and words: $F1(2,16) = 12.320$, $p = .0006$; $F2(2,62) = 8.787$, $p = .0004$, and $F1(1,8) = 12.324$, $p = .0080$; $F2(1,31) = 8.102$, $p = .0078$, respectively. The two-way interaction between environment and sex approached significance by words, $F2(2,62) = 3.065$, $p = .0538$, but it was not significant by talkers, $F1(2,16) = 1.859$, $p = .1879$. The three-way interaction of accent, environment, and sex was not significant either, $F1(2,16) = 2.612$, $p = .1043$; $F2(2,62) = 1.086$, $p = .3439$. The figure in (1) shows the $F_0$ rise values for final-accented and unaccented words. In order to illustrate the effects of accent in sentence and isolation, the data for the focus frame and non-focus frame were collapsed and shown as words produced in sentence. As seen in (1), the $F_0$ rise for final-accented and unaccented words did not differ reliably when they were produced in isolation. The error bars that indicate standard error of the mean overlap considerably for male and female talkers. By contrast, when words were produced in sentence, the $F_0$ rise was greater for final-accented words than unaccented words for both male and female talkers. The results show that, in spite of the traditional account of Japanese pitch accent that the two accent types are

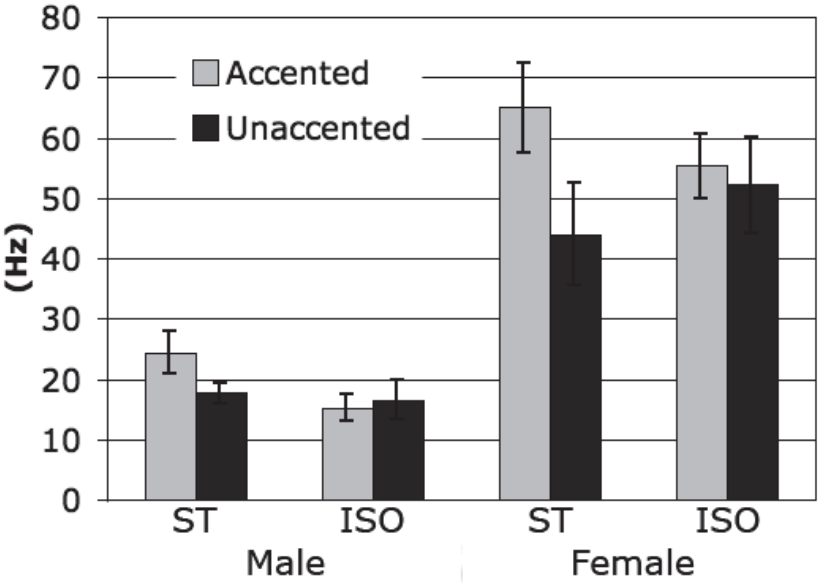
[2] No clear, consistent effects of sentence type were observed in any of the analyses of $F_0$ rise, $F_0$ peak, or $F_0$ fall. Since males and females typically differ in their normal $F_0$ and therefore in $F_0$ range, significant main effects of sex were found in all analyses.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

identical within words and differ only on the following particle (e.g. Kindaichi 1947, McCawley 1968), the two accent types were not the same within words when they were produced in sentence. The results were consistent with experimental findings (e.g. Poser 1984, Sugito 1979, Vance 1995). The figure in (2) shows the $F_0$ contours of the final accented word /mame^/ 'bean' and the unaccented word /mame/ 'diligence' and the following particle /to/, a citation marker, produced by a female talker, as created by Praat. The solid line shows the $F_0$ contour of the final-accented word and the dashed line shows the $F_0$ contour of the unaccented word. These $F_0$ tracks illustrate that $F_0$ rose steeply throughout the second mora for the final accented word and then dropped steeply into the particle. By contrast, the $F_0$ was relatively flat for the unaccented word. In fact, the $F_0$ was higher on the particle than on the second mora of the target word, which was not uncommon for unaccented words. The figure clearly shows that the two accent types differed within words as well as on the following particle.

(1) Mean $F_0$ rise values for words produced in sentence (ST) and in isolation (ISO) for male and female talkers. In the legend, Accented stands for final-accented words. Error bars indicate standard error of the mean.



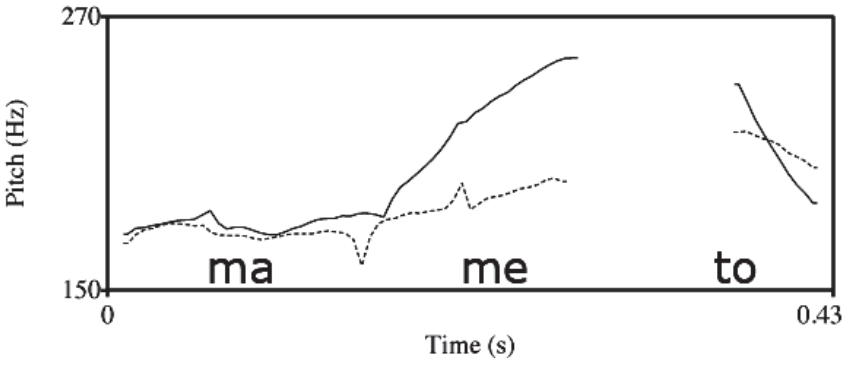

The results from the current study were consistent with the traditional claims (e.g. Kindaichi 1947, McCawley) that final-accented and unaccented words were virtually the same when they were produced in isolation. On the other hand, for words produced in sentence, the results were consistent with findings by Sugito



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(1979) and Vance (1995), with final-accented words showing a greater rise than unaccented words.

(2) The pitch contours of a final-accented word (solid line) and an unaccented word (dashed line) produced by a female talker.




### 2.2.2. $F_0$ Peak

The statistical results for $F_0$ peak showed a very similar pattern to those for $F_0$ rise. In short, while final-accented words and unaccented words did not differ significantly when they were produced in isolation, the $F_0$ peak was significantly higher for final-accented words than unaccented words when they were produced in sentence. As mentioned earlier, Sugito (1979) and Vance (1995) had different views as to whether $F_0$ rise or $F_0$ peak was a better correlate of accent. Since reliable effects of accent were found on both measures in the present data, they were equally good acoustic correlates of accent.

### 2.2.3. $F_0$ Fall

Traditionally, the contrast between final-accented and unaccented words has been thought to be found only in the $F_0$ fall. It remains high for unaccented words whereas it falls on the following particle. The $F_0$ fall was primarily measured to replicate this finding and thus to verify that the data collected in this study were not off the track.

As expected, a three-way ANOVA on $F_0$ fall found significant effects of accent, $F1(1,8) = 47.336$, $p = .0001$; $F2(1,35) = 180.844$, $p < .0001$, and environment, $F1(1,8) = 7.650$, $p = .0245$; $F2(1,35) = 11.653$, $p = .0016$. The effect of sex was significant by words, $F2(1,35) = 29.413$, $p < .0001$, although it was only marginal by talkers, $F1(1,8) = 4.548$, $p = 0.0655$. Accent reliably interacted with environment, $F1(1,8) = 18.303$, $p = .0027$; $F2(1,35) = 6.781$, $p = .0134$. The two-way interaction between accent and sex was significant by words, $F2(1,35) = 21.329$, $p < .0001$, but it was only marginal by talkers, $F1(1,8) = 4.552$, $p = .0654$. The two-way interaction between environment and sex was not reliable by either

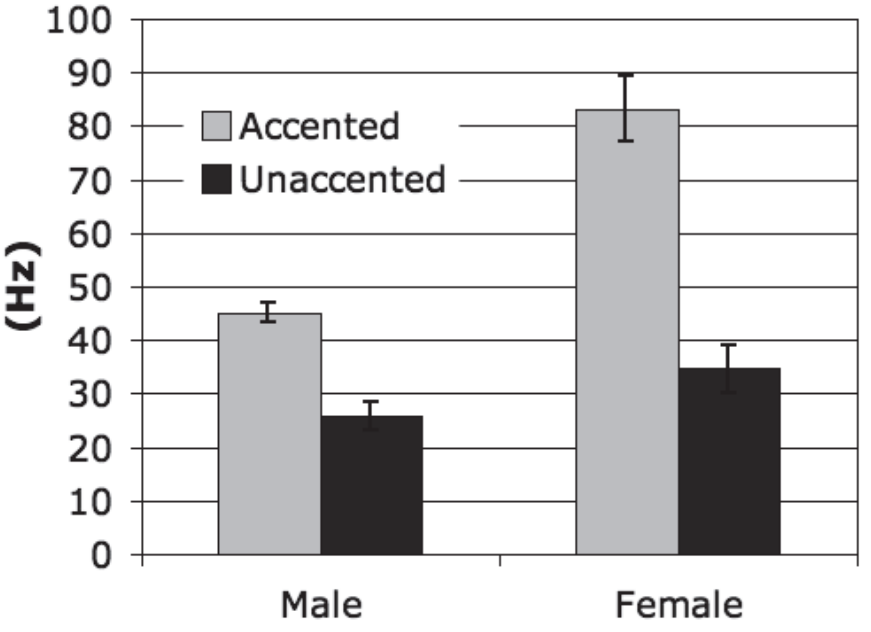


In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

talkers or words, $F1(1,8) < 1$; $F2(1,35) < 1$. The three-way interaction of accent, environment, and sex was significant by both talkers and words, $F1(1,8) = 16.853$, $p = .0034$; $F2(1,35) = 6.847$, $p = .0130$.[3] The effect of accent on $F_0$ fall is illustrated by the figure in (3).

As claimed in the traditional account and found in previous experimental work, the effect of accent was quite substantial, with final-accented words having a much greater $F_0$ fall than unaccented words (Kindaichi 1947, McCawley 1978, Poser 1984, Sugito 1979, Vance 1995). This can also be confirmed in the pitch track in (2). At the onset of the particle, the $F_0$ is higher for the final-accented word than for the unaccented word. However, the $F_0$ falls rapidly for the final-accented word to end up being lower than that for the unaccented word.

(3) Mean $F_0$ fall values for words produced sentence for male and female talkers. Error bars indicate standard error of the mean.




[3] Since two- and three-way interactions involving environment (only two levels, focus frame and non-focus frames, for $F_0$ fall) were reliable, a brief explanation is warranted here. These interactions seemed due to male and female talkers showing somewhat different patterns. Final-accented words had a greater $F_0$ fall than unaccented words for both speakers regardless of the sentence type. However, for females, the size of $F_0$ fall for unaccented words was not as much affected by the sentence type as that for males.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 3. Perception Experiment

The production study found that final-accented and unaccented words did not differ in $F_0$ rise or $F_0$ fall when they were produced in isolation. By contrast, the two accent types differed significantly in $F_0$ rise and $F_0$ fall when they were produced sentence-medially followed by a particle. The perception experiment was conducted to examine perceptual cues for distinguishing the two accent types.

### 3.1. Method

*Listeners.* Thirty-two native speakers of Tokyo Japanese between the ages 19 and 35 years old were recruited at the University at Buffalo.

*Stimuli.* Recordings of one male and one female talkers collected in the production experiment were used to create three types of stimuli: 1) final-accented and unaccented words produced in isolation (isolation speech), 2) final-accented and unaccented words alone excised from a sentence (no particle speech), 3) words and the following particle excised from a sentence (particle speech). The stimuli for the particle speech were created by editing out the target word and the following particle from a sentence. The stimuli for the no particle speech were created by removing the particle from the particle speech. If listeners identify words in the isolation speech better than chance, it indicates that some acoustic cue(s) other than $F_0$ rise or $F_0$ peak are present, signaling the accent type. If listeners' performance is better than chance for the no particle speech, it shows that listeners can use the differences in $F_0$ rise and $F_0$ peak to distinguish the two accent types. Judging from the literature on Japanese pitch accent, it is likely that listeners can identify words with high accuracy for the particle speech.

*Procedure.* The listeners were told that they would hear Japanese words. At each trial, two alternatives appeared on a computer screen and the listeners' task was to choose the word they heard by pressing a key on a computer board (two-alternative forced choice task). Each listener heard the forty words once in each stimulus type in male and female voices. The total number of stimuli presented to each listener was: 40 (words)×3 (stimuli types)×2 (voices)=240.

### 3.2. Results & Discussion

A three-way ANOVA was performed for correct responses, with either listeners (*F1*) or final-accented and unaccented words (*F2*) as the repeated measures. All of the three factors examined were within-listeners factors: accent (final-accent or no accent), stimulus type (isolation speech, no particle speech, particle speech), and voice (male or female). There were no between-listeners factors. After all the data were collected, the percentage of correct responses was calculated by dividing the number of correct responses by the number of responses provided by the listeners. The trials that listeners failed to respond to within the four seconds of time limit were treated as missing data and not included in the statistical analyses. Out of 5520 trials presented to the participants, only 18 trials resulted in missing data.

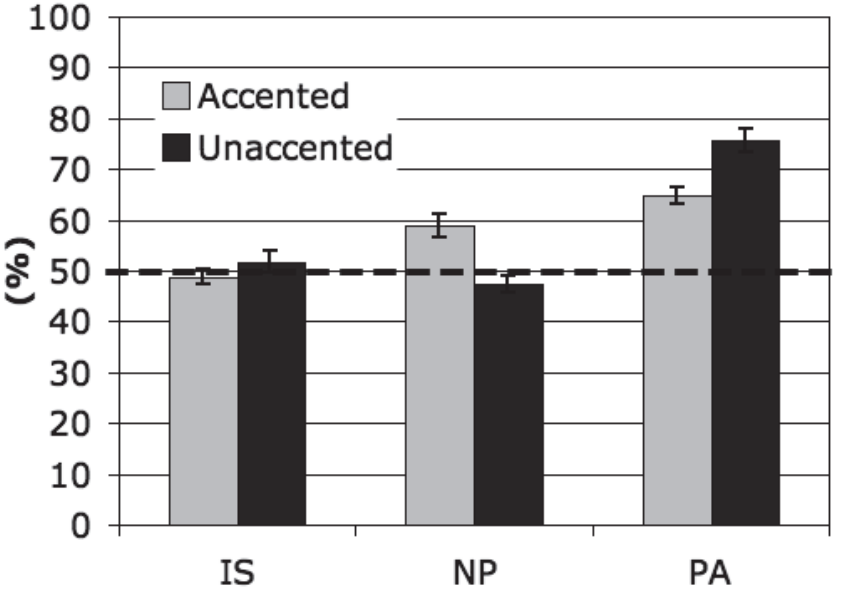
The three-way ANOVA revealed a significant effect of stimulus type, $F1(1,22) = 64.504$, $p < .0001$; $F2(2,38) = 29.518$, $p < .0001$. The effect of voice



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

was marginal by listeners, $F1(1,22) = 2.954$, $p = .0997$, but it was not significant or marginal by words, $F2(1,19) = 1.215$, $p > .10$. The main effect of accent was not significant, $F1(1,22) = .175$, $p > .10$; $F2(1,19) = .008$, $p > .10$. A significant two-way interaction was found between accent and stimuli, $F1(2,44) = 21.541$, $p < .0001$; $F2(2,38) = 5.852$, $p = .0061$. Neither the interaction between stimuli and voice nor accent and voice was reliable, $F1(2,44) = 2.346$, $p < .1076$; $F2 < 1$, and $F1 < 1$; $F2 < 1$, respectively. There was also a three-way interaction of accent, stimuli, and voice, $F1(2,44) = 5.592$, $p = .0069$; $F2(2,38) = 3.609$, $p = .0367$. The results are illustrated by the figure in (4). In the figure, the results for male and female voices are collapsed to show the effect of stimulus type on the number of correct responses. Keep in mind that what is at issue here is whether or not word identification was better than 50 percent for both accent types. Recall that the listeners' task was two-alternative forced choice. Thus, if one accent type has high accuracy well over 50 percent but the other well below 50 percent, it only means that listeners' responses are biased. It is only when both final-accented and unaccented words have reasonably high accuracy that the words are considered to be intelligible.

(4) IS, NP, and PA on the x-axis stand for isolation speech, no particle speech, and particle speech, respectively. Error bars indicate standard error of the mean.






In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

For the isolation speech, correct identification was chance for both accent types. This suggests that no acoustic properties other than $F_0$ rise or $F_0$ peak were present in the signal to convey accent information, making the two accent types unintelligible in terms of accent. Unlike earlier studies, no response bias for final-accented words was observed. The accuracy was slightly higher for the no particle speech than the isolation speech, but on average, the accuracy was only slightly higher than 50 percent. This result indicates that the $F_0$ peak and $F_0$ rise differences observed for words produced in sentence were not useful to listeners for identifying words. As expected, the percentage of correct responses exceeded 50 percent for both accent types for the particle speech. The accuracy was about 65 percent for final-accented words and 76 percent for unaccented words. However, it should be added that the listeners' performance was not as good as suggested in the literature, even when the $F_0$ fall information was present.

## 4. Conclusion

The primary goal of this study was to establish the acoustic correlates and perceptual cues to distinguish final-accented and unaccented words. Twenty minimal pairs of final-accented and unaccented words that have a high familiarity searched from a database of Japanese words were used as test items.

The results of this study show that, in order for final-accented and unaccented words to be realized differently, they have to be produced with a following particle. Put differently, realizing the contrast is, as it were, all or nothing. When it is realized at all, multiple correlates are observed: $F_0$ rise, $F_0$ peak, and $F_0$ fall. Otherwise the contrast is neutralized, at least in terms of these three measures. The results are summarized in (5). Among the three correlates, the largest difference appears in the $F_0$ fall from the second mora into the following particle. Contrary to the traditional account, final-accented and unaccented words themselves are produced differently when they occur sentence-medially before a particle, with final-accented words having a higher $F_0$ peak on the second mora and a greater $F_0$ rise from the first to second mora. By contrast, when the two types of words are produced in isolation, not only is there no particle that indicates accent information on the following words, but also the difference on the $F_0$ peak also disappears, making the two accent types identical.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(5) Results Summary

| | Isolation | | Sentence | |
|---|---|---|---|---|
| | Production | Perception | Production | Perception |
| $F_0$ peak | × | × | √ | × |
| $F_0$ rise | × | × | √ | × |
| $F_0$ fall | — | — | √ | △ |

**Note:** The symbol × in the isolation columns indicates that no significant difference was found between final-accented and unaccented words. The symbols √/× in the sentence columns indicate good/poor accuracy in listeners' word identification. The symbol △ indicates that word identification was better than chance but was not as good as expected.

The perception study was conducted to examine if listeners actually use the acoustic differences between final-accented and unaccented words to identify words. The results of the no particle speech show that, in spite of the $F_0$ rise and $F_0$ peak differences between the two accent types, these differences alone are not enough for listeners to distinguish them. The listeners' performance improves with additional $F_0$ information from the following particle, but the accuracy reaches only about 70 percent. Considering that the $F_0$ on the following particle has been argued as if it is the "dead giveaway" for the accent type, its contrastive function is not as clear as has been suggested in the literature. This result suggests that, in normal conversation, listeners may rely on context to distinguish final-accented and unaccented words.

**References**

Amano, Shigeaki, and Tadanori Kondo. 1999. *Nihongo-no Goitokusei*. Tokyo: Sanseido.

Amano, Shigeaki, Tadahisa Kondo, and Kazumi Kato. 1999. Familiarity Effect on Spoken Word Recognition in Japanese. *Proceedings of the 14th International Congress of Phonetic Sciences* 2:873-876.

Boersma, Paul, and David Weenink. 2005. Praat: Doing Phonetics by Computer [Computer Program]. http://www.praat.org/.

Han, Mieko. 1962. *Japanese Phonology: An Analysis Based upon Sound Spectrograms*. Tokyo: Kenkyusha.

Hasegawa, Yoko, and Kaue Hata. 1992. Fundamental Frequency as an Acoustic Cue to Accent Perception. *Language and Speech* 35:87-98.

Kindaichi, Haruhiko. 1947. Tookyoogo ni okeru "hana" to "hana" no kubetsu – tookyoo akusento shinnidankan kyoochooron. [The distinction between "hana 'flower'" and "hana 'nose'" in the Tokyo dialect – the emphasis of the new two-level theory of the Tokyo accent]. *Kokugo* [The Japanese language], Summer.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Kitahara, Mafuyu. 2001. Category Structure and Function of Pitch Accent in Tokyo Japanese. Ph.D. diss., Indiana University.

Kubozono, Haruo. 1993. *The Organization of Japanese Prosody*. Tokyo: Kuroshio.

McCawley, James. 1968. *The Phonological Component of a Grammar of Japanese.* The Hague: Mouton.

Neustupný, Jirí. 1978. *Post-Structural Approaches to Language: Language Theory in a Japanese Context*. Tokyo: University of Tokyo Press.

Pierrehumbert, Janet, and Mary Beckman. 1988. *Japanese Tone Structure*. Cambridge, MA: MIT Press.

Poser, William. 1984. The Phonetics and Phonology of Tone and Intonation in Japanese. Ph.D. diss., Massachusetts Institute of Technology.

Sugito, Miyoko. 1979. Tookyoo akusento ni okeru "hana" to "hana" no hatsuwa to chikaku ni tsuite. *The 79th Meeting of the Linguistic Society of Japan* (in Sugito 1998).

Sugito, Miyoko. 1998. *Nihongo onsei no kenkyu 5: "hana" to "hana."* Osaka: Izumi Shoin.

Sugiyama, Yukiko. 2008. The Nature of Japanese Pitch Accent: An Experimental Study. Ph.D. diss., University at Buffalo, The State University of New York.

Vance, Timothy. 1995. Final Accent vs. No Accent: Utterance-Final Neutralization in Tokyo Japanese. *Journal of Phonetics* 23:487-499.

Wright, Richard. 1997. Lexical Competition and Reduction in Speech: A Preliminary Report. *Progress report* 21, Speech Research Laboratory, Bloomington, IN.

Yukiko Sugiyama
University at Buffalo, The State University of New York
Department of Linguistics
609 Baldy Hall
Buffalo, NY 14260-1030

yukiko_sugiyama@mac.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# The Relative Importance of Rhythm and Intonation for the Perception of New Zealand English Dialects

ANITA SZAKAY
*University of British Columbia, Canada*

## 0. Introduction

The present paper is part of a larger research project that set out to investigate the production and perception of suprasegmental features of the two main ethnolects of New Zealand English. Maori English (ME) is spoken by the indigenous population, while the variety used mainly by people of European descent is referred to as Pakeha English (PE).

Previous research has demonstrated that these two ethnic dialects display distinct rhythmic qualities as well as differing intonational patterns. ME has been shown to be significantly more syllable-timed than PE (e.g., Warren 1998). Using the vocalic Pairwise Variability Index (PVI) (Grabe and Low 2002), Szakay (2006) also confirmed that ME (mean PVI = 46.4) is significantly less stress-timed than PE (mean PVI = 57.2), where a lower PVI indicates a more syllable-timed language and a higher PVI indicates a more stress-timed language.

The two varieties also differ in their use of the High Rising Terminal contour (HRT), which is a salient rise in pitch at the end of non-interrogative intonational phrases (uptalk). HRT has been extensively studied in New Zealand English, and is reported to be used mainly by young, female speakers. A major study carried out by Britain (1992) showed evidence that this pattern is used in different proportions by Maori and Pakeha. His analysis indicated that Maori speakers use a significantly higher percentage of HRTs than Pakeha. The results also revealed that young Maori men use levels similar to women, while young Pakeha men are extremely low users of HRTs.

The present study aimed to investigate whether listeners are aware of these prosodic differences and whether they are capable of tuning in to speaker rhythm and intonation to facilitate dialect identification. The study also hoped to determine the relative importance of the rhythmic and intonational patterns of a speaker for ethnic dialect categorization in New Zealand by establishing whether listeners rely more on rhythm or HRTs to identify a speaker's ethnicity.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



## 2. Results

Logistic regression models were fit for each condition to reveal what suprasegmental features significantly affect listeners' perception of a speaker's ethnicity. The analysis was carried out using the R Statistical Package.

### 2.1. Rhythm

As reported in Szakay (2008b), rhythm was shown to be a significant predictor of perceived ethnicity in all conditions where it was retained in the speech signal. Syllable-timed speakers are identified as Maori sounding, while stress-timed speakers are more likely to be classified as Pakeha, indicating that overall New Zealanders are in fact aware of the rhythmic difference between Maori English and Pakeha English. The social network of a listener was also shown to be of importance for their ability to rely on rhythm. Listeners who are highly integrated into Maori social networks did consistently better at the dialect identification task than those who are not integrated (for more detail see Szakay (2008b)).

### 2.2. Intonation

The results regarding the production of HRTs confirm previous research demonstrating that, overall, Maori speakers use a significantly higher percentage of HRTs than Pakeha speakers (linear regression, $p<.05$).

The percentage of HRTs used by a speaker was also a significant predictor of perceived ethnicity in all conditions of the perception experiment where intonation was retained in the speech signal. Results for each of the four conditions are reported below.

#### 2.2.1. Condition Seven – Normal Speech

In the unaltered speech condition, the regression model reveals that perceived ethnicity is affected by a significant interaction, which occurs between the percentage of HRTs and the speaker's actual ethnicity. This is shown in (1). The y-axis shows the log odds of a speaker being identified as Pakeha. A higher value indicates that the speaker is more likely to be perceived as Pakeha, while a low value indicates that the speaker is more likely to be identified as Maori. The coefficient table for the model of perceived ethnicity is shown in (2), while the corresponding anova table is presented in (3).

The percentage of HRTs seems to be a very important cue for dialect identification in the case of Maori speakers. If a Maori speaker has a low percentage of HRTs, then they are more likely to be identified as Pakeha. However, if they use a lot of HRTs then they are considered to be Maori sounding. Listeners do not make use of the percentage of HRTs in the case of Pakeha speakers. As the relatively flat line around zero indicates on the graph, the percentage of HRTs used by a Pakeha speaker does not seem to influence participants' responses in either direction. This presumably indicates that HRT use is a secondary cue in this condition, unlikely to influence responses alone, but increasing the certainty of the listener if a speaker has other characteristics that make them sound Maori.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 1. Method

The methodology followed in this study is nearly identical to the one described in Szakay (2008b). Accordingly, 36 New Zealanders were used for the analysis of rhythm and intonation. The 24 Maori and 12 Pakeha speakers were recorded reading a passage as well as narrating a story.

The rhythmic patterns of the speakers were analyzed using the normalized vocalic PVI (Grabe and Low 2002). The total number of vocalic segments taken into consideration for the analysis of rhythm was 3281, based on both reading passages and narratives.

HRTs were analyzed in the spontaneous speech segments only, as speakers did not produce a great number of HRTs in the reading passages. HRTs were manually labeled on a separate textgrid tier in Praat, from the valley to the peak of the phrase final pitch rise. Both actual and potential occurrences were coded for, allowing for the computation of the percentage of HRTs used by each speaker. Of the 36 narrative passages, 16 did not contain any HRTs and were excluded from the analysis.

Twenty narratives (10 Maori, 10 Pakeha) were chosen to be included in the dialect identification experiment as stimulus material. Seven different speech conditions were created that all retained different suprasegmental cues in the speech signal. The present study concentrates on 4 of these conditions, that preserved the intonational patterns of the original passage:

(a) Condition Seven: Normal speech
(b) Condition Six: Low-pass filtered speech
(c) Condition Five: Resynthesized Rhythm and Intonation together
(d) Condition Four: Intonation only

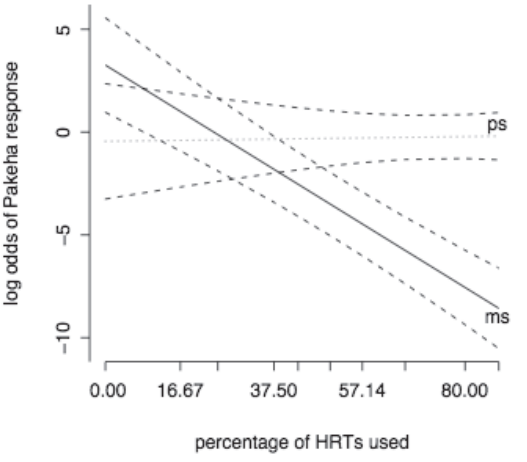
All conditions were created using the Praat acoustic analysis software (Boersma 2006). Low-pass filtering was carried out at 400Hz, thus retaining both the rhythmic and the intonational patterns of the speaker (and arguably voice quality features as well). Condition Five was created by first humming the signal, then replacing all consonants by silence. The intonation only condition also made use of Praat's humming option but only original pauses were replaced by silence. A more detailed description of how these conditions were created can be found in Szakay (2008a, 2008b).

55 Pakeha and 52 Maori listeners were asked to perform a forced-choice dialect identification task in all seven conditions. The results reported below concentrate on the above-mentioned 4 conditions.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(1) Condition Seven – Model effects showing likelihood of Pakeha perceived ethnicity by percentage of HRTs used and actual speaker ethnicity.




(2) Condition Seven - Coefficient table for model of perceived ethnicity.

| Variable | Coef | S.E. | Wald Z | P |
|---|---|---|---|---|
| Intercept | -31.75 | 7.53 | -4.21 | 0.0000 |
| PVI | 0.04 | 0.04 | 1.12 | 0.2607 |
| PMII | -0.58 | 0.18 | -3.24 | 0.0012 |
| log SD of pitch | 27.41 | 5.61 | 4.88 | 0.0000 |
| speaker gender=male | 32.50 | 7.57 | 4.29 | 0.0000 |
| % of HRTs | -0.13 | 0.01 | -7.95 | 0.0000 |
| speaker ethnicity=Pākehā | -3.70 | 1.14 | -3.25 | 0.0011 |
| minimum pitch | 0.02 | 0.00 | 3.21 | 0.0013 |
| mean slope of HRTs | -0.01 | 0.00 | -6.28 | 0.0000 |
| PVI * PMII | 0.01 | 0.00 | 3.10 | 0.0019 |
| log SD of pitch * speaker gender=male | -24.71 | 5.38 | -4.59 | 0.0000 |
| % of HRTs * speaker ethnicity=Pākehā | 0.13 | 0.02 | 6.08 | 0.0000 |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(3) Condition Seven - Anova table for model of perceived ethnicity.

| Factor | Chi-Square | d.f. | P |
|---|---|---|---|
| PVI | 15.53 | 2 | 0.0004 |
| PMII | 11.51 | 2 | 0.0032 |
| log SD of pitch | 26.25 | 2 | <.0001 |
| speaker gender | 24.26 | 2 | <.0001 |
| % of HRTs | 65.21 | 2 | <.0001 |
| speaker ethnicity | 64.82 | 2 | <.0001 |
| minimum pitch | 10.31 | 1 | 0.0013 |
| mean slope of HRTs | 39.46 | 1 | <.0001 |
| PVI * PMII | 9.64 | 1 | 0.0019 |
| log SD of pitch * speaker gender | 21.03 | 1 | <.0001 |
| % of HRTs * speaker ethnicity | 36.97 | 1 | <.0001 |
| TOTAL INTERACTION | 57.81 | 3 | <.0001 |
| TOTAL | 385.18 | 11 | <.0001 |

### 2.2.2. Condition Six – Low-pass Filtered Speech

As pitch movement is retained by low-pass filtering, HRTs are easily perceivable in this condition. However, not all participants seem to use the percentage of HRTs present to identify speaker ethnicity. Whether a speaker uses many HRTs or none at all does not seem to have an effect on the responses of Maori participants in this condition. This is illustrated in the left panel of (4) by the flat lines for both Maori male and female participants. The behavior of Pakeha males parallels that of Maori participants, as they do not seem to use HRTs as a cue either. Pakeha females, however, do tune in to the percentage of HRTs used by a speaker in this condition. For them a speaker who uses many HRTs sounds very Maori, while the lack of HRTs indicates that the speaker is more likely to be Pakeha. See the right panel of (4) for this gender difference. Coefficient and anova tables for the model in Condition Six are shown in (5) and (6) respectively.

### 2.2.3. Condition Four – Intonation Only

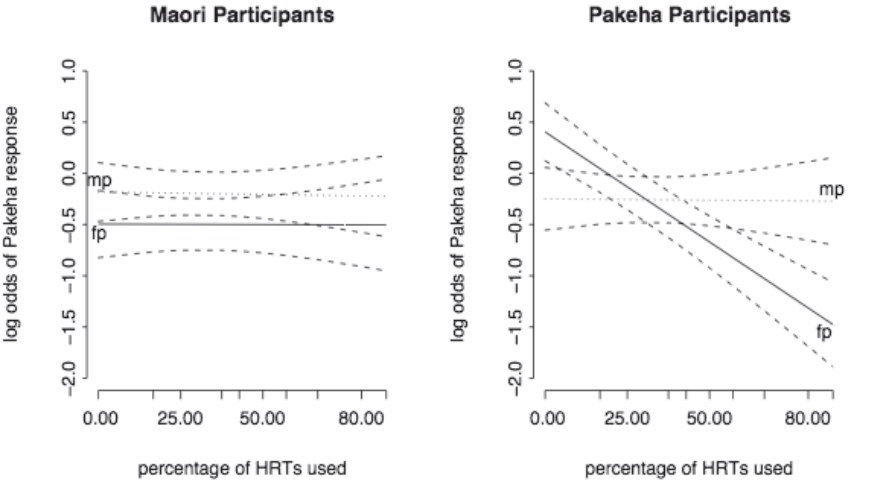
HRTs were only used by Maori participants as a cue in this condition. For Maori listeners, the more HRTs a speaker uses, the more likely the speaker is to be identified as Maori sounding. Pakeha participants, on the other hand, do not make use of HRTs as a cue for dialect identification in the intonation alone condition: whether a speaker uses many HRTs or not does not influence Pakeha participants' responses in either direction. This is illustrated in (7) by the flat line marking



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Pakeha responses. The corresponding coefficient and anova tables are presented in (8) and (9), that also reveal that Pakeha listeners tune into speakers' standard deviation of pitch instead of HRTs in this condition.

(4) Condition Six – Model effects showing likelihood of Pakeha perceived ethnicity by percentage of HRTs used and listener gender. Coefficients set to Maori listeners in left panel, to Pakeha listeners in right panel.




(5) Condition Six - Coefficient table for model of perceived ethnicity.

| Variable | Coef | S.E. | Wald Z | P |
|---|---|---|---|---|
| Intercept | -5.42 | 0.85 | -6.36 | 0.0000 |
| % of HRTs | -0.00 | 0.00 | -0.03 | 0.9759 |
| participant ethnicity=Pākehā | 0.89 | 0.24 | 3.74 | 0.0002 |
| participant gender=male | 0.31 | 0.19 | 1.58 | 0.1142 |
| PVI | 0.04 | 0.01 | 4.05 | 0.0001 |
| PMII | -0.28 | 0.06 | -4.57 | 0.0000 |
| minimum pitch | 0.01 | 0.00 | 6.31 | 0.0000 |
| speech rate | 0.52 | 0.11 | 4.44 | 0.0000 |
| number of pauses | -0.12 | 0.03 | -3.91 | 0.0001 |
| % of HRTs * participant ethnicity=Pākehā | -0.02 | 0.00 | -4.93 | 0.0000 |
| % of HRTs * participant gender=male | -0.00 | 0.00 | -0.09 | 0.9322 |
| participant ethnicity=Pākehā * part gender=male | -0.96 | 0.27 | -3.48 | 0.0005 |
| PVI * PMII | 0.00 | 0.00 | 4.50 | 0.0000 |
| % of HRTs * part ethn=Pākehā * part gender=male | 0.02 | 0.00 | 3.53 | 0.0004 |

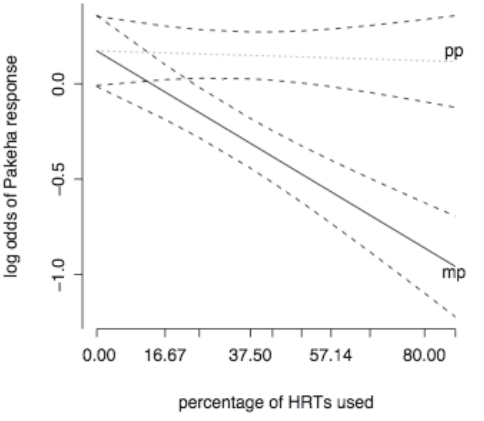


In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(6) Condition Six - Anova table for model of perceived ethnicity.

| Factor | Chi-Square | d.f. | P |
|---|---|---|---|
| % of HRTs | 50.38 | 4 | <.0001 |
| participant ethnicity | 26.43 | 4 | <.0001 |
| participant gender | 28.90 | 4 | <.0001 |
| PVI | 142.74 | 2 | <.0001 |
| PMII | 20.92 | 2 | <.0001 |
| minimum pitch | 39.76 | 1 | <.0001 |
| speech rate | 19.74 | 1 | <.0001 |
| number of pauses | 15.31 | 1 | 1e-04 |
| % of HRTs * participant ethnicity | 24.29 | 2 | <.0001 |
| % of HRTs * participant gender | 24.13 | 2 | <.0001 |
| participant ethnicity * participant gender | 14.35 | 2 | 8e-04 |
| PVI * PMII | 20.27 | 1 | <.0001 |
| % of HRTs * part ethnicity * part gender | 12.48 | 1 | 4e-04 |
| TOTAL INTERACTION | 59.63 | 5 | <.0001 |
| TOTAL | 279.5 | 13 | <.0001 |

(7) Condition Four – Model effects showing likelihood of Pakeha perceived ethnicity by percentage of HRTs used and listener ethnicity.






In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(8) Condition Four - Coefficient table for model of perceived ethnicity.

| Variable | Coef | S.E. | Wald Z | P |
|---|---|---|---|---|
| Intercept | -1.40 | 0.25 | -5.52 | 0.0000 |
| log SD of pitch | 1.13 | 0.19 | 5.92 | 0.0000 |
| participant ethnicity=Pākehā | 0.00 | 0.12 | 0.01 | 0.9948 |
| % of HRTs | -0.01 | 0.00 | -6.06 | 0.0000 |
| participant ethnicity=Pākehā * % of HRTs | 0.01 | 0.00 | 4.32 | 0.0000 |

(9) Condition Four - Anova table for model of perceived ethnicity.

| Factor | Chi-Square | d.f. | P |
|---|---|---|---|
| log SD of pitch | 35.02 | 1 | <.0001 |
| participant ethnicity | 38.14 | 2 | <.0001 |
| % of HRTs | 36.67 | 2 | <.0001 |
| participant ethnicity * % of HRTs | 18.67 | 1 | <.0001 |
| TOTAL | 78.15 | 4 | <.0001 |

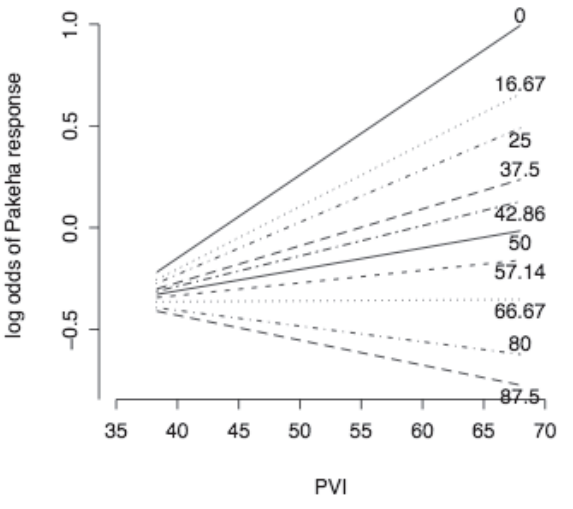
### 2.3. Interaction Between Rhythm and Intonation

Condition Five reveals an interaction between rhythm and the percentage of HRTs used by a speaker. If a speaker is very syllable-timed, they are identified as Maori. In this case, it does not matter what percentage of HRTs the speakers uses. However, if the speaker is more stress-timed, then the perceived ethnicity is in fact determined by the frequency of HRTs. This operates in the following way. If the stress-timed speaker does not use HRTs, they will be identified as very Pakeha. However, if the stress-timed speaker does use a lot of HRTs, they will be perceived as Maori, despite having a high PVI value. That is, the frequency of HRTs seems to be more important a cue than rhythm itself, *if* the speaker is stress-timed. On the other hand, rhythm is more important than HRTs *if* the speaker is very syllable-timed. The interaction between rhythm and the percentage of HRT is shown in (10). Coefficient and anova tables for this model are presented in (11) and (12).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(10) Condition Four – Model effects showing likelihood of Pakeha perceived ethnicity by PVI and percentage of HRTs used.




(11) Condition Five - Coefficient table for model of perceived ethnicity.

| Variable | Coef | S.E. | Wald Z | P |
|---|---|---|---|---|
| Intercept | -1.18 | 0.67 | -1.77 | 0.0774 |
| PMII | -0.21 | 0.05 | -3.83 | 0.0001 |
| PVI | 0.01 | 0.01 | 0.98 | 0.3275 |
| log SD of pitch | 0.75 | 0.19 | 3.90 | 0.0001 |
| % of HRTs | 0.02 | 0.01 | 1.84 | 0.0654 |
| PMII * PVI | 0.00 | 0.00 | 3.65 | 0.0003 |
| PVI * % of HRTs | -0.00 | 0.00 | -2.84 | 0.0045 |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(12) Condition Five - Anova table for model of perceived ethnicity.

| Factor | Chi-Square | d.f. | P |
|---|---|---|---|
| PMII | 15.58 | 2 | 0.0004 |
| PVI | 34.39 | 3 | <.0001 |
| log SD of pitch | 15.24 | 1 | 0.0001 |
| % of HRTs | 62.93 | 2 | <.0001 |
| PMII * PVI | 13.31 | 1 | 0.0003 |
| PVI * % of HRTs | 8.06 | 1 | 0.0045 |
| TOTAL INTERACTION | 21.09 | 2 | <.0001 |
| TOTAL | 97.20 | 6 | <.0001 |

## 3. Discussion

As discussed in the Szakay (2008b), rhythm seems to be a reliable cue for ethnic dialect identification in the New Zealand context. However, the use of HRTs is just as useful a cue for the listener. Previous research has shown that ME speakers are likely to use a higher percentage of HRTs than Pakeha speakers (e.g., Britain 1992). The results from the production experiment in this study also indicated that overall Maori speakers use significantly more HRTs. The results also reveal that listeners' perception is in line with the findings of these studies, in that participants generally expect Maori speakers to use more HRTs in their speech than do Pakeha speakers. The percentage of HRTs used by the speaker is a variable that showed a significant effect in all conditions where intonation was retained in the speech signal.

In Condition Seven, where all information, including segmental features, was preserved in the speech signal, the percentage of HRTs interacting with speaker ethnicity had a significant effect on perceived ethnicity. Only the percentage of HRTs used by Maori speakers influenced participants' responses. The more HRTs a Maori speaker uses, the more Maori sounding they will be marked by the listener. However, participants do not make use of HRTs in the case of Pakeha speakers. This suggests that the segmental features of Pakeha English are more important for ethnic dialect identification and as such override the frequency of the HRTs used by the speaker.

In Condition Six, low-pass filtered condition, where segmental information is no longer available, only Pakeha females are tuning into the percentage of HRTs. The direction of their responses is the same as in all other conditions, that is the more HRTs a speaker uses, the more Maori sounding they are perceived to be. Pakeha men and Maori participants are tuning in to cues other than HRTs when the low-pass filter is applied (e.g., rhythm, speech rate, minimum pitch and the number of pauses) (see Szakay 2008a).

Condition Five demonstrates that HRTs in some instances serve as more useful an indicator of perceived ethnicity than rhythm itself. In this condition a stress-timed speaker's perceived ethnicity will depend on how often they use HRTs.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Again, more HRTs are an indicator of a more Maori sounding speaker. In the case of syllable-timed speakers, however, rhythm is more important a factor for listeners than the percentage of HRTs. In Condition Five the statistical model predicts that all participants use these variables the same way, regardless of their ethnicity. In contrast, only Maori participants rely on HRTs in the intonation only Condition Four. Again, a greater number of HRTs suggests that the speaker is more Maori sounding. Pakeha listeners do not make use of HRTs in this condition to distinguish between the two dialects. Instead, they rely on the speaker's standard deviation of pitch.

