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PROCEEDINGS OF THE TWENTY-THIRD ANNUAL MEETING

OF THE

BERKELEY LINGUISTICS SOCIETY

February 14-17, 1997

GENERAL SESSION

and

PARASESSION

ON

PRAGMATICS

AND

GRAMMATICAL STRUCTURE

Edited by

Matthew L. Juge

and

Jeri L. Moxley

Berkeley Linguistics Society

Berkeley, California, USA

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• • •

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

The Long and Short of it: Perception of Segment Length in Luganda
KATHLEEN HUBBARD

Aspects of Faroese Dialect Syntax
DIANNE JONAS

PREFACE

BLS proceedings are always collaborative efforts, but this volume has been an especially clear example of this. The editors would like to thank two main groups: those who helped get BLS 1997 off the ground and those who assisted in the production of the volume itself. In the first group, special thanks go to Ashlee Bailey and Jan Johnson, the latter being especially instrumental in reconciling the inevitable differing points of view that arise in such enterprises. Among those contributing to the volume, Jeff Good and Lisa Conathan deserve special mention for coming on board and helping sort out a number of issues. As always, we also wish to thank the graduate students in the Berkeley Linguistics Department and, of course, the presenters, who showed great patience in the editing process and without whom neither the conference nor the proceedings would have been possible.

Matthew L. Juge
Jeri L. Moxley

General Session

Edge-Crispness effects in moraic structure*

Brett Baker
University of Sydney

1. Introduction. In this paper I examine the stress facts of Ngalakan, a Non-Pama-Nyungan Australian language of the Gunwinjguan family (see, e.g. Alpher, Evans and Harvey to appear). The definition of syllable weight in Ngalakan appears to be unique to the stress literature. Weight for stress is assigned only to syllables which have a heterorganic coda to a following onset, and not to any other syllables. Although other analyses (e.g. Bach 1975, Zec 1995) have shown that the sonority of the syllable coda can be distinguished for weight, differences in association of autosegmental structure to syllable structure have not previously been shown to play a role. The evidence of Ngalakan is therefore crucial for determining what it is about syllables that contributes to weight, and hence to stress.

I propose an analysis in OT-theoretic terms (e.g. Prince and Smolensky 1993) using a constraint CrispEdge[μ]. Although this particular constraint has not been proposed previously (to my knowledge) it is a relatively straightforward instantiation of a constraint family CrispEdge[ProsodicCategory] (PCat) proposed by Ito and Mester (1994). The constraint CrispEdge[μ] can distinguish mora associations to segments according to their sub-melodic structure. In particular, segments which are non-discrete for place association to syllable structure cannot be associated to a mora. CrispEdge[μ] in effect prevents full syllabification of homorganic codas.

In what follows I first examine the bulk of the relevant examples in §2 and §3. In §3 I examine the evidence for a weight distinction in Ngalakan based on segment-to-syllable association. In §4 I propose the constraints that account for the patterns in an OT framework. Finally, I argue in §5 that the same constraints can help us account for otherwise mysterious asymmetries in stem gemination allomorphy. The conclusion is in §6.

2. Stress types. Open disyllabic roots show initial stress:

(1) a. ṭáṭa 'wild honey'
b. kíṭi 'young girl'
c. máṭu 'paperbark sp.; baby-carrier'
d. cíwi 'liver'
e. máḷa 'centipede'

Open trisyllabics show initial stress. There is no secondary stress on the final syllable when open; I assume it is unfooted.

(2) a. pícuṭu 'big wind'
b. wáṭiya 'multiparous woman'
c. céraṭa 'women's ceremony'
d. ŋúḷiri 'black duck sp.'
e. kómoḷo 'white crane'

Open quadrisyllabics show initial stress. There is secondary stress on the third syllable.

(3) a. círiṯiti 'bird sp.'
b. páɹamùnu 'sand goanna' (large lizard sp.)
c. káṇamùru 'wild-honeybee sp.'
d. wáriṯila 'hooked boomerang'
e. kúṇiṇàra 'tree sp.'
f. ṭárapi̯ya 'black cockatoo'
g. púrukùlu 'snake sp.'

There are no examples of open-syllabled roots with more than four syllables. One example is open except for a nasal stop cluster. Here again, the primary stress is initial; secondaries are placed on every following odd-numbered syllable:

(3) h. káɹaŋkàŋaŋ̇ini 'macropod sp.'

For words with only open syllables in Ngalakan, the generalization is initial stress with secondary stresses on every following odd syllable. In OT-terms this kind of metrical pattern is to be accounted for with constraints FootForm, FootBinarity (demanding left-headed, bimoraic trochees) ranked above Parse[σ], demanding every syllable to be parsed into a foot. AlignLeft(Peak, ProsodicWord) will require the primary stress to be initial in the word.

3. Weight in Ngalakan. In Ngalakan, syllables which contain a coda which is heterorganic to a following onset are assigned root stress over both initial syllables and syllables with codas homorganic to a following onset. Trisyllabics with medial heterorganic coda syllables are the most consistent:

(4) a. puṭólko? 'brolga' (bird sp.)
b. kuṭálpun 'together'
c. miṛárppu? 'crab'
d. purúṭci 'water python'
e. waṛúrkku 'fighting club'
f ḷuŋúrwa 'vine sp.'
g kaṭáykka 'paperbark (*Melaleuca*) sp.'

In all of the above examples (4a-g), primary word stress is aligned with a non-initial syllable, in contrast to the examples with all open syllables in §2. What the above examples have in common is a medial syllable in which the coda is heterorganic to the onset of the final syllable.