The results discussed in Szakay (2008b) also revealed that participants who have had more exposure to ME are more capable of relying on syllabic rhythm in a dialect identification task, even in the lower conditions, where those participants with less exposure seem to be tuning into speech rate instead of rhythm itself. These results prove that different listeners utilize different cues for ethnic dialect identification. Thomas and Reaser (2002) argue that it is also possible that different cues are used to identify different speakers. The results from the present study support this claim showing that speakers who are very syllable-timed will be identified as Maori based on their rhythmic characteristics. Those speakers who demonstrate more of a stress-timed rhythmic pattern, however, will be instead judged on their use of HRTs. They might still be identified as Maori regardless of being stress-timed, if they use a high percentage of HRTs.

## 4. Summary

Rhythm and the percentage of HRTs used by the speaker proved to be extremely useful cues for participants in the dialect identification task. In the case of these two prosodic features, not only do we have production evidence of a divergence between ME and PE, this evidence is supported by perception evidence that shows that listeners are aware of these features and associate them with ethnicity. The acoustic analysis in Szakay (2006) demonstrated that ME speakers are significantly more syllable-timed than PE speakers, while the dialect identification experiment in Szakay (2008b) showed that listeners are aware of this difference and are able to rely on rhythm in ethnic dialect differentiation.

The production data also confirmed the results of previous research on the use of HRTs in New Zealand (e.g., Britain 1992), showing that, overall, Maori use a significantly higher percentage of HRTs than Pakeha. Listeners are aware of this tendency and expect a high number of HRTs to be an indicator of a Maori speaker. Moreover, the perception results also revealed the relative importance of rhythm and HRTs. Listeners heavily rely on rhythm in their ethnic judgments when the speaker is very syllable-timed. These speakers will be identified as Maori, regardless of their use of HRTs. However, if the speaker is stress-timed, it is in fact the frequency of HRTs that will be the deciding factor in distinguishing ME from PE. Thus, we can conclude that both of these prosodic features facilitate accurate dialect identification in the New Zealand context.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



**References**

Boersma, Paul, and David Weenink. 2006. Praat: Doing Phonetics by Computer. Version 4.4.12. Computer Program, http://www.praat.org/ (accessed March 1, 2006).

Britain, David. 1992. Linguistic Change in Intonation: The Use of High Rising Terminals in New Zealand English. *Language Variation and Change* 4(1):77-104.

Grabe, Esther, and Ee L. Low. 2002. Durational Variability in Speech and the Rhythm Class Hypothesis. In C. Gussenhoven and N. Warner, eds., *Laboratory Phonology 7*, 515-546. Berlin: Mouton de Gruyter.

Szakay, Anita. 2006. Rhythm and Pitch as Markers of Ethnicity in New Zealand English. In P. Warren and C. Watson, eds., *Proceedings of the 11th Australasian International Conference on Speech Science & Technology*, 421-426. Auckland, New Zealand: University of Auckland.

Szakay, Anita. 2008a. *Ethnic Dialect Identification in New Zealand: The Role of Prosodic Cues*. Saarbrücken, Germany: VDM Verlag Dr. Müller.

Szakay, Anita. 2008b. Social Networks and the Perceptual Relevance of Rhythm in Maori English: A New Zealand Case Study. In K. Gorman, ed., *U. Penn Working Papers in Linguistics 14.2: Papers from New Ways of Analyzing Variation 36*, 148-156.

Thomas, Eric, and Jeffrey Reaser. 2002. Delimiting Perceptual Cues used for the Ethnic Labeling of African American and European American Voices. *Journal of Sociolinguistics* 8(1):54-87.

Warren, Paul. 1998. Timing Patterns in New Zealand English Rhythm. *Te Reo: Journal of the Linguistic Society of New Zealand* 41:80-93.

Anita Szakay
University of British Columbia
Department of Linguistics
Totem Field Studios
Vancouver, BC, V6T 1Z4

szakay@interchange.ubc.ca



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Nibbling is not many bitings in Italian and French: A Morphosemantic Analysis of Event Internal Plurality

LUCIA M. TOVENA and ALAIN KIHM
*Université Paris 7 and CNRS*

## 1. Introduction

By the term 'pluractionality', one generally refers to the explicit indication that the event denoted by some verb occurs or occurred or will occur not once, but several times within a certain time span. Event plurality is overtly marked in many languages through various devices of verbal morphology and with various semantic effects (see, e.g. Cusic, 1981; Mithun, 1988; Haji-Abdolhosseini et al., 2002). Here, we will examine verbs expressing event internal plurality in Italian and French, in order to find out how they are formed and what they mean precisely. Typical examples of such verbs are It *mordicchiare* and Fr *mordiller*, both meaning 'nibble'. These verbs, just like their English counterpart, denote sequences of sorts of subevents of a given event, sequences of biting sort-of-events in the present case, each of which is somewhat less (in intensity, duration, accomplishment, and so forth) than the singular event denoted by the simple verbs *mordere* and *mordre* 'bite'. They are numerous, although their number cannot be extended at will (see below), and many of them (not the examples just given) belong to a colloquial, emotionally coloured register.

Traditional grammars have analysed these verbs as instances of an evaluative group and formed by a morphological process of affixation of a diminutive suffix. This type of analysis has been taken up in current morphological studies, that focus primarily on the facet of meaning of diminution, see e.g. (Grandi, 1998; Bertinetto, 2004), and (Dressler and Merlini Barbaresi, 1994) on the diminutive suffix in general. On the contrary, our study focusses on the multiplication effect, hence the relabelling of the group as pluractional. In section 2, we look at data and the morphological side of these verbs and claim that they do not result from a derivational process despite appearances. In section 3 we look at semantic properties of the phenomenon, and in section 4 we try to account for the conjunction of repetition and diminution that is a regular component of the meaning of these pluractional verbs. We wish to establish that internal repeated phases only have a dependent existence



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

with respect to the event that contains them. Because of this, they are not accessible to properties of tense-aspect affixes, adverbs, etc., which only modify at event level. Phase multiplication within an unextended event is what produces, we suggest, the diminution effect through a compensation process. Considering both sides from a morphosemantic perspective, the reason why plurality applies to phases rather than to the event may well be that event internal pluractionality in Italian, French and English is expressed by words, simple words like English *nibble, flutter*, etc., or possibly more complex words like *mordicchiare* and *mordiller*. This suggests that, at least in these languages, pluractionality expressed in the word only accesses the level of the phase, whereas phenomena taking place at levels higher than words access the two higher levels identified by Cusic (1981), events and occasions (see below), and possibly phases as well.

## 2. The Morphology side

### 2.1. Data and Morphological Properties

As mentioned, French and Italian include a sizable number of verbs characterized by special pluractional-diminutive meanings as well as by specific endings. Many, like It *mordicchiare* and Fr *mordiller* are paired with simplexes, here *mordere* and *mordre*, having the same meaning but for the pluractional-diminutive nuance. Other examples are It *canticchiare* 'hum' vs. *cantare* 'sing', *dormicchiare* 'slumber' vs. *dormire* 'sleep', etc. Many verbs of this class, however, showing the same meaning and the same endings, stand on their own, either because the simplex counterpart does not exist or because it cannot be semantically related. Examples of the former state of affairs are It *balbettare* 'stammer' and Fr *boursicoter* 'play the Stock Exchange in a petty way', as neither *balbare nor *bourser are actual words. In the case of It *volteggiare* 'fly about' and Fr *barbouiller* 'daub', on the other hand, there are the simplexes *voltare* and *barber*, but they mean 'turn about' and 'bore' respectively.

No matter whether they are paired or not, all these verbs consist in a stem and a particular ending. Both languages make use of several of these phonological strings. A preliminary survey enabled us to extract the following fourteen endings for Italian and nine for French.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Table 1 Phonological strings used in pluractional verbs

| phonological string | Italian example | phonological string | French example |
|---|---|---|---|
| /akkj/ | *fumacchiare* | /aj/ | *tirailler* |
| /ač/ | *sprimacciare* | /as/ | *rêvasser* |
| /dzol/ | *penzolare* | /et/ | *voleter* |
| /edž/ | *sorseggiare* | /ij/ | *mordiller* |
| /ekkj/ | *punzecchiare* | /ikot/ | *tournicoter* |
| /ell/ | *saltellare* | /niš/ | *pleurnicher* |
| /ett/ | *fischiettare* | /on/ | *chantonner* |
| /ikkj/ | *canticchiare* | /ot/ | *vivoter* |
| /iñ/ | *tocchignare* | /uj/ | *mâchouiller* |
| /ukol/ | *piagnucolare* | | |
| /ol/ | *tremolare* | | |
| /ondzol/ | *gironzolare* | | |
| /ukkj/ | *leggiucchiare* | | |
| /uts/ | *tagliuzzare* | | |

Data like It *mordicchiare, fumacchirare* look as cases of staightforward deverbal derivation by means of suffixes analogous to, say, Latin inchoative /sk/ in *florescit* 'it begins to blossom' next to *floret* 'it blossoms'. Several facts militate against this conclusion, however. We shall present them according to their increasing weight. First there is the fact that most endings listed in Table 1 are unproductive. In Italian productivity mostly concerns the four endings in [kkj]. In French only /aj/, /-ot/, and /uj/ seem to be moderately productive (see Corbin, 1987; Roché, 2002, to appear). True, it is a rather common situation for derivational suffixes to be no longer productive in the present state of a language, even though they still can be analysed and recognized as such: cf. English -th in *depth, width,* etc. next to *deep, wide,* etc. Yet, given the specificity of the meaning attached to them, their often colloquial character, and their easy segmentation from the stem, we would expect more productivity for these endings than is actually observed. Secondly, the fact that some verbs appear with two different endings without any meaning difference (e.g., Fr *mâchouiller* and *mâchonner*, both more or less meaning 'chew') isn't unheard of in derivational morphology (cf. Fr *nettoyage* and *nettoiement*, both meaning 'cleaning'). However, the usual state of affairs is for one form to 'block' all other possible forms, as with English *arrival* blocking *arrivation (see Aronoff, 1994) or for the two forms to specialize their meanings. Alternate endings are rare in our class of verbs, but they are not exceptional, at least in French.

A third reason for doubt, probably the most serious, is the massive presence of verbs like It *sorseggiare* or Fr *barbouiller*, which include the particular endings and the pluractional meaning, but cannot be paired with simple verbs lacking the endings and sharing the same basic meanings. Isolated pseudo-derivations exist, for instance, *sloth* does not relate to *slow* any longer, and there isn't any English verb at the source of *tuition*. But the usual and reasonable conclusion is precisely



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

that *sloth* and *tuition* are not derived words similar to *depth* and *intuition* in Modern English despite their ending in something that looks exactly like the suffixes -th and -ion of the latter forms. In other words, in *sloth* and *tuition* the final segments belong to the root as they do in *moth* and *carrion*. One could extend this reasoning to *sorseggiare* and *barbouiller*, considering them simple verbs like, say, *specchiare* 'reflect in a mirror' and *mouiller* 'wet'. But then, it would follow that /(e)kkj/ and /uj/ are viewed as parts of the root in *sorseggiare* or *barbouiller*, but as derivational suffixes in *canticchiare* and *mâchouiller*—which can be paired with *cantare* and *mâcher*—despite the fact that all these verbs share a common and specific shade of meaning clearly related to the ending's presence. The number of verbs that belong to the unpaired case disfavours this hypothesis.

We are thus facing a dilemma: on the one hand, the point that *sorseggiare* and *barbouiller* are not deverbal derived verbs is consistent with our other reasons for rejecting a derivational analysis across the board, so that *canticchiare* and *mâchouiller* shouldn't be viewed as derivations either despite appearances. On the other hand, although we accept that /-uj/, /-(V)kkj/, etc. are not derivational suffixes under any circumstances, we feel very reluctant to regard them as mere segments of the roots—in paired as well as unpaired items—given the obvious part they play in the interpretation of the verbs. The dilemma is a real one and we shall have to find a way to resolve it.

That said, some of the unpaired verbs could still be considered to be derived, only not from verbs, but from nouns: Fr *boursicoter* from *bourse* 'purse, stock exchange', *grappiller* from *grappe* 'bunch', *pianoter* from *piano*, *sorseggiare* from *sorso* 'sip', etc. This is not the general case, however: no noun—or none with the relevant meaning in the present-day language—can be associated to, e.g., Fr *barbouiller* (*barbe* means 'beard'), *marmonner, tripoter* (*tripot* means 'low-life gambling place, dive'), etc., or It *pencolare, sprimacciare*, etc. All these verbs share involved, usually obscure histories. For instance, *barbouiller*, attested as soon as the 15th century, is said to be possibly related to *barboter* 'dabble, splash about' with a change of ending, *tripoter* (1482) may have to do with an old, now quite forgotten sense of *tripot*, namely 'wiles, trickery', *gribouiller* perhaps comes from Dutch *kriebelen*, the ending of which was assimilated to native /-uj/.

Even when the relationship to a noun is fairly clear, the actual path between the two items is always intricate. In *pianoter*, for instance, the /o/ is probably the final vowel of *piano*, while /t/ represents the usual epenthetic consonant in French, so *pianoter* is indeed historically a denominal verb similar to, say, Fr *marteller* and It *martellare* 'hammer' next to *marteau* and *martello* 'hammer'. Yet its meaning, apparently constant since the first attestation in 1841, indicates that the /ot/ ending immediately caused it to be assimilated into the pluractional-diminutive group. Likewise, *boursicoter* (1580) was formed on the now extinct diminutive form *boursicot* of *bourse* in the special sense of 'stock exchange'. All this, anecdotic as it may be, goes towards the assumption that the endings that identify our verbs never



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

were verbal suffixes, but are semantically active by virtue of their form.

Before spelling out the conclusion we wish to draw from this, we point out a few more facts that also support our assumption. One is the very formal exuberance of the class as compared with the relative semantic uniformity of its members. Not only are the endings numerous, but no synchronic explanation can be found for the presence of one rather than the other in a given verb. It is not clear why we have It *canticchiare* (not *cantellare) next to *saltellare* (not *salticchiare), Fr *mâchouiller* (not *machiller) next to *sautiller* (not *sautouiller). In contrast, alternative derivational suffixes with the same meaning are never so numerous, and the presence of this or that one, say -th in *depth* as compared with -ity in *rapidity*, can generally be accounted for historically.

Next, all these verbs belong to the 1st conjugation class, whereas paired simplexes (when they exist) appear in all classes. Such an uniformity is surprising, because conjugation class in Italian and French is a property of the simple stem. Finally, a weaker, but still significant reason is that, were they derivational formatives, these endings would realize the only suffixal, verb-to-verb derivation in the Romance languages generally, where deverbal verbs are eminently prefixal, cf. It *fraintendere* 'misapprehend' vs. *intendere* 'apprehend', Fr *dénouer* 'untie' vs. *nouer* 'tie', to take examples where there is a clear meaning relation between simple and derived verbs.

### 2.2. An Alternative Morphological Analysis

Being neither suffixes, i.e. morphemes in their own right, nor undistinguished parts of the root, the endings of the verbs under consideration must be submorphs, i.e. phonological strings without a meaning, but inducing meaning effects related to their phonic substance through what is traditionally called 'sound symbolism' (see Dressler, 1990). Perhaps the best-known examples of such elements are the /sl/ and /gl/ clusters in English *slip, slide, slither, slobber,* etc., or *glimmer, glint, glitter, glow,* etc. Our claim, then, is that /uj/, /ot/, /ekkj/, /ell/, etc. are similar to /sl/ and /gl/ insofar as their very sound draws native speakers of Italian and French to assign a certain interpretation to the items that include them, even if they don't know the exact meaning of the item: you may be unsure as to what precise event is described by *tournicoter*, but by just hearing it you can't be in any doubt about the type of event it is. This type is that of an event the internal structure of which is characterised by a multiplicity of micro-events having the same nature and distinct from the whole event. Pluractionality is thus a feature of the whole form, flagged by the phonetic form of the ending. This agrees with the semantic nature of internal pluractionality, not an added specification, but an inherent modification of the structure of the event denoted by the verb without the submorph, if any. It also accounts for why there need not be a verb without the submorph, cf. *grouiller* 'swarm' also including a submorph, compare *swell, swelter, swill, swirl*.

Analysing the endings as submorphs allows us to resolve the dilemma pointed



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

to above: they are parts of the root, but their phonetics makes them distinguished parts of the root. Given this, such verb forms as It *canticchia* 'she hums, sings to herself' may be morphologically represented as composed of a root/stem /kantikkj/ plus /a/ which is the realisation of the set of inflectional features including conjugation class (1st), tense (Present), mood (Indicative), and the agreement features 3rd person singular. The same applies to Fr (elle) *chantonne*, mutatis mutandis.

## 3. Semantic Properties

### 3.1. General Semantic Properties

As said in the introduction, pluractional verbs are understood to denote pluralities of events. In his seminal contribution, Cusic (1981) has supposed that verbal plurality concerns several conceptual levels and has proposed a hierarchical arrangement of bounded units in three levels of structure: occasions, events, and phases. Pluralisation is possible at each level, indicating more than one isomorphic bounded unit of that level (Cusic, 1981, p.69). Every event is composed of at least one phase and every phase belongs to at most one event. Similarly, every occasion is composed of at least one event and every event belongs to at most one occasion (see his event ratio parameter 1). The different forms of event plurality can combine.

Depending on the level that is pluralized, one is led to distinguish two types of plurality. First, there is event external plurality when the event itself is pluralized and viewed as 'repeated' action cases, which is the case in occasions and events repetition. The source of the multitude of occurrences of one event type is identified by Cusic (1981) as i) a plural participant giving rise to a distributive effect (his distribution parameter 4), and ii) the assumption of an interval long enough to be a closure over a relevant set of intervals/occurrences, e.g. frequentative and habitual readings, according to our understanding of his connectedness parameter 3. Second, there is event internal plurality when pluralisation occurs at the level of phases, being interpreted as phase repetition within the boundaries of one event. Phase is a term often used with a different meaning in the literature on aspect and to avoid confusion, we will rename the relevant notion as C-phase (for Cusic's phase) in the following. C-phases are isomorphic event internal units, and no structure internal to them is visible. Our claim is that C-phases are dependent units and their emergence in linguistic terms is the manifestation that the threshold of resolution for perception that allows a grouping has been crossed. The threshold corresponds to the point from where the type of the description is no longer valid. Therefore, we see no reason to maintain that single events are constituted of one C-phase and we will be led to abandon strict structural identity of pluralities at all levels.

Finally, a peculiarity of the phenomenon is the fact of allowing variation in the relative measure of one dimension of the events, i.e. Cusic's relative measure parameter 2.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 3.2. Specific Semantic Properties

Event plurality does not find its source in argument plurality in Italian and French. For instance, the subject is strictly unmodified by event plurality as such in the group of verbs under examination, i.e. all the C-phases have the same agent. The action described by a verb of this type does not have a duration that differs from that of the 'simple' verb. No order, be it temporal or spatial, is associated with C-phases, as shown by (1) where more holes can be punched at the same time or place.

(1) Il colpo di fucile ha bucherellato l'otre 'The gunshot riddled the waterskin with holes'

Intuitively, the change in the structure of the event between *bucare* 'make a hole' and *bucherellare* 'riddle with small holes' is an effect of redistribution of resources over a larger number of C-phases coupled by what looks like a compensatory operation that ensures that the event remains maximally connected. The holes are increased in number and decreased in size and are viewed against the same spatiotemporal backdrop, where the holes need not be evenly distributed.

## 4. Semantic Analysis

### 4.1. Discussion

Lasersohn (1995) offers a formalisation of Cusic's analysis of pluractional markers. In particular, he endorses the idea that the plural forming operation is the same at all levels and posits the same structure for the resulting internal and external event pluralities. For a given verb V, the meaning of a pluractional form which is a combination of the verb with a pluractional marker (PA) is as in (2), (Lasersohn, 1995, p.256). The set of events with property V is a collection whose elements are events with property P and whose cardinality is pragmatically set to a value that can vary but is necessarily no less than 2.

(2) $\text{V-PA(X)} \Leftrightarrow \forall\, e \in X[P(e)]\ \&\ \text{card(X)} \geq n$

The price to pay for this uniformity between events and C-phases is that the insight expressed by the hierarchical structure is lost, at best it comes down to the unexplained quirky constraint on the property of events P, which is equated to V for event external pluractionals but is defined case by case in the lexical entries of the verbs in event internal pluractionals.

The instances of an event type that make up the collection are differentiated along the three temporal, spatio-temporal or participant dimensions. Disjunction along one of them warrants boundedness, which provides a semblance of discretude sufficient for plurality. Thus, Lasersohn adds to (2) a clause requiring non overlap in either time, space or participants, that determines whether the distributivity is temporal, spatio-temporal or participant based. This constraint is problematic for event internal plurality, since it says that the C-phases of an event, like full events, can always be all singled out along one dimension. However, distinction i) can



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

be barred for C-phases in a dimension open to events, namely participants, and ii) gives an inaccessible output in all cases.

Let us consider the first problem. Like internally complex single events, internally plural events require argument identity across C-phases. Lasersohn's solution consists of allowing thematic relations $\theta$ to hold between groups of events X and their participants g, see (3) (Lasersohn, 1995, p.257).

(3) $\theta(X)(g) \Leftrightarrow g = \{x \in U | \exists e \in X\ \theta(e)(x)\}$

However, this does not help in explaining why constraints on thematic relations differ for pluralities of events and C-phases. In internal plurality, thematic relations must hold between groups of C-phases and the same atomic participants. Example (4a) means that Daniel ate each biscuit in little-bitings. The sentence cannot describe felicitously the situation where half of them were swallowed in big gulps. He may not eat a few biscuits, but the rest must be eaten little by little. Daniel also does not have to eat any biscuit in total. Similarly, in (4b), one or two cuts per apple won't do even if there are many apples, hence many cuts in total.

(4) a. Daniele ha mangiucchiato i biscotti 'Daniel nibbled the biscuits'

b. Luisa ha tagliuzzato le mele 'Louise chopped the apples'

As for the second problem, the inaccessibility of C-phases shows in the fact that C-phases cannot be ordered in time, nor is it possible to check that the intervals they occur in are disjoint, because they do not occur as such and the running time of C-phases is not specified individually. Running time is defined at the level of the event and provides the interval within which C-phases take place with no a priori positioning. The little-bitings making up a nibbling take place one after the other only for pragmatic reasons, because each of them is done by the same mouth, not because there is an external constraint that prevents their running times to overlap. But the temporal trace function that Lasersohn uses for preventing overlap among events making up a plurality is meant to ban overlaps for events and C-phases alike. A clear counterexample is provided by (1), where many holes can be punched at the same time and many at the same place. Furthermore, little-bitings cannot be too wide apart and yet constitute one and the same nibbling event, instead they require a temporal proximity which is not accounted by the proposal.

Further evidence that C-phases do not occur individually is provided by the fact that C-phases cannot be counted. Example (5) means only that there were two events of nibbling, not two little-bitings making up one nibbling. Similarly, adverbs never quantify on C-phases and (5) show that the ban is not just on numerical quantification, as for Chechen according to Yu (2001).

(5) Daniele ha mordicchiato la matita due volte 'Daniel nibbled the pencil two times'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(6) a. Ha mordicchiato molte volte la matita 'S/he nibbled the pencil many times'

b. Ha mordicchiato spesso la matita 'S/he often nibbled the pencil'

The impossibility of counting C-phases follows from the lack of information that single them out. Duration of events can be compared, not duration or number of C-phases, see (7) and (5).

(7) Daniele ha mordicchiato la matita più di Maria 'Daniel nibbled the pencil more (=longer) than Mary'

At this point, a natural question to ask is whether we can still claim that there is a plurality of C-phases. The two tests for pluractionality proposed in the literature (Filip and Carlson, 2001; Laca, 2007) concern the incompatibility with adverbs negating the existence of disjoint V-intervals, like *simultaneously*, and the incompatibility with adverbs asserting the complete temporal overlap of V-subevents, like *all at once*. When we apply them to our verbs we get the results in (8). But since these tests fail for activities (atelic) and states (homogeneous), as shown in (9), it is not clear what we test in (8). Furthermore, we have argued that temporal disjunction cannot be enforced on C-phases.

(8) a. *Daniele ha mordicchiato la matita simultaneamente 'Daniel nibbled the pencil simultaneously'

b. # Daniele ha mordicchiato la matita tutto in un colpo 'Daniel nibbled the pencil all at once'

(9) a. *Ha corso simultaneamente 'He run simultaneously'

b. *Ha corso tutto in un colpo 'S/he run all at once'

c. *E' contento tutto in un colpo 'S/he is happy all at once'

We propose a new criterion based on the observation that for several of the paired verbs, the simplexes have semelfactive readings that are systematically blocked for the pluractional verbs, see (10).

(10) a. # Daniele ha tossicchiato (un colpo di tosse) 'Daniel coughed (a single cough)'

b. # Daniele ha mordicchiato la matita (un singolo morso) 'Daniel nibbled the pencil (a unique bite)'

c. # Ha tocchignato l'avocado (una sola toccata) 'S/he touched the avocado (a single touching)'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 4.2. Treating C-phases

As pointed out above, some aspects of Cusic's proposal are difficult to reconcile. One must give up either the event/C-phase distinction, or the notion of a unique plural formation operation at all levels. In a way, Lasersohn gives up the former; In this paper we explore the hypothesis of partially giving up the latter, while keeping Cusic's claim that event-internal plurality produces single events.

The data discussed in the previous section provide evidence that in an internally plural event, C-phases are independent from any plurality expressed in an argument position. C-phases are units that depend on the event they belong to. Their dependent status manifests itself primarily in the fact that thematic relations are defined at the level of the event, and then the participants in the event are related with the entities involved in the event's C-phases. These pluractional verbs meet the unique participant constraint for each thematic role. We assume that event internal plural verbs are basic predicates, in the sense that they are predicates with a thematic commitment so that, whatever properties are associated with a thematic role, the object that fills that role in that predication has those properties at the event level. In a sentence like (11), the subject Daniel fills the thematic role of agent of the verb and the pencil is the patient.

(11) Daniele ha mordicchiato la matita 'Daniel nibbled the pencil'

We think that the key to explain the thematic constraint noticed above lies in the fact that the collection of C-phases really makes a single event and that events are the basic level in the ontology; As an aside, note that this explains the connectedness fact. Thus, we have to define the type of the event and fill the thematic roles first. Only then, we can equate the event with the groupification of a plurality whose elements are C-phases. This form of nesting makes C-phases no longer accessible at discourse level. We can use the star operator (Link, 1983; Landman, 2000), thus the plural formation remains the same at all levels. However, Landman shows that when a plural role of a predicate *P is filled with an atom, say a, the statement $\exists$ e (*P(e)$\wedge$ *Ag(e,a)) reduces to singular predication. The atomicity of the range of a function plural role warrants plurality of events, a distributive reading; But for a single atom, plurality requires grinding, so that the atom can be partitioned into parts over which to distribute. Grinding usually applies to the explicit or implicit patient/theme of these verbs. The predicate used at C-phase level is a 'partial' version of the event predicate. Its roles are plural roles except for the grinded argument. For this argument, we borrow from Landman the definition of a mass cover role, which is a role that takes an atom as argument and requires the application of the corresponding plural role to the cells of its cover. Putting it all together gives the entry in (12) for *mordicchiare*.

(12) $\lambda x \lambda y \lambda e[(\text{MORDICCHIARE}(e)\ \&\ \text{Ag}(e,y)\ \&\ \text{Pat}(e,x)) \Leftrightarrow$
$\exists e'(*\text{MORDICCHIAREPart}(e')\ \&\ e =\uparrow e'\ \&\ *\text{Ag}(e',y)\ \&\ {}^{\text{M}}\text{Pat}(e',x))]$



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

As it is, definition (12) accounts for the diminution effect, but not yet fully for multiplication. We still have to add that the cover applied in event internal plurality is necessarily weaker than the cover that has the atom as its unique cell. Notice also that this case of plurality falls outside the system devised by Landman inasmuch as the parts are not atoms. It should be clear why we do not want them to be atoms—the parts of the pencil in (11) are never taken as individuals, but how to fix it must be left as future work.

## 5. Conclusions

Event internal pluractional verbs in Italian and French are not the result of a morphological derivation process combining two actual morphemes. Submorphemic status captures the fact that /ikkj/ or /ij/ in *mordicchiare, mordiller* and like verbs point to two specific operations of semantic decomposition. The event is decomposed into a plurality of C-phases and at least one participant is decomposed into parts, and the C-phases are subevents affecting the parts of the participant demoted to a sum. The constant function of the submorphs is to flag a phenomenon, i.e. the crossing of a threshold for perception of a type of event internal structure. C-phases are the manifestation of a change of resolution in looking at an event that requires a new V-type of description. The constraint P≠V that Lasersohn had to stipulate falls out of the logic of our treatment. Finally, this view of event internal pluractionality casts some light on why pluractionality resembles aspectual modification at times.

## References

Aronoff, M. 1994. *Morphology by itself: Stems and inflectional classes*. Cambridge Mass USA: MIT Press.

Bertinetto, P.M. 2004. Verbi deverbali. In M. Grossmann and F. Rainer, eds., *La formazione delle parole in italiano*, 465-472. Tübingen: Niemeyer.

Corbin, D. 1987. *Morphologie dérivationnelle et structuration du lexique*. Tübingen: Niemeyer.

Cusic, D. 1981. *Verbal plurality and aspect*. Ph. D. diss., University of Stanford.

Dressler, W. 1990. Sketching submorphemes within natural morphology. In J. Méendez Dosuna and C. Pensado, eds., *Naturalists at Krems*, 33-41. Salamanca: Ediciones Universidad Salamanca.

Dressler, W. and L. Merlini Barbaresi. 1994. *Morphopragmatics*. Berlin: Mouton de Gruyter.

Filip, H. and G. Carlson. 2001. Distributivity strengthen reciprocity, collectivity weakens it. *Linguistics and Philosophy 24*:417-466.

Grandi, N. 1998. Sui suffissi diminutivi. *Lingua e Stile 4*:627-653.

Haji-Abdolhosseini, M., D. Massam, and K. Oda. 2002. Number and events: Verbal reduplication in Niuean. *Oceanic Linguistics 41*:475-492.

Laca, B. 2007. Pluriactionnalité. Sémanticlopédie du GDR Sémantique et modélisation.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Landman, F. 2000. *Events and plurality*. Dordrecht: Kluwer.
Lasersohn, P. 1995. *Plurality, conjunction and events*. Dordrecht: Kluwer.
Link, G. 1983. The logic analysis of plural and mass terms: a lattice theoretical approach. In R. Bäuerle, C. Schwarze, and A. von Stechow, eds., *Meaning, Use and Interpretation of Language*, 302-323. de Gruyter.
Mithun, M. 1988. Lexical categories and the evolution of number marking. In M. Hammond and M. Noonan, eds., *Theoretical Morphology*, 211-234. New York: Academic Press.
Roché, M. 2002. Aux origines du suffixe -ouille(r). In M. Aurnague and M. Roché, eds., *Romania et Vasconia. Hommage à Jacques Allières*, 561-572. Biarritz: Atlantica.
Roché, M. to appear. Quelques exemples de morphologie non conventionnelle dans les formations construites à partir d'un mot en -ouille(r). In B. Fradin, ed., *La raison morphologique*. Amsterdam: Benjamins.
Yu, A. C. 2001. Pluractionality in Chechen. In *Papers from the 37th Annual Meeting of the Chicago Linguistic Society*, 623-659, Chicago.

Université Paris 7
2 place Jussieu
F – 75005 Paris

tovena@linguist.jussieu.fr



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# The Agent-Obfuscating Function of *Mono* 'Things' in Japanese Discourse

NINA AZUMI YOSHIDA
*University of California, Los Angeles*

## 0. Introduction[1]

A noted characteristic of the Japanese language is its preference for grammatical patterns that suppress or obfuscate (individual) human agency (e.g. passives, honorifics, subject-ellipsis, etc.) This tendency is claimed to be a linguistic manifestation of Japan's collectivistic behavioral and cultural norms (Ikegami 1981, Yamamoto 2006). This study examines another phenomenon in Japanese seen as reflective of this cultural concept, namely, the modal functions of *mono* in Modern Japanese, and presents a unitary analysis to account for the seeming multi-functionalities the morphosyntactic unit *mono* has as a marker of speaker modality in Japanese discourse.

The analysis is termed a unitary one in claiming that a continuity exists in the semantics born by *mono* in each of its different modal uses, and that these represent inferable extensions of *mono*'s primary meaning as a nominal that arise as a result of this element's occurrence in certain constructions which have become grammaticalized (Hopper and Traugott 1993) in Modern Japanese. It will also be suggested that the obfuscation of the speaker as (an event-controllable) agent is a functional byproduct of such *mono* constructions in the context of discourse. In further illustration of the linguistic phenomenon under examination, the following section briefly surveys the main lexical and grammatical uses of *mono* in contemporary Japanese. In order to highlight the uses particular to it, *mono* will be compared, where relevant, against another nominal considered quite similar to it in meaning—namely, *koto*.

[1] The following abbreviations are used: ACC=Accusative; ALL=Allative; ASP=Aspect; CL=Clause; CONJ=Conjunctive; COP=Copula; DAT=Dative; DES=Desiderative; NEG=Negative; NOM=Nominative; NPST=Nonpast; POL=Polite; PRX=Prefix; PST=Past; QT=Quotative; SE=Sentence Extender; TE= *Te* Connective; TMP=Temporal; TOP=Topic



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Nina Azumi Yoshida

## 1. Lexical and Grammatical Uses of *Mono* and *Koto*

As lexical items, both *mono* and *koto* have traditionally been categorized in Japanese grammar as belonging to a relatively small and closed set of nominals called *keisiki meisi* ('formal nouns') and as such, are said to possess a minimal and opaque meaning, much like *thing(s)* of English. Being formal or dependent nouns, *mono* as well as *koto* typically occurs with a modifier, but may appear alone in the limited contexts of fixed or idiomatic expressions.[2]

### 1.1. *Mono* and *Koto* as Head Nouns

Generally speaking, *mono* and *koto* express the meaning 'thing' of English. Reference grammars for students of Japanese commonly explain the choice between them as being governed by the opposing semantic notions of "concrete" versus "abstract" (Martin 1975, McGloin 1989), or "tangible" vs. "intangible" (Makino and Tsutsui 1986). Consider the following sentences taken from McGloin (1989),[3] in which such oppositions are neatly exemplified:

(1) a. Iroiro-na **koto** (***mono**) o naratta.
various **KOTO** (***MONO**) ACC learn:PST
'(I) learned various things.'

b. Iroiro-na **mono** (***koto**) o katta.
various **MONO** (***KOTO**) ACC buy:PST
'(I) bought various things.'

*Koto* is often preceded or modified by a verb phrase in the non-past or imperfect form to indicate 'the activity of'.[4] When this *koto* is replaced by *mono*, and is preceded by a transitive verb, it indicates the object upon which the act takes place or the performer of the act. Examples of this usage are given in (2):

(2)

| Verb | Verb *+koto* | Verb *+ mono* |
|---|---|---|
| <kaku> | <kaku**koto**> | <kaku**mono**> |
| 'to write' | 'writing' | 'things to write on' (paper, desk, etc.) |
| | | 'things to write with' (pen, crayon, etc.) |
| | | 'the one who writes' |

---

[2] (i) Tosiyori wa yoku **mono** o sitteiru.
elderly people TOP well thing ACC know:NPST
'The elderly know things well' --> 'The elderly are wise.'

(ii) **Koto** ga okiru mae ni syori-sita hoo ga ii.
thing NOM happen:NPST before TMP deal:PST side NOM good
'(It) is better (we) deal with (it) before (some)thing happens' -->
'(We) should deal with (it) before an accident/incident occurs'

[3] McGloin 1989: 110

[4] In this grammatical function, *koto* is more commonly recognized as a nominalizer; one of the two (along with *no*) existing in Modern Japanese.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



| <tukuru> | <tukuru**koto**> | <tukuru**mono**> |
|---|---|---|
| 'to make' | 'making' | 'things to make' |
| | | 'things to make (something) with' |
| | | 'the one who makes' |

### 1.2. Prenominal/Preadjectival Uses of *Mono*

*Mono* possesses a grammatical use whose equivalent is not found in the case of *koto*. When *mono* is attached pre-adjectivally or pre-nominally, it imparts a sense of indefiniteness or vagueness, roughly equivalent to *somehow* in English. It increases the ambiguity or the inability to pinpoint the underlying source of the sensation or phenomenon to which it is prefixed. Examples of this usage of *mono*+adjective and *mono*+noun are provided in (3) and (4), respectively:

| | | |
|---|---|---|
| (3) | sizuka / **mono**-sizuka | 'quiet; serene' / 'strangely quiet' |
| | sabisii / **mono**-sabisii | 'lonely' / 'vaguely lonely |
| (4) | oto ga suru / | **mono-**oto ga suru |
| | 'hear sounds' | 'hear the sounds of something' |
| | kage ni kakureru / | **mono-**kage ni kakureru |
| | 'to hide in the shadows' | 'to hide in the shadows of something' |

### 1.3. The *Mon(o)da* and *Kotoda* Construction

*Mono* (as well as *koto*) functions frequently as a complementizer in Japanese, the common pattern being that of *mono* (or *koto*) immediately preceded by a clause or phrase in the *rentaikei* 'attributive' form, and followed by the copula *da*, as shown diagrammatically in (5):

(5) [clause]$^{\text{attributive}}$ + *mono/koto* + copula *da*.

The *mon(o)da*[5] construction, in particular, has been identified by a number of modern Japanese grammarians (e.g. Martin 1975, Makino and Tsutsui 1986) as possessing the linguistic capacity to imbue an otherwise neutral or "objective" statement with various degrees of the speaker's subjective or emotive affect, ranging from nostalgic reminiscences, long-nurtured desires, deep amazement/ wonder, conviction toward an unquestionable/natural truth, as well as to indirect commands. Examples of each are given, respectively, in (6) to (10) below:[6]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (6) | Mukashi wa | yoku | kono | kooen | de | asonda | **mon(o)**da. |
| | long ago TOP | well | this | park | at | play:PST | **MONO**:COP |
| | 'Back then/Long ago, (I) sure used to play at this park a lot' | | | | | | |

[5] In colloquial or informal discourse contexts, *mono* may take the contracted form *mon*; hence, *monoda*, may, in such contexts, become *monda.*

[6] Examples adapted from Martin (1975:725-726).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(7) Konna rippa-na uchi ni ichido wa sumitai **mon**(o)da.
like this magnificent house in once TOP want to live **MONO**:COP
'If just once, (I) sure would want to live in a magnificent house like this.'

(8) Yoku(mo) anna koto ga ieru **mon**(o)da.
well that kind of thing NOM can say:NPST **MONO**:COP
'It's incredible/amazing that (you) could say such a thing.'

(9) Inu wa hoeru **mon**(o)da.
dog TOP bark:NPST **MONO**:COP
'Dogs naturally bark.'/'It's expected that dogs bark.'

(10) Hito ni wa amari meiwaku o kakenai **mon**(o)da.
people DAT TOP too much trouble ACC cause:NEG:NPST **MONO**:COP
'(You) shouldn't cause people too much trouble.'

### 1.4. *Mono* Clausal Connective Constructions

A number of clausal linkers or clausal connective constructions that involve *mono* (e.g. *mononara*, *monodakara, monode*, *monono*, etc.) also exist in Modern Japanese. Such *mono* clausal connective constructions (hereafter, referred to as "*mono* CCCs") grammatically function to embed the *mono* CCC-marked clause as an adverbial and subordinate it within a main clause while semantically signaling an antecedent-consequent relationship that is either conditional (with *mononara*), causal (with *monodakara* and *monode*), or concessive (with *monono*) between the propositional contents of the two clauses they combine. An illustrative example of each of these *mono* CCCs are given in (11) to (14):[7]

(11) Pari e ikeru **mono**nara, itte-mitai desu.
Paris ALL can go:NPST MONO CCC go:TE-see:DES COP:POL
'If (only) (I) could go to Paris, (I) would like to go and see (how it is).'

(12) Mada tiisakatta **mono**dakara, yoku oboete-imasen.
still small:PST MONO CCC well remember:TE-ASP:NEG:POL
'(I) was still young, so (I) don't remember (it) well.'

(13) Isoide-ita **mono**de, go-aisatu mo sezu situree simasita.
hurry:TE-ASP:PST MONO CCC PFX-greeting even do:NEG be rude:PST:POL
'(I) was in a hurry, so (I) was rude to not have even greeted (you).'

(14) Kyooto made itta **mono**no Kinkakuji wa mimasendesita.
Kyoto until go:PST MONO CCC Kinkakuji TOP see:POL:NEG:PST
'Although (I) went up to Kyoto, (I) didn't see the Kinkakuji Temple.'

In the case of examples (11)–(13), it is interesting to note that the omission of *mono* would still result in a grammatical sentence expressing the same conditional and causal clausal relationships.

[7] Examples adapted from Nagara et al. (1987:112-114).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



### 1.5. Utterance-Final Uses of *Mono*

*Mono* (and its contracted form *mon*) can also appear in the utterance-final position to reflect the speaker's "stance" toward the proposition uttered. Such uses of *mon(o)* utterance-finally are strictly limited to casual conversation, and do not appear in written or formal spoken discourse. By adding *mono*, the speaker expresses a highly subjective attitude toward the proposition with the intent of "self-justification" (Fujii 2000:101), or offers an excuse or explanation based on subjective reasoning, as seen in the next question-response pair:[8]

(15) A: Doosite sonna-ni kaado o tukaitagaru no?
why like.that credit card ACC use:DES:NPST Q
'Why do (you) (keep) want(ing) to use (your) credit card so much?'
B: Datte, genkin o tukaitakunai n da **mon(o)**.
but cash ACC use:DES:NEG:NPST SE COP:NPST MONO
'Cuz, (I) don't want to use cash.'

In light of its seemingly wide range of uses in Japanese grammar and discourse, previous accounts have suggested multiple functions for *mono* itself (e.g. as a verbal auxiliary in (6)-(10), a connective in (11)-(14), an utterance final particle in (15)). However, in taking a position similar to Fujii (2000), I will likewise maintain that it is the occurrence of *mono* within the context of a particular grammatical construction and discourse instance that causes it to be interpreted in association with a certain type of speaker modality. My analysis, moreover, will highlight the particular role played by *mono* within these constructions, notably in terms of the semantic contribution *mono* is making in each grammatical environment that involves it. The underlying semantics hypothesized for *mono* is one that has been arrived at by comparing it against *koto,* with which *mono* is claimed to stand in a mutually oppositional, semantic relationship.

## 2. The Semantics of *Mono*

As earlier noted, reference grammars tend to employ the conceptual terms of "concrete" or "tangible" in explaining the meaning of *mono*. Although such semantic notions succeed in capturing the majority of *mono*'s lexical uses, they do not fully address the acceptability of sentences such as in (16), where the logical referent of *mono* does not appear to possess any obvious features of "concreteness" or "tangibility":

(16) Inoti wa tootoi **mono** da.
life TOP precious MONO COP
'Life is (a) precious (thing).'

[8] Example adapted from: http://www.enpitu.ne.jp/usr6/bin/month?id=64931&pg=200211



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Teramura (1981) has further provided the insight that *mono* denotes an object, or a category thereof, possessing some type of "physical concreteness" which can be perceived by one of the five bodily senses. Additionally, its meaning encompasses those phenomena having "a reality (capable of being) sensed psychologically" (Teramura 1981:754).

Taking such accounts into consideration, Yoshida (2008, to appear) has proposed a primary semantics of "physically perceived/unrationalized" for *mono*. Namely, *mono* signals an existence that is sensorily perceptible (i.e. through the five bodily senses--sight, smell, sound, taste, and touch—as well as one's inner state experiences, such as pain, hunger, emotions, etc.), and is thus indicative of a "physically perceived", and by token of this notion, an "un-rationalized" experience, an existence whose presence is "directly" perceptible, or to be perceived, without the aid or use of one's mind and its rationalizing powers.[9]

Furthermore, because *mono*'s semantics denote a phenomenon whose actual existence can be validated by sensorial means alone (i.e. without the need for mental processing) it prototypically indicates a physical or material object. However, since its meaning also signals an existence whose perceived presence is to remain "unrationalized", it connotes that which "somehow exists", and by token of this, is unidentified, undifferentiated or un-individuated; namely, a "generic", "general", or "collective" entity.

In this respect, *mono* may potentially reference a substance having an (actual or construed) internal homogeneity, such as in the case of abstract nouns (e.g. *inoti* 'life', *yasasisa* 'kindness', *kiboo* 'hope'), or a person, albeit in a generic, physical sense, and would thus be inappropriate in referring to a uniquely identified individual or one meriting respect or distinction.[10]

Next, the structural properties of the *mon(o)da* construction will be discussed, along with the role which *mono*'s proposed semantics plays within it to generate speaker modality.

## 3. The *Mon(o)da* Construction: Structural Properties

Yoshida (to appear) has initially proposed that the *mon(o)da* construction's close structural resemblance to the commentary predicate[11] --namely, that of a predicative clause nominalized by *mono*, occupying the comment position of a topic-comment (i.e. $NP_A$ *wa* $NP_B$ *da*) type construction--that this is a key

[9] In contrast, Yoshida (2008, to appear) proposed *koto*'s primary semantics as "cognitively conceived/rationalized"; hence, *koto* refers to an existence that either has undergone or will require processing within one's mental faculties, and that one's powers of rationalization must be called in to enable this *koto* to become "(existentially) perceptible".

[10] When employed as a noun with a substantial meaning, the Japanese *kanji* orthography allows a distinction to be made between the *mono* meaning 'person' from that of 'physical object'. However, as noted above, the former refers to a person, but to one lacking distinction; hence, its common use in Japanese to humbly introduce oneself (e.g. *Yosida to iu mono desu ga*. / Lit. 'I am a *mono* (=someone) named Yoshida.')

[11] This term was derived from, and is being used here with same meaning given it in Maynard (1992:591-595).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

structural factor contributing to its pragmatic capabilities. A comparative showing of these two constructions is given below in (17):

(17) < TOPIC > < C O M M E N T >
$NP_A$ *wa* $NP_B$ *da*

< *M O N (O) D A* >
[clause]$^{ATTRIB}$ + ***mono*** +*da*

It was also suggested that there exists two types of *mon(o)da* constructions: i) Those which may be interpreted as consisting of "regular" nominalized predicates, in that the nominal element *mono* serving as the head noun retains its nominal status as the referential object of the *wa*-marked topic, and ii) those which have become formulaic or grammaticalized to the extent that the *mono* has seemingly lost its nominal status and bears only a "non-referential" or modal meaning.

For example, in the absence of additional context, native speakers of Japanese may find the token of *mon(o)da* use in (18) ambiguous, with two or more possible readings as given in (18a)-(18c):

(18) Hasi wa taberu toki ni tukau **mon(o)**da.
chopsticks TOP eat:NPST when DAT use: NPST **MONO**:COP
a. 'Chopsticks are (some)thing (one) uses when (one) eats.'
b. 'Normally/Generally, chopsticks are used for eating.'
c. '(You) are supposed to use (the) chopsticks for eating.'

In the first reading (18a), the head noun *mono* takes on a referential reading, and refers semantically to a 'thing' modified by the clause *taberu toki ni tukau* 'use when (one) eats', which in turn serves to comment on or define the *wa*-marked topic *hasi* 'chopsticks'. In the second and third, however, *mono* is no longer functioning as a nominal with a referent, but as a modal marker, in this case, to mark the proposition *hasi wa taberu toki ni tukau* 'chopsticks, (one) uses when/for eating' with the speaker's epistemic stance, as a general or common-sensical truth (in 18b), or deontic stance, as a directive (in 18c), respectively.

Thus, the predicative noun *mono* in the non-referential *mon(o)da* construction is a morphologically manifested "cue" whose function it is to direct the hearer on how, or in what manner, its nominalized propositional contents are to be received. It is this proposition, made non-challengeable[12] through its nominalization, and embellished with the speaker's propositional attitude (Fujii 2000) in the form of

[12] As initially noted by Givon (1982), the propositional contents of a clause modifying a nominal element have been shown cross-linguistically to be 'nonchallengeable', or shielded from challenge (Givon 1982:100).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

*mono*, which is then presented to the hearer when a non-referential type nominalized predicate like *mon(o)da* is uttered.

The various attitudinal stances of the speaker (e.g. deontic, epistemic, evaluative) signaled by the *mon(o)da* construction derive themselves from the underlying meaning *mono* possesses as a element in these constructions, as discussed in the section to follow.

## 4. How Speaker Modality Arises in the *Mon(o)da* Construction

In Yoshida (to appear), it was proposed that when *mono* occurs in the *mon(o)da* construction where it functions to convey speaker modality, thus taking on a non-referential reading, the primary meaning signaled by this element is extended to a secondary one. *Mono*, whose underlying semantics denote a certain existence (i.e. one that is "physically perceived/unrationalized"), comes to connote a type of extant "truth" for an epistemic reading (as in 18b), or an "obligation" for a deontic reading (as in 18c). The speaker's choice of nominalizing a propositional content with *mono* functions to point out the authoritative "source" or basis behind the epistemic verity or deontic necessity so marked.

The type of authoritative source *mono* references derives itself by extensions both metaphorically and metonymically inferred of its proposed underlying meaning. Namely, *mono,* whose referential meaning as a nominal denotes an existence that occupies a vaguely defined but constant area in three-dimensional space, "shifts" by way of metaphorical extension (i.e. SPACE > TIME) to connoting a proposition with temporal persistence. *Mono*'s semantics of denoting an "unrationalized" existence with a spatial orientation is furthermore reinterpreted as referencing a basis for a truth or obligation whose validity has persisted, unquestioned and/or unexplicated, throughout time. Moreover, a "physically-perceived" existence is metonymically (i.e. PHYSICAL > SOCIAL) reinterpreted as connoting a socially-recognized one. These mechanisms, operating synergistically, are claimed to generate such secondary meanings as "communal/social norm" or "general/consensual/common-sensical truth"[13] for non-referential *mono*.

A definition is typically that which provides the most commonly recognized description of an entity's qualities or characteristics, namely the one most generally or normally associated with it. Thus, in the epistemic reading given in (18b), the proposition 'use when (one) eats' is being presented as a generally-known truth regarding the *wa*-marked topic, 'chopsticks', and moreover, as one without need of further explication. This results in a so-called "definitional" interpretation, although strongly colored with the speaker's subjective affect that this truth is to be accepted "as is".

As initially suggested in Yoshida (2008), the deontic reading of the *mon(o)da* construction as an indirect command, derives as a result of pragmatic implicatures

[13] This coincides with the notions of *ippanteki* 'generic/general' and *ippansei* 'generality' posited as the meanings of modal *mono* by Agetsuma (1991) and Tsubone (1994), respectively.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



made on the part of the hearer when it occurs in a certain discourse context (i.e. the clause modifying *mono* contains a predicate with non-past inflection, typically a verb denoting an agent-controllable action, and the utterance containing this nominalized predicate is directed toward an overt or implied second-person referent).

Thus, in a situation where example (18) is directed toward a child who is using his chopsticks to play drums (instead of eating) with them, its utterance would be interpreted as a directive stating 'You're supposed to use (the) chopsticks for eating!' It is an "indirect" command in that the speaker is merely stating what the norm or desirable action should be, and it is up to the hearer to then determine how their behavior or actions (as they relate to the current discourse context) deviates from it. Through the speaker's presentation of the propositional contents as a *mono*, they are identifying the authoritative "voice" behind the deontic necessity as that belonging to an unindividuated (i.e. "unrationalized") aggregate of agents, namely, the society or community whom the speaker is acting as the medium for.[14] This in turn, I suggest, results in an "obfuscation" or diffusion of individual agency (including that of the speaker): Precisely who or what was responsible for the establishment of this time-honored obligation/truth gets "muted" from issue. Only the actuality of the obligation/truth's existence is asserted, and this alone serves to validate its necessity or veracity.

It was aforementioned that, by token of its underlying semantics (i.e. physically-perceived/unrationalized), *mono* potentially references an unidentified, undifferentiated or unindividuated existence; namely, a generic, general, or collective entity possessing an internal homogeneity. Such an entity would necessarily be one lacking in agency; such individual agents would be subsumed and obfuscated within the collective whole. From this, I hypothesize that one of the major discourse functions of presenting a propositional content as a certain type of *mono* is to present it as one which lacks the speaker's individual agency. By extension of *mono*'s meaning, a proposition so marked--particularly when employed to mark the speaker's own emotions or evaluative stance--is one that is "uncontrollable".

It is this secondary meaning of uncontrollability, coupled with that of temporal persistence, which gives rise to the evaluative stance *mono* takes on in examples (6) and (7), where it serves as the head noun of a proposition predicated by a verb in the past tense indicating a past event or action, or the desiderative (i.e. *–tai* form). The function of *mono* in such instances is to give the effect of emotional and temporal "depth" to the proposition so marked, resulting in the nostalgic recollections and long-nurtured desire readings, respectively. An

[14] As also claimed in Yoshida (2008) the speaker's ability to cite this social norm, in turn, serves to mark them as standing in a position of higher authority than the hearer, namely, someone who has the authority to acknowledge or identify what constitutes the norm in the community or society they are representing. Thus, by implication, this individual must necessarily be someone of greater superiority in age or experience than the hearer.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

unrationalized sensation is also one that escapes one's mental grasp or which one lacks cognitive "control" over; this is rendered as the evaluative stance of deep wonder/amazement, as in example (8).

## 5. Speaker Agency and Its Obfuscation in *Mono* CCCs

Structurally-speaking *mono* CCCs consist of a clause in the *rentaikee* ('attributive form'), modifying the formal noun *mono* as a head noun, and followed by the clausal linkers *nara* or *(da)kara*, or the connective particles *de* or *no*, which in turn occupies the position of the antecedent clause and is adverbially subordinated to its consequent, main clause. This is shown diagrammatically in (19 below):

(19) <ADVERBIAL SUBORDINATE CLAUSE> <MAIN CLAUSE>
[(Antecedent)$CL_1$ $^{attributive}$*mono*+*nara/dakara/de/no*], [(Consequent) $CL_2$]

It was just suggested that a key structural factor enabling the *mon(o)da* construction to invoke speaker affect stems from its formal similarity to a predicate clause nominalized by, or modifying, the head noun *mono* followed by the copula *da* occupying the comment position of a topic-comment sentence, as illustrated in (16). Etymologically speaking, the conditional *nara* is itself an inflected form of the copula *nari* of Classical Japanese, while the copula *da* must be inserted between *mono* and the clause linker *kara*, which lends support to the notion that *mono* is functioning syntactically as a head noun in these two contexts. Likewise, in the case of the particles *de* and *no*, it may be pointed out that *de* is also the infinitive form of the copula *da*; whereas *no* is the attributive form that the copula *da* takes to mark a noun serving as a modifier. Thus, in formal terms, *mono* CCCs represent instances of a clause headed by the nominal *mono* occupying the antecedent position of a bi-clausal construction, and thus, share the same structural patterning as the *mon(o)da* construction.

It was earlier noted that, in the case of examples (11)–(13), omitting the element *mono* still result in a well-formed sentence expressing the same conditional and causal clausal relationships. However, the addition of *mono* to the conditional clause in (11) reveals the speaker's attitude toward the proposition that they regard the prospects of being able to go to Paris as unlikely or even impossible. Likewise, when *mono(da)* is inserted before causal connectives *kara* and *de* in (12) and (13), the speaker is indicating their lack of control over the situation referred to by the causal clause, *mada tisakatta* '(I) was still young' or *isogasikatta* '(I) was busy', thereby conveying to the hearer that the inability to remember was an inevitable result stemming from an uncontrollable situation which they lacked agency over.

## 6. Lack of Speaker Agency in Utterance-Final *Mon(o)*

It was also earlier noted that in the contexts of informal spoken discourse, *mon(o)* can occur in utterance-final position with the interactional functions of a pragmatic particle. By the addition of this *mon(o)*, the speaker expresses the



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



highly subjective attitude that the proposition so marked--typically a reasoning or excuse--should be accepted "as is", and without further challenge; hence, it has been termed indicative of a "self-justification" (Fujii 2000). It is significant to note that in this particular usage, *mon(o)* is functioning as an independent pragmatic particle that has lost its grammatical status as a noun.

However, despite this formal reanalysis, I claim that the pragmatic effects and attitudinal stance evoked by utterance-final *mon(o)* represents an inferable extension of *mono*'s semantics as a bare noun; namely, a physical entity/truth that "somehow exists" is inferred as a line of reasoning that "somehow exists", namely a subjectively based, "self-justification" reflective of the speaker's lack of control or responsibility over it.

## 7. Conclusion

The aim of this paper has been, first, to show that a continuity exists in the semantics born by the element *mono* in its uses of marking speaker modality (deontic, epistemic, and evaluative) within *mon(o)da*, *mono* CCC's, and utterance-final *mono*. Second, to point out that these represent inferable extensions of *mono*'s primary meaning (i.e. "physically-perceived/unrationalized") that arise by metaphorical and metonymical means when *mono* occurs in certain grammaticalized constructions in Japanese discourse.

It has also been hypothesized that a key feature which remains constant throughout such modal uses of *mono* is a lack of individual (human) agency, and that the diffusion of speaker agency--and thus, of control and responsibility--underlie the discourse intents of such constructions involving *mono*.

## References

Agetsuma, Yuki. 1991. Zissitu meisi "mono" to keisikiteki yoohoo to no imiteki tunagari. [The Semantic Link between Substantial Noun *Mono* and Its Formal Uses]. *Toohoku Daigaku Bungakubu Nihongogakka Ronshuu* 1:2-11.

Fujii, Seiko. 2000. Incipient Decategorizaion of MONO in Japanese Discourse. In G. Andersen and T. Freitheim, eds., *Pragmatic Markers and Propositional Attitude*, 83-118. Amsterdam and Philadelphia: John Benjamins Publishing Company.

Givon, Talmy. 1982. Evidentiality and Epistemic Space. *Studies in Language* 6:23-49.

Hopper, P. and E. C. Traugott. 1993. *Grammaticalization.* Cambridge: Cambridge University Press.

Ikegami, Yoshihiko. 1981. *"Suru" to "Naru" no Gengogaku: Kotoba to Bunka no Taiporozii e no Siron [The Linguistics of* Doing *and* Becoming*: A Hypothesis on the Typology of Language and Culture]*. Tokyo: Taisyuukan Syoten.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Makino, S. & M. Tsutsui. 1986. *A Dictionary of Basic Japanese Grammar*. Tokyo: The Japan Times.

Martin, Samuel. 1975. *A Reference Grammar of Japanese.* London: Yale University Press.

Maynard, Senko K. 1992. Cognitive and Pragmatic Messages of a Syntactic Choice: The Case of the Japanese Commentary Predicate *N(o)da. Text* 12(4):563-613.

McGloin, Naomi. H. 1989. *A Student's Guide to Japanese Grammar*. Tokyo: Taisyuukan Publishing Company.

Nagara S., Hirota, N. and Nakanishi, Y. 1987. *Japanese for Foreigners: Innovative Workbook in Japanese: Volume 2*. Tokyo: Aratake.

Teramura, Hideo. 1981. Mono to koto [*Mono* and *koto*]. *Mabuti Kazuo-hakase Taikankinen Kokugogaku Ronsyuu*, 743-762.

Tsubone, Yukari. 1994. 'Monoda' ni kansuru ichi koosatsu [A study of *monoda*] *Nihongo Kyooiku* 84:65-77.

Yamamoto, Mutsumi. 2006. *Agency and Impersonality: Their Linguistic and Cultural Manifestations.* Amsterdam and Philadelphia: John Benjamins Publishing Company

Yoshida, Nina Azumi. 2008. Nominalized Predicates as Directives in Japanese Discourse. In M. E. Hudson, S. Jun, P. Sells, P. M. Clancy, S. Iwasaki and S. Sohn, eds., *Japanese Korean Linguistics 13*, 371-382. Stanford: CSLI Publications.

Yoshida, Nina Azumi. To appear. How 'Things' (*Mono*) Get Reanalyzed in Japanese Discourse. *Japanese Korean Linguistics 16*. Stanford: Center for the Study of Language and Information.

Nina Azumi Yoshida
University of California, Los Angeles
Department of Asian Languages and Cultures
290 Royce Hall
Los Angeles CA 90095-1540

nyoshida@ucla.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Two Patterns of Reduplication in Washo[1]

ALAN C. L. YU
*University of Chicago*

## 0. Introduction

Early descriptions of Washo treat reduplication in the language as a monolithic phenomenon (Jacobsen 1964, Winter 1970; cf. Kroeber 1907): the reduplicant copies the onset of the final syllable when the root is vowel-initial (1)a, otherwise, the CV of the final syllable is copied and is infixed to the stressed, thus penultimate, syllable (1)b. This paper argues that Washo in fact has two patterns of reduplication, partial and full, each serves different morphosemantic functions. It is argued that forms in (1)c are in fact instances of full reduplication of CV(C) roots, distinct from the partial reduplication pattern instantiated in (1)ab. The vowel-initial forms in (1)c, to the extent they are attested, are the results of truncation that applies under restricted circumstances.

| | | | | |
|---|---|---|---|---|
| (1) | a. | áhad-[2] | háhad- | 'across' |
| | | áŋkaš- | káŋkaš- | 'hollow' |
| | | émc'i- | c'ímc'i- | 'wake up' |
| | b. | dámal- | damámal- | 'to hear' |
| | | bókoŋ- | bokókoŋ- | 'to snore' |
| | | ʔéw.šiʔ- | ʔešíw.šiʔ- | 'father's brothers' |
| | | t'é:liw- | t'elí:liw- | 'to be a man' |

[1] I would like to thank the audience at SSILA 2008 and BLS 34 for their comments and suggestions. Special thanks go to Washo elders who have generously (and patiently) shared their knowledge of the language with me over the years.

[2] The data presented in this paper is given in a modified phonemic orthography adopted from Jacobsen 1964. In syllable-final positions, the three-way (voiced, voiceless, ejective) laryngeal contrast neutralizes toward voicelessness. Capitalized /M, W, L, Y, Ŋ/ stand for the voiceless counterparts of modal voiced sonorants. Voiced and ejective affricates are represented as /z/ and /c'/ respectively. Long vowels are found only in stressed syllables; short vowels can occur in any syllable. For more details on Washo stress and vowel length distribution, see Yu 2005 & In press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

| | | | |
|---|---|---|---|
| c. | ínkin- | kínkin- | 'black' |
| | áynay- | náynay- | 'muddy, gooey' |

This paper is organized as follows: Section 1 introduces the main analytic puzzle, which we argue, in Section 2, is understandable if two patterns of reduplication are distinguished in Washo. Section 3 raises a complication concerning the behavior of certain fully-reduplicated forms. Section 4 resolves this complication by arguing that the apparent resemblance between the two reduplicative patterns results from a truncation process that operates on the full-reduplicated forms. Implications and conclusion are given in Section 5.

## 1. Washo reduplication: the basics

Washo is a severely moribund language spoken by approximately 13 elderly speakers in an area around Lake Tahoe, California and Nevada. Early accounts of Washo morphology recognize only one type of reduplicative morphology in the language: ***partial reduplication*** (Jacobsen 1964, Winter 1970). At its most basic form, the CV of the root-final syllable is copied and serves as the penultimate syllable (1)b.[3] The penultimate distribution of the reduplicant can be clearly established in roots that contain an internal consonant sequence; the reduplicant is lodged before the sequence in such forms (e.g., *nént'uš-u* 'old woman' ~ *neṯ'úṁt'uš-u* 'old women'). The shape of the reduplicant differs when the root is vowel-initial, as already seen in (1)a. The reduplicant copies only the onset of the final syllable when the root is vowel-initial (e.g., *émc'iyi*[4] 's/he wakes up' ~ *c'imc'iyi* 'they wake up').

While the morpho-phonology of this partial reduplication pattern has been worked out in some detail (Broselow & McCarthy 1983, Urbanczyk 1993, Winter 1970, Yu 2005), there remain important issues that are unresolved. Consider, for example, the data in (2).

| | | | | | |
|---|---|---|---|---|---|
| (2) | a. | álʔmul- | b. | ʔmólʔmol- | 'big and round' |
| | | ámk'um- | | k'ómk'om- | 'arched' |
| | | ínkin- | | kínkin- | 'black' |
| | | áynay- | | náynay- | 'muddy, gooey' |
| | | íʔsiʔ- | | síʔsiʔ- | 'fast' |

[3] The interpretation of partial reduplication adopted here follows that of Yu 2005.

[4] Underlying vowel-initial roots are realized with an initial glottal stop phonetically. Whether a root is glottal-stop-initial or vowel-initial can be determined by the choice of the prefixal person allomorphs. For example, when a root is consonant-initial, the first person possessive prefix is *di-* (e.g., *diʔä:t'u* 'my older brother'); when the root is vowel-initial, the first person subject prefix is *l(E)-* where *E* indicates the type of vowel coloring effect the first person prefix has on the root-initial vowel (e.g., *láyuk* 'my parent in law).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

What is peculiar about the data in (2) is the fact that the first and final syllables of the forms in (2)b – the presumed partially reduplicated counterparts of the vowel-initial forms in (2)a – are identical. Why might this be? Two possible explanations readily come to mind. As is assumed in previous accounts, the appearance of root-internal syllable identity could be an accidental consequence of partial reduplication. Alternatively, syllable identity observed in (2)b might reflect a previously undocumented process of full reduplication of CV(C) roots in Washo. Upon closer examination, we found converging evidence in support of the two-pattern analysis. The next section reviews the evidence.

## 2. Arguments for two reduplications in Washo

Support for establishing a full reduplication pattern distinct from partial reduplication comes from two main sources: (i) the morphosemantic behavior of fully vs. partially reduplicated stems, and (ii) the phonotactics of fully reduplicated forms. Let us first consider the morphosemantic evidence.

### 2.1. Morphosemantic distribution

Plurality in Washo is not obligatorily marked. However, nominal plurality may nonetheless be indicated via partial reduplication (e.g., *dáʔa* 'mother's brother' ~ *daʔáʔa* 'mother's brothers'; *pʼísew* 'ear' ~ *pʼisésew* 'ears'). When verbs are partially reduplicated, readings of pluractionality obtain. That is, the event denoted by the verb might be interpreted variously as repetitive (3)a, distributed (3)b, durative (3)c, or having multiple participants (3)d, depending on the context. For example, *dámal-i* 's/he hears' has a multiple-experiencer reading when the verb is partially reduplicated (*damámal-i* 'they hear'). According to Jacobsen (1964: 530), there are instances where partially reduplicated verbs yield multiple interpretations. For example, the stem *-iti?-* 'down, downward' may pluralize the subject as in *uktétiʔi* 'they're looking down' or the object *tumʔtétiʔi* 'he has both feet hanging down'. The verb *tumʔŋáŋaʔi* (< *-aŋaʔ-* 'on') may mean either 'he has both feet on it', 'he keeps putting his foot (or both feet) on it', 'they have their feet (either one or two each) on it', or 'they keep putting their feet (either one or two each) on it'.

(3) a. biŋíŋil- (< bíŋil- 'to try to') 'to try repeatedly'

b. gepúpuʔi (< ípuʔ- 'to find') 'he found several things in several places'
gašášdɨmi (< ášdɨm- 'to hide') 'he's hiding things in different places'

c. duwéweʔ- (< dúweʔ- 'to want to, be about to') 'to keep trying to'

d. mémeʔi (< ímeʔ- 'to drink') 'they're drinking'
šélšɨmi (< élšɨm- 'to sleep' 'they're sleeping'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The morphosemantic functions of fully reduplicated stems, henceforth **F-STEMS**, are far more diverse by comparison. The majority of f-stems are adjectival:

| (4) | túltul- | 'coarse' | šápšab- | 'fuzzy' |
|---|---|---|---|---|
| | ʔyínʔyɨn- | 'varicolored' | háwhaw- | 'light' |
| | púypuy- | 'thin' | k'áwkaw- | 'hard' |
| | húːhu- | 'striped' | ʔmólʔmol- | 'big and round' |
| | p'ɨ́šp'ɨš- | 'long, narrow (of eyes)' | tóʔtoʔ- | 'gray' |
| | káykay- | 'long' | k'ómk'om- | 'arched, hunched' |

Many animal names are either intrinsically fully reduplicated (e.g., *gówgow* 'Canadian goose') or derived from f-stems. For example, the word for 'carrot', *c'ilut'ɨ́nt'ɨn*, is derived from the lexical prefix *c'ilu-* 'hip' and the fully reduplicated adjective *t'ɨ́nt'ɨn* 'wrinkled, rough'. One of the bird names, *síwsiwhu*, is derived from the adjective *síwsiw* 'smooth, slippery' and the nominalizing suffix *-hu*.

| (5) | dezítzidiʔ | 'snowbird' | daʔmuk'áyk'ay | 'mosquito' |
|---|---|---|---|---|
| | zíwziwhu | woodpecker sp. | mákmak | bird sp. |
| | ʔit'óŋt'oŋ | 'Jew's harp' | dewgeltúktuk | 'gasoline engine' |
| | gáːzagaza[5] | bird sp. | deyk'úyk'uyi | 'a crooked person' |
| | c'élc'el | Squirrel sp. | gówgow | 'Canadian goose' |

Besides its adjectival and name-forming usages, full reduplication might serve certain onomatopoetic/iconic function. Full reduplication is, for example, observed in two types of verbs. One major class depicts noise generating events.

| (6) | wákwag- | 'to bark' | ziŋíːŋi- | 'to ring' |
|---|---|---|---|---|
| | dɨnɨ́ːnɨ- | 'to roar' | ʔɨ́yʔɨy- | 'to sob' |
| | wékweg- | 'to quack' | siyɨ́ːyɨ- | 'to hum' |
| | wétwed- | 'to quack' | k'ótk'od- | 'to cluck' |

It is possible that some of the names of animals/objects contain sound-symbolic full reduplication as well. Take, for example, the names of two types of drums in Washo, *ʔitmukhéŋheŋ* 'bass drum' and *dewgebúgbug* 'drum'. Both contain a fully reduplicated component.

The other class of f-stems describes semelfactive actions that prototypically occur in multiple consecutive iterations. Since all the forms in (7) are fully inflected, the f-stem is underlined for ease of reference.

| (7) | leʔlesénseni | 'it's nibbling me' |
|---|---|---|
| | tukc'ímc'imi | 'he's blinking' |

[5] This form suggests that full reduplication might not be restricted to monosyllabic roots only.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

| | |
|---|---|
| tumʔsópsobi | 'he's splashing his feet' |
| bákbagi | 'he's smoking' |
| hesíɬpsiɬbi | 'it's sprinkling; raindrop' |

While the forms in (7) involve repeated actions, they are not to be confused with the pluractional functions of partial reduplication discussed earlier, however. As argued in Wood (2007), there are two subtypes of pluractional verbs: event-internal vs. event-external. Event-internal pluractionals prototypically are semelfactive or achievement verbs that are typically or inherently repeated. They also tend to have high degree of continuity, pertaining to a single occasion with a common goal or completion. The distribution of event-external pluractionals, on the other hand, is far less restrictive. Event-external pluractionals may be found with verbs of all Aktionzarten involving either single or multiple occasions with either a continuous or intermittent reading. Verbs with full reduplication appear to be pluractionals of the event-internal type, while verbs with partial reduplication are pluractionals of the event-external type. Further research is needed to substantiate this analysis. The morphosemantic evidence reviewed thus far, however, strongly supports differentiating the f-stems from those that participate in partial reduplication, henceforth **P-STEMS**. Full reduplication is found in adjectives, names of animals, instruments, and human relations, as well as verbs of noise-generating events and of event-internal repetitive actions. Partial reduplication is only observed when nouns and verbs are pluralized. The fact that fully reduplicated nouns may be partially reduplicated when pluralized (e.g., *sáksak* 'grandfather's brother' ~ *sasáksak* 'grandfather's brothers') further supports distinguishing partial reduplication from full reduplication.

### 2.2. The phonotactics of full and partial reduplications

The morphosemantic evidence notwithstanding, there also are strong phonological reasons for analyzing the f-stems and p-stems differently. Syllables in the native Washo lexicon are maximally CV(C) in shape.[6] Given the relatively simple syllable canon of Washo, the range of root-internal consonant sequences are restricted. A few phonotactic restrictions further limit the range of possible root-internal consonant sequences. To begin with, the three-way laryngeal contrast is neutralized toward the plain series in coda position (e.g., *waːt* 'tomorrow' ~ *waːdiŋ* 'now' ~ *watlíː* 'morning'). Thus, the final consonants of the base and the reduplicant of the f-stem may differ in voicing (e.g., *gawgap'ótp'odi* 'it's crackling' vs. *gawgap'ótp'othayi* 'he's causing it to crackle').[7] Voiceless

[6] Jacobsen considers syllable-initial glottalized sonorants sequences of glottal stop plus modal voice sonorant. However, the status of glottalized sonorants as consonant cluster is currently in dispute. See Peachey (2006) for more discussion.

[7] Recent studies have found that many languages purported to have a voicing contrast are better analyzed as having an aspiration contrast (e.g., Petrova et al. 2006). This might be the case in Washo. The so-called "voiced" stops are rarely fully voiced word-initially; they are generally voiceless unaspirated. In intervocalic positions, the observed voicing might be better analyzed as a



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

sonorants are also never found in coda position. Given these restrictions, let us consider the set of possible post-tonic -$C_1C_2$- sequences in Washo, summarized in Table 1. Of the 136 attested post-tonic consonant sequences in Washo, 106 of these post-tonic consonant sequences are found in p-stems, which include both roots that participate in partial reduplication as well as roots that do not participate in any form of reduplication at all; the set of roots that may be pluralized is limited. Although 23 of these 106 post-tonic consonant sequences are also observed in the set of f-stems, there remains 30 additional post-tonic consonant sequences that are attested only in roots with full reduplication and not elsewhere. Why should the f-stems permit a deviant set of post-tonic consonant sequence phonotactics? This outcome is to be expected given the analysis advocated here. When a CVC root is reduplicated, the coda consonant will come in contact with the first consonant of the root syllable, creating a consonant sequence that might not otherwise be attested in the non-reduplicated roots in the language. For example, the post-tonic consonant sequence -*tw*- is only observed in fully reduplicated words such as *wátwadi* 'the day after tomorrow', which is derived from the root *wá:t* 'tomorrow'.

The divergent post-tonic -$C_1C_2$- phonotactics of p-stems and f-stems highlights the morphologically complex nature of the f-stems. Consonant sequences that are not otherwise found in monomorphemic roots in Washo are nonetheless observed in the f-stems. What then is the status of the CVC roots that form the bases of the f-stems, if forms such as /wekweg/ 'to quack' are supposed to be derived from the full reduplication of /weg/? For the majority of f-stems, the corresponding CV(C) bases are not free standing. Thus, the synchronic status of these monosyllabic roots is open to debate. Languages with frozen fully reduplicated forms are not uncommon, however. Scholars have often recognized their special status and have generally assumed that such forms are derived from some simplex base forms (Bat-El 2006, Buckley 1997, Rose 1997). To be sure, while the synchronic status of the monosyllabic roots might be questionable, the productivity of full reduplication *per se* is not in doubt. Recent loanwords may undergo full reduplication, as evidenced by the adaptation of English 'ball' as *bólbol* 'spherical' in Washo. Also, certain time expressions are transparently derived from full reduplication (e.g., *ʔlóːt* 'yesterday' ~ *ʔlótʔlodi* 'the day before yesterday'; *wáːt* 'today' ~ *wátwadi* 'tomorrow').

matter of passive voicing. If such an analysis is proven correct for Washo, then the final consonants of the base and the reduplicant of roots such as /waːd/ is better analyzed as /waːt/.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

| p | t | k | ʔ | s | š | h | m | n | ŋ | l | w | y | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | x | | | | | | p |
| x | | x | | | | | | ? | | | ? | ? | t |
| | | | x | | | | | | x | x | ? | | k |
| | | | | | | | | | | | | x | ʔ |
| x | x | | x | | | | x | | | x | x | | b |
| x | x | x | x | x | x | | x | x | | x | x | x | d |
| | x | x | x | x | x | | x | | x | x | x | | g |
| | | ? | | x | | | x | ? | x | | | x | z |
| | x | | | | x | | x | | | | | | p’ |
| x | | | | x | | | x | x | | x | | x | t’ |
| | | | | | | | x | x | | | | x | c’ |
| | x | | | | | | x | x | x? | | | x | k’ |
| x | x | x | x | | | | x | | x | ? | | | s |
| | | x | x | | | | x | | | x | x | x | š |
| | | | | | | | x | | | ? | x | x | h |
| | | | x | x | x | x | | | | x | | ? | m |
| | | | x | | | | | | | | | | n |
| | | | x | | | | | | | x | x | x | ŋ |
| | x | | x | | x | x | x | | x | | x | ? | l |
| | | x | x | | | | | | | x | | x | w |
| | x | | x | | | | x | | | | | | y |
| | | | | | | | | | | x | | | M |
| | | | | | | | | | | | x | | L |

Table 1. The inventory of all possible post-tonic $C_1C_2$ sequences in Washo. The set of possible C1 consonants is presented horizontally (in columns) while the set of possible C2 is given vertically (in rows). The symbol “x” indicates $C_1C_2$ sequences observed in native Washo monomorphemic roots; consonant sequences only found in Washo proper names are marked as “?”; consonant sequences attested in fully reduplicated forms are indicated by the shaded cells.

## 3. Discussion

Now that we have established that certain reduplicated stems are the product of full reduplication while others are that of partial reduplication, a new set of base-reduplicant relationship emerges. That is, in the case of partial reduplication, the relationship between the reduplicant and the base remains unchanged: the reduplicant is CV when the penultimate syllable of the base is consonant-initial; the reduplicant is C when the base form is disyllabic and vowel-initial. However, in the case of full reduplication, the base is presumably underlyingly CV(C) in shape. The reduplicant copies the entire base form. A summary of these two reduplicative patterns is given in (8).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(8) a. Partial reduplication

| *P-stems* | → | *Pluralized p-stems* |
|---|---|---|
| $C_1V(X)C_2V(C_3)$ | | $C_1V\underline{C_1}\underline{V}(X)C_2V(C_3)$ |
| *nént'uš-* 'to be an old woman' | | *net'únt'uš-* 'to be old women' |
| $V(X)C_1(V)(C_2)$ | | $\underline{C_1}V(X)C_1(V)(C_2)$ |
| *élšim-* 'to sleep' | | *šélšim-* '(pl.) to sleep' |

b. Full reduplication

| *CV(C)-roots* | → | *F-stems* |
|---|---|---|
| $C_1V(C_2)$ | | $C_1V(C_2)C_1V(C_2)$ |
| *-nay-* | | *náynay-* 'muddy, gooey' |

This two-pattern analysis of reduplicative morphology in Washo gives rise to a curious puzzle. As the data in (2) suggests, fully reduplicated forms actually have $V(C_2)C_1V(C_2)$ counterparts akin to the vowel-initial p-stems in (1)a. Previous analyses took these vowel-initial f-stems as nothing more than the non-pluralized counterparts of f-stems. Thus, according to Jacobsen (1964), the base form of *náynay* 'muddy, gooey' is *-áynay* (p. 329); the base form of *p'ilp'il* 'blue' is *-ilp'il* (p. 336). The fact that the f-stems resemble products of full reduplication was considered epiphenomenal under Jacobsen's analysis. What is the status of these vowel-initial f-stems (henceforth VF-STEMS) under the current analysis? As will be demonstrated in the next section, the nature of the vf-stems becomes apparent when the distribution of the vf-stems is viewed within the context of Washo verbal morphology: vf-stems are the dependent version of the more freely occurring f-stems, derived via a process of truncation.

## 4. Dependent-stem truncation

As argued in Jacobsen's (1980) seminal paper, many verb stems in Washo are bipartite. That is, many stems are decomposable into two components, the lexical prefix and the dependent stem. What is crucial for the present purpose is the notion of the dependent stem. Dependent stems are bound morphemes that have concrete meanings and must combine with either a lexical prefix or another stem in order to be realized. For example, the stem *-íːgel* 'around something, around in a circle' may combine with a multitude of lexical prefixes:

(9)

| | |
|---|---|
| Múːgel- | 'to run around something, around in a circle' |
| beyúːgel- | 'to flow around in a circle (as in a whirlpool)' |
| húːgel- | 'to mix up, scramble with side of long object' |
| yúːgel- | 'to wind something around something' |
| múːgel- | 'to stir' |
| meʔbúːgel- | 'to be dizzy' |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Likewise, the lexical prefix *dul˘-* 'with hand, arm, descriptive of hand, paw'[8] may occur with a variety of dependent verb stems:

(10) dulá:š- 'to have one's hand in something'
dulé:k'ɨl- 'to cook'; literally 'to swing one's arm around'
duléšɨl- 'to offer one's hand to someone'
dulakákd- 'to move hands slowly'
dule?wí?wid- 'to wave'
dulé:ti?- 'to hold his hand down'
dulepépeš- 'to have black, dirty, greasy hands'

An important generalization concerning the vf-stems is that they are only observed as dependent stems in bipartite constructions.

(11)

| | | | |
|---|---|---|---|
| kinkin- | 'dark' | wedenkin- | 'night' |
| siwsiw- | 'slippery' | yewsiw- | 'to slide' |
| k'awk'aw- | 'to be hard' | tugáwk'aw- | 'to have one's eyes tightly closed' |
| c'ipci'b- | 'perfect' | Múpc'ibi | 'it's running perfectly' |
| p'ílp'il- | 'blue' | tugílp'il- | 'to have blue eyes' |
| witwid- | 'hard, stiff' | métu?étwid- | 'to be frozen stiff' |
| náynay- | 'gooey' | ?íːbik'áynay- | 'to be soft from over-cooking, from being over-ripe' |

The f-stems, on the other hand, are never found in this context; they are readily observable in the predicative adjectival construction, however (e.g., *?ilc'ipc'ibi?i* 'it's perfect'). Why do vf-stems only appear as dependent stems while their supposed partially reduplicated f-stem counterparts appear in the complementary contexts? To be sure, genuine p-stems can function as dependent stems whether they are partially reduplicated or not (12).

(12)

| P-stem | Dependent p-stem | Dependent pluralized p-stem |
|---|---|---|
| ipeš- 'rotten' | dúpeš- 'to be blacken by sunlight' | dulepépeš- 'to have black, dirty, greasy hands' |
| -iti?- 'down' | šíːleti?- 'to fall with a crash' | tuktéti?i 'they're looking down' |
| -ips- 'up, lift' | bípsi 'he's picking it up' | tukpépsi 'they're opening their eyes' |

[8] The symbol [ ˘ ] indicates the presence of a floating mora that docks onto the stressed syllable if the stressed syllable is open.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Also, p-stems often can appear both within and outside the confine of the dependent stem position. For example, the verb *-ihuk'-* '(to be) dry' may appear freely on its own, as in *ʔíhuk'i* 'it's dry'. The same verb may occur with a few lexical prefixes expressing manner of drying, such as *léːhuk'-* 'to dry by wiping, mopping' vs. *séhuk'-* 'to put out to dry'. More importantly, *-ihuk'-* may also function as the first part of a bipartite stem (e.g., *ʔíhuk'etiʔ-* 'to get dry', literally, 'to dry down'; *ʔíhuk'étwid-* 'to be dry, stale, and stiff (e.g., bread)'; *ʔíhuk'átp'udi* 'it's dry and crumbly'). Thus the fact that vf-stems can only appear as dependent stems in bipartite structures cannot be attributed to any intrinsic properties of dependent stems. Likewise, that the f-stem cannot serve as dependent stems does not fall out from the morphosyntatic properties of partial reduplication.

Here, we propose to relate the vf-stems to the f-stems by way of a truncation process. The truncation process eliminates the first consonant of an f-stem. A schematic summary of the relationship between the different types of reduplicative morphology as well as the truncation process is given in (13).

(13) a. Partial reduplication

| *P-stems* | | *Pluralized p-stems* |
|---|---|---|
| $C_1VC_2V(C_3)$ | → | $C_1V\underline{C_1}VC_2V(C_3)$ |
| $VC_1V(C_2)$ | → | $\underline{C_1}VC_1V(C_2)$ |

b. Full reduplication

| *CV(C)-roots* | | *F-stems* |
|---|---|---|
| $C_1V(C_2)$ | → | $C_1V(C_2)C_1V(C_2)$ |

Dependent-stem formation

| *F-stems* | | *Vf-stems* |
|---|---|---|
| $C_1V(C_2)C_1V(C_2)$ | → | $-V(C_2)C_1V(C_2)$ |

What is the nature of this truncation process? To understand its source, it is important to first understand the phonotactics of the dependent stems. All dependent stems are vowel-initial. A quick examination of all reduplicable stems surveyed in Jacobsen 1964 will illustrate this point more clearly. Out of the 117 reduplicable stems examined, 38 are nouns and 69 are verbs. Within the set of verbs, it can be further decomposed into verbs that may only be used as dependent verbs (which all vf-stems belong) and those that have no restricted usage. As summarized in (14), while the non-dependent verbs are almost evenly split between being C-initial and V-initial, all dependent verb stems are vowel-initial. Nouns, on the other hand, are overwhelmingly consonant-initial.

(14)

| | C-initial | V-initial | Total |
|---|---|---|---|
| Verb (free) | 15 | 12 | 27 |
| Verb (dependent) | 0 | 52 | 52 |
| Noun | 37 | 1 | 38 |

The data in (14) suggests that C-reduplication mainly applies to vowel-initial verbs; the only vowel-initial noun has irregular plural form (*-áyuk* 'parent-in-law' vs. *yóːk* 'parents-in-law'). That dependent stems must be vowel-initial is further



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



confirmed by an examination of the 94 dependent stems surveyed in Jacobsen 1980. 91 are vowel-initial. The ones that are not vowel-initial, *bélbel-* 'high (of voice)', *sí:lu-* '(speech) hard to understand, with foreign accent' and *t'át'ad* 'rattling', appear to attach to prefixes that only take C-initial stems. Such prefixes (e.g., the attributive *ʔil-*; classifier-plural marking *wgV-*) might not be lexical prefixes, however. Non-lexical prefixes in Washo (e.g., the instrumental nominalizing prefix *ʔit-*) do not take a dependent-stem as its right-sister. Thus, if this interpretation is correct, there is no exception to the vowel-initial generalization of dependent stems. What this suggestion is that truncation of the initial consonant of f-stems might be triggered by structural analogy to the predominance of vowel-initial dependent stems.

## 5. Conclusion

To summarize, this paper establishes that there are two types of reduplicative morphology in Washo. Fully reduplicated stems exhibit different morphosyntactic functions and phonotactic properties than those with partial reduplication. The vf-stems are derived from a process of dependent stem truncation. This truncation process appears to be motivated by the fact that the phonotactics of dependent stems are invariably vowel-initial. Thus when an f-stem is used in a bipartite construction, by analogy to all other dependent stems, the initial consonant of the f-stem is eliminated, rendering the dependent f-stem vowel-initial. This pattern of truncation is unique among truncation processes cross-linguistically. As Weeda (1992: Section 1.3) points out, subtractive aphaeresis – the elimination of the beginning of a string (thus keeping the end) where the truncated portion is of a certain size/shape – generally have limited functionalities. In particular, all identified instances of subtractive aphaeresis, notes Weeda, furnish word variants and are only pragmatically distinctive; subtractive aphaeresis does not appear to ever be used derivationally. The uniqueness of Washo dependent-stem truncation might stem from the fact that truncation itself is not motivated by prosodic reasons, as truncation patterns generally are; instead, it emerges as a result of structural analogy motivated by the fact that all dependent-stems are vowel-initial.