Quadrisyllabics and higher have the same characteristics, with the added complication that heavy initial or third syllables participate in the typical trochaic pattern. In general, where the heavy syllable is non-final it attracts primary word stress, other syllables receiving secondary stress according to the footing algorithm.

(5) a. pàṭawárkka [place name]
b. màcapúrka? plant sp.
c. càlawárcca 'full'

The few examples with heavies in non-metrically prominent syllables are:

(5) d. kaṇṭálppuru 'female plains kangaroo'
e. kipíṭkuluc 'tawny frogmouth'
f. kùricáṭpoŋko 'olive python'

Note that exx. (5e, f) show that codas are often, but need not be, sonorants to count as heavy for stress. And see section §3.4 for discussion.

3.1 Homorganic codas do not count for weight. Contrast the examples in §3 above, with examples (6) below with homorganic codas to following onsets in medial syllables:

(6) a. móḷoppoḷ 'shovelhead catfish'
b. kámakkun 'properly'
c. cáruṭṭu? 'macropod sp.' (female agile wallaby)
d. mánappuṇ 'echidna' (spiny anteater)
e. móroṭṭin? 'wild cassava'
f. cápatta 'freshwater tortoise sp.'
g. cámpakku 'tobacco' (old loan)
h. wáɹaccàra 'flood water'

i. ŋámuccùlo 'subsection term'
j. ŋóloŋko? 'eucalyptus sp.'
k. cákanta 'macropod sp.' (female plains kangaroo)
l. ŋúruṇtuc 'emu'
m. páṇaŋka 'bird sp.'

Stress is by no means avoided in syllables closed by homorganic codas, but is realized initially, as per the usual rule:

(6) n. ŋáppunun? 'subsection term'
o. káppaṇta? 'white mud'
p. wáccuṇtu 'mature goanna sp.' (large reptile)
q. ŋáɲcuḷa 'eye; seed'
r. wómboroṭ 'macropod sp.' (large rock wallaby)
s. cúṇtupol? 'macropod sp.' (small rock wallaby)

These examples demonstrate the dichotomy of the weight distinction in Ngalakan. While syllables with a heterorganic coda can attract stress away from its normal initial position, homorganic codas can not. Rather, syllables ending in geminates and homorganic nasal-stop clusters behave the same as open syllables in terms of stress assignment. I now examine the characteristics of final syllables which mark them as special for stress purposes.

3.2 Final segment extrametricality. In word-final position, the picture is more complicated. Firstly, simple final closed syllables do not attract stress in Ngalakan:

(7) a. cíṭak 'coolamon' (container)
b. cépaŋ 'line, row'
c. cícuk 'macropod sp.' (large nail-tailed wallaby)
d. kúpuy 'sweat' (n.)
e. yáwok 'yam sp.'
f. kácet 'knife'
g. cáric 'charcoal'
h. cáɹuk 'short'
i. ŋápak '*Eucalyptus* sp.'
j. ŋóṭokoc 'ankle'
k. káyapam 'wild orange' (*Capparis sp.*)
l. cálapir 'red ant sp.'
m. cáṇaran 'jabiru' (large wading bird sp.)
n. cáṭukal 'macropod sp.' (male plains kangaroo)
o. cíliwiṇ '*Capparis sp.*'
p. márawul 'hungry'
q. céntewèrec 'willy wagtail' (bird sp.)

From the data it appears that final simple coda segments do not count for weight, since stress is never attracted to final syllables when closed with a simple coda. In addition, the glottal stop does not count when computing weight anywhere:[1]

(8) a. kú?cel? '(really) cold'
b. cánay? 'goanna sp.'
c. cóṭow? 'morning star'
d. máṭaw? 'tree sp.'
e. múṇaŋ? [subsection term]
f. yána? 'what; something'
g. yére? 'downriver'
h. kámaci? 'swag (bedroll; belongings)'
i. páṭikùlu? 'Eucalyptus sp.'

Nor do medial glottal stop codas (in historically complex forms):

j. ŋáṇa?pay 'and moreover'

There are two things to be explained here: the lack of weight of simple final codas, and the apparent invisibility of the glottal stop. To account for the apparent discrepancy between the weight of codas medially and the lack of weight of simple codas finally, we must assume that word-final consonants are extrametrical.

Weight in Ngalakan depends on discrete place association between a mora and a coda (as I discuss below in §4).The behavior of glottal stop is then expected, since glottal stops are assumed not to be specified for place (Padgett 1991[1995]).[2] As such it does not play a role in the computation of stress. In addition, to make sure that a sonorant plus glottal stop sequence behaves the same for extrametricality as a simple consonant, I must make a further assumption. It has been noted (e.g. Ladefoged 1971) that the glottis plays a dual role in phonetics: both as a feature [glottal stricture] in voice contrasts, and as a possible articulatory place. My assumption for Ngalakan is that glottal stops should be analyzed as a feature [glottalization] on preceding sonorants, rather than as a segment with its own root node.[3] In this case, glottalized sonorants (as they will henceforth be referred to) are contour segments along the lines of Steriade (1992), and behave exactly as non-glottalized sonorants for the purposes of computing weight-for-stress.

3.3 Final heavy syllables. When the final syllable is closed by a cluster, it is usually heavy.[4] Examples with consistent second stress are:

(9) a. kiṇálk 'white ibis'
b. kaḷúrk 'deep'
c. camólk 'for nothing, in vain'
d. piccúrk 'edible tuber sp.'
e. kappúṛk 'dry'

3.4 Multiple heavies and heavies in polysyllabic roots. When there is more than one heavy syllable in a root, the leftmost is assigned word stress. The other heavy syllables in the word optionally receive a secondary stress when non-adjacent:

(10) a. mélwerŋ 'sandfly'
b. cálpurkic 'jewfish'
c. ḻáɹkurca 'vine sp.'