## References

Bat-El, Outi. 2006. Consonant identity and consonant copy: The segmental and prosodic structure of Hebrew reduplication. *Linguistic Inquiry* 37(2): 179-210.

Buckley, Eugene. 1997. Tigrinya root consonants and the OCP. *Penn Working Papers in Linguistics* 4.3, 19-51.

Broselow, E, and J. McCarthy. 1983/1984. A theory of internal reduplication. *Linguistic Review* 3:25-88.

Jacobsen, William H. Jr. 1964. A grammar of the Washo language. PhD diss., Department of Linguistics, University of California, Berkeley.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Jacobsen, William Jr. 1980. Washo bipartite verb stems. In K. Klar et al., eds., *American Indian and Indoeuropean Studies: Papers in honor of Madison S. Beeler*. The Hague: Mouton. 85-99.

Kroeber, A. L. 1907. The Washo language of East Central California and Nevada. *University of California Publication on American Archaeology and Ethnography* 4&5. Berkeley: The University Press.

Peachey, Robert. 2006. *Glottalized resonant in Washo*. MA thesis, University of Chicago.

Petrova, O., R. Plapp, C. Ringen, and S. Szentgyörgyi. 2006. Voice and Aspiration: Evidence from Russian, Hungarian, German, Swedish, and Turkish. *The Linguistic Review* 23: 1-25.

Rose, Sharon. 1997. *Theoretical issues in comparative Ethio-Semitic phonology and morphology*. PhD diss., McGill University, Montreal.

Urbanczyk, Suzanne C. 1993. Infixing and moraic circumscription. In Tim Sherer, ed., *Phonological representations. University of Massachusetts Occasional Papers 16*. 319-357.

Weeda, Donald. 1992. Word truncation in Prosodic Morphology. PhD diss., University of Texas at Austin.

Winter, Werner. 1970. Reduplication in Washo: A restatement. *International Journal of American Linguistics* 35:190-198.

Wood, Esther. 2007. *The semantic typology of pluractionality*. PhD diss., University of California, Berkeley.

Yu, Alan C. L. 2005. Quantity, stress, and reduplication in Washo. *Phonology* 22(3): 437-475.

Yu, Alan C. L. In press. The phonetics of quantity alternation in Washo. *Journal of Phonetics*.

Alan C. L. Yu
1010 E 59th Street
University of Chicago
Chicago, IL 60637

aclyu@uchicago.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# PARASESSION: PIDGINS, CREOLES, and MIXED LANGUAGES

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Prosody, Accessibility, and Sentential Negation in Brazilian Portuguese

MEGHAN E. ARMSTRONG & SCOTT A. SCHWENTER
*The Ohio State University*

## 1. Introduction

Information structure refers to a speaker's choice of linguistic form as it relates to the same speaker's evaluation of her hearer's mental state/attitude. (Lambrecht 1994). In conversation, speakers make hypotheses about the beliefs of their interlocutors, and choose linguistic forms based on these hypotheses. Lambrecht points out that while hypotheses formed by speakers about their hearers' mental states are psychological phenomena, information structure is not in fact psychological, but purely linguistic. He categorizes information structure as a grammatical component, and more specifically as part of sentence grammar, and as potentially manifested in prosodic, syntactic and lexical phenomena. This paper investigates information structure as it relates to canonical and non-canonical syntactic constructions of negation in Brazilian Portuguese (henceforth BP), and the prosodic correlates associated with these constructions.

There is a wealth of evidence, at least for West Germanic languages, supporting the argument that prosody and information structure are closely related. Studies have presented evidence that *new* information is marked with pitch accent where discourse-old or *given* information may not carry pitch accent at all (Baumann & Grice 2006). However, more careful study reveals that this simple dichotomy is insufficient to account for the relationship between prosody and information structure; the relationship seems to be much more gradient. Terken and Hirschberg (1994) found that, for English, deaccenting is dependent not only on givenness, but also on grammatical function and persistence of surface position. They concluded that speakers use deaccenting when conveying meaning deemed highly accessible in the discourse. These authors propose that deaccentuation is used anaphorically, pointing back to some antecedent that is accessible for the hearer. Baumann and Grice (2006) further develop this research program focusing explicitly on the relationship between discourse accessibility and pitch accent. These authors reinforce the variability in terms of givenness as well as accessibility, such that information can be given or accessible to varying



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



degrees. These authors' results showed a high correlation between 'type of pitch accent' and 'type of accessibility', supporting Lambrecht's (1994) view that a direct phonological correlate of accessible information does not exist. In addition, Baumann & Grice claim that prosodic marking of accessible information is by no means arbitrary. Following Chafe (1994), they argue for an intermediate category between new and given information: active (given), semi-active (accessible) and inactive (new). Baumann & Grice propose a scale relating pitch accent type and accessibility type as in (1):

(1) Pitch accent type by accessibility type.

| Active | Semi-Active | Inactive |
|---|---|---|
| No accent | H+L* | H* |

The scale predicts that the more predictable the information, the less likely pitch accenting will be for English.

## 2. Deaccenting of highly accessible information

The use of deaccenting in languages outside of West Germanic is not well researched. In a recent study, Cruttenden (2006) presented evidence for deaccenting as a cognitive universal in a study of twelve languages. Using repetition as an indicator of givenness, in order to assess how givenness and deaccenting correlate crosslinguistically, Cruttenden argues for the existence of obligatory deaccenting in English. In addition, for BP, he cites the following example, taken from Crystal (1975:40):

(2) [*Este livro custa cinco DOLARES*] [*e este aqui três DOLARES*].
'This book costs five dollars and this one here costs three dollars.'

Though Cruttenden did not include BP in his cross-linguistic survey, he notes that (2) follows a tendency in BP to place prominence on the last item in a tone unit even when repeated in a coordinate construction. He concludes that deaccenting is not in fact a cognitive universal, or at least not a straightforward one. His results showed that Arabic and Romance languages actually disfavor deaccenting of repeated information while Greek & German favor deaccenting, like English.

Baltazani (2006) explored the relationship between prosody and information structure for negation in Greek, a language that uses both prosody and word order to mark information status. A L+H* pitch accent as well as longer duration for both topic and focus are found for any utterance in Greek. Consequently, information appearing after the focus is typically deaccented (Baltazani 2006). Baltazani refers to this deaccented information as the "tail" (cf. Vallduví 1990). Relevant to our study, Baltazani discusses topic and tail as they relate to discourse accessibility, and claims that the main difference between the two is that while



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

both contain given information, tails must contain *explicitly given* information. There are two types of melodies for negation in Greek, as outlined in (3):

(3) Two types of melodies for negation in Greek (new vs. given)

| Negation | |
|---|---|
| New (out-of-the-blue) | L*+H nuclear pitch accent with all of the following material deaccented. H boundary tone. Does not matter whether constituents following negative particle are new or given. Negation is the new information. |
| Given | Negation does not receive main sentence stress. Sentence does not have a feel of a negative sentence. |

Therefore, in Greek there is a L+H* pitch accent on the negative particle followed by deaccenting (regardless of the information status of the material after the negative particle), but when the negation is not new to the discourse the negative particle does not receive main sentence stress. The rule of deaccenting all information after the negative particle, then, becomes problematic since tails must occur post-focally and can only contain given information. To resolve this issue, Baltazani claims that elided material encodes discourse-given information. Discourse-new material, by contrast, is deaccented. Chafe proposed a possible cross-linguistic universal that "given information is conveyed in a weaker and more attenuated manner than new" (1976:31). Applying this to Greek, it seems there are marked and unmarked cases for tails in Greek such that for the unmarked case the tail contains information that is necessarily given and deaccented. However, because all information after an accented negative particle must be deaccented but not necessarily given, deaccenting is no longer sufficient to encode information status. This is an extreme case of attenuation such that given information is elided and new information is deaccented. Thus, in out-of-the-blue negative utterances in Greek, the scale for encoding tail information shifts from a pitch vs. non-pitch dichotomy to a non-elided/deaccented vs. elided dichotomy. Given information, conveyed via ellipsis, is still weaker than the deaccented information that is segmentally present.

## 3. Deaccenting in BP

As noted, Cruttenden did not include BP in his cross-linguistic study of deaccenting as a cognitive universal across languages. Indeed, it has not been explicitly claimed that deaccenting in BP is an acoustic signal of givenness. In de Morães' (1998) discussion of BP intonation, he provides a sentence which exemplifies both negation, and what presumably is deaccenting in BP:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(4) *Você só foi lá em casa porque estava chovendo.*
'You only went to my house because it was raining.'
*[Eu NÃO fui a sua CAsa] [porque estava choVENdo].*
'I didn't go to your house because it was raining.'

In de Morães' interpretation of the intonation contours of this utterance, the negative particle is new information and receives pitch accent, and the rest of the sentence is redundant. He implies that "the rest" of the material in (4) is given, and therefore deaccented, but does not make this claim explicitly. Following de Morães' explanation, however, it appears there exists a prosodic distinction in BP signaling a contrast between new and given information.

## 4. Negation in (Spoken) BP

Like pitch accent, non-canonical syntactic constructions are also reliant on information status. Non-canonical constructions are predictable in that they depend heavily on both discourse status and hearer status (Ward & Birner 2006). Relevant for us, these constructions are also sensitive to whether a discourse entity is evoked or can be inferred from something else that was already evoked. With these facts in mind, it seems that non-canonical structures would provide a reliable testing ground for prosodic correlates that are also sensitive to information status. Assuming that deaccenting signals highly accessible information, a likely place to find such a contour would be a non-canonical structure that depends on highly accessible information. Further, the canonical version of such a structure would then be helpful since it would not rely so heavily on information status. The present study uses non-canonical and canonical structures of sentence negation in spoken BP to confirm whether speakers use deaccenting to encode given information through prosody.

There are three morphosyntactic constructions, termed NEG1, NEG2, and NEG3, to express sentential negation in spoken BP (Schwenter 2005). NEG1 displays canonical preverbal negation (5a); NEG2 repeats the preverbal negative in utterance-final position (5b); and NEG3 employs the negative only postverbally (5c). Although all three forms express the same propositional content, they are pragmatically distinct. [1]

| | | | | | | |
|---|---|---|---|---|---|---|
| (5) a. | A | criança | **não** | quer | suco | (NEG1) |
| | The | child | no | want-3sg | juice | |
| b. | A criança **não** quer suco **não** | | | | | (NEG2) |
| c. | A criança quer suco **não** | | | | | (NEG3) |

'The child doesn't want juice.'

[1] Usage for the three forms varies as well, as shown in the frequency distribution across forms found by Alkmim (2001) in her study of the Mineiro dialect: NEG1 (~75%) > NEG2 (~20%) > NEG3 (~5%).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Schwenter characterizes the forms' pragmatic division of labor as in (6):

(6) BP negatives by information status of the negated proposition (Schwenter 2005)

| *Form* | *Discourse-New* | *Inferrable* | *Explicitly Activated* |
|---|---|---|---|
| NEG1 | OK | OK | OK |
| NEG2 | # | OK | OK |
| NEG3 | # | # | OK |

Here there is a scalar relationship between these forms in terms of their dependence on discourse context: NEG1 is not dependent on discourse context, NEG2 is more dependent and NEG3 is fully dependent, as depicted in (7).

(7) Scale of discourse dependence for BP negatives

NEG 1 NEG2 NEG3



Not dependent More dependent Completely dependent

Assuming that deaccenting encodes high accessibility of a discourse entity, we present in (8) our hypotheses for deaccenting and its possible interaction with sentential negation in declaratives in BP.

(8) Hypotheses for relationship between deaccenting and BP sentence negation

| | |
|---|---|
| Hypothesis 1 | NEG1 may or may not show deaccenting, depending on context. |
| Hypothesis 2 | For non-canonical structures in BP that rely on information that has been explicitly activated, there should be evidence for deaccenting. Drawing on prior claims that deaccenting is more common for given information but not obligatory, we hypothesize that this will hold true for BP as well |
| Hypothesis 3 | Assuming that prosodic correlates are found for the non-canonical structures, NEG2 should show a prosodic contour more similar to NEG3 when elicited by explicitly activated information, but may show a distinct contour when negated information is inferrable. |

## 5. BP Intonation

The autosegmental framework assumes for BP that the main property of neutral declaratives is a H+L* bitonal pitch accent associated with the head of phonological phrase (φ) of the intonational phrase (I). These neutral declaratives



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

have a low (L%) boundary tone at the right of I when the last posttonic syllable of I is realized (Tenani 2002; Fernandes 2007). In the same framework, the ToBI system (Beckman and Hirschberg 1994) was initially developed for prosodic transcription of English. The ToBIPI system for BP, which is still under development (Lucente 2007) assumes the following tones for BP: L*, H*, L*+H, H*+L, H+!H* with L% and H% boundary tones.

As regards the occurrence vs. non-occurrence of pitch accent, Fernandes (2007) provides evidence for the distribution of pitch accents with respect to focused elements. She makes the following generalizations (our translation):

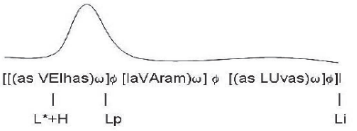
(i) Focused elements may have the same pitch accent that they receive in a neutral context (H*+L versus L*+H) or they may have the same tonal combination that they would receive in a neutral context (L*+H).

(ii) Sentences with a focused subject show, as a critical characteristic that distinguishes them from neutral sentences, the absence of tonal accents associated with intermediate phonological words (between the head of φ which contains the focused subject and the syllable head of the last φ of I.

(iii) Predominance of a focal accent associated with the right boundary of φ which contains the focused subject.

Fernandes' second generalization suggests that material not in focus may not receive a tonal accent. The pitch track in (9) (Fernandes 2007) looks very much like F0 contours that signal deaccenting.

(9) Prosodic focus in BP




*As velhas lavaram as luvas* 'The old women washed the gloves'

(9) was produced in a context where what was presupposed was that someone washed the gloves. The new information carries L*+H bitonal pitch accent but the given information carries no pitch accent.

## 6. Data

Our data for BP sentential negatives were collected from 5 native speakers of BP from the following cities: Recife (1), São Paulo (2), Rio de Janeiro (1), and Franca (1). Speakers were presented with context as well as scripted utterances that were responses to questions or reactions to a given context. Data from the speaker from Recife were not used because it presented intonational patterns that were found to be different from the other dialects surveyed. At this point it is not clear whether these are dialectal differences for the Recife variety of BP or



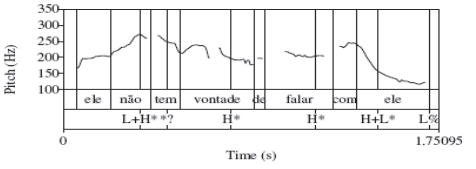
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

whether the differences were idiolectal. We also reference decontextualized data from Armstrong et al. (2008), which we turn to now.

The data presented in this section were chosen because they are representative of typical patterns found in felicitous contexts for the various forms of negation in BP. These examples as they serve as adequate tests for Hypotheses 1, 2 and 3 (henceforth H1, H2 and H3) laid out in (8) above. In this section we detail each hypothesis, presenting data to support each one.

First, as regards H1, lab speech from Armstrong et al. (2008) showed a typical L+H* initial rise on the negative particle for NEG1 (canonical negation):

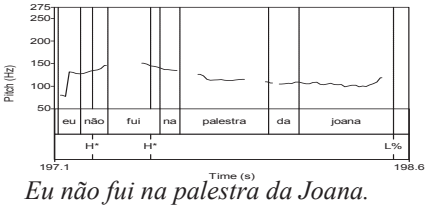
(10) Typical NEG1 with initial L+H* rise and accented propositional content (Decontextualized utterance).




*Ele não tem vontade de falar com ele.*
'He doesn't feel like talking to him.'

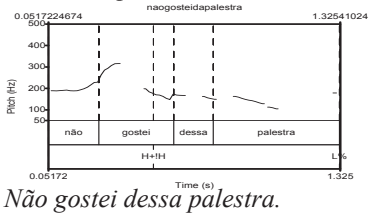
This canonical structure corroborates well-known claims in the literature describing a drop in pitch as due to declination, especially for longer utterances. We also see the characteristic H+L* at the head of φ that has been described as typical for neutral declaratives. (10) therefore demonstrates an unmarked prosodic contour for BP utterances. This is hardly surprising since the utterance exhibits a canonical construction for negation and is produced without preceding context. Because the utterance is decontextualized, it is not controversial to find no deaccenting of propositional material in (10). There is no evidence for the discourse accessibility of the propositional content. After careful analysis of out-of-the-blue negative utterances, we wondered what might happen when a speaker is forced to utter activated information using canonical negation as answers to yes-no questions. (11a) and (11b) display contours that were not predicted:

(11a) NEG1 answer to question
*Você gostou da palestra da Joana?*




*Eu não fui na palestra da Joana.*
'I didn't go to Joana's talk.'

(11b) NEG1 answer to question
*Gostou da palestra da Mariana?*




*Não gostei dessa palestra.*
'I didn't like that talk'.

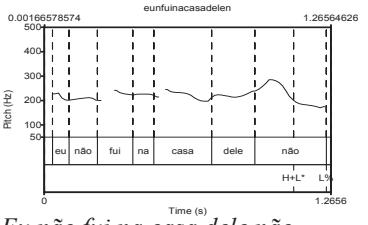


In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In (11a) the speaker is asked whether she liked Joana's talk, to which she responds that she didn't go to the talk. Here there is pitch accent both on the negative particle as well as the verb, but the verb's argument is deaccented. This is information that was evoked in the question, and that in de Morães' account would be considered "redundant" and therefore require no pitch accent. Additionally, it is unexpected that the speaker didn't go to the talk, since her interlocutor asked if she liked the talk, presupposing that she went. We find pitch accent, then, on the negative particle as well as the verb. In (11b) the speaker responded to a similar question, whether or not she liked Mariana's talk. In this case she responds negatively using NEG1. There is no pitch accent on the negative particle, but rather a H+!H tone combination on the verb; the F0 contour also begins to rise within the negative particle. Speakers producing the responses for this trial commented that they would simply respond *Não gostei* rather than repeating the post-verbal information. This is not surprising given the Portuguese tendency to use verbal responses for yes/no questions (Sadock & Zwicky 1985; Armstrong 2008). Therefore, in a case where a speaker would normally elide the information, when forced to produce it there is a tendency to deaccent the additional postverbal material. We can assume, then, that this information is highly accessible, and will undergo attenuation as postulated by Chafe in the form of either deaccenting or elision. Also of note in (11b) is that the verb has already been activated in the question, but there is still find pitch accent in the response. We speculate that this is also due to the tendency to respond with verbal responses in Portuguese. Because the entire VP tells the interlocutor 'yes' or 'no', the entire VP is considered new information, rather than just the negative particle.

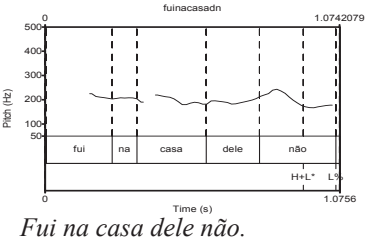
We have successfully confirmed H1, which states that NEG1 may or may not show patterns of deaccenting in BP. We now move on to H2, which was tested by eliciting NEG2 and NEG3 forms in contexts including explicitly activated information. With such information we see pragmatic overlap of the two non-canonical forms. (12a) and (12b) show typical contours for this context/form relationship across speakers:

(12a) NEG2 answer to the question *Você foi na casa do Rodrigo?* 'Did you go to Rodrigo's house?'




*Eu não fui na casa dele não.*
'I didn't go to his house.'

(12b) NEG3 answer to the question *Você foi na casa do Rodrigo?* 'Did you go to Rodrigo's house?'




*Fui na casa dele não.*
'I didn't go to his house'.

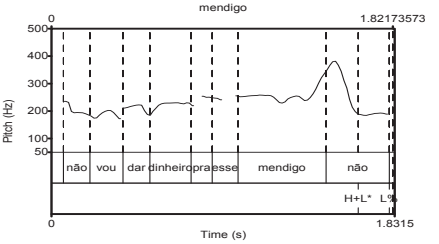


In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The pitch tracks in (12a, b) show that the explicitly activated proposition, i.e. that the speaker went to Rodrigo's house, does not show any pitch accent. These examples as well as others in our data confirm H2, that deaccenting patterns could be found for discourse-old information that was explicitly activated. It is also noteworthy that when the NEG2 version of this utterance is played to hearers without the first two lexical items *eu não,* making the segmental content the same as that of the NEG3 utterance, native BP speakers that listened to the two utterances found them identical. The utterances do, however, show a H+L* tone at the head of φ typical of neutral declarative sentences. In any case, (12a, b) confirm our hypothesis that non-canonical forms evoked by explicitly activated information would show deaccenting patterns.

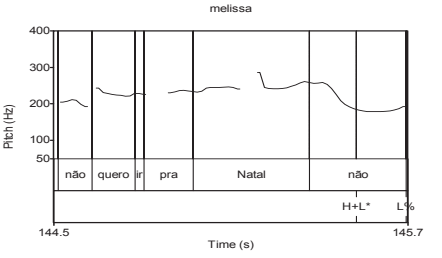
The last hypothesis to be tested was H3. The following examples were employed to test this hypothesis.

(13a) Pitch expansion for inferred NEG2 (Female speaker)
Context: *Você está na praia e pode ver que vem um mendigo pedindo dinheiro das pessoas. Aí você fala para seu amigo*:
You are at the beach and can see a beggar asking for money from people. So you say to your friend:




*Não vou dar dinheiro pra esse mendigo não.*
'I'm not going to give that beggar money.'

(13b) Response to question from context: *Acho que vou comprar uma passagem pra Natal. Você tá a fim?*
'I think I am going to buy a ticket to Natal. Want to go?'




*Não quero ir pra Natal não.*
'I don't want to go to Natal.

In (13a) the speaker states that she would not give money to the beggar. From the presence of a beggar on the beach, it is inferrable that the beggar might want money, and therefore NEG2 is licensed. In (13b) the speaker negates explicitly activated information, i.e. that she would want to go to Natal. The difference between the two utterances is pitch height for the high target. In (13a) the speaker reaches 382.5 Hz ($F_0$ Max), whereas in (13b) the same speaker is only at 285 Hz, within her normal pitch range. Additionally, the rise in pitch from the last syllable



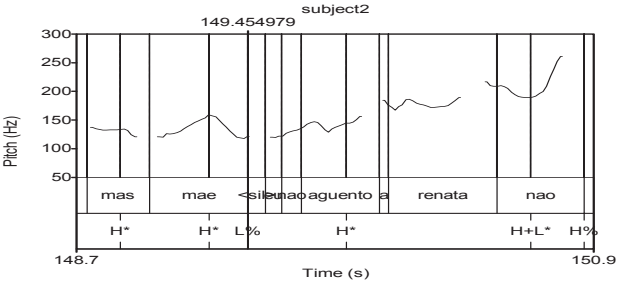
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

of the word occurring before the second negative particle is much sharper in (13a) than in (13b). The difference between these two utterances suggests that pitch widening is used for NEG2s produced in the context of inferrable propositions.

Because all of the examples of NEG2 and NEG3 above show deaccenting of propositional content that is highly accessible, we must ask whether deaccenting is obligatory for these non-canonical forms. (14) below responds to this issue in an example in which the speaker makes the hypothesis that the propositional content was not sufficiently accessible.

(14) Response to Context: Your mother is planning a dinner with the family. She tells you the list of invitees. She knows very well that you don't like your cousin Renata.

Mother: *Vem o tio Roberto, o primo Pedro, a tia Rebeca e a tua prima Renata.*
'Your Uncle Robert is coming, cousin Pedro, Aunt Rebeca, and your cousin Renata.'




*Mas mãe, eu não agüento a Renata não.*
'But mom, I can't stand Renata'.

In (14) there is pitch accent on the verb *agüento*, rather than the typical deaccenting patterns seen in prior examples. Additionally, the speaker climbs in pitch, dropping down and back up substantially at the end of the phrase, ending with a high boundary. The speaker peaks at 263 Hz, which is much higher than his typical range (100-150 Hz). The case is different than others addressed in this paper for various reasons. That the speaker gets along well with his cousin is relevant to the context; we can assume that he will be present at the party that his mother is talking about. Therefore, the speaker's ability to get along well with the other guests is also relevant. We might assume that the speaker is reminding his mother of his inability to deal with his cousin in a social situation, a sort of re-activation of information that the speaker believes is not active or at least not active enough in his interlocutor's mind. The speaker uses both pitch accent and pitch widening to accomplish this re-activation of information. The pitch tracks in (13a, b) and also (14) confirm that other strategies such as pitch accent on propositional content as well as pitch widening can be used depending on context



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



for NEG2s. Additionally, while deaccenting is very common for NEG2s, it is not obligatory.

## 6. Conclusion

In each case of non-canonical negative syntax considered here, there is accompanying prosodic coding to mark the contrast between pieces of information of differing discourse accessibility. There is, however, no one-to-one mapping between non-canonical negative constructions and prosodic structure. Rather, speakers have a number of prosodic resources at their disposal to make explicit the relationship between (parts of) the negated proposition and the prior discourse context. These resources, as illustrated above in our data for BP, include deaccenting and pitch widening. Our hope is that future research, both on BP and other languages, will lead to more comprehensive descriptions of the ways in which non-canonical syntax and prosodic structure interact with each other.

## References

Alkmim, Mônica. 2001. As negativas sentenciais no dialeto mineiro: uma abordagem variacionista. PhD diss., Universidade Federal de Minas Gerais.

Armstrong, Meghan. 2008. Pragmatic Restrictions on Affirmative Response Choice in Brazilian Portuguese. In J. Bruhn de Garavito, ed., *Selected Proceedings of the 10th Hispanic Linguistics Symposium.* Somerville, MA: Cascadilla Proceedings Project.

Armstrong, Meghan; Anouschka Bergmann; and Terrin Tamati. 2008. The Prosody of Negation in Brazilian Portuguese. In *Proceedings of the 4th Conference on Speech Prosody*. Campinas, Brazil. Universidade Estadual de Campinas.

Baltazani, Mary. 2006. Intonation and Pragmatic Interpretation of Negation in Greek. *Journal of Pragmatics* 38:1658-76.

Baumann, Steven, and Martine Grice. 2006 The Intonation of Accessibility. *Journal of Pragmatics* 38:1636-57.

Beckman, Mary E., and Julia Hirschberg. 1994. The ToBI annotation conventions, vers 2.0. Ms., The Ohio State University.

Chafe, Wallace, 1994. *Discourse, Consciousness and Time*. University of Chicago Press, Chicago.

Chafe, Wallace. 1976. Givenness, Contrastiveness, Definiteness, Subjects, Topics and Points of View. In C. N. Li, ed., *Subject and topic*, 25-56. New York: Academic Press.

Cruttenden, Alan. 2006. The De-Accenting of Given Information: A Cognitive Universal? In G. Bernini and M. L. Schwartz, eds., *Pragmatic Organization of Discourse in the Languages of Europe,* 311-55. Berlin: Mouton de Gruyter.

Crystal, David. 1975. *The English Tone of Voice: Essays in Intonation, Prosody and Paralanguage*. New York: St Martin's Press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



de Morães, João Antônio. 1998. Intonation in Brazilian Portuguese. In D. Hirst and A. Di Cristo, eds., *Intonation Systems: a survey of twenty languages*, 179-194. Cambridge: Cambridge University Press.

Fernandes, Flaviane. 2007. Tonal Association of Neutral and Subject-Narrow-Focus Sentences in Brazilian Portuguese. *Journal of Portuguese Linguistics* 5/6:91-115.

Hirst, D., and A. Di Cristo, eds, 1998. *A Survey of Intonation Systems*. Cambridge: Cambridge University Press.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form*. Cambridge: Cambridge University Press.

Lucente, Luciana. 2007. Proposta de um sistema de notação entoacional para o Português Brasileiro. Partial Master's Thesis Report. UNICAMP, Campinas, Brazil.

Prince, Ellen. 1981. Toward a Taxonomy of Given-New Information. In P. Cole, ed., *Radical Pragmatics,* 223-255. New York: Academic Press.

Sadock, Jerrold, and Arnold Zwicky. 1985. Speech Act Distinctions in Syntax. In T. Shopen, ed., *Language Typology and Syntactic Description, Volume 1, Clause structure,* 155-96. Cambridge: Cambridge University Press.

Schwenter, Scott. 2005. The Pragmatics of Negation in Brazilian Portuguese. *Lingua* 115:1427-56.

Terken, Jacques M. B., and Julia Hirschberg. 1994. Deaccentuation of words representing 'given' information: Effects of persistence of grammatical function and surface position. *Language and Speech*, 37:125-145.

Tenani, Luciani E. 2002. Domínios prosódicos no português. Unpublished Ph.D. diss., Universidade Estadual de Campinas.

Vallduví, Enric. 1990. The informational component. PhD diss., University of Pennsylvania.

Ward, Gregory, and Betty J. Birner. 2006. Information Structure. In B. Aarts and A. McMahon, eds., *Handbook of English Linguistics*, 291-317. Oxford: Blackwell.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Encoding Information Structure via Object Agreement in Spanish Interactions

VALERIA A. BELLORO
*Columbia University*

## 0. Introduction

The goal of this paper is to examine the information structure of traditionally named "direct object doubling" (DO-doubling) constructions in Spanish, based on interactional data from the Buenos Aires dialect. Even though Buenos Aires Spanish (often also referred to as *Porteño*, *Río de la Plata*, and 'River Plate' Spanish) is generally considered as the most permissive, these structures have also been attested in the dialects of Corrientes, Argentina (Colantoni 2002), Santiago, Chile (Silva-Covalán 1981), Lima, Perú (Sánchez 2006), Quito, Ecuador (Suñer 1989), and some areas of México (Parodi and Santa Ana, 2002; Alarcón and Orozco 2004) and Spain (Suñer 1989, Franco 2000).

In so-called DO-doubling, an accusative pronominal clitic and a coreferential lexical phrase in canonical posverbal position co-occur inside the clause. Following the proposals put forth by Suñer (1988) and Franco (1993, 2000), I consider the pronominal clitic in "doubling" constructions to be functioning as an object agreement marker.[1] The sentence in (1) serves as an illustration:

(1) El año pasado yo **la** invité **a Mabel**.
'Last year I invited Mabel.'(hc:xiv)[2]

[1] For ease of presentation, I will often use here the traditional label and refer to the cases where the clitic and the lexical phrase co-occur as "doubling" structures, and to the lexical phrase triggering object agreement as the "doubled" phrase. The use of these labels does not entail any particular commitment with respect to the syntactic role of these forms. See Belloro (2007) for an account of the grammatical aspects of these constructions within the framework of Role and Reference Grammar (Van Valin 2005).

[2] The relevant coreferential structure is marked in boldface. The letters 'hc' followed by a roman numeral mean that the example is taken from the corpus *El Habla Culta de la Ciudad de Buenos Aires* (Barrenechea 1987). The number represents the particular interaction from which the example is taken.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The occurrence of an accusative clitic in connection with a lexical phrase in DO function not only is optional, but also relatively constrained. Within formal approaches it has been claimed, for instance, that the clitic is allowed in the structure only if the coreferential phrase is marked by the pseudo-preposition *a* (Jaeggli 1981, 1986), or if the referent it denotes is specific (Suñer 1988, 1999), or presupposed (Franco 2000). Corpora-based studies, on the other hand, have arrived at seemingly contradictory conclusions, correlating the occurrence of accusative doubling with reference to topical (Silva-Corvalán 1981) and new (Colantoni 2002) discourse participants.

With respect to Buenos Aires Spanish, even conceived of as the paradigmatic doubling variety, there is a lack of corpus-based analyses which could confirm or belie the different hypotheses proposed so far. One of the central aims of this research is to address this gap, and to propose an alternative analysis of the interpretive import of these constructions based on naturally occurring data.[3]

With these goals in mind, the organization of this paper is as follows: In section 2, I review the main claims that have been made with respect to the semantics / pragmatics of DO-doubling constructions. Each proposal is evaluated with respect to a corpus of oral interactions among native speakers of Buenos Aires Spanish (Barrenechea 1987). This corpus consists of 33 samples, amounting to about 24 hours of recording (250,000 words). Within it, all sentences containing a post-verbal nominal direct object co-occurring with a coreferential accusative clitic were identified. Although the number of relevant instances is relatively small (119 tokens), this analysis constitutes, to my knowledge, the first attempt to evaluate the existing hypotheses and quantify their relative accuracy based on naturally occurring examples from a homogeneous corpus. The data show that none of the existing proposals can provide a comprehensive account of the context in which doubling constructions emerge. However, in section 3 I suggest that they are in fact consistent with an explanation of accusative agreement as marking the cognitive accessibility of the referents involved, which is proposed as a more accurate alternative for understanding not only under which conditions these structures are allowed, but also the discourse-pragmatic meaning they convey. Further, it is suggested that this approach makes it possible to provide a principled way of distinguishing between the information-structure of "doubling" constructions and its closely related "allosentences" (Lambrecht 1994), namely those structures where only the pronominal clitic or the lexical phrase occur. A brief summary of the analysis and its general conclusion are presented in section 4.

[3] The analysis I develop here follows a proposal originally presented in Belloro (2004) and elaborated in Belloro (2007). See also Estigarribia (2006) for a similar approach.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 1. Direct Object Doubling in Buenos Aires Spanish

### 1.1. A-marking and Animacy

In one of the seminal studies of clitic doubling in Buenos Aires Spanish, Jaeggli (1981, 1986) proposed that accusative doubling is only possible if the lexical phrase is introduced by the preposition-like particle *a*, as in (1) above (cf. also Lyons 1999, Belletti 2005, Anagnostopoulou 2006). The *a*-marking of direct objects is generally triggered by the animacy of the referent, although it may occur with inanimates if they are specific and topical (Torrego 1999, Leonetti 2003). The kind of features associated with *a*-marked direct objects is relevant here inasmuch as it coincides with the ones posited to correlate with "doubled" ones; namely animacy and topicality (cf. Silva-Corvalán 1981, Suñer 1988). Under this perspective, it is claimed that "accusative clitics in Spanish are in strict complementary distribution with direct objects which are not preceded by the marker *a*" (1986:19). This prediction posits the ungrammaticality of sentences such as those in (2) (from Jaeggli 1986:19):

(2) a. **La** compré (***la casa**).
'I bought it (*the house).'
b. **Lo** vendí (***el libro**).
'I sold it (*the book)'.

The analysis of the corpus suggests, on the contrary, that at least in the Buenos Aires dialect doubling is also possible with non *a*-marked DOs, as originally argued for by Suñer (1988). These cases account for 35% of the tokens in the corpus. Two examples are presented in (3):

(3) a. Ahora tiene que seguir usando**ló el apellido**.
'Now she has to keep using the last name.' (hc:xvi)
b. …**lo** han aprendido **el predicativo**.
'…they have learnt the predicative.' (hc:xi)

In fact, the data show not only that non *a*-marked phrases can co-occur with the clitic, but also that the animacy of the referent is relatively irrelevant as well, since almost 40% of the "doubled" phrases (some of them marked by *a*) refer to inanimate entities.[4]

[4] It is important to note that there is no evidence for claiming that these structures involve either a pause or an intonation break before the doubled phrase, and that the doubled phrase does not encode topical participants, facts that would support an analysis in terms of dislocation. Moreover, structures like (3) encode the same pragmatic status, with respect to the referent of the "doubled" phrase, as the *a*-marked counterparts, a fact that would remain mysterious if each were the instantiation of a different construction (cf. Belloro 2008).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 1.2. Specificity and Presuppositionality

It has been suggested that DO-doubling may only occur if the target referent can be conceived of as specific. The hypothesis was originally presented in Suñer (1988) and subsequently adopted, in general terms, by Sportiche (1995), Bleam (1999) and Gutiérrez Rexach (2000), among others.

Suñer's proposal crucially assumes that that specific indefinites allow doubling (4a), but nonspecific definite (4b) do not, thus stressing the relevance of specificity over definiteness, as illustrated in the following examples (from Suñer 1988:396):

(4) a. Diariamente, **la** escuchaban **a una mujer que cantaba tangos**.
'Daily, they listened to a woman who sang[indicative] tangos.'
b. (***Lo**) alabarán **al niño que termine primero**.
'They will praise the boy who finishes first.'

The specificity approach is not problem-free. At least 10% of the instances of the Buenos Aires corpus are difficult to accommodate in terms of specificity, regardless of the particular interpretation this notion is given (cf. Farkas 1994). Some examples involving generic reference are presented below:

(5) a. …hay que ver**las las cosas** para aprenderlas un poquito mejor ¿no?
…one has to see things to understand them a little better, no?' (hc:i)
b. Hasta en el exterior uno inmediatamente, casi a veces esté... viéndolo de lejos, **lo** ve **al porteño**.
'Even abroad you immediately, almost sometimes eh… watching him from far away, you spot the *porteño*.'(hc:i)

As an alternative to specificity, it was proposed that the relevant criterion for DO-doubling is the presuppositionality of the target referent (Franco 2000). The clearest formulation of the sense in which the notion of presupposition is used in this connection appears in Franco and Mejías-Bikandi (1999), based on examples such as the following:[5]

(6) a. **Lo** he visto **a un marinero**.
'I have seen one of the sailors.'
b. He visto a un marinero.
'I have seen a sailor.'

[5] Most of their data come from Basque Spanish in which, as in other "leísta" varieties, animate accusative clitics appear as *le(s)* instead of *lo/a(s)*. In these examples the canonical accusative clitics are substituted for the *leísta* variants occurring in Basque Spanish. Nothing in Franco and Mejías-Bikandi's analysis hinges on this distinction. The same hypothesis summarized here is defended in Franco (2000) with respect to what is there labeled "Southern Cone Spanish."



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In consistence with the glosses they provide, the authors argue that the noun *un marinero* 'one sailor' in (6a) is presuppositional. On the other hand, the object in (6b), may be interpreted either as presuppositional, or as existential non-presuppositional. That is, like (6a) the object in (6b) may refer to a previously introduced set of entities, but it could also be used to introduce a new entity in the discourse.

The presuppositionality of the target referent approach is not problem free either. The analysis of the Buenos Aires corpus shows that over 57% of the tokens in the corpus involve referents which do not have a previously introduced antecedent and have to be considered, in strict terms, "discourse-new" (Prince 1992).

### 1.3. Topicality

In relation to the presence of an antecedent for the "doubled" phrase, it was mentioned above that existing corpora-based studies arrive at contradictory conclusions. In a study of the Spanish of Santiago de Chile, Silva-Corvalán (1981) suggests that doubling is triggered by the high topicality of the certain referents in DO function (in particular, humans) and correlates with continuing topics. On the other hand, based on an analysis of the Spanish of Corrientes, Colantoni (2002) sees doubling as the result of the addition to the structure of a lexical phrase in those cases where exclusive pronominal reference would have been insufficient, as it is the case, for instance, with entities newly introduced in the discourse context.

With respect to the Buenos Aires data, each hypothesis makes it possible to account for the tokens with which the other fails, as doubling occurs in relationship with both "discourse-old" and "discourse-new" referents. The question is, then, whether there is a way of reinterpreting the trends found in Silva-Corvalán and Colantoni's corpora so that they may be not only compatible among themselves but also with the data collected from the Buenos Aires dialect. I would like to propose that such as reinterpretation is indeed possible by acknowledging the relevance to these constructions of the speaker's assumptions about the hearer's knowledge and attentional state.

## 2. Marking Referents' Accessibility

The Buenos Aires data show that the best grammatical correlate of doubling is in fact definiteness (95%), suggesting that these constructions target referents that the speaker assumes the hearer can identify (Lambrecht 1994, Lyons 1999). Since the identifiability of a referent is not exclusively dependent on its prior mention in the discourse context, from the perspective of the encoding of identifiability it is possible to explain why DO-doubling targets discourse-new participants almost as much as discourse-old ones. In effect, the referent of a definite NP may be considered identifiable by virtue of its anaphoric relation with a discourse-antecedent, but also due, for instance, to its associative connection with a different participant evoked in the exchange. In fact, inferential links of this type have been shown to pattern with anaphoric relations in a number of "marked" syntactic constructions



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(Birner 1997). The occurrence of DO-doubling in connection with new participants is therefore not surprising, as long as the participants belong to the set reasonably assumed to be inferrable from some other mentioned entities in the given discourse context. This is exactly what the Buenos Aires data shows. Two typical examples are presented in (7):

(7) a. Y... y cuando se toma el taxi **lo** mira **al taximetrista**...
'And when she takes the taxi she looks at the taxi driver…' (hc:xxxii)

b. …yo la invito a hacer este experimento: tomar todo lo que es sacando Piazzolla, tomar... tomar todo lo que es eh... yo no diría--- nueva ola, diría--- vanguardia en tango;…en todos los movimientos musicales siempre nos interesa la vanguardia; es lo que va quedando, por supuesto. Tomémos**lo a Troilo**, tomémos**lo a Berlingieri**, tomémos**lo a Salgán**…
'…I invite you to do this experiment: take everything except Piazzolla take all that is eh…I wouldn't say--- new wave, I would say--- avant garde in tango; in all musical movements there is always an interest in the avant garde; is what remains, of course. Let's take Troilo, let's take Berlingeri, let's take Salgán…' (hc:ii)

In the example in (7a), the mention of the taxi determines the "inferrability" (Prince 1981) of the taxi driver, given our natural expectations about the described scene. In (7b) the participants targeted by the doubling construction are more culturally specific, they are salient members of the *avant garde* tango music, and they are all introduced in the same turn. Although the different tokens found in the corpus exhibit certain particularities with respect to the inferential processes involved in each case, there is also a common factor relating all the different instances where doubling targets new discourse participants: in all cases they are assumed to be relatively easy to conjure up in the mind of the addressee given the particular discourse-context in which they are mentioned. This suggests that the occurrence of DO-doubling is not dependent on the existence of a coreferential link between the doubled object and a discourse antecedent, but on the existence of some "cluster of interrelated expectations" or "schema" (Chafe 1987:29) which allows the speaker to treat the relevant referents as identifiable.

Let us consider now the case of doubling of discourse-old participants. Two typical examples are presented in (8):

(8) a. Mire el otro día sube al colectivo un un porteño, bien bien calibradamente porteño. Y el que manejaba el colectivo--- era otro bien calibradamente porteño, ésos que manejan de costado--- en ángulo de cuarenta y cinco grados con respecto al volante. Éste no sé si le pagó con cien pesos o con quinientos y el otro le dio un vuelto... esté... marcadamente en monedas--- cualquier cantidad. Entonces éste cuando recibió ese impacto de todas las monedas que no se lo esperaba, quedó ahí con la mano todavía en forma de balanza como pesándola y mirando ese paquete brutal de



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

monedas. Y **lo** miró fijo y provocativamente **al colectivero**, y todo lo que le dijo es: 'Mucho, ¿no?'
'Look, the other day it gets in the bus a *porteño*, a very typical *porteño*. And the guy who drove the bus--- was another very typical *porteño*, those that drive on the side--- in a forty five degree angle with respect to the wheel. And this guy I don't know if he paid him with one hundred or five hundred pesos and the other guy gave him the change… eh… notoriously in coins--- a huge amount of them. Then this guy, when he received the impact of all those coins, that he wasn't expecting, stayed there with his hand still in the shape of a scale like weighing them and staring at this brutal pack of coins. And he looked at the bus driver straight and provocatively, and all he said was: 'A lot, no?' (hc:ii)

b. …tenemos un problema porque ese abrigo suyo vino una clienta y dijo que le quedaba muy bien y se lo quería para ella. Es una clienta hace mucho nuestra, así que se lo vamos a tener que dar." "Ah, no", dice. "Si quiere le hacemos otro, y después se lo mandamos a Bahía Blanca." Y Betty le dijo: "No –dice- yo lo elegí primero. Si ustedes no me **lo** dan **ese abrigo**, yo no compro nada…
'…we have a problem because, that coat of yours, a client came and said that it fit her very nicely and that she wanted it for herself. She has been our costumer for a long time, so we'll have to give it to her'. 'Ah, no', she says. 'If you want we'll make you another one, and then we'll send it to Bahía Blanca' And Betty said: 'No–she says- I chose it first. If you don't give me that coat I won't buy anything…' (hc:xxvii)

In (8a) the speaker is recounting an exchange he witnessed between a bus driver and the person who was buying the ticket from him. The bus driver is introduced in the second clause as "the guy who drove the bus", together with brief description of his physical appearance connoting his general character. Then the attention shifts to the traveler, the paper bill he used to pay for the ticket, and the coins he received in exchange. By the time the speaker wants to focus again on the bus driver, this participant is no longer the focus of attention. It is in this context that this referent appears encoded in a doubling construction.

Consider now the example in (8b). Here the speaker is telling something that happened to a friend of hers with a coat this person had bought. The coat, which the protagonist goes to pick up at the store, is introduced in the second clause as "that coat of yours". Then, several other participants intervene: another client, the clerk, Bahía Blanca and, crucially, *another coat*. When the relevant coat, the one the protagonist wanted, has to be referred to again, a doubling construction is chosen. These sentences exemplify a general trend in the data. If the doubled DO has a discourse antecedent, then between this antecedent and the doubled phrase there has been an attentional shift, so that by the time the doubling construction is used the referent it denotes is no longer the center of attention. It can be assumed to be, however, peripherally active in the mind of the addressee, inasmuch as even



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



if its level of activation decayed as the discourse proceeded, it has not rendered it fully inactive. Crucially, the same "peripheral" activation status with respect to the hearer's attention can also be assumed in relation with those cases involving discourse-new participants. In this later case it is not that their activation decayed from a previous active state, but on the contrary that they have acquired their relative accessibility by virtue of their association with an active conceptual "schema" (Chafe 1987, 1994).

Following Chafe, we can distinguish three levels of activation relevant for grammar: a conceptual representation of a referent may be "active" if it is in the interlocutor's focus of consciousness; "accessible", if it is only peripherally active; or "inactive" if it is in the interlocutors' long-term memory, and neither focally nor peripherally active. This typology makes it possible to capture the contexts where both discourse-old and discourse-new DO-doubling constructions occur, since in both cases these constructions not only target referents which are identifiable, but further those which are assumed to be neither "active" nor "inactive" but specifically "accessible" in the mind of the addressee.

The hypothesis that doubling constructions are sensitive to the *hearer's* knowledge and attentional state is in accordance with the structural properties of the lexical phrases found to co-occur with the clitic. If doubling were sensitive only to the speaker's knowledge (as some interpretations of the specificity hypothesis would predict) we should find at least some tokens where descriptively rich, formally complex lexical phrases were used to convey the speaker's relative familiarity with a referent presumably unknown to the addressee. In other words, where the referent could be assumed to be specific but not identifiable. The example presented in (4a), and repeated below for convenience, is a good candidate for occurring in this kind of context:

(9) Diariamente, **la** escuchaban **a una mujer que cantaba tangos**.
'Daily, they listened to a woman who sang tangos.'

Notably, however, the doubled phrases in the Buenos Aires corpus are consistently simpler than the one in (9); over 70% consist of just a proper noun or a definite determiner and a common noun (Belloro 2007:112). Given the correlation between form of encoding and identifiability (Ariel 1990, 2001; Gundel *et al*. 1993) this pattern, even if not presenting negative evidence against specificity, does suggest that at least in the Buenos Aires dialect doubling is not used in connection with referent which is identifiable for the speaker (i.e. specific) but not for the addressee.

Besides shifting the stress from the speaker to the addressee, another difference between identifiability and specificity or presuppositionality is that whereas the latter are typically understood as binary notions, identifiability is inherently gradual, since the identification of a referent may require more or less processing effort, depending on its relative activation in the mind of the interlocutors. What this perspective affords us, therefore, is the possibility of placing doubling con-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



structions alongside its closest grammatical alternatives, uncovering the particular pragmatic function that binds them; namely, the encoding of the pragmatic properties of the target referents. From this perspective clitic doubling can be interpreted as the formal correlate of an intermediate level of referent accessibility, along a continuum that has clitics and lexical phrases at either end. The proposed relationship between formal encoding and cognitive states for DO arguments can be illustrated as in (11):

(11) Correlation between Formal encoding and cognitive states:

| Form: | Clitic- only | Clitic- doubling | NP- only |
|---|---|---|---|
| Example: | **Lo** mira | **Lo** mira **al taximetrista** | Mira al taximetrista |
| Activation: | Active | Accessible | Inactive |

## 3. Conclusions

This paper examined previous accounts of so-called DO-doubling constructions in Spanish, and in particular the claims that the doubled lexical phrase has to be *a*-marked (which indirectly predicts that doubling of inanimate referents should be virtually unattested), that it needs to be interpreted as specific, and that it has to retrieve an antecedent from the discourse context. These claims were evaluated with respect to a corpus of interactional speech from a paradigmatic accusative doubling variety (Buenos Aires Spanish). The analysis showed that even though current proposals tend to capture general correlations, none of their claims can completely account for the empirical data.

The instances of accusative doubling in the corpus fall within two general categories: those which refer to a discourse antecedent that is no longer the focus of attention in the interactional segment, and those which involve an entity typically associated with some other entity just mentioned or the general issue being discussed. Resorting to Chafe's three-way distinction of cognitive accessibility levels, and his claim that accessible referents acquire this state via deactivation from an earlier active state or association with a semantic schema, I proposed that accusative doubling in Spanish is used to mark accessible referents and, in this sense, could be analyzed in light of its non-doubled alternatives (i.e. NP-only and clitic-only structures) as an extra point along the continuum for encoding the pragmatic properties of discourse-referents.

## References

Alarcón Neve, L. J. and W. Orozco Lecona (2004). El uso del pronombre clítico de objeto directo en el discurso narrativo de los niños de 5to. grado de primaria. *Actas del Séptimo Encuentro Internacional de Lingüística en el Noroeste*. Hermosillo, Sonora: Unison.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Anagnostopoulou, E. 2006. Clitic Doubling. In M. Evaraert and H. van Riemsdijk., eds., *The Blackwell Companion to Syntax,* vol 1. Oxford, UK: Blackwell Publishers.

Ariel, M. 1990. *Accessing noun phrase antecedents*. London: Routledge.

Ariel, M. 2001. Accessibility theory: an overview. In T. Sanders, J. Schilperoord, and W. Spooren, eds., *Text Representation. Linguistic and psycholinguistic aspects*. Amsterdam and Philadephia: John Benjamins.

Barrenechea, A., ed. 1987. *El habla culta de la ciudad de Buenos Aires*. Buenos Aires: Universidad Nacional de Buenos Aires.

Belletti, A. 2005. Extended doubling and the VP periphery. *Probus* 17: 1-35.

Belloro, V. 2004. A Role and Reference Grammar Account of Third-Person Clitic Clusters in Spansih. M.A. thesis, State University of New York at Buffalo.

Belloro, V. 2007. Spanish Clitic Doubling: A Study of the Syntax-Pragmatics Interface. Ph.D. diss., State University of New York at Buffalo.

Belloro, V. 2008. Sobre la interpretación de antitópicos, dislocaciones y doblados. *VII Coloquio de Lingüística de la ENAH*. México DF, Escuela Nacional de Antropología e Historia.

Chafe, W. 1987. Cognitive Constraints on Information Flow. In R. Tomlin, ed., *Coherence and Grounding in Discourse.* Amsterdam: John Benjamins.

Chafe, W. 1994. *Discourse, Consciousness, and Time*. Chicago: The University of Chicago Press.

Colantoni, L. 2002. Clitic Doubling, Null Objects and Clitic Climbing in the Spanish of Corrientes. In J. Gutierrez-Rexach, ed., *From words to discourse: Trends in Spanish Semantics and Pragmatics*. Amsterdam: Elsevier.

Estigarribia, B. (2006) Why clitic doubling? A functional analysis for Rioplatense Spanish. In T. Face, T. and C. Klee, eds., *Selected Proceedings of the 8th Hispanic Linguistics Symposium*. Somerville, MA: Cascadilla Proceedings Project.

Farkas, D. 1994. Specificity and scope. In L. Nash and G. Tsoulas, G., eds., *Langues et Grammaire*s 1. Paris: U. Paris 8. 119-137.

Franco, J. 1993. On object agreement in Spanish. PhD. diss., University of Southern California.

Franco, J. 2000. Agreement as a Continuum. In F. Beukema and M. den Dikken, eds., *Clitic Phenomena in European Languages*. Amsterdam: John Benjamins.

Franco, J. and E. Mejías-Bikandi. 1999. The Presuppositionality Condition. In J. Authier, B. Bullock and L. Reed, eds., *Formal Perspectives on Romance Linguistics*. Philadelphia: John Benjamins.

Gundel, J., N. Hedberg and R. Zacharski. 1993. Cognitive Status and the Form of Referring Expressions in Discourse. *Language* 69(2):274-307.

Jaeggli, O. 1981. *Topics in Romance Syntax*. Dordrecht: Foris.

Jaeggli, O. 1986. Three issues in the theory of clitics: Case, doubled NPs, and extraction. In H. Borer, ed., *Syntax and Semantics* 19. The Syntax of Pronominal Clitics. New York: Academic Press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Lambrecht, K. 1994. *Information structure and sentence form. A theory of topic, focus, and the mental representations of discourse referents.* Cambridge: CUP.

Leonetti, M. 2003. Specificity and Object Marking: the Case of Spanish *a*. In K. von Heusinger and G. Kaiser, eds., *Proceedings of the Workshop "Semantic and Syntactic Aspects of Specificity in Romance Languages".* Universitat Konstanz.

Lyons, C. 1999. *Definiteness*. Cambridge: Cambridge University Press.

Prince, E. 1981. Toward a taxonomy of given-new information. In P. Cole (ed.) *Radical Pragmatics*, 223-256. New York: Academic Press.

Prince, E. 1992. The ZPG letter: Subjects, Definiteness, and Information Status. In S. Thompson and W. Mann, eds., *Discourse Description: Diverse Analyses of a Fund Raising Text*, 295-325. Philadelphia: John Benjamins.

Sánchez, L. 2006. Clitic Doubling and the Checking of Focus. Ms.

Silva-Corvalán, C. 1981. The Diffusion of Object-Verb Agreement in Spanish. *Papers in Romance* 3:163-176.

Suñer, M. 1988. The role of agreement in clitic-doubled constructions. *Natural Language and Linguistic Theory* 6:391-434.

Suñer, M. 1999. Clitic doubling of strong pronouns in Spanish. In J. Franco, A. Landa and J. Martín, eds., *Grammatical analyses in Basque and Romance linguistics.* Amsterdam: John Benjamins.

Torrego, E. 1999. El complemento directo preposicional. In I. Bosque and V. de Monte, eds., *Gramática descriptiva de la lengua española*. Madrid: Espasa.

Van Valin, R. 2005. Exploring the Syntax-Semantics Interface. Cambridge: Cambridge University Press.

Valeria A. Belloro
Columbia University
Department of Spanish and Portuguese
612 W. 116th Street #309
New York, NY 10027

vb2237@columbia.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# What's New (and What's Given) in the Theory of Focus?

Daniel Büring

## 1 Introduction

Central to virtually all versions of focus semantics is the notion of FOCUS SEMANTIC VALUES, FSVs for short (also called FOCUS ALTERNATIVES). Characterized informally, within a given F(OCUS)-DOMAIN D, the meaning of all focused elements can be replaced by type-identical alternatives, which are combined with the ordinary denotations of non-focused constituents in D in the usual way. The result is a set of alternatives to the ordinary denotation of the domain D.

I will use a shorthand notation for FSVs, writing things like (1a–c) to characterize the FSVs of the root domains in (2a–c):

(1) a. John *R* Mary
b. *x* say Mary
c. John saw *y*

(2) a. $[\![\text{John SAW}_{\text{F}} \text{ Mary}]\!]_{\mathcal{F}}$
b. $[\![\text{JOHN}_{\text{F}} \text{ saw Mary}]\!]_{\mathcal{F}}$
c. $[\![\text{John saw MARY}_{\text{F}}]\!]_{\mathcal{F}}$

Both of these stand for sets of denotations $d$, where each element in $d$ is of the same type as the ordinary denotation of the sentence *John saw Mary*, say a set of worlds. Similarly, I'll write things like (3a–c) for sets of NP meanings, sets of VP-meanings etc.:

(3) a. *x* car

[0]This material was presented in various forms at the Berkelely Linguistics Society, the UCL workshop on Information Structure, and at colloquia at UC Santa Cruz and the Goethe Universität in Frankfurt. Thanks to the audiences there for their comments and suggestions, and to Michael Wagner for discussion of the issues.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



b. give $y$ to $z$
c. $R$ slowly

While FSVs, understood in this specific technical sense, are an essential tool in formulating a theory of focus, they do not by themselves constitute such a theory. We have to specify first, what (pragmatic) conditions the FSV has to meet, and second, when and where to 'retrieve' focus values, that is: where and when to form focus domains.

This paper argues for the following answers to these two questions: In order for a focus domain to be felicitous, its FSV has to include a meaning that is salient in the discourse, but moreover contrastive with the ordinary meaning of the focus domain. In this I follow recent arguments in Wagner (2006), contrary to Rooth (1992) and Schwarzschild (1999). Domains are formed due to principles that aim to maximize anaphoricity, an idea found for focus in Williams (1997) and Sauerland (2005), and in a slightly different way Schwarzschild (1997).

It turns out that the answers to these two questions are subtly intertwined, in a way that I will try to make transparent in this paper. In particular, while Wagner's observations were incompatible with the F-marking system proposed in Schwarzschild (1999), they are unproblematic for the account advocated here. The paper concludes by examining a second case of problematic examples for the Schwarzschild (1999) account, brought up in Kehler (2005), which I suggest can be handled in the present theory as well, but not as easily under the assumptions made in Wagner (2006).

# 2 Background

## 2.1 Match and Contrast

As mentioned above, a theory of focus has to clarify, among other things, which conditions the FSV of a given focus domain has to meet. One possibility often assumed is that the FSV of a given focus domain must contain an element which is salient in the discourse. I will call this condition MATCH:

(4) MATCH:
For each focus domain D, there is some element M in the FSV of D which is a salient meaning in the discourse.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



I think Rooth (1992) is a good example of a theory that employs matching in this sense. In that theory, each focus domain restricts a variable, to the effect that its value must be an element of the FSV.[1] The actual value of the variable must be supplied by the context, which I approximate in (4) by saying that it must be salient. A second example of a matching theory is Schwarzschild (1999), at least in the sense that whenever MATCH is met, so is the Givenness condition in that paper (for the inverse, additional assumptions need to be made which I cannot go into here).

One could assume a stronger condition than MATCH, something like (5):

(5) CONTRAST:
For each domain D, there is some element M in the FSV of D which is a salient meaning in the discourse and contrasts with the ordinary denotation of D.

The crux, as Rooth (1992) points out, is that the meaning of the word 'contrast' in the definition of CONTRAST in (5) is itself in need of explication; existing attempts in the literature have either fallen short of giving an explicit definition, or provided one which is too narrow to capture all the kinds of cases Rooth intended to be subsumed under his proposal. Moreover, Rooth claims, there is no need for such a stronger notion, since the rather 'weak' notion of MATCHing seems to capture all the cases we need to.

As said above, in section 4 I will side with Wagner (2006) on the latter point, *pace* Rooth. On the first point, I will offer some tentative remarks on a possible formalization of contrast in section 4.3.

Up until that section I will assume the principle MATCH, in order to facilitate comparison of the present proposal with Rooth (1992) and Schwarzschild (1999).

## 2.2 Domain Formation

The question, when and where to build domains, is not addressed in Rooth (1992), but forms a centerpieces of the proposal in Schwarzschild (1999). In order to demonstrate its relevance, let me first introduce some notation. I will mark focus domains by adjoining an expression $\sim$ ('squiggle'); for example,

[1] This is actually only one of two cases discussed in that paper. In the other, which I will ignore in this paper, hopefully without loss of generality, the variable needs to be a subset of the FSV.



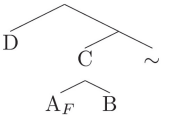
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



in (6), the constituent rooted in C is a focus domain, A is the focus of that domain, B the non-focus of that domain, and D is outside of the domain altogether:

(6)




Assuming MATCH in (4) above, (7) must hold for (6) to be felicitous:

(7) The context needs to contain a salient meaning denoting an element of '$x$ B' (the FSV of C).

In what follows I will often loosely speak of the requirement for an antecedent of the form '$x$ B', which should be understood as a shorthand for (7).

To exemplify, consider the correction sequence in (8) (material in parentheses is given for context only):

(8) a. (Jeanne recommend Mike for the job. — No,...)
b. ...she recommended PAUL for the job.

A possible representation for (8b) is (9):

(9) [she recommended Paul$_F$ for the job]$\sim$

The FSV of this sentence (the sister of $\sim$, to be precise) is 'she recommended $x$ for the job', a set of propositions (where $x$ ranges over individuals). $\sim$ requires that for (9) to be felicitous, some such proposition must be salient in the context. Since (8a) denotes just such a proposition, all is well in (8).

As a second illustration, consider (10):

(10) An AMERICAN farmer took a CANADIAN farmer out for a BEER.

The fact of interest here is that, as indicated by the capitalization, *American/Canadian* is focused, and consequently, *farmer* deaccented. Using the object for illustration, the domain of this focusing must be the NP *Canadian farmer* as in (11):

(11) An American farmer took a [Canadian$_F$ farmer]$\sim$ for a beer.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



The FSV of that NP is '$x$ farmer', which matches the denotation of the subject NP, 'American farmer', as required by MATCH. Note that any larger focus domain, say *took a Canadian$_F$ farmer* or *took a Canadian$_F$ farmer for a beer* would not meet MATCH, since 'took an $x$ farmer' and 'took an $x$ farmer for a beer' are not salient in the context.

A second fact to note about (10) is that while the accent 'shifts' from *farmer* onto *Canadian* due to focus, the main accent of the sentence is on *beer*, just like it would be if the object were *a Canadian banker* (i.e. no local focusing). This follows from the following F-to-Accent Mapping:

(12) F-to-Accent Mapping
   a. within a focus domain, a node dominated by F is stronger (no weaker) than any node not dominated by F
   b. otherwise, apply default prosody

Returning to the issue of where and when to form focus domains, consider now the following representations for (8b) above:

(13) Jeanne recommended Mike for the job. — No...
   a. [she recommended PAUL$_F$ for the job]$\sim$
   b. she [recommended Paul$_F$]$\sim$ for the job
   c. she recommended Paul for the job

(13a) is the desired representation, discussed above. But the alternatives in (13b) and (13c) are wrongly predicted to be ok, too. 'Recommend Mike' is salient, and in the FSV of *recommend Paul$_F$*, 'recommend $x$'; so (13b) meets MATCH. (13c) doesn't have any focus domain, and hence MATCH is not invoked, let alone violated, at all.

The problem is that both (13b) and (13c) would be pronounced with the main pitch accent on *job*, since that is where default prosody puts it, and in neither case is *job* part of a focus domain which would 're-direct' the accent. But intuitively it is completely infelicitous to accent *job* in this example.

What goes wrong here is that the focus domain in (13b) is too small; it should include *for the job* as well, in which case the correct accenting is derived. And similarly, (13c) should have a focus domain to begin with, and then one which includes the entire sentence (or at any rate *Paul* and *job*).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



One way to remedy this is to require that MATCH applies to every constituent in the clause. Put differently, every constituent is a focus domain. So while there would be nothing wrong with the domain in (13b), which, by (12) directs the accent onto *Paul*, there has to be another domain encompassing the entire sentence, and in that domain, too, the main accent has to be on *Paul*, thereby forcing deaccenting of *job*.

This, in effect, is the proposal in Schwarzschild (1999), which requires that every constituent be Given, in a technical sense used there. As pointed out earlier, MATCH in (4) has very similar effects to Schwarzschild's Givenness condition, and hence the requirement that every constituent be a focus domain (and hence invoke MATCH) closely follows Schwarzschild's proposal.

As noted in that paper, the proposal also closely follows earlier work on focus and accent in English, such as Rochemont (1986) and in particular Selkirk (1984, 1995), which, too impose certain requirements of being contextually salient on every constituent in the clause. We will introduce our own, slightly weaker version of this requirement in section 3 below.

## 2.3 Overfocusing

Consider another variant of our earlier example:

(14) (Did Jeanne recommend Mike for the job? — No,...)
[she recommended $\text{PAUL}_{\text{F}}$ for the $\text{JOB}_{\text{F}}$]$\sim$

In (14), both *Paul* and *job* are focused. By (12), both are pitch accented, and by default prosody, the final pitch accent is stronger than the pre-final ones, yielding the main accent on *job* once more, contrary to the desired outcome.

The obvious problem is that *job* is focused, but shouldn't be. But formally, MATCH is met in (14), because the FSV of the sentence, 'Jeanne recommended $x$ for $y$' does contain 'Jeanne recommended Mike for the job', which is a salient antecedent in (14). This is an instance of the problem known as OVERFOCUSING.

Schwarzschild (1999) provides a remedy against overfocusing as well, in the form of a constraint AVOIDF!, which basically says that among two competing F-patterns that both meet all other conditions on focus, the one with fewer F-markings is to be preferred. Thus, (9) is preferable to, and hence rules ungrammatical, (14).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



The same route is open here: Within each focus domain, focus as little as possible while still meeting MATCH. Our final proposal in section 3 will entail such a constraint.

# 3 Maximize Anaphoricity, and a New Theory of Domain Formation

One way to motivate Schwarzschild's AVOIDF! principle is in terms of what it does for the anaphoric relations a sentence enters into. Note that MATCH essentially imposes an anaphoric requirement on the context: That a certain meaning (out of the FSV) must be prominent.

To facilitate discussion, let me define the notion of Anaphoric Constituent:

(15) Anaphoric Constituent (in a focus domain)
A constituent C within a focus domain D is anaphoric if it neither bears, nor is dominated by, an F-marker in D.

Thus in $[A_F\ B\ ]\sim$, B is an Anaphoric Constituent; A, and anything dominated by it, is not. Intuitively, an anaphoric constituent in a focus domain D is one whose meaning is constant in all the alternatives in the FSV of D.

Suppose now that there is a principle that says that it is good to have as many Anaphoric Constituents in a focus domain as possible (cf. 'Don't Overlook Anaphoric Possibilities' in Williams, 1997).[2] Among other things, this principle would favor stingy use of F, since every F-marked constituent is no longer anaphoric itself, nor is any constituent that is dominated by it. Likewise, given the choice between a focus on a constituent A and a proper subconstituent B of A, this principle favors focusing B, since whatever is included in A but not B is then anaphoric.

(17) states such a principle, based on the generalization of (15) in (16):

(16) Anaphoric Constituent
A constituent C within a phrase marker S is anaphoric if it is anaphoric in a focus domain within S.

(17) Maximize Anaphoricity (MAXANA):
Maximize the number of Anaphoric Constituents in a sentence, while

[2] Other predecessors include the Attentiveness Maxim in Schwarzschild (1997) and Maximize Presuppositions in Sauerland (2005).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



respecting MATCH.

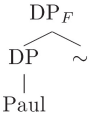
MAXANA not only favors fewer F-marks and smaller foci, but also big focus domains, since anything not included in any focus domain cannot, by definition, be an Anaphoric Constituent. MAXANA will make the whole sentence a focus domain, unless the entire sentence would then need to be F-marked. Furthermore, it will make each F-marked constituent itself a focus domain (unless that domain, again, wouldn't contain any Anaphoric Constituents). Take (18) as a simple example again:

(18) [she recommended [Paul]$_F$ for the job]$\sim$

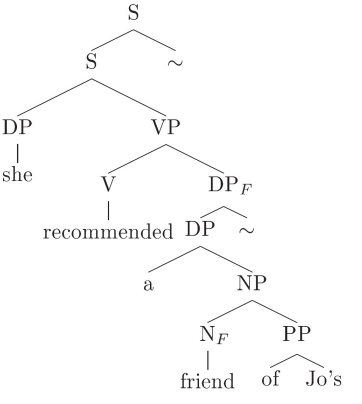
(18) meets MATCH because *Paul* is F-marked, and 'she recommended x for the job' matches the previous utterance (*she recommended Mike for the job*). The root focus domain makes *she, recommended, for the job, recommended Paul, recommended Paul for the job*, and *she recommended Paul for the job* Anaphoric Constituents.

No further focus domains could possibly introduce any additional Anaphoric Constituents; the only candidate, obviously, would be *Paul*, that is, one could try something like (19):

(19)




(20)




However, the focus domain *[Paul]*$\sim$ does not meet MATCH, since Paul is not salient in the context. To meet MATCH, *Paul* would need to be F-marked, but then the focus domain doesn't have any Anaphoric Constituent in it, and we may as well leave it out.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



If we have a larger focus with another focus in it (deaccenting), e.g. (21), MaxAna will urge the construction of two focus domains, as in the tree in (20) above:

(21) (Who did Jo's mom recommend? —) She recommended a FRIEND of Jo's.

If a larger focus contains only new elements, it need not itself be a focus domain. The situation is essentially the same as with $[_{DP}Paul]_F$ above. If on the other hand, a larger focus contains only new items, it will form a focus domain, but one without any F-markings. That way, all elements within the domain become Anaphoric Constituents, maximizing Anaphoric Constituents.[3]

Note that in this set-up, all-new constituents and all-given constituents differ in focus domain assignment (all-given constituents must be (part of) focus domains, whereas all-new constituents needn't, since they don't increase the number of Anaphoric Constituents), but not F-marking (none in either). Consequently, both will show default prosody. I take this to be a positive results, since, as is well known, all-new and all-given constituents regularly display the same prosody. Under the present proposal, this is so by necessity since neither contains any F-marking. This feature will also become relevant in our discussion of Wagner's examples below.

# 4 Wagner's (2006) Challenge

In the discussion so far we have assumed, with Rooth (1992), Schwarzschild (1999), the rather weak Match condition on focus, and invoked no notion of contrast other than 'be in the FSV of'. We will now review some recent arguments presented in the literature that suggest that a stronger notion is required.

[3] I have not stated a principle that limits the formation of focus domains to those that increase anaphoricity. So in principle, one could still make any constituent a focus domain. One can prove, however, that no focus domains besides the two kinds just mentioned (root, and below any F-marker) will increase anaphoricity (basically any additional domain would be a proper subdomain of either the root domain or one of the sub-F domains, and therefore not introduce any new Anaphoric Constituents). All examples discussed here only include the minimal amount of focus domains necessary to maximize anaphoricity. One could add a constraint 'Avoid focus domain' to the system, but at present I see no harm in having optional additional focus domains.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



## 4.1 Deaccenting requires local contrast

Consider (22) from Wagner (2006):

(22) Mary's uncle, who produces high-end convertibles, is coming to her wedding. I wonder what he brought as a present.
   a. He brought a [CHEAP convertible].
   b. #He brought a [RED convertible]
   c. He brought a red convertible.

In the context of (22), (22a), with a deaccented noun, is an acceptable answer, as expected: *cheap*$_F$ *convertible* matches 'high-end convertible(s)'. By the same token, (22b) would be expected to be fine, since *red*$_F$ *convertible* matches 'high-end convertible' just the same. But deaccenting here seems odd. The natural response (in the context of (22)) in this case is (22c).

I found similar judgements for a number of sentences I made up and informally asked about a dozen speakers to judge, using a questionnaire. In the following two examples, at least half of the speakers preferred deaccenting the noun and accenting the adjective alone:

(23) a. Mary plays many instruments, her favorite being the Spanish guitar. So I asked if she would play on my birthday. — She agreed to play some electric guitar.
   b. Steve is a Steinway dealer (the finest pianos in the world). He's also my daughter's godfather. I wonder what she'll get from him for her 5th birthday. — He'll probably get her a cheap piano.

On the other hand, less than a third of the speakers accepted a deaccented noun in the following examples, and nearly everyone preferred a regular accent pattern with accent on both A and N, the latter nuclear:

(24) a. Sarah is well known for her delicious chocolate cakes. So when we had a potluck dinner, guess what she signed up for bringing? — She signed up to bring a small cake.
   b. Kate has this amazing record collection, which is the apple of her eye. But when she was strapped for cash, guess what she sold? — She sold some classical records.

The contrast between (24) and (23), in particular the lack of deaccenting in (24) raises the same question as Wagner's (22b)/(22c): Why is the noun,



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



whose meaning is clearly salient in these discourse, not made an Anaphoric Constituent, and hence deaccented?

## 4.2 Wagner's Proposal

Intuitively, what goes wrong in (22b) is that deaccenting the noun (inappropriately) suggests that 'red convertible' contrasts with 'high-end convertible'. 'Cheap convertible', on the other hand, does contrasts with 'high end convertible', so deaccenting the N in (22a) is felicitous. This is precisely what Wagner (2006) claims, proposing the constraint in (25):

(25) An expression and its alternative(s) must contrasts.

In other words, the set of alternatives to a focused expression is restricted to those meanings that semantically contrast with the meaning of the focused item (and are in the same denotation domain). Accordingly, 'high end' is an alternative to *cheap*, but not to *red*.

Wagner's particular implementation differs from the type of system discussed in the present paper in various other ways, most notably in that grammar marks G(ivenness), rather than F(ocus). The central condition on the interpretation of G-marking is paraphrased in (26):

(26) A structure of the form *[A $B_G$]* is well-formed only if there is a (contrasting) alternative A* to A s.t. 'A* B' is salient.

In the case of (22a), the representation that yields deaccenting of the N is *CHEAP convertible*$_G$, i.e. A=*cheap*, B=*convertible*; since the context contains (and thus makes salient) the phrase *high-end convertible*, and since 'high-end' is an alternative to 'cheap', we can have A*=*high-end*, meeting (26).

To justify N-deaccenting in (22b), we'd need a representation *RED convertible*$_G$, which in turn requires that 'A* convertible' be Given, where A* is an alternative to 'red'. The only likely antecedent is *high-end convertible*, which would require that A*='high end', but since 'high end' is *not* an alternative to 'red', this option, and thus deaccenting N, is impossible.[4]

[4]Wagner doesn't provide a representation for the felicitous version (22c), but presumably this would have to be one of the representations in (i):

(i) a. he brought her a red convertible



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

It should be noted that the choice of G-marking over F-marking does not seem essential here. Assume we added (25), the requirement that focus alternatives be 'truly contrastive' with the focused item, to the theory from section 3. The prerequisite representation to deaccent N would be (27):

(27) (he brought) $[_{\text{DP}}$ a $\left\{ \begin{array}{l} \text{red}_{\text{F}} \\ \text{cheap}_{\text{F}} \end{array} \right\}$ convertible$]_{\sim}$

The obvious antecedent is 'high-end convertible', and in order to meet MATCH — that the antecedent be in $[\![\text{DP}]\!]_{\mathcal{F}}$ — 'high end' must be an element of $[\![\text{A}_{\text{F}}]\!]_{\mathcal{F}}$, which it is for A=*cheap*, but not for A=*red*. Thus in the latter case the correct structure would have to be (28):[5]

(28) [ he brought [a red convertible]$_{\text{F}}$]$_{\sim}$

This would be ok, since the set of alternatives ('he brought candy', 'he brought a harp', 'he brought a red convertible', 'he brought a red convertible',...) is matched by the question *(I wonder) what he brought as a present*.

Wagner (2006) similarly notes that his proposal could be implemented in the system of Rooth (1992), using F-marking. But recall that that system doesn't specify conditions on when to form focus domains. And indeed it is crucial for the F-version that not every constituent needs to be a focus domain. For consider what would happen if *red* and *convertible* n (28) had to be focus domains on their own. If neither is F-marked, their FSVs are {'red'} and {'convertible'} respectively, so they need to find salient antecedents 'red' and 'convertible'. This is easy for the latter, but not for the former, since 'red' is not salient in the context. F-marking *red*, however, will not help either, assuming that the set of its focus alternatives does not contain 'high-end' (as per the 'true alternative' requirement). In other words, *red* neither has a salient antecedent, nor is it contrastive, and hence there is no appropriate marking for it in isolation (note that *red convertible* in turn *is* contrastive, since it contrasts with other possible things the uncle could have brought). This is why this type of example is problematic for a theory like Schwarzschild (1999), in which every constituent must be Given (≈ meet MATCH).

b. [he brought her]$_{\text{G}}$ a red convertible

[5]Here, too, a structure without any F-marking would do the trick as well, though I suspect that this is just a coincidence.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Wagner's proposal elegantly circumvents this problem by putting the contrast requirement on the complement of the G-marked node. Therefore, not every non-G-marked constituent must be contrastive, but only the 'biggest' one, which in (28) is *a red convertible*.

Following the proposal from section 3 above, not every constituent needs to be a focus domain. But does it allow the structure in (28)? Not quite. We should in fact build a focus domain around *convertible*, which isn't in any focus domain yet, but could be made an Anaphoric Constituent:

(29) [ he brought [a red [convertible]$\sim$]$_{\mathrm{F}}$]$\sim$

It should also be clear that making *red* a focus domain wouldn't increase Anaphoric Constituents, since *red* is not anaphoric to begin with. What about the NP *a red convertible*, then? Without F-marking on *red*, this domain would violate MATCH, since 'red' is not salient. With F-marking on *red*, this doesn't introduce any additional ADs. But more importantly, since 'high end' is not a true alternative to 'red', *red$_F$ convertible* as a focus domain couldn't be matched with 'high-end convertible' (or any other salient meaning) to begin with, so this focus domain could never comply with MATCH. Since MAXANA only requires us to maximize Anaphoric Constituents to the extent that MATCH is met, no further focus domains containing *red* are required by that theory.

## 4.3 Explicating Contrast (at Least a Little Bit)

Before going on I would like to elaborate a little on the notion of contrast alluded to in 'true alternative'. In Wagner's formalism, whether or not something is a true alternative is decided at the level of the focused element itself; 'high end' is an element of $[\![\mathrm{cheap_F}]\!]_{\mathcal{F}}$, but not of $[\![\mathrm{red_F}]\!]_{\mathcal{F}}$. But the informal discussion in that paper already makes it clear that we should rather think of this in the context of other expressions.[6] I will assume that whether or not an element of the FSV counts as a true alternative is decided at the level of the focus domain.

A second elaboration regards the notion of 'contrastive' itself. The intuition I'd like to formalize here, and again one that can be found in one way or the other in many places in the literature, is that *cheap convertible* and *high*

[6] Wagner's examples is: 'used' is a true alternative to 'new' in the context of 'car', but not 'boy friend'.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



*end convertible* contrast because it is immediately plausible to understand them as exclusive: 'a cheap, not a high end, convertible'. On the other hand, it is much less plausible to understand *red convertible* as 'red, not high end' — unless the context makes it clear that red convertibles are generally not high-end, in which case *RED convertible* is in fact perfectly possible. For now, I will frame this using the notion of an ISSUE.

For example, in (8b), the literal meaning of the focus domain is 'she recommended Paul for the job', and the contextually salient alternative from the FSV is 'she recommended Mike for the job'. The issue is: Did she recommend Paul for the job, or did she recommend Mike for the job?', or more abstractly: 'ordinary meaning or focus alternative(s)?' One condition on an issue must be that exactly one of the alternatives is true. Put differently, an issue is plausible if it is plausible to assume that every world in the context set belongs to exactly one of the alternatives in the issue. (8b) is felicitous because it is plausible that she either recommended Mike (but not Paul), or Paul (but not Mike).

In the case of the convertible, things are more complicated, since the focus domain is the NP, which denotes a property. The sentence thus asserts that he gave her a red convertible, and the issue addressed is whether *that* convertible is a red convertible or a high-end convertible. But this issue is an issue only if we can assume that the convertible he gave her is either red (but not high-end), or high-end (but not red). The reason this is odd is because it seems unmotivated to think that that should be true: the convertible could very well be red *and* high-end, or in fact neither. On the other hand, that it is either high-end (but not cheap), or cheap (but not high-end) seems to be a reasonable assumption (and hence the question, which one it is, an issue) in just that sense.

To a very rough approximation, we can state the pertinent focus condition as in (30):

(30) let A be a constituent of any type, and $\vec{x}$ a sequence of variables s.t. $[\![\mathrm{A}]\!]_{\mathcal{O}}(\vec{x})$ is a proposition, then $A\sim$ denotes $\lambda\vec{x}.[\![\mathrm{A}]\!]_{\mathcal{O}}(\vec{x})$, provided that...

a. there is a salient meaning $a$ which is in $[\![\mathrm{A}]\!]_{\mathcal{F}}$, (presupposition 1)
b. and whether $[\![\mathrm{A}]\!]_{\mathcal{O}}(\vec{x})$ or $a(\vec{x})$ is an issue (presupposition 2)

This should suffice to explicate the notion of contrast for the purpose of this



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

paper, though clearly much more needs to be said.[7]

### 4.4 Interim Summary

We've seen in this section that Wagner's examples make a case for focus being contrastive (in its domain). This is incompatible with the theory in Schwarzschild (1999), in which anything that is not Given is F-marked; rather, things can be new, yet non-contrastive. If, on the other hand, new things don't always need to be F-marked, we can't maintain that F-less elements in general don't need to be accented. This, presumably, is the reason Wagner proposes to mark G(ivenness), rather than F(ocus): Now everything that's not Given, contrastive or just new, is grouped together, to be marked by default stress and prosody.

We have seen, however, that the exact same empirical picture can be modelled using F-marking, rather than G-marking, within the system laid out in section 3 above; default prosody kicks in whenever there is no *contrast* in F-marking: within a focus, and outside of focus domains. There is thus no inherent reason to use G (as Wagner does), rather than F.

The natural question, then, is whether there are independent reasons to choose G marking over F marking, or *vice versa*. I believe that examples brought up in Kehler (2005) might provide such reasons.

## 5 Kehler's (2005) Challenge

### 5.1 Data

Kehler (2005) discusses the contrast between (31) (from Schwarzschild, 1999) and (32):

(31) John cited Mary, but...

[7]For example: If a focus domain A doesn't contain any focus, $[\![A]\!]_{\mathcal{O}} = \{[\![A]\!]_{\mathcal{F}}\}$. The issue then must be 'A or A?' I suppose technically this may still be ok. Since A is not focused, we take it as a given that A, and hence it is plausible to assume that in each context world, exactly one element of {A} is true.

Alternatively, we could go with intuitions and deem 'A or A?' a non-issue. In that case, there can't be any focus domains without foci, contrary to what I suggested in section 3 above. As far as I can tell, this will change some of the representations, but not the accenting they predict. I'll thus leave this issue open.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



a. ...he DISSED SUE.
b. ?...he dissed SUE.

(32) Fred read the menu and then...
a. ...he ordered a HAMburger.
b. #...he ORdered a HAMburger.

There is at least a preference to accent both V and the object *Sue* in (31), but comparable double accenting seems distinctly odd in (32). Kehler presents these data as a challenge to the proposal in Schwarzschild (1999); while we cannot go into the details here, the challenge is roughly that according to that paper, every non-Given element needs to be F-marked, in particular both *dissed* and *Sue* (*ordered* and *hamburger*). But then how can the difference between the double-peak pattern and the single peak pattern be represented and interpreted?[8]

Kehler describes the difference between, say, (32a) and (32b) as that between one accent and two accents. I think more accurately, the difference is between one or two nuclear accents. The verb can be accented in either version, but when it does, its accent in (32a) (and (31b)) is less prominent than that on the object in these sentences, whereas in (31a) (and (32b)), V and O are accented equally strong. I submit that in (31a), V and O bear nuclear pitch accents, each within its own intermediate phrase. In (32a), there is only one intermediate phrase, and its nuclear accent is on O; V in this case can, but need not, bear a prenuclear phrase accent.

Pretheoretically, what we're dealing with here is the difference between one focus, (32b), and two foci, (31b). It is this intuition that I want to pursue.

[8]One would suspect that the difference is simply represented as follows: double accent = (ia) single accent = (ib) or (b'):

(i) a. $[V_F\ O_F]$
b. $[V\ O]_F$ b.' $[V_F\ O_F]_F$

However, (ib) would require both V and O to be given, which they aren't in either example. On the other hand, it is unclear what would ever license (ib'), given that (ia) has the same givenness requirements (namely: none), and uses one less F-mark; so according to Schwarzschild's AvoidF! principle, (ia) should block (ib').



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 5.2 Proposal

I want to suggest that in the double-peak examples, we express two separate contrasts, or issues. For example, *John DISSED SUE*, in the context given, contrast dissing Sue both with quoting Sue and dissing Mary; the issues are 'did he diss Sue or did he quote Sue?'; and 'did he diss Sue or did he diss Mary?'

On the other hand, the double peak in *John ORDered a HAMburger*, in the context given, would contrast ordering a hamburger with reading a hamburger and ordering the menu. The odd issues are 'did he order a hamburger or did he read a hamburger?'; and 'did he order a hamburger, or did he order the menu?'

I will assume that the domain for both foci is the entire clause, though as far as I can see, it could also be VP. What is crucial, however, is that each focus introduces an alternative relative to the ordinary meaning of its sister, even though that sister is itself focused. That is, we need one alternative of the form 'John $R$ Sue' (here: $R$='quote') and one of the form 'John dissed $x$' (here: $x$=Mary). One the other hand, neither of these alternatives is actually salient, though their combination, 'John quoted Mary', is.

This requires a complication in our focus semantics. We need to be able to selectively access foci in a domain. To do so, we follow Krifka (1991/2) and Wold (1996) in indexing foci. For an example like (33), we now have three FSVs (in the sentential domain):

(33) John $\text{DISSED}_{\text{F1}}$ $\text{SUE}_{\text{F2}}$.
  a. John $R$ Sue
  b. John dissed $x$
  c. John $Rx$

(33a) is the FSV for focus 1, (33b) the FSV for focus 2, (33c) the FSV *simpliciter*. In order to access these FSV, we index our domain operator $\sim$, yielding the full representation in (34):

(34) (John quoted Mary, but) $[[[\text{he dissed}_{\text{F1}}\ \text{Sue}_{\text{F2}}]\sim_1]\ \sim_2$

$\sim_1$ retrieves the FSV for focus 1, (33a), and contrasts one of its elements (here: 'John quoted Sue') with 'John dissed Sue'. $\sim_2$ retrieves the FSV for focus 2, (33b), and contrasts one of its elements (that John dissed Mary) with 'John dissed Sue'. In addition, both $\sim_1$ and $\sim_2$ retrieve the FSV simpliciter,



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(33c), and require that one of its elements ('John quoted Mary') be salient in the context.

So we've seen that multiple free foci can be captured by our system, appropriately amended to allow for selective indexing of foci. Let me close by pointing out why this may argue in favor of marking F, rather than G, as in W's system. Suppose we assumed the following condition (essentially Wagner's):

(35) [A $B_G$] is felicitous only if there is some A* s.t. [A* B] has an antecedent in the discourse.

Let us furthermore assume that a contrast condition just like the one contemplated here is imposed on [A* B], and finally, and this is crucial, that 'A' in (35) is understood to mean 'A with or without G' (this is certainly not W's intention, but it seems the best shot we have at making G-marking do what F-marking does so far). In that case, we could aim to represent (31a) as in (36), which would effectively count as *two* instances of (35), namely (36a) and (36b), with the conditions given below them:

(36) he $\text{dissed}_G$ $\text{Sue}_G$

a. he $\text{dissed}_G$ Sue
   it is given that he $X$-ed Sue

b. he dissed $\text{Sue}_G$
   it is given that he dissed $y$

The problem with this is that neither 'he $X$-ed Sue' nor 'he dissed $y$' *are* in fact given. Could we amend the system further, along the lines of (37)?

(37) [A $B_G$] is felicitous only if for some A*, 'AB or A*B' is an issue.

Assuming (36) and (37), we could get to the issues 'did he diss Sue or Mary' and 'he diss or quote Sue'. This seems right. But note that now there is no actual requirement of saliency on A or B any more. In Kehler's cases, this is fine, but in these cases, B itself is accented. In the general case, however, B is unaccented, and this should only be possible if its meaning is salient.