The few examples of trisyllabics with final heterorganic clusters do not show final primary stress. They receive a final secondary stress on the heavy syllable:

(11) a. péɹemèlk 'shoulder blade'
b. cácapàɹŋ? 'yesterday'
c. cíliwùɹk 'guts'
d. kúnuŋùɹk 'tree sp.'
e. páɹamàlk 'wild cucumber'

In almost all examples of heavy syllables the coda is a continuant and the following onset a stop, though (5e-f) show that this need not be the case for attraction of stress. Therefore the Ngalakan stress pattern is not dependent on the sonority of the coda in order to count as heavy for stress (as shown for Kwakiutl by Bach 1975, other languages Zec 1995). There are examples where a low-sonority heterorganic stop coda attracts (primary) stress (12a, c), while a corresponding high-sonority but homorganic nasal coda does not (12b, d). Ex. (12e) shows that the stress pattern of the root in (12c) contrasts with the typical five syllable pattern.

(12) a. purúṭci 'water python'
b. ŋóloŋko? 'eucalyptus sp.'

c. kùricáṭpoŋko 'olive python'
d. kálaŋàṇṭa? 'edible tuber sp.'
e. ṇáɪakkaɪàni [place name]

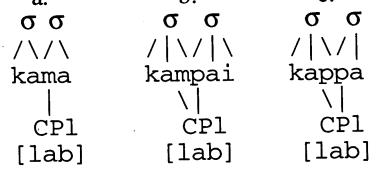
4. Analysis: preliminaries. In this section I outline an analysis of Ngalakan weight in an Optimality Theoretic (OT) framework (see for example Prince and Smolensky 1993). What OT allows us to do is to set up a relatively small number of general conditions on outputs in Ngalakan, like well-formedness conditions. But it is in the interaction of these often competing demands that OT differs from other theories. OT hypothesizes that some demands ('constraints') outrank others in deriving a well-formed output. Moreover, the effects of constraints are general throughout the language. OT specifically predicts that constraints on outputs will be the same whether in the realm of stress rules or allomorphy or compounding. This is a strong claim, but if true, it makes the theory more constrained and all the stronger for its consistency of application throughout the grammar.

4.1 CrispEdge. My analysis of the weight-for-stress distinction in Ngalakan makes crucial reference to a constraint family proposed by Ito and Mester (1994; see also Merchant 1994): 'CrispEdge[Prosodic Category]'. Ito and Mester propose CrispEdge as a constraint family to resolve certain contradictions in the use of the constraint family Align. They propose that the Coda Condition of Ito (1986) should be revised in favour of an instantiation of the general constraint family Align (and cf. McCarthy and Prince 1993). In languages with strong constraints on codas, the CodaCond should be restated as an alignment of consonant place with the left edge of the syllable. Thus in Japanese, where the only allowed codas are a homorganic nasal or homorganic stop (i.e. geminate), the constraint would be (Ito and Mester 1994:34):

CodaCond (Japanese, etc): Align-Left (CPlace, σ)

The fact that, in cases such as Japanese, homorganic codas are commonly exempted from the general prohibition on codas must be accounted for within this theory. In the three cases in (13a-c) below, Align must be satisfied in all three:

(13)



In these cases, therefore, alignment must be relatively 'loose,' since CPlace is associated not only with the onset in (a, b and c) but also with the coda in (b and c). In very similar circumstances, however, alignment must fail, precisely because it is loose.

Consider the example of Axininca Campa examined in McCarthy and Prince (1993:39-40). In this language, stems maintain their prosodic integrity by epenthesizing. Given the input form /iN-koma-i/ in tableau (14), the output is [iN.ko.ma.Ti]:

(14) /iN-koma-i/	Onset	AlignR (Stem, σ)	Fill
✈ a) iN.ko.ma.Ti			*
b) iN.ko.mai		*!	

(N homorganic nasal, T an epenthetic consonant, periods indicate syllable boundaries)

Despite the fact that *[iN.ko.mai] is a completely well-formed word in Axininca Campa, phonologically speaking, candidate (14b) fails. The constraint responsible for these forms, McCarthy and Prince argue, is Align, specifically, an instantiation of Align which demands coincidence of the right edges of stems with the right edge of a syllable. Onset can compel violation of Align in (15):

(15) /cik-aanci/	Onset	AlignR (Stem, σ)	Fill
✈ a) ci.kaan.ci		*	
b) ci<k>.aan.ci	*!		

But in (16) there appears to be a better candidate which satisfies both constraints:

(16) /kim+aanci/	Onset	AlignR (Stem, σ)	Fill
✈ a) ki.maan.ci		*	
b) ki<m>.aan.ci	*!		
? c) kim.Paan.ci		**?**	*

The existence of forms like [ci.kaan.ci] from underlying /cik-aanci/ shows that the higher ranking of the universal constraint Onset can force misalignment. However, the real problem is with forms like underlying /kim-aanci/, realized as [ki.maan.ci]. The problem is explaining why the output isn't [kim.Paanci], with epenthetic onset. This form should be more optimal than the former candidate, since it not only has an onset, it also satisfies the alignment constraint.

McCarthy and Prince argue that the latter candidate fails, in essence, because of the association of the final segment of the stem (through CPlace) with the onset of the following morpheme. In their words "Align requires sharply-defined morpheme edges, but linking as in [kim.Paanci], undoes the desired relation between the morphological and prosodic constituency of a form" (McCarthy and Prince 1993: 39). They note that if the epenthetic consonant is not supplied with a CPlace node (in an attempt to satisfy Align), the form violates CodaCond, since the CPlace of the coda [m] is now not licensed through linking to the onset.