A further problem lies, I suspect, in the syntax-to-prosody mapping. Note that in (36), both G-marked constituents must be accented. This should happen if and only if one G-marked constituent is sister to another G-marked constituent (in all other cases, G-marking should correspond to deaccenting).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Though accenting G-marked material may strike one as counter-intuitive, this could still be captured by a syntax-to-prosody mapping along the lines of (38):

(38) a. if in *[A B]* (order irrelevant), A is G-marked and B is not, B is metrically stronger than A; otherwise...
b. apply default prosody

But note that in the double-accent examples such as *He DISSED SUE*, the accent on *dissed* is actually stronger than in the default case (I argued above that it is a nuclear accent within an intermediate phrase *he dissed*). It is unclear how this effect would follow from G-marking.

Does it follow from F-marking? We required that a focus within a focus domain is no weaker than any other element in that domain. A straightforward way to use this is to say that two nuclear accents, i.e. two intermediate phrase heads, are equally strong, whereas for each two accents *within* an intermediate phrase, one is stronger. It follows that whenever a domain D contains more than one focus — either because D has two foci, or because D overlaps with another domain whose focus falls into D (and is different from the focus of D), two intermediate phrases must be formed. [9]

# 6 Summary

In this paper I addressed three issues: The nature of the pragmatic condition on focusing (MATCH or CONTRAST), how to get enough focus domains so as to predict accent patterns (every node is a focus domain, or Maximize Anaphoricity), and how to represent focus in the syntax (F-marking or G-marking).

It was shown that, if we accept the arguments in Wagner (2006) to the effect that MATCH is an insufficiently weak condition on focusing, we are lead towards a system that maximizes focus domains, but doesn't require every node to be one. We are not forced, however, to use G-marking rather than

[9] A slightly more involved theory would go as follows: (A) For any domain, the focus has to be strongest in the prosodic constituent containing that domain. Clearly, if a domain contains two foci, A will be violated. Crucially, violations of A are cumulative: one violation for every element of the focus domain which is not within the prosodic constituent in which F is maximally prominent. In other words, each focus will try to be maximally prominent in as big a sub-part of its domain as possible.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

F-marking; the two options seem to fare equally well. Finally I argued that in order to extent the analysis to cases of double focusing, or juxtaposition, it may be preferable to indeed mark focus, not its complement, givenness.

Based on a new notion of Anaphoric Constituent, I proposed a new, formal implementation of what it means to maximize focus domains, MAX-ANA. I argued that this condition also subsumes the effects of the constraint AVOIDF in Schwarzschild (1999) I proposed an implementation of the notion of anaphoricity which is, to the best of my knowledge, novel. Finally I sketched a first formal implementation of the notion of contrast used here.

## References

Jacobs, Joachim, 1991/2. *Informationsstruktur und Grammatik*. Opladen: Westdeutscher Verlag. (= *Linguistische Berichte* Sonderheft 4).

Kehler, Andrew, 2005. *Coherence-Driven Constraints on the Placement of Accent*. In *Proceedings of the 15th Conference on Semantics and Linguistic Theory (SALT-15)*.

Krifka, Manfred, 1991/2. *A Compositional Semantics for Multiple Focus Constructions*. In *Jacobs (1991/2)*, 17–53.

Rochemont, Michael, 1986. *Focus in Generative Grammar*. Amsterdam/Philadelphia: John Benjamins.

Rooth, Mats, 1992. *A Theory of Focus Interpretation*. *Natural Language Semantics* 1:75–116.

Sauerland, Uli, 2005. *Don't interpret focus: Why a presuppositional account of focus fails, and how a presuppositional account of givenness works*. In *Proceedings of Sinn und Bedeutung 9*, 370–384. Nijmegen.

Schwarzschild, Roger, 1997. *Interpreting Accents*. *Ms. Rutgers University* .

Schwarzschild, Roger, 1999. *GIVENness, AvoidF and Other Constraints on the Placement of Accent*. *Natural Language Semantics* 7(2):141–177.

Selkirk, Elisabeth, 1984. *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge, Mass.: MIT Press.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Selkirk, Elisabeth, 1995. *Sentence Prosody: Intonation, Stress, and Phrasing.* In John A. Goldsmith, ed., *The Handbook of Phonological Theory*, 550–569. London: Blackwell.

Wagner, Michael, 2006. *Givenness and Locality.* In Jonathan Howell and Masayuki Gibson, eds., *Proceedings of SALT 16.* Ithaca: CLC Publications.

Williams, Edwin, 1997. *Blocking and Anaphora. Linguistics Inquiry* 28:577–628.

Wold, Dag, 1996. *Long distance selective binding. the case of focus.* In Teresa Galloway and Justin Spence, eds., *Proceedings of* Semantics and Linguistic Theory (SALT) VI, 311–328. Ithaca, NY: Cornell University.

Daniel Büring
Linguistics Department
University of California Los Angeles
Campbell Hall
Los Angeles, CA 90095-1543

buring@humnet.ucla.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# The Syntax-Pragmatics Interplay in Yaqui

LILIÁN GUERRERO
*Instituto de Investigaciones Filológicas, Universidad Nacional Autónoma de México*

## 0. Introduction

Variable word order patterns can result from an interaction of syntactic and pragmatic constrains which may be ranked differently across languages. The aim of this paper is to explore the nature of main clause word order in Yaqui (Uto-Aztecan) and to locate it within a typological classification, drawing upon Van Valin (1999)'s hypothesis on the interplay of syntax and focus structure. In this proposal, rigid vs. flexible syntax interacts in interesting ways with rigidity vs. flexibility of focus structures, generating four language types. It turns out that Yaqui is fairly rigid in its syntax but flexible in its pragmatics.

The Yaqui language belongs to the Taracahita group of the Southern Uto-Aztecan family. There are about 15,000 speakers in Sonora (Northwest of México), and approximately 6,000 in Arizona (USA). The analysis presented here is based on data from my own fieldwork on the Sonora dialect. The information is organized as follows: Section 1 outlines a basic morpho-syntactic description of Yaqui simple clauses. In section 2 the theory of the syntax-pragmatics interplay is presented, and in Section 3 the Yaqui typological classification is proposed. Section 4 concludes the paper.

## 1. Basic Morpho-Syntactic Properties of Yaqui

Yaqui is a synthetic/agglutinative verb-final language, and it is generally agreed that nominals show a relatively free order (Escalante 1990; Rude 1996; Dedrick & Casad 1999; Félix 2000; Guerrero 2006). There is a nominative-accusative case system. In nominal forms, the nominative is unmarked and the accusative is marked by the suffix *–ta* as shown (1a). There is no dative case, but postpositions like the directional *-u* indicate oblique core arguments of verbs like *nooka* 'talk to' in (1b). The accusative and plural suffixes are mutually exclusive. In (1c), the preferred reading is that where the first NP acts as the subject, e.g. *the coyotes bit the dogs*, but it can also mean *the dogs bit the coyotes*. The pronominal inventory in (2) ranges in status from fully independent forms, to clitics, to affixes, and



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



clearly distinguishes among the nominative, accusative, genitive, reflexives, as well as object of postposition functions.[1]

(1) a. U jamut-Ø Peo-ta bicha-k.
DET woman-NOM Pedro-ACC see-PFV
'The woman saw Pedro'.

b. U o'ou-Ø jamut-ta-u nooka-k.
DET man-NOM woman-ACC-DIR talk-PFV
'The man talked to the woman'.

c. U-me goi-m u-me chu'u-im ke'e-kan.
DET-PL coyote-PL the-PL dog-PL bite-PASTC
'The coyotes bit the dogs'.

(2) Yaqui pronominal system

| | Nominative | Accusative | Object of postposition | Reflexive | Genitive |
|---|---|---|---|---|---|
| 1sg | inepo =ne | nee | ne- | ino | in, nim |
| 2sg | empo ='e | enchi | e- | emo | em |
| 3sg | aapo | apo'ik a | a-, ae- | eu, au, emo | a, apo'ik |
| 1pl | itepo =te | itom | ito- | ito | itom |
| 2pl | eme'e ='em | enchim | emo- | emo | em, enchim |
| 3pl | bempo | apo'im, am | ame- | emo | bem, bempo'im |

The strength of the head-final order is seen in the use of postpositions (3a), verbal suffixes (3b), noun-genitive (3c), and adjectives preceding the noun (3b), although relative clauses follow the modified noun (3d). Yaqui is a language where the order of the constituents seems to be determined by the grammatical relation of the NP. For instance, the position of the subject NP is strongly clause-initially in a transitive clause (3a), an intransitive unergative verb (3b), as well as an unaccusative verb (3d), except when it is realized as a pronoun, in which case it may appear in second-position (3c).

(3) a. Aapo wakas-ta jinu-k bw'awa-ta betchi'ibo.
3SG:NOM meat-ACC buy-PFV soup-ACC for
'She bought meat for the soup'.

[1] Abbreviations: ACC: accusative, CLM: clause linkage marker, DET: determiners, DIR: directional, GEN: genitive, LOC: locative, NEG: negation, NOM: nominative, NMLZ: nominalizer, PST: past, PASTC: past continuative, POT: potential, PRF ~ PFV: perfective, PL: plural, PRES: present, Q: question particle, REL: relative, SG: singular, SUBJ: subject.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. Ili uusi-Ø bwaan-taite-k.
little child-NOM cry-start-PFV
'The child started crying'.

c. Joan-ta juubi = ne bicha-k.
Joan-ACC wife = 1SG:NOM see-PFV
'I saw John's wife'.

d. Mesa-Ø [em jinu-ka-'u] jamte-k
table-NOM 2SG:GEN buy-PFV-CLM break-PFV
'The table you bought broke down'.

For Yaqui, as for most languages of the family, the structuring of information within the clause has not yet been explored. Dedrick & Casad (1999:43-45) only comment that topicalization occurs sentence initially (4); in oral narratives, the topical element may be followed by discourse particles like *intok* 'and' or *bea* 'then'. It is also said that the unmarked focus position is clause initially.

(4) Kauwis-Ø intok pocho'o-kun-bicha-u bwite-k.
fox-NOM and woods-to-site-DIR run-PFV
'And the fox ran toward the woods.' (Dedrick & Casad 1999:43)

## 2. The Syntax-Pragmatics Interplay Theory

The central aim of this paper is to provide a first examination of Yaqui main clause word order adhering to the Role and Reference Grammar (RRG) approach (Van Valin 1999, 2005; Van Valin and LaPolla 1997).[2] Van Valin (1999) defines a typology based on the way languages grammatically organize the expression of focus structure and its interaction with certain syntactic features.

Following Lambrecht (1994), the focus structure of the sentence is understood as the grammatical means which indicate the scope of the assertion in an utterance in contrast to the presupposed or topical part of the utterance. In this approach, there is a distinction between broad focus, i.e., the focus domain encompasses more than one constituent such as predicate or sentence focus, and narrow focus, i.e., the focus domain extends only over a single argument. Predicate focus is universally the unmarked type, and coincides with the traditionally recognized 'topic-comment' organization of information in a sentence: the subject is the topic and the predicate is a comment or assertion about the subject-topic. In the examples below, there is a NP serving as the topic (*my car*); this is the subject NP in English and Italian. The focus element appears in small caps.

[2] For the RRG theory of focus structure based on Lambrecht (1994), I refer to Van Valin and LaPolla (1997:199-241) and Van Valin (2005:68-88). Some studies dealing with this approach include Bently (in press) for Italian and Sicilian; Shimojo (1995, in press) for Japanese; Belloro (2007, in press) for Spanish.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(5) Q: How's your car?
A: a. My car/it BROKE DOWN. English
b. (la mia macchina) si è ROTTA. Italian

Sentence focus does not have a topical subject but the focus domain is the entire sentence. In (6), the whole sentence is new information. In English, the subject receives focus stress, while in Italian the subject appears post-verbally and with focus stress.

(6) Q: What happened?
A: a. MY CAR broke down. English
b. Mi si è rotta la MACCHINA. Italian
(Lit: 'broke down to me the car')

In narrow focus, the focus domain is a single constituent. In (7), the presupposition 'something broke down' is associated with the sentence, and the assertion is that it is the speaker's car, rather than something else, which broke down. In English, this is signaled by focal stress on the subject or by a cleft construction, e.g., it was my car that broke down. Italian likewise has two options: post-posing the subject or using a cleft construction.

(7) Q: I heard your motorcycle broke down.
A: a. My CAR broke down. English
a'. It's my CAR that broke down.
b. Si è rotta la mia MACCHINA. Italian
(Lit: 'It is my car that broke down.')
b'. È la mia MACCHINA che si è rotta.
(Lit. 'It's my car that broke down.')

To complement Lambrecht's approach, Van Valin (1999) includes a distinction between the actual focus domain, that part of the sentence in focus, and the potential focus domain, the part of the sentence in which a focal element may be potentially found. In English, for example, the entire main clause is the potential focus domain; in (5a) the actual focus domain is *broke down*, in (6a) it is the whole clause *my car broke down*, and in (7a) it is the subject NP *my car*.

Van Valin's typology is concerned with comparing languages in terms of the rigidity vs. flexibility of their word order, on the one hand, and the rigidity vs. flexibility of their focus structure on the other, resulting in four language types. The expression of 'syntactic rigidity' refers to a fixed word order for major constituents (see Bently in press for a different notion). The notions of rigid and flexible focus structure refer to restrictions on the potential focus domain: languages in which the potential focus domain is the entire main clause are considered to have a 'pragmatically flexible' structure, whereas those in which the potential fo-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

cus domain is restricted to a subpart of the main clause are considered to show a 'pragmatically rigid' structure.

(8) Typology of the interplay of focus structure and syntax (Van Valin 1999:4)

| | Rigid Focus Structure | Flexible Focus Structure |
|---|---|---|
| Rigid Syntax | (i) French, Toba Batak | (ii) English, Toura |
| Flexible Syntax | (iii) Setswana, Italian | (iv) Russian, Polish |

English and French are prime examples of languages that are rigid in syntactic terms. English, however, exhibits a flexible focus structure, while French has a rigid focus structure. In English main clauses, any clause-internal position can be focal as shown in (9). Due to syntactic rigidity, the English subject must be preverbal in declarative clauses (10a); the pragmatic role of focal subjects is marked prosodically (10b), as is the case with any focal constituent. The examples are from Van Valin's (1991).

(9) a. Kim sent the book to LESLIE yesterday.
b. Kim sent the book to Leslie YESTERDAY.
c. Kim sent THE BOOK to Leslie yesterday.
d. Kim SENT the book to Leslie yesterday.
e. KIM sent the book to Leslie yesterday.

(10) a. What happened? - **BROKE DOWN MY CAR*
b. I guess your motorcycle broke down. – MY CAR broke down.

French is a good example of the first type: its syntax and focus structures are both rigid. In general terms, the focus domain cannot be preverbal, and thus preverbal focal subjects are banned (with the exception of *wh*-arguments). Since French syntax is rigid, subjects are strongly disallowed in postverbal position in declarative clauses. According to Lambrecht (1994:22), in a context like that of (5), the focal argument will not be the subject as shown in (11a). As for a narrow focus structure (7), its closest counterpart is a cleft sentence like (11b).

(11) Q: How's your car?
a. J' AI MA VOITURE QUI EST EN PANNE.
I have.1SG my car REL be.3SG in breakdown
'My car broke down'. (lit. I have my car that is broken down)

Q: I heard you motorcycle broke down.
b. C'est MA VOITURE qui est en panne.
it be.3SG my car REL be.3SG in breakdown
'It is my car that broke down'.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The third type of language restricts the domain of the assertion to a portion of the clause, but it is relatively flexible in syntactic terms. A good example is Setswana (Bantu) where the potential focus domain is limited to the verb and the following part of the clause. Although this language exhibits a tendency towards SVO order (12a), it requires a postverbal subject if the subject is focal (12b). In (12a), the preverbal argument must be presupposed, while the postverbal argument can be interpreted as topical or focal, depending on the context.

(12) a. Monna o-bed-its-e mosimane.
man SUBJ-hit-PRF-MD boy
'The/*a man beat a/the boy'.

b. Ho-filh-il-e MONNA.
LOC-arrive-PRF-MD man
'There arrived A MAN / A MAN arrived'.

Finally, languages of the last type do not limit the focus domain to a portion of the clause: the potential focus domain is extended to the whole clause. Unlike English, however, they do not have any strict syntactic constrains. Russian is a good example, since the linear order of topical and focal elements is not necessarily determined by their grammatical relation to the predicate (13a), which is clear evidence of syntactic flexibility. In presentational intransitive constructions, the subject can precede or follow the verb as in (13b) and (13c), although a preference for a preverbal subject is attested.

(13) a. Viktora zaščiščajet MAKSIM-Ø.
Victor.ACC defend.3SG Maxim-NOM
'MAXIM defends Viktor'.

b. MAŠINA SLOMALAC'.
car break.down.3SG.PST
'(My) car broke down'.

c. SLOMALAC' MAŠINA.
break.down.3SG-PST car
'(My) car broke down'.

In what follows I propose that Yaqui can be classified as a language with a rigid syntax and a flexible pragmatics. Syntactically, the canonical order of major constituents is SOV, and alternations to this order entail morpho-syntactic and pragmatic consequences. A focal element must occur pre-verbally. Postverbally, topical but not focal elements are allowed.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 3. Yaqui: Rigid-Syntax and Flexible-Pragmatics

The default position of topical arguments in Yaqui is clause-initial. This is shown in (14), in which the NP *u jamut* 'the woman' is the given information, the starting point of the sentence. The default position of focal arguments is preverbal; in (14b) the predicate is the comment or assertion about the subject-topic.

(14) a. Jita-sa u jamut-Ø ya'a-Ø?
What-Q DET woman-NOM do-PRES
'What does the woman do?'

b. U jamut / aapo KAFE-TA BWASA-Ø.
DET woman-NOM 3SG.NOM coffee-ACC toast-PRES
'The woman / she is toasting the coffee'.

The examples in (15) are sentence focus constructions. In the response to the question 'what happened?', the focal information is the entire sentence, meaning there is no topical subject.

(15) a. Jita-sa weye-k?
What-Q go.SG-PFV
'What happened?'.

b. JOAN-Ø HERMOSIO-U SIIKA.
Joan-NOM Hermosillo-DIR go.SG.PFV
'John went to Hermosillo'.

c. U JAMUT TOTO'I-M JINU-K.
DET woman hen-PL buy-PFV
'The woman bought the hens'.

The unmarked word order in Yaqui main clauses is compatible with sentence focus and predicate focus. This is also true for presentational sentences like (16) which encode sentence focus.

(16) Inii junaa'a yoawa-Ø emo nasuk jiapsi-su-ka-me.
This that animal-NOM 2PL among live-finish-PFV-NMLZ
'This one is the animal which lived among you (pl)'.

Within the information structure perspective adopted here, there is also a contrast between the unmarked narrow focus and the marked narrow focus, the distinction being where the focus falls. For English, if it falls on the final constituent in the clause, then it is unmarked, whereas if it falls to the left of that, it is marked. Thus, narrow focus on a 'direct object' as in (17) is a case of unmarked argument focus.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(17) Q: What did Sally buy?
A: She bought A NEW CAR.

For Yaqui, the potential focus domain can figure at any clause-internal preverbal position. Because it is a verb-final language, this coincides with the whole clause. Moreover, the default position of focal arguments seems to be before the verb, as shown with the focal intransitive subject in (18a) and the focal object in (18b). Although the focal subject in (18c) is in the default position, this structure is not well-formed; focal subjects of transitive sentences must appear clause initially (i.e. marked narrow focus). The focal role is expressed prosodically. The fact that the word order is the same in predicate (14), sentence (15) and narrow focus (18) suggests that Yaqui is flexible in pragmatic terms, but not in syntactic terms.

(18) Q: 'Who did dance?'
a. QUETA-Ø ye'e-k.
Queta-NOM dance-PFV
'Queta danced'.

Q: 'What did the woman buy?
b. U jamut-Ø TOTO'I-M jinu-k.
DET woman-NOM hen-PL buy-PFV
'The woman bought hens'.

Q: 'Who did buy the hens?'
c. *Toto'im U JAMUT-Ø jinu-k.
hen-PL DET woman-NOM buy-PFV
'The woman bought the hens'.

d. U JAMUT-Ø toto'im jinu-k.
DET woman-NOM hen-PL buy-PFV
'The woman bought the hens'.

The discussion has so far dealt with non-contrastive focus. In Yaqui, contrastive focal arguments also appear pre-verbally. The NPs *Queta* (19a), *toto'ita* 'hen' (19b), and *Mariatau* 'to María' (19c) provide the new elements of information in the reply, and contrast with the antecedents which have been introduced previously in discourse. Notice that the contrastive subject and contrastive objects are found in the same position as narrow focused elements (18), which coincides with their canonical position. Focus structure then adapts to a rigid syntax.

(19) Q: Did Lupe dance?
a. e'e QUETA-Ø ye'e-k.
NEG Queta-NOM dance-PFV
'No, Queta danced'.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Q: 'Did Aurelia buy a dog?'
b. e'e, Aurelia-Ø TOTO'I-TA jinu-k.
NEG Aurelia-NOM hen-ACC buy-PFV
'No, Aurelia bought a hen'.

Q: 'Did Aurelia sell the hen to Lupe?'
c. e'e, Aurelia-Ø toto'i-ta MARIA-TA-U nenka-k.
NEG Aurelia-NOM hen-ACC María-ACC-DIR sell-PFV
'No, she sold the hen to María'.

Claiming that the Yaqui language represents type-(ii) of Van Valin's typology in (8) does not mean that other non-canonical word orders are banned. In fact, topical subject (20a), accusative (20b) and oblique core arguments (20c-d) can appear postverbally. However, when an accusative or oblique NP (but not a subject NP) follows the verb, two properties must be satisfied: the extraposed NP must be a definite NP, and a clitic pronoun must occur core-internally.[3]

(20) a. TOTO'I-M jinu-k, u jamut-Ø .
hen-PL buy-PFV DET woman-NOM
'The woman bought the hens'.

b. María-Ø $a_i$ = bicha-k u-ka jamut-$ta_i$.
María-NOM 3SG:ACC = see-PFV DET-ACC woman-ACC
'María saw her, the woman'.

c. Aurelia-Ø toto'i-ta a-$u_i$ = nenka-k u-e María-ta-$u_i$.
Aurelia-NOM hen-ACC 3SG-DIR = sell-PFV DET-OBL María-ACC-DIR
'Aurelia sold (her) the hen to María'.

d. Kajlos-Ø ae-$mak_i$ e'tejok u-e jamu-ta-$make_i$.
Carlos-NOM 3SG-with talk-PFV DET-OBL woman-ACC-with
'Carlos chatted with her, with the woman'.

How to determine if a NP is definite or specific is still an open question in Yaqui grammar. Although useful, determiners display considerable complexity. For instance, determiners are marked by *–ta* when modifying an accusative NP (20b), but with *–e* if the NP is marked by a postposition (20c-d); as with nominal case marking, if the NP is plural, then the determiner is likewise plural, which can be used to mark nominative, accusative or oblique NPs as in (21). Determiners are

[3] Following Rude (1996:501), a pause between the verb and the extraposed NP is possible but not necessary. However, a detailed analysis regarding the intonation of these constructions would be necessary.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



commonly optional when modifying a noun, but they become obligatory when either there is no noun (e.g., *I bought those*), or the noun appears right-detached.

Extraposed NPs need to be topical elements. The clauses in (21a-b) are ruled out since there is a focal unit at the right-edge. The relevant example is in (21c), which is a natural answer to the question 'Who bought the hens?', in which the detached NP must be a topical (but not a focal) unit. A sentence with a topical object exhibits a marked word order. Notice that both the clitic and the determiner before the NP are obligatory, otherwise the construction is ungrammatical (21d-f).

(21) Q: Who bought the hens?
a. *U-me toto'i-m jinu-k, U JAMUT-Ø .
DET-PL hen-PL buy-PFV DET woman-NOM
'The woman, (she) bought the hens'.

Q: What did the woman buy?
b. *U jamut-Ø $am_i$ = jinu-k U-ME TOTO'I-$M_i$.
DET woman-NOM 3PL.ACC = buy-PFV DET-PL hen-PL
'The hens, the woman bought them'.

Q: Who bought the hens?
c. U JAMUT-Ø $am_i$ = jinu-k u-me toto'i-$m_i$.
DET woman-NOM 3PL.ACC = buy-PFV DET-PL hen-PL
'The woman bought them, the hens'.

d. *Aurelia jinu-k ume toto'im.
e. *Aurelia jinu-k toto'im.
f. * Aurelia am jinu-k toto'im.

The above data suggest that Yaqui word order is not entirely rigid in syntactic terms, but rather, non-canonical word order may have some morpho-syntactic consequences. The constraints seen in extraposed structures further support the hypothesis that the preverbal position is the default site of the focal argument in Yaqui.

A detailed analysis of the syntactic, semantic and discourse constrains of postverbal noun phrases in Yaqui goes beyond the scope of this paper (however, see Guerrero and Belloro, in prep). What is evident is that, similar to dislocation in English (Foley 2007:443, Lambrecht 2001:1051), postverbal NPs in Yaqui present a topic NP juxtaposed immediately to the right of the clause and a pronominal element within the clause referring to the topic NP. This right-branching direction (Dryer 1992) is atypical considering Yaqui is a verb-final language.

## 4. Final comments

The analysis presented here suggests that Yaqui is a prime example of a rigid syntax and flexible pragmatics language type. Syntactically, major nominal argu-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



ments are aligned according to their grammatical relation to the predicate, with a canonical word order of SOV. Pronominal arguments and adverbial phrases do show a flexible arrangement within the clause. Pragmatically, the potential focus domain is the main clause and there are no restrictions on where focus can occur pre-verbally. The elements outside the clause are also outside the potential focus domain. This is what is meant by flexible focus structure. An issue which awaits further investigation is the syntactic-pragmatic status of postverbal nominative NPs, accusative and oblique NPs, with the last two requiring a resumptive pronoun inside the main clause.

## References

Belloro, Valeria. 2007. The Syntax-Pragmatic Interface: A study of Spanish Clitic Doubling. Ph. D. diss., University at Buffalo.

Belloro, Valeria. In press. Spanish Datives: Remarks on the Information-Structure Side of the Story. In L. Guerrero, S. Ibañez, and V. Belloro, eds., *Studies in Role and Reference Grammar*. México: Universidad Nacional Autónoma de México.

Bentley, Delia. 2008. The Interplay of Focus Structure and Syntax: Evidence from two Sister Languages. In R. Van Valin ed., *Investigations of the Syntax-Semantics-Pragmatics Interface*. 263-284. Amsterdam: John Benjamins.

Dedrick, John and Eugene H. Casad. 1999. *Sonora Yaqui Language Structure.* Tucson: The University of Arizona Press.

Dryer, Matthew. 1992. The Greenbergian Word Order Correlations. *Language* 68(1): 81-138.

Escalante, Fernando. 1990. Voice and Argument Structure in Yaqui. Ph.D. diss., The University of Arizona.

Felix, Rolando. 2000. Las relaciones gramaticales en yaqui: un análisis en el marco de la Gramática del Rol y Referencia. M.A. thesis, Universidad de Sonora.

Foley, William. 2007. A Typology of Information Packaging in the Clause. In T. Shopen, ed., *Language Typology and Syntactic Description 2: Clause Structure,* 362-446. Cambridge: Cambridge University Press.

Guerrero, Lilián. 2006. *The Structure and Function on Yaqui Complementation*. Studies in Native American Linguistics 54. Munich: Lincom.

Guerrero, Lilián and Valeria A. Belloro. In prep. *On Information Structure in the Yaqui Language*. Ms.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form: Topic, Focus, and the Mental Representations of Discourse Referents*. Cambridge: Cambridge University Press.

Lambrecht, Knud. 2001. Dislocation. In M. Haspelmath et al, eds., *Language Typology and Language Universals*. Berlin: Mouton de Gruyter.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Rude, Noel. 1996. Objetos dobles y relaciones gramaticales: el caso del yaqui. *Memorias del Tercer Encuentro de Lingüística en el Noroeste*, 491-522. Hermosillo: Editorial Unison.

Shimojo, Mitsuaki. 2009. Focus structure and Beyond Discourse-Pragmatics in Role and Reference Grammar. In L. Guerrero, S. Ibañez, and V. Belloro, eds., *Studies in Role and Reference Grammar*. México: Universidad Nacional Autónoma de México.

Shimojo, Mitsuaki. 1995. Focus Structure and Morphosyntax in Japanese: *wa* and *ga*, and Word Order Flexibility. Ph.D. diss., University at Buffalo.

Van Valin, Robert D. 2005. *Exploring the Syntax-Semantics Interface*. Cambridge: Cambridge University Press.

Van Valin, Robert D. and Randy LaPolla, J. 1997. *Syntax. Structure, Meaning and Function*. Cambridge: Cambridge: Cambridge University Press.

Van Valin, Robert D. 1999. A Typology of the Interaction of Focus Structure and Syntax. In Raxilina and J. Testelec, eds., *Typology and Linguistic Theory: From Description to Explanation*, 511-24. Moscow: Languages of Russian Culture.

Lilián Guerrero
SLI-Instituto de Investigaciones Filológicas
Universidad Nacional Autónoma de México
Circuito Mario de la Cueva
Ciudad Universitaria, 04510
México, D.F.

l.guerrero.vlz@gmail.com



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# The Sentence-Internal Topic and Focus in Chinese[1]

YU-YIN HSU
*Indiana University, Bloomington*

## 0. Introduction

In Chinese, the object is allowed to occur in the domain between the subject and the verb, which I refer as the "sentence-internal domain," approximately below TP and above vP. This is called the preposed object construction, as in (1).

(1) Zhangsan na.ben.shu$_1$ kanguo.le ec$_1$
Zhangsan that.CL.book read.PERF
'Zhangsan has read that book.'

In the literature, there is a dispute over the preposed object construction. Some linguists argue for such sentences as involving a Secondary Topic, as opposed to the sentence-initial Topic (e.g. Tsao 1990 and Paul 2002). Conversely, some linguists refer to such sentences as involving Focus, based on the contrastive interpretation conveyed by the sentence-internal element (e.g. Tsai 1994, Ernst and Wang 1995, Shyu 1995, and Huang 2009).

In this paper, I argue for the sentence-internal domain in Chinese. I will show that the preposed object can be either Topic or Focus in the sentence-internal domain. I will argue that two distinct projections are needed sentence internally for Topic and Focus, and that an analysis of single-projection as proposed by Lambova (2004) for Bulgarian is not supported by Chinese data. The discussion will then proceed to show how the proposed analysis accounts for the preposed-object and the so-called verb-copying constructions in Chinese.

## 1. The Sentence-Internal Domain in Relation to Information Structure

In Chinese, Topic and Focus show different syntactic properties in answering *wh*-questions, in the structure of emphatic *shi* and in terms of indefinite noun

[1] I am especially grateful to Dr. Yoshihisa Kitagawa for discussions and comments which have been of great help and inspiration, and I want to thank Dr. Steven Franks for his suggestions and for his always being supportive. I also thank Dr. Daniel Büring and the audience of BLS34 for their insightful comments.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

phrases. Assuming Chinese can license Topic and Focus in the domain of CP, the following discussion will show that the same contrast between Topic and Focus also carries over to the sentence-internal domain.

Generally, Topic can be either overt or covert in answering questions, but answers to *wh*-questions are Focus and cannot be optional. This observation holds in the sentence-internal domain of sentences in Chinese. (2a) and (2b) show that the sentence-internal item *zuoye* 'assignment' can be optional when it is mentioned in the previous discourse, i.e., Topic (also see Paul 2002).

(2) ni zuoye xiewan.le ma?
you assignment write.PERF Q.PART
'Are you done with your assignment?'
a. wo zuoye xiewan le
I assignment write PERF
'I am done with the assignment.'
b. wo ec xiewan le
I write PERF
'I am done with [it].'

On the other hand, while sentence (2a) is used to answer a *wh*-question like (3a), the sentence-internal element *zuoye* 'assignment' is obligatory, since it is the answer to the *wh*-question. In other words, the same domain now is relevant to Focus. Furthermore, the stressed intonation on *zuoye* 'assignment' in (3b) indicates its Focus status.

(3) a. ni shemo xiewan.le?
you what write.PERF
'What have you finished?'
b. wo zuoye xiewan le (*zuoye* can be stressed)
I assignment write PERF
'THE ASSIGNMENT, I have finished it.'

Examples (2) and (3) suggest that the sentence-internal domain can be used for both Topic and Focus. The distinction between sentence-internal Topic and sentence-internal Focus is further supported when we look at examples of emphatic *shi*. In Chinese cleft sentences, emphatic *shi* marks Focus phrases sentence-internally. It is known that emphatic *shi* can occur sentence-internally to mark focused phrases.

(4) a. wo [***shi* zuotian]** huilai de (bushi jintian)
I SHI yesterday return DE (not today)
'It is yesterday that I came back (, not today).'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. wo [***shi*** kanwanshu.le]
I SHI read.book.PERF
'I did finish the reading.'

We find that when the preposed object involves given information, it is not compatible with emphatic *shi*, as in (5).

(5) a. ni zuoye xiwan.le ma?
you homework write.PERF Q-PART
'Did you do the homework?'
b.wo (*shi) zuoye xiewan.le
I SHI homework write.PERF
'I did the homework.'

However, when the preposed object is the answer to *wh*-questions, as in (6b), it is compatible with the emphatic *shi*.

(6) a. ni shemo xiwan.le? (Baogao?)
you what write.PERF
'What did you finish? (Paper?)'
b. wo shi zuoye xiewan.le (baogao hai.mei)
I SHI assignment write.PERF paper not.yet
'It is the assignment that I finished (, not the paper).'

Thus, the contrast shown in (5) and (6) indicates the difference between Topic and Focus in the sentence-internal domain. The same distinction can also be found in sentences with indefinite phrases. It is pointed out by Li and Thompson (1981) that Topic in Chinese must be either generic or definite, but an indefinite Topic is not allowed. However, as reported by Tsai (1994), an indefinite phrase is allowed in the sentence-internal domain, e.g. *yi.pian.lunwen* 'one paper' in (7).

(7) wo yi.pian.lunwen keyi yingfu (, liang.pian jiu bu xing le )
I one.CL.paper can handle 2. CL.paper then not can ASP
'I can handle ONE PAPER (, but not two).'

Example (7) suggests that besides Topic, the sentence-internal position can host a Focus phrase. Given the fact that emphatic *shi* is compatible only with Focus but not with Topic, we can see in example (8) that the sentence-internal indefinite NP in (7), *yi.pian.lunwen* 'one paper', is compatible with emphatic *shi* as expected.

(8) wo shi yi.pian.lunwen keyi yingfu (, liang.pian jiu bu xing le)
I SHI 1.CL.paper can handle 2. CL.paper then not can ASP
'It is one paper that I can handle (, but not two).'



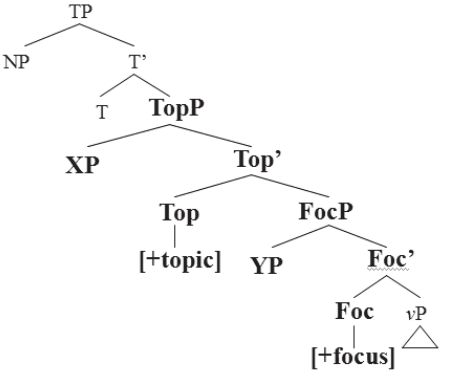
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

The previous discussion shows that both Topic and Focus are available to NPs in the sentence-internal domain in Chinese, and that such Topic and Focus do show different properties syntactically. It then further suggests that treating the sentence-internal noun phrase as either Topic (e.g., Tsao 1990 and Paul 2002) or Focus (e.g., Tsai 1994 and Shyu 1995) only illustrates part of the facts. Therefore, in the spirit of Rizzi (1997), I propose that two functional projections, TopP and FocP, are available in the sentence-internal domain to host Topic and Focus when needed.

## 2. Proposal: TopP and FocP in the Sentence-Internal Domain

The previous section shows that the preposed object involves either Topic or Focus interpretation. To account for this fact, I claim that two distinct projections should be identified in the sentence-internal domain (i.e., between TP and *v*P) to host Topic and Focus respectively. The proposed structure is shown in (9), where TopP and FocP sit between TP and *v*P, and TopP is higher than FocP.

(9) TopP and FocP in the sentence-internal domain




The gist of the proposed structure is that, in the sentence-internal domain, both Topic and Focus can be licensed when proper contexts are provided. This structure predicts that Topic and Focus can co-occur in the sentence-internal domain, with Topic always higher than Focus. The prediction is borne out. In (10a), Topic *shu* 'book' and Focus *xiaoshuo* 'novel' co-occur in the sentence-internal domain, and they have to occur in a fixed order (e.g. (10b)).

(10) 'Speaking of books, it is novels that he reads most.'

| | | | | | |
|---|---|---|---|---|---|
| a. ta | shu$_{\text{-TOP}}$ | xiaoshuo$_{\text{-FOC}}$ | | kan.de | zui duo |
| he | book | novel | | read.RESULT | mostmany |
| b. *ta | xiaoshuo$_{\text{-FOC}}$ | | shu$_{\text{-TOP}}$ | kan.de | zui duo |
| he | book | | book | read.RESULT | mostmany. |



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Moreover, the following examples show when there are two elements in the sentence-internal domain, the differences between Topic and Focus still holds. With respect to *wh*-questions, the discourse in (11) shows that the Topic NP in the sentence-internal domain (i.e. *shuiguo* 'fruit') is optional, but the focus NP is obligatory (i.e. *pingguo* 'apple').

(11) a. ta shuiguo shemo zui.chang chi?
he fruit what most.often eat
'Speaking of fruit, what does he eat most often?'
b. ta (shuiguo) *(pingguo) zui.chang chi
he fruit apple most often eat
(Fruit,) he eats apples most often.'

The contrast between Topic and Focus in the sentence-internal domain is further supported by cleft sentences. In (12), emphatic *shi* is only compatible with Focus NP *xiaoshuo* 'novel', as shown in the contrast between (12a) and (12b).

(12) 'Speaking of books, it is novels that he reads most.'
a. *ta [shi shu] xiaoshuo kan.de zui.duo
he SHI book novel read.DE most.many
b. ta shu [shi xiaoshuo] kan.de zui.duo
he book SHI novel read.DE most.many

Different analyses of emphatic *shi* have been proposed in the literature. Chiu (1993) proposes that emphatic *shi* heads a functional projection as ShiP. Lee (2005) argues that emphatic *shi* is a grammaticalized focus marker heads a focus phrase. Based on facts of ellipsis, Li in progress argues that emphatic *shi* is subcategorized for an IP. It has also been argued that emphatic *shi* is generated in the split INFL domain and projects its functional projection, as proposed by Huang (1988, 2009). I thereby adopt the approach that emphatic *shi* is analyzed as heading its functional projection. Its intervention indicates that Topic and Focus in the sentence-internal domain do not form a constituent (contra Lambova (2004). The proposed structure is thus supported. It is then predicted that sentences with a ditransitive verb like *song* 'send' would allow both direct and indirect objects to be preposed in the sentence-internal domain.[2] The prediction is borne out as shown in example (13). Unlike the canonical pattern as in (13a), sentences like (13b) and (13c) convey interpretations for specific pragmatic contexts.

(13) a. wo zuotian song.le Zhangsan na.ben.Chomsky.de[3] shu
I yesterday send.PERF Zhangsan that.CL.Chomsky.DE book
'Yesterday, I sent Zhangsan that book of Chomsky'

[2] Thanks to Dr. Daniel Büring for pointing this out to me.
[3] The marker *-de* is for nominal modifiers.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. wo, *Zhangsan*, na.ben.Chomsky.de shu zuotian song.le
I Zhangsan that.CL.Chomsky.DE book yesterday send.PERF
'Speaking of Zhangsan, I sent [him] THAT BOOK OF CHOMSKY.'
c. wo, *na.ben.Chomsky.de shu*, Zhangsan song.le (qita.ren haimei)
I that.CL.Chomsky.DEbook Zhangsan send.PERF other.person not.yet
'As for that book of Chomsky, it is to Zhangsan that I sent it already (,
but not to other people).'

In sum, I agree with the previous analyses of the preposed object as proposed by Tsai (1995) and Shyu (1995) for Focus and by Paul (2002) for Topic, but depart from them in arguing that both Topic and Focus are allowed to license the preposed object in Chinese (cf. Belletti 2004 for Topic and Focus in the low IP area in Italian). Given the proposed structure, in the following section, I will show that the so-called "verb-copying construction" can be accounted for by the present analysis.

## 3. The So-Called Verb-Copying Construction

Since Huang (1982), it has been noticed that Chinese has a construction referred to as like Verb-copying (or "verb duplication" in Huang 1982) construction. In Chinese, a transitive verb cannot be followed by an object together with a complement phrase denoting the duration (e.g., 14a) or by a resultative phrase (e.g., 14b). In other words, there is at most one complement allowed for each verb.

(14) a. *ta kan.le [shu] [liang.ge.xiaoshi]
he read.PERF book 2.CL.hour
'He has read books for two hours.'
b. *ta kan.le [shu] [hen lei]
he read.PERF book very tired
'He read books and got very tired.'

Therefore, "an extra copy of the head verb" is needed to salvage sentences like (14), as shown in (15).

(15) a. ta [kan shu] [kan.le liang.ge xiaoshi]
he read book read.PERF 2.CL.hour
'He has read books for two hours.
b. ta [kan shu] [kan.de hen lei]
he read book read.RESULT very tired
'He read books and got very tired.'

In terms of the construction at issue, Huang argues for a VP adjunction analysis, with the structure is in (16). He claims that such duplication is motivated



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

by a PF filter, *viz.* copying the verb for extra complement, and then the original VP1 functions like an adverbial of the duplicated V2 in forming a bigger VP unit.[4]

(16) ta [$_{VP}$ [$_{V1'}$ qi$_{\text{-original}}$ ma ] [$_{V2}$ qi$_{\text{-duplicated}}$.le xan.ge.xiaoshi]]
he ride horse ride PERF 3.CL.hour
'He rode for three hours.'

However, there are some problems shared by VP-analyses. For example, the relative position of the *ba*-phrase is problematic for mono-clausal VP analyses, because it is not clear why VP1 never follows *ba*-phrases, if VP1 and its following VP form a bigger VP and *ba*-phrases indicate the left-periphery of VP. (17) shows that the *ba*-phrase occurs between VP1 and V2, but it cannot precede VP1.

(17) ta (*ba ma) [$_{VP1}$xunlian$_1$ ma] (ba ma) xunlian$_2$.de hen hao
he BA horse train horse BAhorse train.RESULT very well
'He trains horses very well.'

This suggests that the VP1 *xunlian ma* 'train horse' in (17) is at a position outside of the predicate-VP. Besides, if VP1 is analyzed as part of the predicate-VP, it is not clear why the distribution of VP1 is similar to that of temporal or locatives expressions. As in (18a), VP1 is a constituent independent of the predicate-VP.

(18) a. ([$_{VP1}$kan shu]) ta ([$_{VP1}$kan shu]) keyi ([$_{VP1}$kan shu]) kan$_2$ haojige.xiaoshi
readbook he readbook can readbook read many.hour
'he can read books for many hours.'
b. (jintian/zai.zheli) wo (jintian/zai.zheli) keyi (jintian/zai.zheli) kan shu
today/at home I today/at home can today/at home read book
'Today/At home, I can read books.'

Also, under VP-analyses, it is not clear why the "duplicated" V2 can carry aspect markers but the "original" VP1 never does. In (19), when V1 takes aspect markers, the sentences become ungrammatical (i.e. (19b) and (19c)).

[4] To simplify the discussion, I refer to the original verb and its complement as VP1 and the duplicated verb as V2.