If Ito and Mester's reformulation of the CodaCond as an alignment constraint is well-motivated, then there is a conflict in the conception of alignment as regards syllable wellformedness and alignment as morpheme-to-prosodic category wellformedness. Their proposal is that there be a separate family of constraints, CrispEdge, requiring that PCategories should have uniquely associated edges. The distinction in the definitions of Align and CrispEdge rests on the formal difference between the upwards-tracing relation *is-a* and the downwards-tracing *be-the-content-of* (see Ito and Mester 1994 for further discussion).

Their definition (Ito and Mester 1994:38) is as follows:

(17)

a. Dfn. Let A be a terminal (sub)string in a phonological representation, C a category of type PCat, and A be-the-content-of C. Then C is crisp (or: has crisp edges) if and only if A is-a PCat.

b. CrispEdge[PCat]: PCat is crisp

Besides Axininca Campa, Ito and Mester cite Sino-Japanese compounds for CrispEdge[PrWd], English word-internal ambisyllabicity for CrispEdge[Ft]. CrispEdge[σ] rules out geminates and other cases of cross-linking. Ito and Mester have no examples of CrispEdge[μ] but I suggest that this is precisely the case of Ngalakan. The application of this constraint to explaining Ngalakan stress is explored more fully in the following sections.

4.2 CrispEdge in Ngalakan stress. I assume the Weight-to-Stress Principle (Prince 1990; Prince and Smolensky 1993) is operative in this language. WtS demands that heavy syllables receive an accent in metrical structure. In polysyllabic words with some open and some closed syllables, the ranking of Weight-to-Stress >> AlignL(Pk, PrWd) derives the correct result, that heavy syllables receive primary stress over initial syllables:

(18)	WEIGHT-TO-STRESS	ALIGNL(PK, PRWD)
✈ a) l̪uŋúrwa		*
b) l̪úŋurwa	*!	

Given an underlying representation (UR) like [mo̪loppo̪l] then, we might expect that stress will move to the second syllable. In current theory (e.g. McCarthy and Prince 1993; cf. Hyman 1985) geminates are assumed to be represented underlyingly as a segment pre-linked to a mora. Singletons, by contrast, are assumed to be moraified only as a possible candidate analysis supplied by GEN (the device which generates potential surface outputs for an underlying representation). Given the moraic theory of geminates, then the second syllable of a form like [mo̪loppo̪l] should be considered as bimoraic and therefore heavy by the grammar. It should therefore be stressed, under WtS.

Rather than the moraic theory, I will instead be assuming the 'Two Root Theory' of length proposed in Selkirk (1988), for reasons which will become clearer below. Under this theory, segment length is distinguished at the root node level, rather than being represented by pre-linking to a mora underlyingly. URs then consist only of autosegmental feature-node structure. I assume that GEN supplies candidates with a number of possible prosodic parses (as is assumed generally in OT) but that it can also supply various moraifications, to be evaluated by universal constraints. The family Parse[ProsodicCategory] prefers representations that are as fully parsed as possible. Markedness constraints such as CrispEdge[μ], and potentially Zec's conditions on coda sonority for weight, serve specifically to prune these representations of moras at the surface level.

Now consider the tableau in (19). I assume a constraint demanding moraification of codas, called Parse[Seg].[5] This constraint demands that codas be moraic, rather than being adjoined to the syllable node directly. This constraint will account for the weight of syllables with non-homorganic codas. In Ngalakan however, this constraint is ranked below a constraint CrispEdge[μ], which disprefers

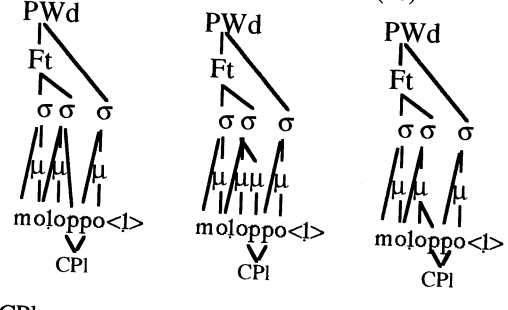
moras dominating linked structure (cf. figures (4a, b, c)).[6]

CrispEdge[μ]: Moras are crisp.

(19)	CRISPEDGE[μ]	PARSE[Seg]
✈ a) +mó̩lop`po̩l		*
b) mo+l̩óp`po̩l	*!	

The candidate representation supplied by GEN in (4b) fails this constraint. Consider the diagrammatic representation in (4b) (=19b) in reference to the definition of CrispEdge given in (17).

Figures: (4a) (4b) (4c)



(where CPl represents consonant place-stricture features (assuming the feature geometry proposed in Padgett 1991[1995]); IPA symbols represent root nodes. The final segment, being extrametrical, is associated directly to the PrWd node).

Let A = the CPl node of (4b); this is the terminal substring of the phonological representation of this segment. Let ProsodicCategory C = the mora dominating the coda root node of the second syllable (i.e. the first half of the geminate segment). Tracing downwards from the PCat, the content of this mora is the root node in the coda and the CPl node to which it is associated. Tracing upwards from this CPl node, however, does not result in a *unique* PCat of the relevant kind. The CPl associated with the geminate can be traced upwards not only to the mora associated with the coda position, but also to the syllable node of the following syllable. Therefore, this mora is not crisp, since it is not true that the CPl node 'is a' (unique) mora. It is clear that Parse[Seg] and CrispEdge[μ] will always conflict where the coda segment in question is homorganic to a following onset, since the coda/onset boundary is non-discrete in that case.

In forms with two possible peaks, CrispEdge[μ] again prefers the candidate with the non-linked coda, even though by doing so it violates Parse[Seg]. Consider then the candidates in (20) (moraic association represented for codas only, all vowels are assumed to be moraified by universal convention):

(20)	CRISPEDGE	WTS	PARSE[SEG]
μ | ✈ a)(kùri)(cát)poŋko			* [ŋ]
μ μ | | b) (kùri)(cáṭ)(pòŋ)ko	*! [ŋ]		
μ |			
c) (kùri)caṭ(póŋ)ko	*!		* [ṭ]

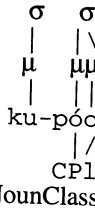
In (20a), GEN has supplied a candidate which assigns a coda mora only to the heterorganic coda in the third syllable. This form violates Parse in not realizing the mora of the homorganic coda in the following syllable. Since WtS demands that the heavy syllables are stressed, primary stress falls on the heavy third syllable, the first two syllables form a secondary, bimoraic foot. Candidate (b) maximally satisfies Parse and WtS by realizing the moras of, and stressing, both medial syllables. However, the moraic assignment to the homorganic nasal violates higher-ranked CrispEdge. Candidate (c) fatally violates CrispEdge as well. However it has not parsed the coda of the third syllable with a mora, and thus in some sense does not violate WtS either. I assume that Parse[Seg] is violated in this candidate because the coda is not moraified.

The (20b) candidate shows what is at issue here is not whether the syllable with a homorganic coda receives stress. It is simply that such a syllable can not be associated with a mora. Thus, it cannot receive stress as compelled by Weight-to-Stress. Although homorganic-coda syllables can freely be stressed under purely metrical assignment, as shown in the examples in (6).

5. Implications. Part of the justification of constraints is the work they can do for us in explaining a range of phenomena, rather than a single feature of one language. This section will outline how CrispEdge[μ] can derive some other, previously problematic, phenomena.

Like other constraints, CrispEdge[μ] is ranked and violable. The existence of CrispEdge[μ] in the grammar of Ngalakan could also explain the absence of contrastive long vowels in the language, unusual in quantity-sensitive systems, although long vowels do appear in stressed open monosyllabic roots under the compulsion of Align L(Stem, Foot) and Foot Minimality, e.g. [ŋùruṇmu-ṇéːt] 'it (sun, MU-class) is burning us'. Long vowels in a representation such as figure (5) below would also be ruled out by CrispEdge[μ], since the mora is associated with a non-discrete segment:

Figure (5)



(SR of /ku-po/ NounClass-river)

Ngalakan shows an asymmetry with respect to the crispness of stem edges: the left edge must be crisp but the right edge often is not. The right edges of roots and stems can be 'blurred' with the addition of suffixes beginning in geminates or homorganic nasal-stop clusters. Stem initials often geminate when compounded to the right of reduplicants or other stems. However, stem initials never geminate after inflectional prefixes (as broadly opposed to derivational ones)(see Baker 1997b for details).

This pattern is by no means uncommon among prefixing languages. The Nilotic language Shilluk (Gilley 1992) has phonemically distinctive gemination of all consonantal segments. The final segment of many verb and noun roots is geminated to express morphological derivation and inflection (plurality and possession in nouns, tense/aspect in verbs) (Gilley 1992:41). Consider exx. (21)(= Gilley (156), 1992:75).

(21) a. ya yepːa d̪ɔ ɔt 'I opened the door.'
b. ya yeːp 'I opened.'
c. ya yeːpi̱ meya 'I opened (it) for my mother.'
d. ya yeːba tɔŋ 'I opened (it) with a spear.'

Here the verb tense/aspect is indicated by weight contrasts of the rhyme among other things (the underlining of the vowel signifies expanded pharynx, the colon indicates phonemic gemination). Shilluk also has several regular prefixes for tense/aspect distinctions and some frozen prefixes for gender. None of these cause gemination of the initial segment of the stem.

In both languages, the Prosodic Word is associated to the left edge of stems. In Shilluk the initial association of tone to words is to the first TBU of the stem, excluding the prefix. In Ngalakan, footing for word stress is aligned in the first instance to the left edge of the stem, again excluding prefixes from stress assignment. Hence, I assume that the asymmetry of gemination in Shilluk and Ngalakan stems is to be handled by a constraint CrispEdgeLeft(Prosodic Word), in association with AlignLeft(Stem, ProsodicWord). The former constraint refers specifically to the left edges of stems, and bars non-discrete association of feature nodes to the segments at the left edges of stems (cf. Ito and Mester's (1994) 'CrispEdge[PrWd]' with reference to Sino-Japanese compounds).[7]

6. Conclusion. The stress patterns in Ngalakan suggest that our notions of what can contribute to the distinction of weight in syllables needs to be revised. We need to be able to recognize that segment-to-syllable association can play a role, as well as the characteristics of segments *qua* codas in terms of sonority. OT provides a framework that can handle a stress system like Ngalakan's, which integrates metrical structure with a distinction of weight that respects the discreteness of mora association. A constraint family CrispEdge[PCat] has already been proposed and defended on the basis of evidence from several languages, showing that prosodic categories often require exclusive isomorphism with morphological categories, i.e.

no cross-association or multiple exponence, as it were, is allowed. My suggestion is that this same type of constraint is also at work here, in that the segments associated with moras in Ngalakan must be entirely within the respective syllable, and must not be ambiguous as to syllabic affiliation. The interaction of CrispEdge with well-established constraints on stress assignment elegantly derives the Ngalakan facts without recourse to any new language-particular constraints.