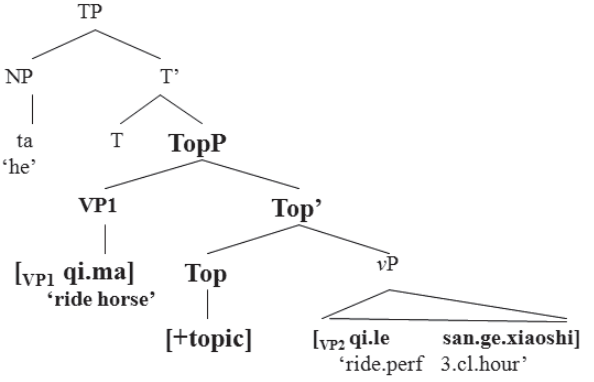
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(19) 'He read books for three hours.'
a. ta kan$_1$ shu kan$_2$.le san.ge.xiaoshi
he read book read.PERF 3.CL.hour
b.*ta kan$_1$.le shu kan$_2$ san.ge.xiaoshi
he read.PERF book read 3.CL.hour
c.*ta kan$_1$.le shu kan$_2$.le san.ge.xiaoshi
he read.PERF book read.PERF 3.CL.hour

Therefore, unlike VP-analyses, I argue that the so-called verb-copying construction in Chinese is better accounted for under the present analysis. I propose that the VP1 at issue can be base-generated at TopP or FocP in the sentence-internal domain, where it gets the corresponding interpretation. The realization of the sentence-internal VP in each functional projection is discussed as follows.

As shown in structure (20), VP1 can be base-generated as Topic in the sentence-internal domain, while VP2 is the predicate of the sentence.

(20) VP1 as Topic in the sentence-internal domain




In a discourse like (21), VP1 *xue zhongwen* 'learn Chinese' in (21b) is optional in answering (21a), because it is mentioned in question (21a), hence is the Topic.

(21) a. ni [$_{VP1}$xue zhongwen] xue$_2$.le wu.nian ma?
you learn Chinese learn.PERF five.year Q.PART
'Did you learn Chinese for 5 years?'
b. dui, wu ([$_{VP1}$xue zhongwen]) xue$_2$.le wu.nian
yes, I learn Chinese learn.PERF 5.year
'Yes, I spent five years learning Chinese.'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

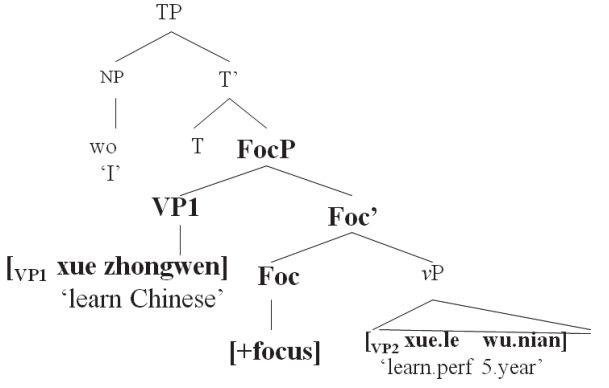
The other supporting evidence comes from *lian*-phrases. *Lian*-phrases are analyzed as Focus phrases with the marker *lian*- 'even' in Chinese (see Shyu 1995 and Paul 2002). We find that when a *lian*-phrase occurs in the sentence-internal domain, VP1 is most naturally interpreted as Topic and VP1 must precede the *lian*-phrase:

(22) ta (*lian minima) [$_{VP1}$ qi ma] lian minima dou qi$_2$ bu hao
he even mini.horse ride horse even mini.horse all ride not.well
'He can't ride well, even a mini.horse.'

Therefore, I argue that VP1 can be licensed as Topic in the sentence-internal domain. It follows that such Top-VP1 cannot take aspect markers (e.g. (19)) and that it has a freer distribution, since Chinese also allows Topic in the CP domain (e.g. (18)). Moreover, it comes as a natural result that *ba*-phrases cannot precede Top-VP1 (e.g. (17)). The present analysis also predicts that VP1 has to precede VP2, since Top-VP1 is higher than the predicate-VP. Examples that are problematic to VP analyses are thus explained.

Given the proposed two-projection analysis, one may wonder about another possible location for VP1, i.e., the Spec-Foc. The corresponding structure is shown in (23).

(23) VP1 as Focus in the sentence-internal domain




The Focus status of VP1 is shown when by the answers to *wh*-questions. We see that VP1 is used to answer the question in (24a), which suggests that VP1 in (24b) *xue zhongwen* 'learn Chinese' is Focus in the sentence-internal domain.

(24) a. ni shemo xue.le wu.nian?
you what learn.PERF 5.year
'What have you learned for five years?'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

b. wo [$_{VP1}$ xue zhongwen] [$_{VP2}$xue.le wu.nian]
I learn Chinese learn.PERF 5.year
'I have learned Chinese for five years.'

The preceding discussion shows that the sentence-internal domain can license base-generated VPs as Topic or Focus. The proposed structure predicts that the co-occurrence of internal Topic and internal Focus should be allowed. The sentence in (25) shows two VPs occurring before the predicate and after the subject of the sentence, where the former *zuo yundong* 'do exercise' receives the Topic interpretation and the latter *da wangqui* 'play tennis', the Focus.

(25) ta [$_{Top\text{-}VP}$ zuo yundong] [$_{Foc\text{-}VP}$ da wangqui] keyi [$_{vP}$ [$_{VP}$ da haoji.xiaoshi]]
he do exercise play tennis can play many.hour
'Speaking of doing exercise, it is playing tennis that he can do for a long time.'

It is thereby confirmed that Topic and Focus can be licensed in the sentence-internal domain in Chinese and that the so-called verb-copying construction in fact involves base-generated VPs as Topic/Focus.

Following this line of analysis, there are examples which further support the proposed analysis. The relative order of sentential adverbs and modals suggests that VP1 is licensed at the INFL domain, higher than the predicate-VP.

(26) ta (xianran) qi.ma (xianran) qi.de (*xianran) hen.lei
he obviously ride.horse obviously ride.RESULT obviously very.tired
'Obviously, he got very tired because of riding.'

(27) ta (yinggai) kan.shu (yinggai) kan.le (*yinggai) shi.ge.xiaoshi
he should see.book should see.PERF should ten.CL.hour
'He should have read [a book] for 10 hours.'

Sentences like (26) and (27) are expected given the present analysis with distinct functional projections. In addition, sentences with emphatic *shi* further support the distinction between Top-VP and Foc-VP in the sentence-internal domain. As shown by (28a), when VP1 *xue zhongwen* 'learn Chinese' is the Focus of the sentence, it is compatible with the emphatic *shi*. However, in (28b), the same VP1 with a Topic interpretation is not compatible with the emphatic *shi*.

(28) a. Focus
wo shi xue.zhongwen xue.le wu nian (, bu shi xue hanyu)
I SHI learn.Chinese learn.PERF 5.year
'It is learning Chinese that I spent five years doing (, not learning Korean).'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



b. Topic
*wo shi xue.zhongwen xue.le wu nian (, bu shi si nian)
I SHI learn.Chinese learn.PERF 5.year
'Speaking of learning Chinese, it is five years that I spent doing it (not four years).'

Furthermore, sentences with co-occurring VPs are also possible. Example (29) shows that VP licensed in TopP (e.g., *zuo.yundong* 'do.exercise'), is not compatible with emphatic *shi* and that a following VP licensed in FocP (e.g., *da.wangqui* 'play tennis') is fine with the emphatic *shi*. Thus, it is concluded that VPs in the sentence-internal domain should be analyzed as being in the projection of TopP or FocP, rather than as part of the predicate VP.

(29) ta (*shi) [$_{\text{Top-VP}}$ zuo yundong] (shi) [$_{\text{Foc-VP}}$ da wangqui] keyi
he SHI do exercise SHI play tennis can
[$_{vP}$ [$_{VP}$ da haoji.xiaoshi]]
play many hour
'Speaking of doing exercise, it is playing tennis that he can do for a long time.'

## 4. Concluding Remarks

Given that Chinese is an SVO language, it has been a point of dispute whether the object preposed to the position between the subject and the predicate is a Topic (e.g., Tsao 1990 and Paul 2002) or a Focus (e.g., Tsai 1994 and Shyu 1995). Through the careful examination of this and other constructions, this paper argued that the "split-CP" approach *à la* Rizzi (1997) can and should be extended to the sentence-internal domain in Chinese, enabling Topic and/or Focus to appear, which echoes claims in Belletti (2004) about Italian syntax, but contrary to Lambova's (2004) analysis of single projection. The present study also showed that the phenomenon of the preposed object is better accounted for under such an analysis. In other words, both Topic and Focus are available to NPs in the sentence-internal domain when proper contexts are provided. All these facts can be captured by postulating Topic and Focus projections in this hierarchical order in the sentence-internal domain, i.e., between TP and *v*P, on a par with the CP domain. This analysis can account for the information structure carried by the sentence-internal elements, their co-occurrence and their ordering restriction. The proposed analysis also applies to the so-called verb-copying construction in Chinese. By this joint approach of syntax and the information structure, I demonstrated that issues related to the so-called verb-copying sentences, such as fixed ordering and aspect-marker taking, are properly accounted for, and that problems in the previous analyses are avoided. Finally, the preposed object construction and the so-called verb-copying construction can be accounted for by a unified account.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



**References**

Belletti, Adriana. 2004. Aspects of the Low IP Area. In *The Structure of CP and IP*. Luigi Rizzi (ed.) Pp 16-51.

Chiu, Bonnie Hui-chun. 1993. *The Inflectional Structure of Chinese.* Ph.D. diss., University of California, Los Angeles.

Ernst, Tomas and Chengchi Wang. 1995. Object Preposing in Mandarin Chinese. *Journal of East Asian Linguistics 4:3*, 235-260.

Huang, C.-T. James. 1982. *Logical Relations in Chinese and the Theory of Grammar.* New York & London: Garland Publishing, Inc.

Huang, C.-T. James. 1988. On 'Be' and 'Have' in Chinese (Shuo Shi gen You). *The Bulletin of the Institute of History and Philosophy Vol. LIX, Part I.* Taipei: Academica Sinica.

Huang, C.-T. James., Audrey Li and Yafei Li. 2009. *The Syntax of Chinese.* Cambridge University Press.

Lambova, Mariana Dobreva. 2004. *On Information Structure and Clausal Architecture: Evidence from Bulgarian.* Ph.D. diss., University of Connecticut.

Lee, Hui-Chi. 2005. *On Chinese Focus and Cleft Constructions.* Ph.D. diss., National Tsing Hua University, Taiwan.

Li, Charles N. and Sandra A. Thompson. 1981. *Mandarin Chinese: A Functional Reference Grammar.* Berkeley: University of California Press.

Paul, Waltraud. 2002. Sentence-internal Topics in Mandarin Chinese: The Case of Object Preposing. *Language and Linguistics 3:4* , 695-714.

Rizzi, Luigi. 1997. The Fine Structure of the Left Periphery. In L. Haegeman, ed., E*lements of Grammar: Handbook in Generative Syntax*, 281-337. Dordrecht: Kluwer Academic Publishers.

Shyu, Shu.-Ing. 1995. *The Syntax of Focus and Topic in Mandarin Chinese.* University of Southern California: Dissertation.

Tsai, Wei.-Tian. Dylan. 1994. *On Economizing the Theory of A' Dependencies.* Ph.D. diss., Massachusetts Institute of Technology.

Tsao, Feng.-Fu. 1990. *Sentence and Clause Structure in Chinese: A Functional Perspective.* Taipei: Student Book, Co.

Yu-Yin Hsu
Indiana University, Bloomington
Department of Linguistics; Memorial Hall 322
1021 East Third Street
Bloomington, IN, 47405-7005

hsuy@indiana.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# Presentation: From Comment to Topic

STEFAN HUBER
*University of South Florida, Tampa*

## 0. Introduction

Traditional descriptions of information structure (IS) have been focusing on intra-sentential dichotomies such as *topic-comment*, *background-focus*, *theme-rheme*, and possibly *presupposition-contrast* (cf. Molnár 1993, Lambrecht 1994, Frey 2004 and many others). The goal of this paper is to argue for a new IS category *presentation* and to show its relevance and independence from other layers of IS. Presentation is regarded as an inherently pragmatic concept that can be expressed in a variety of marked syntactic constructions.

Consider, e.g., the following *there is*-construction, often labeled *the* presentational construction in English:

(1) There is a man at the door. [He is selling shoelaces.]

Intuitively, the DP *the man* is properly introduced in this context since it is originally mentioned and then resumed and predicated upon. Such a basic strategy containing indefinites I will contrast below with more intricate structures, using examples from both German and English.

The organization of the paper is as follows: in section 1, I briefly discuss the theoretical syntactic and pragmatic assumptions regarding IS. In section 2, the basic idea concerning presentation is outlined. It is shown that presentation has to be viewed as a two-step strategy, which parallels other IS dichotomies. Section 3 deals with marked presentational constructions in English and German, e.g., English "indefinite demonstratives" and German so-called "V2 relative clauses." In the final section 4, I return to the theoretical framework and argue that the presentational steps do not coincide with other informational categories, such as rheme or topic, but that they must form an independent layer.

## 1. Information Structure: Syntax and Pragmatics

Some of the basic IS notions, such as topic, focus, and even contrast, have lately attracted a lot of attention within syntactic research, as they purportedly are responsible for numerous ordering phenomena at the surface. This not only



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



applies to so-called discourse-configurational languages such as Hungarian, Finnish, and Basque (cf. Brody 1995, Järventaustta & Molnár 2002, Arregi 2001), but presumably also to Romance (Rizzi 1997) and Germanic (Meinunger 1998, Frey 2004, den Dikken 2005). More specifically, IS categories are claimed to project syntactic phrases in the so-called C-domain, into which marked items have to be moved overtly in order to be interpreted appropriately. The obvious problem, at least for Germanic, is that IS categories such as focus or contrast also can be interpreted in situ, rendering informationally motivated movement (partially) optional.

The problem might be traced back to the assumption that IS is an inherently pragmatic, i.e. discourse-ordering, concept that interacts with syntax in a more or less principled way. Some such view is advocated by e.g. Molnár (1993) and I will adhere to this idea here. In Molnár's theory, IS is to be treated as a layered system of dichotomies that correspond to certain aspects of a discourse situation, as roughly sketched in (2):

(2) **Table 1**. The layers of IS according to Molnár (1993)

| | | | |
|---|---|---|---|
| Message | Topic (T) | – | Comment (C) |
| Hearer | Theme (Th) | – | Rheme (Rh) |
| Speaker | Background (B) | – | Focus (F) |

The message layer can be divided into a part that the utterance is about (*topic; T*)[1] and a part that contains the actual IS predication (*comment; C*). Furthermore, the speaker organizes the utterance with regard to their assumptions as to hearer-old information (*theme; Th*) or hearer-new information (*rheme; Rh*). Finally, the speaker may mark the more important (*focus; F*) and less important (*background; B*) information.

In the prototypical case the categories T/Th/B and C/Rh/F overlap, as in (3):

(3) (I met an old friend.) $[\text{He}]_{\text{T/Th/B}}$ $[\text{used to be a professor}]_{\text{C/Rh/F}}$.

Molnár stresses, though, that the layers are independent from each other, which leads to a wide array of distinctive IS patterns. In particular she points out that the categories topic and focus are not mutually exclusive, as has often been claimed, but that they rather apply on different levels. This can be demonstrated with sentences containing multiple foci (4a) or all-focused sentences that nevertheless display a topic-comment division (4b):

(4) a. (Who did what?) $[\text{Peter}]_{\text{F1=T1}}$ $[\text{danced}]_{\text{F2=C1}}$ and $[\text{Mary}]_{\text{F3=T2}}$ $[\text{sang}]_{\text{F4=C2}}$.
b. (What happened?) $[[\text{A man}]_{\text{T}}$ $[\text{entered the store}]_{\text{C}}]_{\text{F}}$.

[1] This notion goes back to Reinhart's (1982) formulation of "aboutness." Molnár also discusses other shades of topicaliy, for instance Chafe's (1976) "frame topics."



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Although a three-layer model can account for many IS types, it will become evident from the argumentation below that we have to assume yet another layer, namely presentation.

## 2. The Basic Idea: Presentation as a Two-Step Strategy

Re-regard example (1). The entity *a man* was argued to be properly introduced, i.e. presented, in the ongoing context. It is explicitly verbalized in a first sentence and then mentioned again and predicated upon in the ensuing sentence. I take these two steps to be fundamental to every presentation and will call them *import* (*I*) and *process* (*P*). Note that both steps are indispensible, i.e. the bare mentioning of an (indefinite) DP does not automatically trigger its presentation, cf. the contrast in (5):

(5) a. There is [a man]$_{I}$ at the door. [He is selling shoelaces.]$_{P}$
b. There is a man at the door. But I won't open it.

Only in (5a), *a man* is processed in the following sentence and is therefore properly presented. No such operation is carried out in (5b), as there is no corresponding process part. Hence, the presentation of *a man* does not take place.

Presentations in the sense above are not necessarily confined to sentence pairs, but can easily be extended to longer textual passages, where several sentences are used to process the newly introduced item in one cohesive chunk (6a). Moreover, presentations may occur recursively, meaning that another item can be imported within the process part of a previously presented entity, as in (6b):

(6) a. There is [a man]$_{I}$ at the door.
[He is selling shoelaces.]$_{Pa}$
[He has a little suitcase and is wearing a funny suit.]$_{Pb}$
[He doesn't strike me as a very serious person.]$_{Pc}$
b. There is [a man]$_{I1}$ at the door.
[He is selling [shoelaces]$_{I2.}$]$_{P1}$
[They come in the colors black, brown and mauve.]$_{P2}$

It is also noteworthy that presentations do not seem to be restricted to indefinites. If the speaker is aware that a definite expression could be non-salient in the hearer's mind, they might want to re-import the expression before elaborating on it (see also section 3.2. below). This kind of strategy can be observed in (7):

(7) I met [Peter Giles]$_{I}$ again. [He is bald nowadays.]$_{P}$

(7) shows that the speaker's intention is to direct the hearer's attention to a specific entity. Thus an import could be defined as a contextual insertion which the speaker holds to be a necessary preparation for the successful understanding



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



of a following utterance. In this sense, a presentation is a hearer-oriented text-organizational strategy performed by the speaker.

The rather strong hypothesis that I will put forward here is that presentation is a pragmatic universal that is reflected in a wide variety of marked syntactic construction types. In the following, I will address some such constructions in both English and German.

## 3. Presentational Constructions

As indicated by example (7), presentational constructions are not confined to indefinite DPs. Limiting the discussion to nominal elements, I want to demonstrate how both indefinites and definites can occur as presentees.

### 3.1. Indefinites

#### 3.1.1. Simple Indefinites

The simplest case to introduce an item into the ongoing context is to encode it as an indefinite, as in (1). In semantic terms, such an indefinite cannot receive a purely existential reading, but must be specific. Following von Heusinger (2002), I assume that a specific indefinite is "referentially anchored" to a discourse participant, in this case the speaker. Therefore, it stays "online" and is subject to further linguistic (i.e. discourse) operations. If it goes "offline" the intrinsic index variable of the DP is existentially bound. In other words, a pragmatic reflex of the specificity of an indefinite DP is that the speaker provides more information about its referent in the following context. This is exactly what happens in what was called the process part of a presentation above.

Note, though, that the reverse is not true, i.e. not every specific item is necessarily presented in a discourse. Regard the minimal difference in (8):

(8) a. Speaker A: Somebody forgot <u>his</u> valium this morning.
Speaker B: No doubt.
b. Speaker A: Look at that: Somebody forgot <u>their</u> valium this morning.
Speaker B: Just grab it and be happy.

The discourse (8a) could occur in a scenario where two speakers observe a person performing spastic movements on the dance floor. Since the person is in plain sight, the gender (and number) can be determined, hence the possessive *his*. (8b), on the other hand, might be uttered when two speakers find a couple of valium pills on a table. Unable to determine who has forgotten them, speaker A resorts to the non-specific possessive *their*. Now note that *his* in (8a) refers to an individual that is co-textually given, which makes the DP *somebody* highly specific. However, this DP is not properly processed in the context and hence a presentation of *somebody* in the sense above does not take place.

So far, it seems as if presentations always involve two independent sentences. The examples in (9), however, display complex sentences containing a coordination (9a) and an appositive relative clause (9b; see also below, 3.2.3.). These



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

constructions can be used for presentational purposes. On a closer look, they only seemingly contradict the "bi-sententiality" requirement:

(9) a. I met [some people]$_I$ in London and [they showed me the city]$_P$.
b. I met [some people]$_I$ in London, [who showed me the city]$_P$.

Although coordinations and appositive relative clauses allow for multiple proposition-embedding within the same clause, they often display background-focus structures of their own (Brandt 1990). At least on a pragmatic level, the two propositions contained in such configurations ought to be taken as independent structures. As for presentational sequences, it seems as if we have to assume separate focus domains for the parts in which the import and the process take place. I will return to this question in section 4.

**3.1.2. "V2-Relative Clauses" in German** (V2-RCs)
An OV-language, German displays the finite verb in the last position of embedded clauses, including relative clauses (RCs). However, there seems to be a class of exceptional RCs showing the main clause order V2 (cf. Gärtner 2001, Endriss and Gärtner 2005). Some examples are given in (10):

(10) a. Es war einmal ein König, der hatte eine schöne Tochter.
there was once a king he had a beautiful daughter
'Once upon a time there was a king who had a beautiful daughter.'
b. Ich habe ein Land besucht, da kostet das Bier ein Vermögen.
I have a country visited there costs the beer a fortune.
'I visited a country where beer costs a fortune.'

Gärtner (2001) points out numerous morphosyntactic differences between these constructions and regular (restrictive) relative clauses: The initial pronoun is rather demonstrative than relative (11), the "RCs" are always extraposed (12), and "RC"-internal material is immune to C-binding (13):

(11) a. Ich habe ein Land besucht, *da/$^{OK}$wo das Bier ein Vermögen kostet.
b. Ich habe ein Land besucht, $^{OK}$da/*wo kostet das Bier ein Vermögen.

(12) a. Ich habe ein Land {wo das Bier ein Vermögen kostet} besucht
{wo das Bier ein Vermögen kostet}.
b. Ich habe ein Land {*da kostet das Bier ein Vermögen}, besucht
{da kostet das Bier ein Vermögen}.

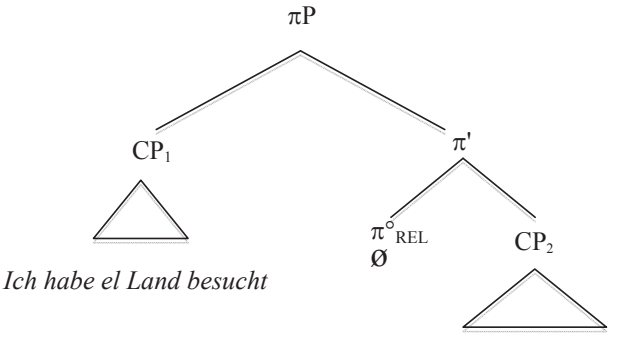
(13) a.$^{??}$ In Köln traf er$_i$ Leute, die Hans$_i$ nicht erkannt haben.
in Cologne met he people they Hans not recognized have
b. In Köln traf er$_i$ Leute, die haben Hans$_i$ nicht erkannt.
'In Cologne Hans met people that didn't recognize him.'



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

On the other hand, Gärtner argues that V2-RCs trigger the same reading as restrictive relative clauses.[2] Therefore, he suggests the following hybrid syntactic analysis, which must be interpreted as some sort of "relative coordination." The most prominent feature is the empty coordinative head π:

(14)




The stipulation of a silent "relative coordinator" might appear somewhat dubious. Probably a regular (asyndetic) coordination might just do as well. I will assume that it is a demonstrative, rather than a relative connection between the two clauses that licenses such an unmediated coordination.
In any event, it seems as if the indefinite DP in the main clause meets exactly the necessary preconditions to function as a presentee: it is highly specific (i.e. it stays "online") and the speaker provides more restrictive information about it in the ensuing "RC," i.e. it is processed. The somewhat marked coordinative construction, on the other hand, can be regarded as a reflex of the tight correlation between the import and the process part. Hence I suggest the following IS for V2-RCs:

(15) Ich habe [ein Land]$_I$ besucht, [da kostet das Bier ein Vermögen]$_P$.

[2] In particular, Gärtner argues that V2-RCs do not trigger certain implicatures, just like restrictive relative clauses, but unlike regular coordinations:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (i) | a. | Das Blatt hat | eine | Seite, die | ist | ganz | schwarz. |
| | | the sheet has | a/one | page it | is | completely | black |
| | | 'The sheet has a page that is completely black.' | | | | | |
| | b. | Das Blatt hat eine Seite, die ganz schwarz ist. | | | | | |
| (ii) | (#) | Das Blatt hat eine Seite und die ist ganz schwarz. | | | | | |

According to Gärtner, one can conclude only from (ii) that the sheet has only one page, which strides against our world knowledge. Gärtner takes this as an argument against a regular coordination. However, I do not necessarily regard (ii) as infelicitous: if one interprets *eine Seite* as specific such an implicature can be avoided ('the sheet has a certain page and it is black').



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

### 3.1.3. "Syntactic Amalgams" in English

Lambrecht (1988) discusses relative clauses in English that apparently violate the restriction on RC-internal subject marking. Calling these constructions "syntactic amalgams," he points out their presentational character. Examples are given in (16):

(16) a. There was a farmer [$_{RC}$ had a dog]. [3]
b. I have a friend in the Bay Area [$_{RC}$ is a painter].

Although the RCs are subjectless, they are acceptable in these contexts. As with the German constructions above, the heads in these "amalgams" in English are specific and are processed in the following relative clause. Hence a proper presentation is carried out and I assume a similar IS for these constructions:

(17) There was [a farmer]$_{I}$ [had a dog]$_{P}$.

The licensing of the empty subject position within the relative clause might be an effect of the very presentational character of the construction: apparently there must never be any material between the import and the process clause, but these components must be adjacent. This "closeness" requirement might even lead to the phonological deletion of otherwise grammatically required function words. Note that the insertion of other material between the import and process clauses deteriorates the sentence:

(18) ?? There was a farmer here during the Great Depression had a dog.

## 3.2. Definites

### 3.2.1. Simple Definites

As pointed out above, the speaker can re-present an item that they want to activate in the hearer's mind, although it might technically be thematic knowledge. In this case, a definite DP can be re-imported before processing it, as shown in (7). Further examples for such a strategy are provided in (19):

(19) a. I met [the Indian grocer]$_{I}$ again. [He seemed much older.]$_{P}$
b. I often think of [my foster daughter]$_{I}$.[She must be 22 years old now.]$_{P}$

Note also that in German, proper names may marginally occur in constructions displaying "V2-RCs:"

[3] Lambrecht (1988) indeed presents an amalgam structure for these clauses, in which the head of the RC is represented simultaneously in the RC and the main clause. A discussion of his syntactic approach is beyond the scope of this article.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(20) (?) Dann kam [Peter]$_I$, (und) [der war total aufgeregt]$_P$.
then came Peter and he was totally upset
'Peter came. He was very upset.'

Assuming that these constructions are always presentational, *Peter* must be the import. Hence definite imports should be licit.

### 3.2.2. "Indefinite Demonstratives"

Gundel et al. (1993) describe constructions in English, in which demonstrative determiners fail to render a definite reading of the underlying DP, as in (21):

(21) I saw [this woman]$_I$. [She just took my breath away.]$_P$

Nevertheless, these "indefinite demonstratives" are highly specific, and refuse to go "offline." The following examples demonstrate this behavior:

(22) (What happened to you yesterday?)
a. I saw this woman. # Ø
b. I saw this woman. # Then I went shopping.
c. I saw this woman. OK She just took my breath away.

An indefinite demonstrative needs to be resumed in the following context. If stranded (22a) or abandoned (22b) it is interpreted as a regular (definite) demonstrative. The only proper way of using indefinite demonstratives is to resume and predicate on them, which is exactly what was described as a presentational strategy above (hence the indexes in example 21). Therefore, I regard indefinite demonstratives as an unambiguous presentational strategy.

### 3.2.3. Appositive Relative Clauses (AppRCs)

Appositive relative clauses provide further illustration of the phenomenon of presentation. Remember that these RCs show a certain informational and phonological independence, i.e. they display a background-focus structure of their own. In (23) the two separate nuclear accents have been marked with capital letters:[4]

(23) I met [MAX]$_I$ again, [who had gotten MARried]$_P$.

The separate focus domains in examples such as (23) are reminiscent of the examples with simple definites (19). Since every independent sentence must display at least one nuclear focus, the difference between (19) and (23) boils

[4] Lambrecht (1988) argues that there is a difference between (mid) AppRCs and (final) "continuative" relative clauses, the latter modifying the entire preceding clause. In this respect (23) could be ambiguous. However, I am not sure whether there is a clear semantic and IS distinction between those two RC types. I will have to leave this question to further research.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

down to the fact that the two foci in (23) have been realized within the same sentence. Other than that (and the realization of the resumed item as a relative pronoun), (23) seems to express the same presentational strategy, i.e. a specific DP is imported and processed, as indicated by the indexes. Therefore, I assume that (at least some) AppRCs can be used for presentational purposes.

## 4. Back to Theory: The Relevance of Import and Process

The discussion so far has shown that presentations can be realized in numerous (marked) ways. The question to be addressed now is whether we can argue for the necessity of the categories *import* and *process* theoretically. In other words, do we really need those new categories or can they be derived from the already existing ones such as rheme, topic, focus, etc.? In the following I want to show that there is reason to assume that import and process are not identical with other informational concepts and that the presentational layer must be independent.

### 4.1. Import-Process vs. Other Dichotomies

Intuitively, an imported item should be somewhat new. Otherwise the speaker would not make the effort of presenting it. Nevertheless, definite DPs are acceptable as presentees, as shown in the examples (7) and (19) above.

Now consider a prototypical theme-rheme structure in which a presentation occurs:

(24) $[\text{I}]_{\text{Th1}}$ [saw [a bird]$_{\text{I}}$]$_{\text{Rh1}}$. [$[\text{It}]_{\text{Th2}}$ [had no feathers]$_{\text{Rh2}}$.]$_{\text{P}}$

Both in the import and the process clauses, thematic and rhematic material can occur. As is pointed out by the indexes, these informational domains do not coincide with the categories import and process. Hence we have to assume that import and process must apply on a level different from the theme-rheme structure.

To capture the "newness" of the imported item, various means could be suggested (see, e.g., the cognitive scales suggested by Gundel et al. 1993). For our purposes a secondary feature within the category [± thematic] information might suffice. Let us call this feature [± activated]. Thus thematic (and possibly rhematic) information can be assumed to be salient ([+ activated]) or not ([- activated]). Regarding imports we can then conclude that they always have to be [- activated], either because they are completely new (= rhematic) or given, but non-salient (= thematic, but [- activated]).

Another intuitive component of imports is that they seem to trigger an "aboutness" reading. Endriss and Gärtner (2005) go as far as to call the "heads" of V2-RCs (described as imports above) "pre-topics." Obviously, the speaker introduces the item to be presented in order to say something about it, i.e. the item stays "online." Nevertheless, a more fine-grained IS of a presentational sequence shows that topic and import are not the same thing:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

(25) (Speaking of Paul, let me tell you this:)
[Paul]$_{T1}$ [met [this woman]$_{I}$]$_{C1}$. [[She]$_{T2}$ [totally bewitched him]$_{C2}$.]$_{P}$
(They even got married!)

The first sentence shows that the import, i.e. the indefinite demonstrative *a woman*, is distinct from the sentential (aboutness) topic *Paul*. Moreover, in the process clause a second topic-comment structure can be discerned. Thus the topic-comment structure and the presentational layer occur on different levels.

Finally, it can also be shown that the presentational layer must be kept apart from the background-focus structure. For instance, the background-focus structure of (25) is largely identical with its topic-comment structure, as demonstrated in (26). Again, the import-process structure and the background-focus structure do not overlap, which underlines the necessity of separating the presentational layer from all other IS dichotomies, including the background-focus structure:

(26) [Paul]$_{B1}$ [met [this woman]$_{I}$]$_{F1}$. [[She]$_{B2}$ [totally bewitched him]$_{F2}$.]$_{P}$

### 4.2. The Domains of Import and Process

Let us return to a question that was raised in section 3.1.1.: Do the import part and the process part obligatorily have to be realized in separated sentences? Using example (9), it was indicated above that the two domains do not have to be syntactically independent, which was further illustrated with V2-RCs in German and "syntactic amalgams" in English. Therefore it seemed as if not so much a syntactic, but rather a pragmatic independence (separate background-focus structures) was the necessary condition for a successful presentation.

A problem for this focus-based approach comes from V2-RCs in German. As Gärtner (2001) and Endriss and Gärtner (2005) note, V2-RCs can be realized with one single focus domain, which comprises both the "main" and the "relative" clause. If V2-RCs constructions always present the "head" of the "RC," one faces the dilemma that there is no necessary double background-focus structure:

(27) [Ich habe [ein Land]$_{I}$ besucht, [da kostet das Bier ein Vermögen]$_{P.}$]$_{F}$

Fortunately, the problem can be solved by turning to the very definition of a process. According to the characterization above, in the process clause of a presentational sequence a newly imported item is resumed and predicated upon. This is nothing else than to say that a process by definition must display a topic-comment structure. So the more adequate description is that it is two comment domains rather than two focus domains that are required for a successful presentation. In such a configuration the presentee is promoted from being an import in a first comment domain to becoming the topic in a second topic-comment structure. The strategy can be carried out by either producing two separate syntactic units, as in the case of simple (in-) definite or indefinite demonstratives (28a), or just one, which might either be divided into two focus domains, as in the case of



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

appositive RCs (28b), or left undivided, as in the case of V2-RCs constructions (28c):[5]

(28) a. $[\text{Paul}]_{T1}$ [met [this woman]$_I$]$_{\underline{C1}}$.
[[She]$_{T2}$ [totally bewitched him]$_{\underline{C2}}$.]$_P$
b. [I]$_{B1=T1}$ [met [MAX]$_I$ again]$_{F1=\underline{C1}}$,
[[who]$_{B2=F2}$ [had gotten MARried] $_{F2=\underline{C2}}$]$_P$.
c. [[Ich]$_{T1}$ [habe [ein Land]$_I$ besucht]$_{\underline{C1}}$,
[[da]$_{T2}$ [kostet das Bier ein Vermögen]$_{\underline{C2}}$]$_P$.]$_F$

## 5. Summary

It then seems as if there is sufficient evidence to assume a separate presentational layer. Extending Molnár's (1993) model, one might ask whether this layer pertains to one of the existing dimensions of communication (message, speaker, hearer), or whether it should form an independent layer. Although I will have to leave an in-depth discussion of this question open here, I will describe the presentational layer as a separate dichotomy. Since presentation obviously can have inter-sentential effects, the layer is named "context". Thus, an extension of Molnár's theory could be sketched as in table 2:

(29) **Table 2**. Four layers of IS

| | Sentence 1 | | | Sentence 2 + |
|---|---|---|---|---|
| (Sentential) Message | Topic | – | Comment | |
| Hearer | Theme | – | Rheme | |
| Speaker | Background | – | Focus | |
| Context | Import | – | {Process} | {Process} |

Further research will hopefully show whether even more layers of IS are necessary. Also, it might worthwhile investigating if other morphosyntactic categories, e.g. VPs or TPs/CPs, might be presented in the sense suggested above, and if so, how this can be accounted for.

## References

Arregi, Karlos. 2001. Focus and Word Order in Basque. Ms. Massachusetts Intsitute of Technology.

Brandt, Margareta. 1990. *Weiterführende Nebensätze*. Stockholm: Almqvist & Wiksell International.

[5] The description of a double comment within a V2-RC construction fits nicely with Gärtner's (2001) semantic observation that V2-RCs carry "(proto-) assertional" force.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Brody, Michael. 1995. Hungarian Focus and Bare Checking Theory. *Arbeitspapiere des Sonderforschungsbereichs 340*. University of Tübingen.

Chafe, W.L. 1976. Givenness, Contrastiveness, Definiteness, Subjects, Topics, and Point of View. In C. Li, ed., *Subject and Topic*. New York: Academic Press: 25-55.

den Dikken, M. (2005), A Comment on the Topic of Topic-Comment. *Lingua* 115: 691-710.

Endriss, Cornelia, and Hans-Martin Gärtner. 2005. Relativische Verbzweitsätze und Definitheit. In: F.-J. d'Avis, ed., *Deutsche Syntax: Empirie und Theorie.* Göteborg: Acta Universitatis Gothoburgensis:195-220.

Frey, Werner. 2004. The Grammar-Pragmatics Interface and the German Prefield. *Sprache & Pragmatik* 52:1-39.

Gärtner, Hans-Martin. 2001. Are there V2 Relative Clauses in German? *Journal of Comparative Germanic Linguistics* 3(2):97-141.

Gundel, Jeanette, Nancy Hedberg, and Ron Zacharsky. 1993. Cognitive Status and the Form of Referring Expressions in Discourse. *Language* 69:274-307.

von Heusinger, Klaus. 2002. Specificity and Definiteness in Sentence and Discourse Structure. *Journal of Semantics* 19:245-274.

Järventaustta, Marja and Valéria Molnár. 2002. Diskurskonfigurationalität im Finnischen und im Ungarischen. Ms. Lund University.

Lambrecht, Knud. 1988. There as a farmer had a dog: Syntactic Amalgams Revisited. *Proceedings of the 14th Annual Meeting of the Berkeley Linguistics Society.* UC Berkeley, CA:319-339.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form.* Cambridge: Cambridge University Press.

Meinunger, André. 1998. A Monoclausal Approach to Cleft and Pseudocleft Sentences. *ZAS Papers in Linguistics* 10:89-105.

Molnár, Valéria. 1993. Zur Pragmatik und Grammatik des TOPIK-Begriffes. In M. Reis, ed., *Wortstellung und Informationsstruktur*. Tübingen: Niemeyer: 155-202.

Reinhart, Tanya. 1982. Pragmatics and Linguistics: An Analysis of Sentence Topics. *Philosophica* 27:53-94.

Rizzi, Luigi 1997. The Fine Structure of the Left Periphery. In L. Haegeman, ed., *Elements of grammar. Handbook in generative syntax*. Dordrecht: Kluwer: 281-337.

Stefan Huber
Department of World Languages
University of South Florida
4202 East Fowler Avenue, CPR 107
Tampa, Fl 33620

shuber@cas.usf.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

# Information Structure and Discourse Function of Amalgam *Wh*-Clefts

CHRISTIAN KOOPS and SEBASTIAN ROSS-HAGEBAUM
*Rice University*

## 0. Introduction

This paper is concerned with a variant of the English *wh*-cleft construction which we refer to as *amalgam* wh-*cleft*, following Lambrecht (2001). Amalgam *wh*-clefts are not generally used in writing, but they are common in spoken discourse. An example is given in (1).[1]

(1) So what I'm gonna do is,
I'm gonna leave the small ones here,
and take my mother's big one. (CFAE 4315, 3:43)

Amalgam *wh*-clefts differ from standard *wh*-clefts in the syntactic form of the copular complement, or *focus phrase* (FP). Whereas in standard *wh*-clefts the FP has a form appropriate to its role as a syntactic argument, in the amalgam variant the FP displays a lack of syntactic integration, having instead the form of an independent main clause; cf. (2) and (3). This main clause typically corresponds to the canonical (non-cleft) counterpart of the *wh*-cleft construction; cf. (4).

(2) What I'm gonna do is [$_{FP}$ leave the small ones here ...]
(3) What I'm gonna do is, [$_{FP}$ I'm gonna leave the small ones here ...]
(4) I'm gonna leave the small ones here ...

The amalgam structure is unexpected from a traditional view of *wh*-clefts. *Wh*-clefts (or pseudoclefts) are traditionally understood as information structure constructions which pragmatically structure a proposition into two parts, a presupposition and a focus (Prince 1978, Lambrecht 2001, *inter alia*). The *wh*-

[1] Examples with corpus citations are taken from our data base of six corpora of spoken American English (see Section 2). Transcription conventions follow Du Bois *et al*. (1993). A new line represents a new intonation unit, and three types of prosodic boundaries are distinguished: final intonation (.), continuing intonation (,), and appeal intonation (?).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

clause expresses a presupposed open proposition, i.e., a proposition with a missing argument (e.g., 'I'm gonna do x'), and the FP provides a value for the variable in the presupposed open proposition (e.g., 'leave the small ones here'). The function of the construction is to specify the content of the FP as the value for the variable contained in the *wh*-clause (e.g., x = 'leave the small ones here').

However, as pointed out by Lambrecht (2001: 499), amalgam *wh*-clefts do not accord with this traditional view. First, they display a syntactic mismatch. An independent main clause appears as a syntactic argument, which is not generally possible in English. Second, there is a semantic mismatch. The FP contains more material than is strictly required to supply a value for the variable in the *wh*-clause. It is not intuitively obvious why speakers 'repeat' the subject, as well as other material (e.g., *I'm gonna* in (1)), rather than use the structurally simpler standard variant.

Amalgam *wh*-clefts have been cited in the syntactic literature on cleft constructions as evidence for a deletion analysis of *wh*-clefts (Ross 1972, 2000; Den Dikken *et al.* 2000). The deletion account assumes that at an underlying level of representation the FP of *wh*-clefts is a main clause. Standard *wh*-clefts are then derived by means of an optional deletion (or ellipsis) rule, as in (5a). Non-application of this rule results in amalgam *wh*-clefts like (5b).

(5) a. What they should do is ~~they should~~ pat the cat.
b. What they should do is they should pat the cat. (Ross 2000:385)

The explanatory power of the deletion analysis however is limited. Deletion accounts seem to require that the *wh*-clause and the FP contain lexically identical material (e.g., *they should* in (5)) for the ellipsis rule to apply. The examples cited in the syntactic literature are of the same form as the sentences in (5), with FPs that are the canonical (non-cleft) counterpart of the cleft construction and that therefore 'repeat' material from the *wh*-clause. Yet, although most amalgam *wh*-clefts in our data fit this pattern, not all do.

First, as pointed out by Weinert & Miller (1996:178), in amalgam *wh*-clefts the TAM values of the *wh*-clause do not always match those of the FP. An example of tense-aspect mismatch (past perfect *vs.* simple past) is given in (6).

(6) Also what it'*d done*,
is it *caused* him to be introverted, (SBCSAE 6, 18:21)

Second, amalgam *wh*-clefts sometimes contain *wh*-clause and FP subjects that are not lexically identical. Pronominalization, as in (7), is fairly common.[2]

[2] Example (7) also illustrates another common non-integration effect, *viz.* omission of the copula. Copula omission occurs almost exclusively in cases of amalgam syntax. See also ex. (19).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



(7) What *the kid*'s able to do now,
*he*'s able to go to any grad school he wants to. (CFAE 6092, 10:28)

Finally, speakers sometimes use *wh*-clefts with 'split' subjects, as in (8), where the *wh*-clause subject denotes a set of participants which includes, but is not co-extensive with, the referent of the FP subject.

(8) What *we* would do is,
*they* would take care of the account maintenance. (SBCSAE 14, 17:50)

The option of having non-identical subjects is used in order to specify events involving multiple participants (e.g., *What we'll do is, John will write up a draft and you and I will send him our comments*).

Non-integration effects like those seen in (6) - (8) demonstrate that the FP in amalgam *wh*-clefts need not be the canonical (non-cleft) counterpart of the cleft construction. That is, speakers are not strictly bound by the syntactic form of the *wh*-clause in constructing the FP. While this calls into question the deletion analysis on formal grounds, an account which seeks to relate two types of *wh*-clefts (standard and amalgam) in purely formal terms is also lacking in other ways. In particular, it remains silent on the question of what, if any, functional differences exist between these two *wh*-cleft constructions, and thus leaves unexplored the possibility that the observed syntactic effects may be explained by the discourse functions associated with the two constructional variants.[3]

In this paper, we propose that the formal properties of amalgam *wh*-clefts can be insightfully related to their information structure and discourse function. To this end, we present a multifactorial, statistical analysis of the distribution of standard and amalgam *wh*-clefts in spoken discourse to establish the factors which determine the selection of one or the other variant. On the basis of this analysis, we then interpret the non-integration effects found in amalgam *wh*-clefts with reference to the information structure and discourse function of the two types of *wh*-cleft constructions.