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Data come from my own fieldnotes mid 1994-mid 1996 and also Merlan (1983). Merlan's judgements on stress differ in some cases from mine. This and other differences in our data possibly reflect distinct dialects spoken by our respective teachers.

[1]The glottal stop shows a restricted distribution in all the languages of this region (the north of the Northern Territory) in which it occurs (and see Harvey 1991 for an analysis). In Ngalakan it occurs only morpheme-finally, except for a few frozen compounds. Historically, it appears to have marked morpheme boundaries in languages of this region, and still has this purpose synchronically in Dalabon.

[2]Thanks to Mark Harvey for pointing this out.

[3]Evidence for this position comes from the productive, open class of verb stems in the language (McKay 1975 makes the same argument for the closely related language Rembarrnga). Stems regularly form the potential and future inflections by geminating a final consonant of the stem: [maṇiŋ], [maṇiŋ-ɲa] 'help, help-FUT'; [puḷ], [puḷ-ḷa] 'drown, drown-FUT'. Stems which end in a sonorant followed by a glottal stop geminate the sonorant, ignoring the glottal stop: maṇiŋʔ:maṇiŋʔ-ɲa 'make', tuḷʔ:tuḷʔ-ḷa 'light' (exx. from Merlan 1983:120, and own field notes).

[4] Though there is some variation: in bisyllabic roots stress sometimes vacillates between initial and second stress.

[5] I use 'Parse' here in the sense of McCarthy and Prince's (1993) 'Parse[syll]' constraint, demanding syllables be parsed into feet. This use of Parse should not be confused with earlier OT uses ruling out deletion. These are now handled by 'Correspondence' constraints.

[6] Sharon Inkelas has pointed out that this constraint predicts that other feature nodes (besides [place]) could contribute to a moraic-linking situation barred by CrispEdge. The example she suggests, [voice], is non-contrastive everywhere in Ngalakan, but this is certainly a possibility to be considered in other languages.

[7] Ngalakan and Shilluk therefore provide empirical support for edge specification in CrispEdge constraints, evidence for which was lacking in Ito and Mester (1994).

References

Alpher, Barry; Nicholas Evans and Mark Harvey. Ms. Reconstructing verb inflections in Proto-Gunwinjguan. Studies in comparative Non-Pama-Nyungan, ed. by Nicholas Evans. To appear. Canberra: Pacific Linguistics.

Bach, Emmon. 1975. Long vowels and stress in Kwakiutl. Amherst: University of Massachusetts, MS.

Baker, Brett. MS a. Edge-Crispness: segment-to-mora isomorphism. Paper presented at the 16th meeting of WCCFL, UWA Seattle.

Baker, Brett. MS b. Geminate dissimilation as prosody in Ngalakan. To appear in MIT Working Papers in Linguistics.

Gilley, Leoma G. 1992. An autosegmental approach to Shilluk phonology. Arlington: Summer

Institute of Linguistics and University of Texas. [Publications in Linguistics 103.]
Harvey, Mark. 1991. Glottal stop, underspecification and syllable structures among the Top End languages. Australian Journal of Linguistics 11.67-105.
Hyman, Larry M. 1985. A theory of phonological weight. Dordrecht: Foris.
Ito, Junko. 1986. Syllable theory in Prosodic Phonology. UMass dissertation. [Available from University of Massachusetts Graduate Linguistics Student Association, Amherst.]
Ito, Junko and R. Armin Mester. 1994. Reflections on CodaCond and Alignment. Phonology at Santa Cruz 3.27-46.
Ladefoged, Peter. 1971. Preliminaries to a linguistic phonetics. Chicago: University of Chicago Press.
McCarthy, John J. and Alan S. Prince. 1986. Prosodic Morphology. UMass and Rutgers, MS.
McCarthy, John J. and Alan S. Prince. 1993. Generalized Alignment. University of Massachusetts Amherst and Rutgers University New Brunswick, MS. [Published in Geert Booij and Jaap van Marle (eds.) Yearbook of morphology 1993: 79-153. Dordrecht: Kluwer.]
McCarthy, John J. and Alan S. Prince. 1995. Faithfulness and reduplicative identity. Papers in Optimality Theory, ed. by Jill N. Beckman, Laura Walsh and Suzanne Urbanczyk, 21-52. (University of Massachusetts Occasional Papers 18.) Amherst, MA: University of Massachusetts Graduate Linguistics Student Association.
Merchant, Jason. 1994. German fricative assimilation, ambisyllabicity, and noncrisp alignment. Phonology at Santa Cruz 3.65-77.
Merlan, Francesca. 1983. Ngalakan grammar, texts and vocabulary. Canberra: Pacific Linguistics B:89, ANU.
Padgett, Jaye. 1991. Stricture in feature geometry. UMass dissertation. [Distributed by GLSA. Published, Stanford CA: Center for the Study of Language of Information, 1995]
Prince, Alan. 1990. Quantitative consequences of rhythmic organization. Parasession on the syllable in phonetics and phonology. CLS.355-398.
Prince, Alan and Paul Smolensky. 1993. Optimality Theory: constraint interaction in generative grammar. New Brunswick NJ: Rutgers University and Boulder: University of Colorado, MS.
Selkirk. 1988. A two root theory of length. Amherst: UMass, MS. [Distributed in UMass Occasional Papers 14, 1990.]
Steriade, Donca. 1992. Segments, contours and clusters. Los Angeles: UCLA, MS.
Zec, Draga. 1995. Sonority constraints on syllable structure. Phonology 12.85-129.

Explaining Kashaya Infixation

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In this paper I show that, as in languages like Tagalog, the position of infixes in Kashaya (a Pomoan language of northern California) is subordinate to surface phonological well-formedness. What distinguishes Kashaya from more typical examples of this sort is that infixation occurs for featural, rather than strictly syllabic, reasons: to improve the featural content of the coda, and to prevent the deletion of distinctive features. In both cases, coronal consonants behave as special relative to labials and dorsals.

I begin in §1 by outlining the basic approach established in Optimality Theory for the Tagalog pattern. After introducing the Kashaya 'Plural Act' morpheme in §2 and its vowel-initial allomorphs in §3, which are always suffixed, I move on to its infixed allomorphs: *-ta-* which is sometimes infixed (§4), and *-t-* which is always infixed before a root-final consonant (§5). I show in §6 that the proposed analysis also accounts for the non-infixation of other consonant-initial allomorphs, and give in §7 a brief conclusion.*

1. Prosodic Infixation: Tagalog

One of the most striking types of evidence in favor of the ranked and violable surface constraints of Optimality Theory is the elegant account they provide for prosodically motivated infixation (Prince and Smolensky 1993: 33f). A classic example is Tagalog 'actor focus' *-um-*, which occurs after the initial consonant(s) of a word (Schachter and Otanes 1972: 292, French 1988).

(1)	a.	abot	um-abot	'reach for'
	b.	tawag	t-um-awag	'call'
	c.	sulat	s-um-ulat	'write'
	d.	gradwet	gr-um-adwet	'graduate'

A derivational analysis can formalize this generalization by means of prosodic circumscription (McCarthy and Prince 1986, 1990): the onset (possibly null) is set aside, *um-* is prefixed, then the onset is restored.

(2)	a.	*Circumscribe onset*	(gr) adwet
	b.	*Prefix um-*	um-adwet
	c.	*Restore onset*	gr-um-adwet

The fundamental problem with such an approach is that it fails to relate the form of the infix to its positional properties. For example, why aren't there any CV infixes which occur after the onset? The obvious answer, long recognized, is that infixation of a VC prefix results in a better syllable structure by avoiding codas (Anderson 1972: 259), while a CV infix would produce a complex onset and two vowels in hiatus: cf. *ma-tulog* 'sleep', not **t-ma-ulog*.

Optimality Theory, with its focus on the surface form of output candidates, provides the tools to formalize this intuition. In Tagalog and similar languages, a syllable structure requirement outranks a constraint identifying the morpheme as a prefix (Prince and Smolensky 1993).

(3) a. NoCoda Syllables do not have codas.
ALIGNL-*um* The morpheme *um* aligns with the left edge of the stem.

b. NoCoda » ALIGNL-*um*

Because of the ranking in (b), alignment (i.e. status as a prefix) is sacrificed to syllabic well-formedness, but only minimally; the infix remains as close to the left edge as possible without creating a new coda.

(4)

	NoCoda	ALIGNL-*um*
a. um.ta.wag	**!	
b. ☞ tu.ma.wag	*	*
c. ta.wu.mag	*	**!*

I show below that the complex facts of infixation in Kashaya must also be explained in terms of surface well-formedness. The optimal position of the affix — either as a simple suffix, or before the final consonant of the stem — depends on independent featural processes, a fact captured by comparing alternative surface representations.

2. The Plural Act in Kashaya

The Kashaya 'Plural Act' verb marker indicates that 'the act is plural, either because the object that is undergoing the action is plural or because the act is performed on the same object more than once' (Oswalt 1961:168).

(5) a. dacʰa- 'grab a single object once'
b. dacʰa-t- 'grab several objects' *or* 'grab one object several times'

This affix has a number of allomorphs (Oswalt 1961, Buckley 1994), determined partly by the final segment of the verb root and partly by arbitrary lexical choice. For example, while *-aq* occurs only after /l/, several other suffixes are possible there; for any verb ending in /l/ the choice of suffix must be lexically specified.[1]

(6)

	Root	*Plural Act*
a.	-bil-	-bil-ta-
b.	-hal-	-hal-at-
c.	-ʔḳol-	-ʔḳol-aq-

Some of the allomorphs are always suffixed, but two are also infixed. My concern here is, given a particular allomorph and root, how do we predict whether or not infixation occurs? I show that once the grammar is properly understood, no stipulation as to position is necessary (though some lexical stipulation of allomorph choice is unavoidable).

3. Vowel-initial suffixes

As noted, some allomorphs of the Plural Act are always suffixed, and never occur as infixes. This includes the vowel-initial allomorphs *-at* and *-aq*, which appear only after consonant-final roots — specifically, after /l, n/ only.[2]

(7)	a.	dahal-	dahal-**at**-	'dig (hole)'
	b.	qahpʰul-	qahpʰul-**at**-	'winnow'
	c.	ċihwin-	ċihwin-**at**-	'get red-hot'
	d.	šuhwe:n-	šuhwe:n-**at**-	'shake'
(8)	a.	diʔǩol-	diʔǩol-**aq**-	'prune (branch)'
	b.	bahcʰital-	bacʰital-**aq**-	'string (batch of meat)'
	c.	muhkul-	muhkul-**aq**-	'cook'

There is a simple prosodic explanation for this generalization. Just as a CV prefix would never be infixed after the onset, so infixation of a VC suffix before the last consonant merely produces vowel and consonant clusters, e.g. **daha-**at**-l-*. There is no syllabic motivation for violating right alignment (9), and in fact that would introduce a violation of ONSET.

(9) ALIGNR The Plural Act morpheme aligns with the right edge of the root.
ONSET Syllables have onsets.

(10)

	ONSET	ALIGNR
a. ☞ da.ha.la.t		
b. da.ha.at.l	*!	*
c. da.ha.ta.l		*!*

While the constraint ranking NOCODA » ALIGNR would produce the same result, we see below that this ranking cannot hold (e.g. (15)). ONSET, however, is undominated (i.e. never violated) in Kashaya.