## 1. Methodology and Data Base

Our methodological approach is usage-based, in the sense that it seeks to derive the constraints on constructions from statistical generalizations emerging from usage data. The data used for the analysis presented in this paper is a subset of a larger data base consisting of the *wh*-clefts occurring in the following corpora of spoken American English: the *Santa Barbara Corpus of Spoken American*

[3] In fact, Ross (1972:89) explicitly claims that the two *wh*-cleft variants are in "free variation with one another." Den Dikken *et al.* (2000:46) find that amalgam *wh*-clefts "vary in acceptability from case to case and speaker to speaker" and that the "reasons behind much of this variation are obscure."



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

*English* (Du Bois *et al.* 2000-2005), the *Callfriend* and *Callhome* corpora of American English (Canavan and Zipperlen 1996a, 1996b; Canavan *et al.* 1997), the *Corpus of Classic Sociolinguistic Interviews* (Strassel *et al.* 2003; US speakers only), as well as samples of the *Switchboard*-1 corpus (Godfrey and Holliman 1997) and the *Michigan Corpus of Academic Spoken English* (Simpson *et al.* 2002). In order to ensure that all *wh*-clefts were exhaustively identified, we extracted exhaustive concordances of each *wh*-word and then individually inspected each hit.

Our analysis here is restricted to *what*-clefts because amalgam syntax is best attested for this type, which is also far more common than *wh*-clefts built on other *wh*-words. We further included only those structural types to which the standard *vs.* amalgam alternation applies, thus excluding cases in which *what* appears as the subject of the *wh*-clause (e.g., *What bugs me is ...*). Finally, we also did not count as *wh*-clefts instances of the *That's X is Y* construction (e.g., *That's what I'm trying to do is go back to blonde*), a conventionalized grammatical construction in its own right, with its own information structure and discourse function (see Ross-Hagebaum 2004).

To begin with, our data show a strong asymmetry in the types of *wh*-clause predicates used in the two constructions. Previous authors, working on the basis of grammaticality judgments (Ross 2000, Den Dikken *et al.* 2000), have reported that speakers more readily accept amalgam *wh*-clefts if the *wh*-clause predicate is the verb *do* (as in all examples cited so far) than, for example, verbs projecting an NP object complement. An example of the latter type is given in (9).

(9) What they want,
is they want American accents.
For their data base. (CFAE 4074, 0:17)

This intuition is supported by our data. Table 1 shows that the amalgam is indeed far more common with *do* as *wh*-clause predicate, i.e., in cases where the standard *wh*-cleft has a non-finite VP in its FP, than with predicates projecting copular complements of other phrasal categories. In fact, when the *wh*-clause predicate is *do*, the amalgam variant is more common than the standard variant.

Table 1: Proportion of *wh*-cleft variants by phrasal category of projected FP

| Projected phrasal category | Standard *wh*-cleft | Amalgam *wh*-cleft |
|---|---|---|
| VP (i.e., *do* in *wh*-clause) | 47% (120) | 53% (136) |
| NP | 80% (86) | 20% (22) |
| other (PP, AP, *that*-clause) | 98% (249) | 2% (5) |

## 2. Factors Predicting Amalgam or Standard *Wh*-Cleft

We coded all *wh*-clefts in our data for various semantic, syntactic, prosodic, and discourse-level variables which we suspected might be correlated with the choice of either of the two constructional variants. We then fit a logistic regression model



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

to the data in order to determine which variables actually govern the alternation. We chose to include in our regression model only cases of projected VPs because the data on projected NPs and other phrasal categories does not include enough amalgams to yield significant results (cf. Table 1; the issue of projected NPs will be taken up again in Section 4.) Moreover, as one of the predictor variables in our model is the length of the FP, measured in terms of the number of clauses contained in it, we had to exclude all cases for which no such number could be established because the *wh*-cleft construction was abandoned in favor of another grammatical construction prior to completion. As a result, the number of observations in our model is 229, which is slightly smaller than the number of cases of projected VP tabulated in Table 1. The model is shown in Table 2.

Table 2: Logistic regression model predicting amalgam *wh*-cleft

| Significant predictors of amalgam | z | p |
|---|---|---|
| academic discourse | -3.98 | < 0.001 |
| no. of additional FP syllables | -5.22 | < 0.001 |
| no. of FP clauses | 3.78 | < 0.001 |
| (strict) topic continuity | -2.45 | = 0.014 |

Total Chi-squared = 84.91, $p < 0.0001$, Pseudo r-squared = 0.27

As seen in Table 2, we found four significant predictor variables, which will be explained and discussed in the remainder of this section. The z-score in the second column of Table 2 is a normalized regression coefficient, which indicates the strength and the direction of the effect of each predictor variable. Positive z-values indicate that the variable favors the amalgam; negative z-values indicate that the variable favors the standard variant.

### 2.1. Predictor #1: Discourse Genre

The amalgam *wh*-cleft is more widely used in informal than in formal (here, academic) discourse. Our operational definition of academic discourse is occurrence in the MICASE corpus.

Table 3: Distribution of *wh*-cleft variants across discourse genres

| Discourse genre | Standard *wh*-cleft | Amalgam *wh*-cleft |
|---|---|---|
| academic (= MICASE) | 68% (54) | 32% (25) |
| informal (= all other corpora) | 38% (57) | 62% (93) |

This sociolinguistic constraint is in line with the known restriction of amalgam *wh*-clefts to spoken language and the normative pressures of academic discourse.

### 2.2. Predictor #2: Number of Additional FP Syllables

Note that main clause FPs always include at least one more word than their non-finite VP counterparts, *viz.* the subject; cf. (10) and (11a). Complex *wh*-clauses



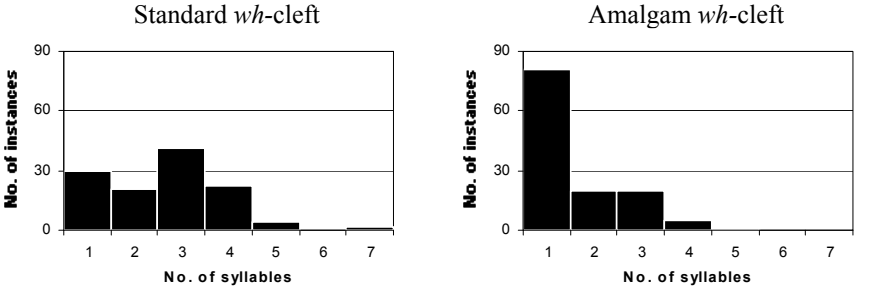
In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

containing modal, auxiliary, or other additional verbs require the 'repetition' of even more material, as shown in (11b) and (11c).

| | | | | |
|---|---|---|---|---|
| (10) | | What she did | is | call me. |
| (11) | a. | What she did | is, | she called me. |
| | b. | What she could do | is, | she could call me. |
| | c. | What she should have done | is, | she should have called me. |

The amount of additional syllables required to construct a main clause FP (rather than a non-finite VP) is inversely correlated with the likelihood of speakers choosing the amalgam. The histograms in Figure 1 show that the amalgam is strongly preferred when only a single syllable is 'repeated', as in (11a), but that there is no such effect in the case of the standard variant.

Figure 1: Choice of *wh*-cleft variant by (potential) additional FP syllables




We interpret this result as a processing constraint which leads speakers to produce the structurally simpler standard variant when using the amalgam would involve additional effort. However, if that additional effort is limited to having to produce only one extra syllable, the amalgam is strongly preferred.

### 2.3. Predictor #3: Number of Clauses in the FP

It is not unusual for *wh*-clefts in spoken discourse to include FPs which consist of multiple clauses, or in fact, multiple independent sentences, constituting an entire discourse segment (see also Hopper 2001, to appear). For example, the FP of Kirsten's *wh*-cleft in (12) contains four independent main clauses.

(12) KIRSTEN: So what a penguin will do,
is it'll go back,
it'll squeeze the gland,
it'll get some oil on its beak,
and then,
.. it's rubbing .. [that waterproofing],
LORI: [So it can keep itself water]proof,

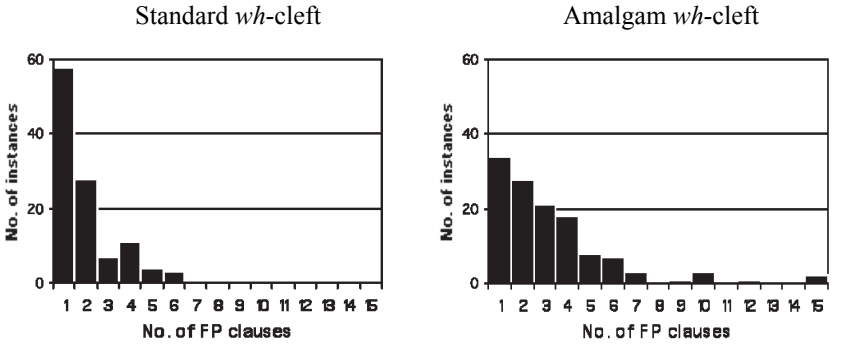


In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

right.
KIRSTEN: waterproofing,
LORI: [Mhm=].
NICOLE: [Oh].
KIRSTEN: .. all over its feathers. (SBCSAE 39, 12:37)

*Wh*-clefts with longer, more complex FPs (measured in terms of the number of contained independent or dependent clauses) are more likely to take the amalgam form. The histograms in Figure 2 show that the standard *wh*-cleft is strongly preferred when the FP contains only a single clause, or at most two clauses. The amalgam shows no such extreme skewing and also occurs with much longer FPs.

Figure 2: Choice of *wh*-cleft variant by number of FP clauses




We interpret the effect of FP length as a clear reflection of the amalgam construction's discourse function (see below).

### 3.4. Predictor #4: Topic Continuity

Previous discourse-based studies have found that *wh*-clefts (in general) are used for topic management purposes, specifically to shift the discourse topic. In written English (Jones and Jones 1985), *wh*-clefts often occur at transition points as writers turn from one idea to the next. In conversation (Kim 1995), *wh*-clefts are used to re-orient the course of the ongoing talk, for example, when resuming a temporarily suspended topic after a digression. This topic shift function can be seen in example (13), taken from a question-and-answer session after a guided tour of the Hoover Dam. Note how Ben's *wh*-clause brings about a shift from 'where the electricity goes' to 'what the government did.'

(13) AUD: How far are you sending electricity.
California?
BEN: .. Okay.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

.. Fifty-six percent of our power goes to southern California,
twenty-five percent of it stays in Nevada,
nineteen percent of it goes to Arizona.
What the government did,
is that they got together the delegates from those three states in nineteen-thirty.
To allocate the power that would be generated here when this dam was completed. (SBCSAE 38, 10:22)

However, previous studies did not systematically operationalize the notion of topic shift. Doing so is difficult because topics at the level of discourse are less easy to identify objectively than sentence topics. Moreover, there are different degrees of topic shift, from more dramatic to more subtle ones. We therefore decided, for reasons of methodological rigor, to code the parameter of topic shift *vs.* topic continuity in a binary fashion, distinguishing only between cases where *strict topic continuity* is identifiable on the basis of lexico-grammatical criteria and those where it is not. An example of the former type is given in (14).

(14) Now blood tests aren't really being .. called for,
what they're doing is,
calling for piss tests. (SWB 4307, 2:21)

We can be sure that the *wh*-cleft in (14) continues the discourse topic of the preceding talk because an alternative value for the variable grammatically coded in the *wh*-clause of the cleft was mentioned and rejected in the immediately preceding clause (i.e., we are dealing with a contrastive context).

Table 5 shows that strict topic continuity, defined in this way, correlates with the selection of the standard *wh*-cleft.

Table 4: Choice of *wh*-cleft variant by topic continuity

| | Standard *wh*-cleft | Amalgam *wh*-cleft |
|---|---|---|
| (strict) topic continuity | 71% (15) | 29% (6) |
| other | 46% (96) | 54% (112) |

We interpret this correlation as evidence that the amalgam *wh*-cleft is specifically associated with the function of topic shift at the level of discourse.

## 3. Sentence Topic and Discourse Topic

*Wh*-cleft constructions (in general) are known topic marking constructions. For example, in (15) the VP *leave the small ones here* forms part of a sentence whose topic is the *wh*-clause *what I'm gonna do.*

(15) [$_{TOP}$ What I'm gonna do] is leave the small ones here ... (= [2])



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



However, in the amalgam construction, where the FP is an independent main clause with its own topic-comment articulation (in the sense of Lambrecht 1994), the pragmatic role of the *wh*-clause is different. Note that the VP *leave the small ones here* in (16) is part of a sentence whose topic is *I*.

(16) What I'm gonna do is, [$_{TOP}$ I]'m gonna leave the small ones here ... (= [3])

What, then, is the role of the *wh*-clause in (16)? We argue that the role of the *wh*-clause in the amalgam construction is that of *discourse topic* (D-TOP), which we distinguish from *sentence topic* (S-TOP) (in Lambrecht's 1994 sense). We follow Ochs Keenan and Schieffelin's (1983) definition of discourse topic as

> a proposition (or set of propositions) expressing a concern (or set of concerns) the speaker is addressing. [...] It may be the case that *the same discourse topic is sustained over a sequence of two or more utterances*. (p. 72, emphasis added)

We then define the information structure of the two *wh*-cleft types as follows:

(17) Information structure of standard *wh*-cleft:
[$_{S\text{-}TOP}$ *What I'm gonna do*] *is leave the small ones here.*

(18) Information structure of amalgam *wh*-cleft:
[$_{D\text{-}TOP}$ *What I'm gonna do*] *is*, [$_{S\text{-}TOP}$ *I*]*'m gonna leave the small ones here*.

The amalgam construction assigns a different pragmatic interpretation to the *wh*-clause. The choice of either variant provides speakers with a way of differentially coding these two types of topics.

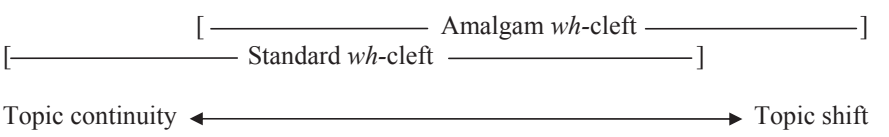
An understanding of the information structure of amalgam *wh*-clefts in terms of the notion of discourse topic accounts for both predictors #3 and #4. As for the effect of FP length seen in Section 2.3, the amalgam *wh*-cleft is specifically used to define a topic that is to be subsequently sustained over multiple clauses or independent sentences. This is precisely the distinguishing feature of discourse topics, as emphasized in the above definition. With regard to the topic shift function, as pointed out in Section 2.4, *wh*-clefts are known to shift the discourse topic, so the use of the amalgam variant in topic shift situations, and the use of the standard variant in topic continuity situations come as no surprise.

We represent this division of labor in topic management in terms of the discourse-pragmatic map in Figure 3.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Figure 3: Form-function mapping of *wh*-cleft variants




In summary, we propose that the main functional difference between standard and amalgam *wh*-clefts lies in how they are employed for topic management purposes. The two quantitative measures which speak to this (predictors #3 and #4) can both be motivated by this difference. The use of the standard variant signals that the FP is to be understood as relevant with respect to the current topic, whereas the amalgam variant signals that the FP is to be understood as relevant with respect to a more general topic, one that has not already been at issue at the point the construction is uttered. The constraint against extra FP syllables (predictor #2), and the sociolinguistic constraint (predictor #1) are obviously not represented on the map in Figure 3. However, it is worth pointing out that, were there no such constraints, the form-function mapping would show even less overlap because the amalgam *wh*-cleft could be used more frequently, and the standard *wh*-cleft less frequently, in topic shift situations.

## 4. Amalgam *Wh*-Clefts with Verbs Projecting NP Focus Phrases

We can now propose several reasons for why amalgam *wh*-clefts are more common with *do* than with verbs taking an NP complement, e.g., lexical verbs like *want* in (9). First, verbs other than *do* will almost always require more 'repeated' words (subject and verb). Second, *wh*-clauses with *do* are better suited to express discourse-level variables than lexical verbs are because *do* is semantically general, whereas lexical verbs are semantically more concrete.

The other verbs that show a tendency to be used in the amalgam *wh*-cleft are, in fact, those which are semantically more abstract. One of these is the verb *be* (our data include 6 standard and 6 amalgam *wh*-clefts with *be*), as in (19).

(19) A: It's uh like a bright flash,
B: Yeah.
A: out of the uh,
left part of the eye,
you know I see em every once in a while?
And what it is,
it's called like a sinus migraine. (CFAE 6955, 18:30)

The verb *be* does not incur an extra syllable when it cliticizes onto the subject, as in *what it is, it's ...* seen in (19), and *wh*-clauses with *be* are also semantically general.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 5. Conclusion

We have found that the selection of either of the two *wh*-cleft variants is determined by a combination of social, cognitive, and pragmatic factors. Regarding the latter, most important factor, and in terms of information structure, the *wh*-clause in the standard variant has the role of *sentence topic*, while in the amalgam variant it has the role of *discourse topic.* One of the motivations for marking a discourse topic is that of changing the topic. The discourse functions of the standard and amalgam *wh*-clefts map onto opposite regions of a discourse-pragmatic continuum from topic continuity to topic shift.

Returning to the problems posed by the amalgam construction for the traditional analysis of *wh*-clefts, we can note that, first, the syntactic mismatch is only apparent. Since the *wh*-clause in the amalgam *wh*-cleft codes a discourse-level (rather than sentence-level) variable, it is not unexpected that the value specification should take the form of a discourse-sized FP, i.e., an independent main clause or a sequence of such clauses. Second, there is also no semantic mismatch. The 'repetition' of *wh*-clause material in the FP is an epiphenomenon. It is also expected that aspects of the definition of a discourse topic (such as participants in an event) will reappear in the sentence or set of sentences which specify the discourse-level variable. The syntax of the FP thus need not mirror the grammar of the *wh*-clause in terms of the identity of the subject and TAM values.

## References

Canavan, Alexandra, David Graff, and George Zipperlen. 1997. *CALLHOME American English.* Philadelphia, PA: Linguistic Data Consortium.

Canavan, Alexandra, and George Zipperlen. 1996a. *CALLFRIEND American English - Non-Southern Dialect.* Philadelphia: Linguistic Data Consortium.

Canavan, Alexandra, and George Zipperlen. 1996b. *CALLFRIEND American English - Southern Dialect.* Philadelphia: Linguistic Data Consortium.

Den Dikken, Marcel, André Meinunger, and Chris Wilder. 2000. Pseudoclefts and Ellipsis. *Studia Linguistica* 54(1):41-89.

Du Bois, John, Stephan Schuetze-Coburn, Susanna Cumming, and Danae Paolino. 1993. Outline of Discourse Transcription. In J. Edwards and M. Lampert, eds., *Talking Data: Transcription and Coding in Discourse Research*, 45-89. Hillsdale, NJ: Erlbaum.

Du Bois, John *et al*. 2000-2005. *Santa Barbara Corpus of Spoken American English*. Parts 1-4. Philadelphia: Linguistic Data Consortium.

Godfrey, John, and Edward Holliman. 1997. *Switchboard-1 Release 2*. Philadelphia: Linguistic Data Consortium.

Hopper, Paul. 2001. Grammatical Constructions and their Discourse Origins: Prototype or Family Resemblance? In M. Pütz, S. Niemeier, and R. Dirven, eds., *Applied Cognitive Linguistics*, 109-129. Berlin: Mouton de Gruyter.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Hopper, Paul. 2008. The Openness of Grammatical Constructions. In *Proceedings from the Annual Meeting of the Chicago Linguistic Society*, 153-175. Chicago: Chicago Linguistic Society.

Jones, Larry B., and Linda K. Jones. 1985. Discourse Functions of Five English Sentence Types. *Word* 36(1):1-21.

Kim, Kyu-hyun. 1995. Wh-clefts and Left-dislocation in English Conversation. In P. Downing and M. Noonan, eds., *Word Order in Discourse*, 247-296. Amsterdam: Benjamins.

Lambrecht, Knud. 1994. *Information Structure and Sentence Form: Topic, Focus, and the Mental Representations of Discourse Referents*. Cambridge: Cambridge University Press.

Lambrecht, Knud. 2001. A Framework for the Analysis of Cleft Constructions. *Linguistics* 39(3):463–516.

Ochs Keenan, Elinor, and Bambi Schieffelin. 1983. Topic as a Discourse Notion. In E. Ochs and B. Schieffelin, eds., *Acquiring Conversational Competence*, 66-113. London: Routledge.

Prince, Ellen. 1978. A Comparison of Wh-clefts and It-clefts in Discourse. *Language* 54(4):883-906.

Ross, John Robert. Act. In D. Davidson and G. Harman, eds., *Semantics of Natural Language*, 70-126. Dordrecht: Reidel.

Ross, Háj. 2000. The Frozenness of Pseudoclefts -- Towards an Inequality-based Syntax. In A. Okrent and J. P. Boyle, eds., *CLS 36-1: The Main Session: Papers from the 36th Meeting of the Chicago Linguistic Society,* 385-426. Chicago: Chicago Linguistic Society.

Ross-Hagebaum, Sebastian. 2004. The That's X is Y Construction as an Information-Structure Amalgam. In M. Ettlinger, N. Fleischer and M. Park-Doob, eds., *Proceedings of the 30th Annual Meeting of the Berkeley Linguistics Society*, 403-414. Berkeley: Berkeley Linguistics Society.

Simpson, Rita C., Sarah L. Briggs, Janice Ovens, and John M. Swales. 2002. *The Michigan Corpus of Academic Spoken English*. Ann Arbor, MI: The Regents of the University of Michigan.

Strassel, Stephanie, Jeffrey Conn, Suzanne Evans Wagner, Christopher Cieri, William Labov, and Kazuaki Maeda. 2003. *SLX Corpus of Classic Sociolinguistic Interviews*. Philadelphia: Linguistic Data Consortium.

Weinert, Regina, and Jim Miller. 1996. Cleft Constructions in Spoken Language. *Journal of Pragmatics* 25(2):173-206.

Department of Linguistics, MS 23
Rice University
6100 Main Street
Houston, TX 77005

ckoops@rice.edu
srh@rice.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t

# Specification under Discussion[1]

LINE MIKKELSEN
*University of California, Berkeley*

## 0. Introduction

In her influential 1996 paper, Craige Roberts draws a distinction between information structure of sentences (ISS) and information structure of contexts (ISC). ISS partitions sentences and labels their parts with information structural notions like GROUND and FOCUS, as in (1).

(1) [Hilary ate]$_{\text{GROUND}}$ [bagels]$_{\text{FOCUS}}$.

ISC structures the inquiry pursued in a given discourse, as exemplified in (2) below for a domain of inquiry containing two individuals, Hilary and Robin, and two foods, bagels and tofu (Roberts 1996:101).

(2) **IS1.** Who ate what?
**a.** What did Hilary eat?
**a**$_i$. Did Hilary eat bagels?
*Yes*.
**a**$_{ii}$. Did Hilary eat tofu?
*Yes.*
**b.** What did Robin eat?
**b**$_i$. Did Robin eat bagels?
*No*.
**b**$_{ii}$. Did Robin eat tofu?
*Yes*.

In (2), the main Question under Discussion (QUD) is *Who ate what?*, which has the two subquestions IS1a and IS1b. Each of these in turn has two (polar)

[1] The idea of examining specificational clauses in the Question under Discussion framework was suggested to me by Judith Aissen. The audiences at BLS 34 and the Berkeley Syntax and Semantics Circle provided much useful feedback, though space limitations prevent me from incorporating most of that here. Finally I thank Nick Fleisher, Russell Lee-Goldman and Maziar Toosarvandani for helpful comments on a pre-final draft.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

subquestions. Roberts argues that ISC is crucial to understanding the distribution and contribution of information structure markers in sentences. Specifically, Roberts proposes that prosodic focus in English expresses a presupposition about the structure of the current discourse. So, (1), with prosodic focus on *bagels*, presupposes the QUD in IS1a.

In this paper I apply the QUD framework, as developed by Roberts (1996) and Büring (2003), to a well-known puzzle in the literature on copular clauses. Early on it was noticed that specificational copular clauses exhibit a fixed topic-focus structure: $NP_{TOPIC}$ be $NP_{FOCUS}$ (Halliday 1967, Akmajian 1979, Higgins 1979, Heycock and Kroch 1999, 2002, Partee 2002), whereas other types of copular clauses are not restricted in this way. The puzzle is why this should be the case. I argue that QUD cannot explain **why** specificational clauses have this fixed topic-focus structure, but it can draw a principled connection between two kinds of data used in the literature to demonstrate the topic-focus structure of specificational clauses, namely restrictions on specificational answers to constituent questions (section 2.1) and restrictions on specificational answers to polar questions (section 2.2). This leads me to conclude that there is information structure at the sentence level in the sense of restrictions on information structure that cannot be explained by the larger context of utterance.

## 1. Question-Answer Congruence

Long before Roberts' paper, focus and questions were tied together in Halliday's (1967) notion of question-answer congruence. A question-answer pair is congruent if the constituent in the answer that corresponds to the wh-phrase in the question is focus. In (3), A1 is congruent because the focussed constituent, *Sally*, corresponds to the wh-phrase of the question. (Caps indicate prosodic fous, i.e. Jackendoff's (1972) Accent A or Pierrehumbert's (1980) H*.) A2 is incongruent because the focussed constituent, *chair*, does not correspond to *who*.

(3) Q: Who took the chair?
A1: SAlly took the chair.
A2: #Sally took the CHAIR.

More formally, Roberts defines congruence as in (4):

(4) **Congruence** (Roberts 1996:111)
Move $\beta$ is congruent to a question $?\alpha$ iff its focal alternatives $\| \beta \|$ are the Q-alternatives determined by $?\alpha$, i.e. iff $\| \beta \| = \text{Q-alt}(\alpha)$.

Focus-alternatives and Q-alternatives are in turn defined as below:

(5) **Focus alternative set** (Roberts 1996:112)
The focus alternative set corresponding to a constituent $\beta$, $\| \beta \|$, is the set of all interpretations obtained by replacing all the F-marked (focused) and *wh*-constituents in $\beta$ with variables, and then interpreting the result relative



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

to each member of the set of all assignment functions which vary at most in the values they assign to those variables.

(6) **Q-alternatives set** (Roberts 1996:96-7; see formal definition in (1), p. 96)
To derive Q-alt($\alpha$) "abstract over any *wh*-elements in $\alpha$ and permit the variables of abstraction to vary freely over entities of the appropriate sort in the model."

Returning to the example in (3) with these definitions in hand, we can say that A1 is congruent because || A1 || = Q-alt(Who took the chair?) = {Harvey took the chair, Sally took the chair, Robert took the chair, ...}. A2 is incongruent because || A2 || = {Sally took the chair, Sally took the book, Sally took the chalk, ...} ≠ Q-alt(Who took the chair?).

In addition to being more explicit, the QUD framework improves on Halliday's congruence condition in three ways that are relevant for what follows. First, it generalizes to "answers" without explicit questions. This is achieved by the condition stated in (7):

(7) **Presupposition of prosodic focus in an utterance *$\beta$** (Roberts 1996:112)
$\beta$ is congruent to the question under discussion at the time of utterance.

Applying this condition to A1 and A2 in (3), yields different results. A1 presupposes the QUD 'Who took the chair?', whereas A2 presupposes the QUD 'What did Sally take?'. This lets us understand the felicity of A1 in the context of the explicit question in (3), which matches the QUD presupposed by A1, as well as the infelicity of A2 in the context of the same explicit question, which does not match the QUD presupposed by A2. Importantly, it also makes predictions about the felicity of A1 and A2 outside question-answer pairs. The second advantage of the QUD framework, is that it generalizes to non-declaratives; the * in (7) ranges over declaratives and interrogatives. Hence a polar question like *Did SAlly take the chair?* presupposes the QUD 'Who took the chair?', whereas *Did Sally take the CHAIR?* presupposes the QUD 'What did Sally take?'. Finally, a clean distinction is drawn between coherence, which is a matter of content, and congruence, which is a matter of form (Büring 2003:517ff). Both are relevant for felicity, as can be shown by elaborating (3) as in (8):

(8) Q: Who took the chair?
A1: SAlly took the chair.
A2: #Sally took the CHAIR.
A3: #SAlly eats peanuts.

A2 is incongruent, A3 is incoherent (under any pronunciation), and A1 is congruent and coherent.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

## 2. Copular Questions and Answers

The distinction between specificational and predicational copular clauses is part of the larger taxonomy of copular clauses proposed in Higgins (1979). While other parts of the taxonomy have been disputed, the distinction between predication and specification is generally accepted, and supported by a dossier of tests (see Higgins 1979: chapter 5). In this paper, all predicational clauses will have the form [name *be* description], as in (9), and all specificational clauses the form [description *be* name], as in (10):

(9) Sharon is the chair. [predicational]
(10) The chair is Sharon. [specificational]

Note that (9) and (10) are truth-conditionally equivalent, which means that they have the same content and hence the same coherence conditions. On the other hand, (9) and (10) differ in form, which opens up the possibility that they have different congruence conditions. Evidence that they do is provided in the following two subsections.

### 2.1. Constituent Questions

We start by considering the copular question in (11), and the associated ISC in (12).

(11) Q: Who is the graduate advisor? [= IS2b]
A1: EVE is the graduate advisor. [predicational]
A2: The graduate advisor is EVE. [specificational]

(12) **IS2.** Who is who (in the department)?
**a.** Who is the chair?
**a**$_i$. Is Sharon the chair?
*Yes*.
**a**$_{ii}$. Is Eve the chair?
*No.*
**b.** Who is the graduate advisor?
**b**$_i$. Is Sharon the graduate advisor?
*No*.
**b**$_{ii}$. Is Eve the graduate advisor?
*Yes*.

In (11), A1 is predicational, A2 is specificational, and both are felicitous. This is explicable by Halliday's congruence condition: in both A1 and A2, the focus constituent is *Eve* and in both it corresponds to the wh-phrase of the question. It is also explicable by Roberts' congruence condition in (7): A1 and A2 both presuppose the QUD in IS2b, which is 'Who is the graduate advisor?', and that QUD is explicitly evoked by the question in (11).



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

*Specification under Discussion*

Next consider the exchange in (13) and the associated ISC in (14).

(13) Q: Who/What is Eve? [= IS3b]
A3: Eve is the GRAduate advisor. [predicational]
A4: #The GRAduate advisor is Eve. [specificational]

(14) **IS3.** Who is who (in the department)?
**a.** Who is Sharon?
**a**$_i$. Is Sharon the chair?
*Yes*.
**a**$_{ii}$. Is Sharon the graduate advisor?
*No*.
**b.** Who is Eve?
**b**$_i$. Is Eve the chair?
*No*.
**b**$_{ii}$. Is Eve the graduate advisor?
*Yes*.

Again, one answer (A3) is predicational and the other (A4) is specificational, but here there is an asymmetry between them in that only the predicational answer is felicitous. The question is whether this asymmetry can be accounted for in terms of congruence. My claim is that it cannot. Starting with Halliday's notion, we observe that A3 and A4 are both congruent to the question in (13), since in both the focused constituent is *the graduate advisor* and in both that corresponds to the wh-phrase of the question. Similarly, A3 and A4 both presuppose the QUD in IS3b, namely 'Who is Eve?', which is matched by the explicit question in (13). Hence Roberts' congruence condition in (7) is satisfied by both A3 and A4 and both are predicted to be felicitous in the cited context, contrary to fact.

It is instructive to compare A4 in (12) to A2 in (3), repeated here as (15):

(15) Q: Who took the chair?
A2: #Sally took the CHAIR.

Both are infelicitous, but their status within the QUD framework is different. A2 is incongruent (by (7) it presupposes a QUD that is not matched by the explicit question), whereas A4 is congruent (it presupposes a QUD that is matched by the explicit question) and coherent (its propositional content matches that of the question).

Büring (2003:530) notes that some strategies for answering a question may be dispreferred, not on linguistic grounds, but because our world knowledge deems them inefficient or pointless. His example is a strategy of going by clothing, as opposed to people, when trying to determine which pop stars wore which clothing during a concert. I don't think we can appeal to world knowledge in ruling out A4. After all, it presupposes the exact same QUD as A3, which is perfect-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

ly felicitous. The problem with A4 thus does seem to be a linguistic one. We could propose that specificational clauses of the form [NP1 *be* NP2] cannot "answer" QUDs of the form [Who is NP2?], as a way to account for the infelicity of A4. I see two problems with this. First, "answer" in the required sense is not part of Roberts' system (nor of Büring's). Second, it obscures the fact that the problem with A4 is a sentence-internal one (note that A4 is infelicitous in any context): a specificational clause does not allow focus (or focus prosody) on the subject. This latter formulation, which is common in the literature on copular clauses, seems no more stipulative than the hypothetical QUD-answerability condition, and, unlike the QUD-answerability condition, it explicitly identifies the trouble spot. More importantly, though, neither brings us any closer to understanding the original puzzle; why do specificational clauses have the fixed information structure they do? On the other hand, the QUD framework does provide a systematic link between the data in (11) and (13), which is frequently cited in the literature on copular clauses, and another set of data, which is cited less frequently, but no less instructive. I turn to this data next.

### 2.2. Polar Questions

In (16) we have a polar copular question and two felicitous copular answers; one predicational (A1) and one specificational (A2):

(16) Q: Is Eve the chair?
A1: No, SHAron is the chair.
A2: No, the chair is SHAron.

The first thing to note is that Halliday's notion of question-answer congruence does not apply to (16): there is no wh-phrase in the question and hence no predictions about where the focus must fall in the answers. Roberts' congruence condition from (7) does apply, since it works directly off the focus prosody in the answer to restrict the QUD. This process is sketched for A1 in (17) below:

(17) i. A1 contains focus prosody (*SHAron*) and hence carries the presupposition that it is congruent to the QUD at the time of utterance.
ii. To be congruent, the focus-alternatives of A1 must equal the question-alternatives of the QUD, that is || A1 || = Q-alt(QUD).
iii. || A1 || = {Eve is the chair, Sharon is the chair, Gary is the chair, ...}
iv. {Eve is the chair, Sharon is the chair, Gary is the chair, ...} = Q-alt(Who is the chair?)

The calculation in (17) shows that A1 is congruent to the QUD 'Who is the chair?'. The reason A1 is felicitous in (16) is that the stated question *Is Eve the chair?* is a subquestion of the presupposed QUD, as can be seen in IS2 (the presupposed QUD is IS2a and the explicit question corresponds to IS2$a_{ii}$). A2 is felicitous in (15) for the exact same reason: since A2 has focus on the same constit-



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

uent as A1, they have the same focus-alternatives and, hence, presuppose the same QUD.

Consider (18) next. The question is the same as in (16), but the answers are different:

(18) Q: Is Eve the chair?
A3: No, Eve is the GRAduate advisor.
A4: #No, the GRAduate advisor is Eve.

The predicational answer in A3 is felicitous, but the specificational answer in A4 is not. We calculate the focus presupposition of A3 in (19):

(19) i. A3 contains focus prosody (*the GRAduate advisor*) and hence carries the presupposition that it is congruent to the QUD at the time of utterance.
ii. To be congruent, the focus-alternatives of A3 must equal the question-alternatives of the QUD, that is || A3 || = Q-alt(QUD).
iii. || A3 || = {Eve is the chair, Eve is the graduate advisor, Eve is the undergraduate advisor, ...}
iv. {Eve is the chair, Eve is the graduate advisor, Eve is the undergraduate advisor, ...} = Q-alt(Who is Eve?)

The focus on *the graduate advisor* in A3 presupposes that the QUD is 'Who is Eve?'. As seen in IS3, that is a super question of the explicit question posed in (18) (the presupposed QUD is IS3b and the explicit question is IS3b$_i$), which explains the felicity of A3 in this exchange. Turning to A4, we see that it too has focus prosody on *the graduate advisor*, which means that it has the same focus alternatives as A3 and, therefore, that it too presupposes IS3b. Since A3 is congruent, A4 is too. A4 also carries the same propositional content as A3, so if A3 is coherent, A4 is too. So why is A4 infelicitous? Well, A4 in (18) is identical to A4 in (13) and following the discussion of the latter in section 2.1 we could say that both are bad because they are specificational clauses that presuppose a QUD of the form 'Who is NAME?' (appealing to ISC) or we could say that both are bad because they are specificational clauses with focus on the subject (appealing to ISS). As argued in section 2.1, these seem equally stipulative. Again, an extra-linguistic explanation for the infelicity of A4 in (18) is effectively ruled out by the observation that A4 invokes the exact same QUD and strategy as the perfectly felicitous A3.

### 2.3. Taking Stock

The examination of specificational clauses above reveals that the QUD framework cannot **explain** why they invariably have the form $NP_{TOPIC}$ be $NP_{FOCUS}$, but it does connect the two sets of data − specification answers to constituent questions and specificational answers to polar questions − in a systematic way. Earlier work (e.g. Wunderlich 1980, Kiefer 1980, and Yadugiri 1986) has pointed out



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

that polar questions regularly invoke constituent questions, but Roberts (1996) and Büring (2003) provide a formal and fully general framework that can incorporate these observations, though no formal incorporation has been provided here.

If the focus properties of specificational clauses cannot be explained by considering the information structure of contexts, it must be a sentence-internal matter. As pointed out to me by Maziar Toosarvandani, this groups specificational clauses with focus constructions like *it*-clefts and possibly clauses containing focus "associators" like *only* and *even*. One difference between these and specificational clauses is that in the former, there is some discernable linguistic material to hang the focus structure on, so to speak, namely the cleft structure and the word *only*/*even.* In specificational clauses there is only word order. In so far as word order is a matter of syntax, this raises the question of whether syntax "knows" that this word order is associated with a particular topic-focus structure. This question is answered in the positive in Mikkelsen (2005: chapter 9), where I propose that a topic feature is active in the syntax and centrally involved in the derivation of specificational clauses. One could also posit a specificational construction, in the sense of Kay and Fillmore (1999), and tie both word order and topic-focus structure to the construction. Finally, one could reject any direct link between syntax (word order) and information structure (topic and focus) by analyzing the infelicity of specificational clauses like A4 in (13) and in (18) as a syntax-phonology mismatch: specificational clauses may not carry focus **prosody** on their subject. The data discussed in this paper does not help us decide between these options, but it does demonstrate that some restriction must be imposed at the clause level. It is not enough to appeal to context.

## 3. A Final Speculation

So why is A4, and more generally, specificational clauses with focus (prosody) on the subject infelicitous? I don't know, but the following possible explanation was suggested to me by Daniel Büring (public comment, February 10, 2008): the unmarked position for focus in English is the VP and the unmarked "position" for the semantic predicate is likewise the VP. Given this specificational clauses with subject focus are doubly marked: the focus falls on the subject (not on the VP) and the semantic predicate is realized in subject position (not as the VP; this is the major claim of the analysis of specificational clauses in Mikkelsen 2005). The grammar of English is flexible enough to allow either of these: there are indisputable cases of subject focus, and, if the analysis of specificational clauses in Mikkelsen (2005) is right, a semantically predicative NP may surface in subject position under particular circumstances. But perhaps it is not flexible enough to allow both of these to occur together, as is the case in a specificational clause with subject focus. If something like this is on the right track, we need to ask whether this restriction is conventional or actively computed in an OT-style grammar. Again, I don't know, but the data in (20) (partly due to Bill Ladusaw) could be taken to suggest the latter:



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

*Specification under Discussion*

(20) Q: Is that Eve?
A1: No, that's SHAron.
A2: No, THAT's Eve.
A3: *No, Eve's THAT.

Q, A1, and A2 are identificational clauses in Higgins' taxonomy. They characteristically involve a demonstrative subject and an individual-denoting post-copular element, and have been argued to be specificational clauses with pronominal subjects (see Mikkelsen 2007 and references cited there). If they are indeed specificational clauses, it is no surprise that A1 is felicitous: the focus falls on the post-copular element and presupposes a QUD compatible with the explicit question. It is more surprising that A2 is felicitous, since it involves subject focus. A3 shows that a "predicational" version of A2 is impossible. From this one could reason as follows: normally specificational clauses with subject focus lose out to their predicational variants, which have a "better" focus-syntax alignment (focus inside VP) and a "better" semantics-focus alignment (predicative element inside VP), but when the predicational variant is unavailable (as is the case for a specificational clause with a demonstrative subject), a specificational clause with subject focus surfaces as the best expression of a given content.

**References**

Akmajian, Adrian. 1979. *Aspects of the Grammar of Focus in English*. New York: Garland.

Büring, Daniel. 2003. On D-Trees, Beans, and B-Accents. *Linguistics and Philosophy* 26(5):511-545.

Halliday, M.A.K. 1967. Notes on transitivity and theme in English (Part 2). *Journal of Linguistics* 3(2):199-244.

Heycock, Caroline and Anthony Kroch. 1999. Pseudocleft Connectedness: Implications for the LF Interface Level. *Linguistic Inquiry* 30(3):365-397.

Heycock, Caroline and Anthony Kroch. 2002. Topic, Focus, and Syntactic Representations. In Line Mikkelsen and Christopher Potts, eds., *Proceedings of West Coast Conference on Formal Linguistics 21*, 101-125. Somerville, MA: Cascadilla Press.

Higgins, Roger Francis. 1979. *The Pseudo-cleft Construction in English.* New York: Garland.

Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar.* Cambridge, MA: Massachusetts Institute of Technology Press.

Kay, Paul and Charles J. Fillmore. 1999. Grammatical Constructions and Linguistic Generalizations: The *What's X doing Y?* Construction. *Language* 75(1):1-33.



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

Job Name: -- /337544t



Kiefer, Ferenc. 1980. Yes-No Questions and Wh-Questions. In John R. Searle, Ferenc Kiefer, and Manfred Bierwisch, eds., *Speech Act Theory and Pragmatics*. 97-119. Dordrecht: D. Reidel.

Mikkelsen, Line. 2005. *Copular Clauses: Specification, Predication and Equation*. Amsterdam: John Benjamins.

Mikkelsen, Line. 2007. On so-called truncated clefts. In Ljudmila Geist and Björn Rothstein eds., *Kopulaverben und Kopulasätze: Intersprachliche und Intrasprachliche Aspekte*, 47--68. Tübingen: Niemeyer Verlag.

Partee, Barbara. 2000. Copula Inversion Puzzles in English and Russian. In Kiyomi Kusumoto and Elisabeth Villalta, eds., *Issues in Semantics.* (University of Massachusetts Occasional Papers 23), 183-208. Amherst, MA: University of Massachusetts.

Pierrehumbert, Janet (1980) The Phonology and Phonetics of English Intonation. Ph.D. diss. Massachusetts Institute of Technology.

Roberts, Craige. 1996. Informative Structure in Discourse: Toward an Integrated Formal Theory of Pragmatics. In Jae Hak Yoon and Andreas Kathol, eds., *OSU Working Papers in Linguistics 49: Papers in Semantics*, 91-136. Colombus, OH: The Ohio State University.

Wunderlich, Dieter. 1981. Questions about Questions. In Wolfgang Klein and William Levelt, eds., *Crossing the Boundaries in Linguistics*, 131-176. Dordrecht: D. Reidel.

Yadugiri, M. A. 1986. Some Pragmatic Implications of the Use of *Yes* and *No* in response to *Yes-No* Questions. *Journal of Pragmatics* 10(2):199-210.

Line Mikkelsen
University of California, Berkeley
Department of Linguistics
1203 Dwinelle Hall
Berkeley, CA 94720-2650

mikkelsen@berkeley.edu



In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.

In order to view this proof accurately, the Overprint Preview Option must be checked in Acrobat Professional or Adobe Reader. Please contact your Customer Service Representative if you have questions about finding the option.