4. Infixation of *-ta-*

The central goal of this paper is to account for two allomorphs, *-ta-* and *-t-*, which can occur as infixes. First consider *-ta-*. It is suffixed when the verb ends in one of the consonants /l, n, ṅ, ċ/.

(11)	a.	dahqoṭol-	dahqoṭol-**ta**-		'fail (to do)'
	b.	diṭan-	diṭan-**ta**-		'bruise by dropping'
	c.	duhluṅ-	duluṅ-**ta**-	[dulu**ʔta**-]	'pick (berries)'
	d.	dayeċ-	dayeċ-**ta**-	[daye**ʔta**-]	'press hand against'

It is infixed, however, when the final consonant is /m, q, qʷ, c/.

(12)	a.	bilaqʰam-	bilaqʰa-**ta**-m-	'feed'
	b.	sima:q-	sima-**ta**-q-	'go to sleep'
	c.	qašo:qʷ-	qašo-**ta**-qʷ-	'get well'
	d.	duqa:c-	duqa-**ta**-c-	'get lost'

The basic generalization is that we find suffixation after a coronal, otherwise infixation. (I return to the question of plain palato-alveolar /c/ below.) Buckley (1994: 350) analyzes this pattern using prosodic circumscription as in (2), and has to stipulate the consonants which are set aside before suffixation. A more explanatory approach, as with Tagalog, is to compare surface forms which would result from the alternatives of suffixation and infixation. The question is why for the roots in (11) the coda is permitted, while for those in (12) infixation is preferred.

4.1. Markedness of codas

It is well known that coronal consonants often behave as less marked relative to other places of articulation (cf. Paradis and Prunet 1991). This lower markedness holds also for coda position specifically; for example, in Lardil the only codas permitted are coronals (excluding cases of shared place features; see Hale 1973, Wilkinson 1988, Prince and Smolensky 1993). In Kashaya, we can conclude that non-coronal codas are permitted but still disfavored: infixation is employed in (12) to avoid creation of a labial or dorsal coda.

Following Prince and Smolensky (1993) and Smolensky (1993), a positive harmonic scale (13) can be converted into ranked negative constraints as in (14).[3]

(13) $\text{Cor}]_\sigma \succ \text{Lab}]_\sigma \succ \text{Dor}]_\sigma$

(14) $*\text{DOR}]_\sigma \gg *\text{LAB}]_\sigma \gg *\text{COR}]_\sigma$

Since the placement of the Plural Act distinguishes between coronals and other consonants, it follows that ALIGNR is ranked as shown in (15). (In Lardil, MAX occupies the same position; cf. Smolensky 1993.) With this ranking, infixation occurs to avoid a dorsal or labial coda, but not to avoid a coronal coda.[4]

(15)

	*DOR]$_\sigma$	*LAB]$_\sigma$	ALIGNR	*COR]$_\sigma$
a. ☞ di.ṭan.ta				*
b. di.ṭa.ta.n			*!	
c. bi.la.q^{h}am.ta		*!		
d. ☞ bi.la.q^{h}a.ta.m			*	

In tableaux here, I treat the final consonant in these incomplete forms as an onset, since a following vowel-initial suffix can be assumed. In the complementary context, i.e. with a consonant-initial suffix, paradigm uniformity requires that the affix occupy the same position (cf. Kenstowicz 1995).

These examples show that infixation of *-ta* occurs in order to preserve non-coronal features in the root-final consonant.

4.2. Uvular debuccalization

A complication arises in the case of uvular-final stems. By regular process, a uvular stop in the coda loses its place features, so that underlying /q, q^w/ becomes [h]. The following plain suffixes illustrate this.

(16) a.	ʔusaq-wa	→	ʔusa̲hwa	'did he wash his face?'
b.	sima:q-meʔ	→	sima̲hmeʔ	'go to sleep!'
c.	qašo:q^w-t^h	→	qašo̲ht^h	'he isn't getting well'

I attribute this deletion of features — rather than the entire segment — to the ranking MAX » *DOR]$_\sigma$ » IDENT(Dor). For precise definitions of the correspondence constraints in (17), see McCarthy and Prince (1995: 264).

(17) MAX Do not delete a segment.
IDENT(F) Do not change the value of feature F of a segment.

That the stop surfaces as [h] rather than [ʔ] indicates the latter is disfavored, at least in the coda. As in (14), harmonic $h]_\sigma \succ ʔ]_\sigma$ translates to $*ʔ]_\sigma$ » $*h]_\sigma$.

(18)

		MAX	*DOR]σ	IDENT(Dor)	*ʔ]σ	*h]σ
a.	ʔu.saq.wa		*!			
b.	ʔu.saʔ.wa			*	*!	
c. ☞	ʔu.sah.wa			*		*
d.	ʔu.sa.wa	*!				

The same process should be expected for the uvular-final stems in (12). That is, while a candidate such as *simaq-**ta**- is ruled out by $*DOR]_\sigma$ » ALIGNR, parallel to the labial in (15), we must also consider the alternate candidate *simah-**ta**-.

(19)

		*DOR]σ	IDENT(Dor)	ALIGNR
a.	si.maq.ta	*!		
b.	si.mah.ta		*!	
c. ☞	si.ma.ta.q			*

Here infixation actually occurs to avoid the loss of place features, rather than to avoid a dorsal coda. The overall generalization remains the same, namely that Kashaya infixation is determined by featural preferences, rather than simple syllable structure.

4.3. Coronal debuccalization

As indicated in (11), glottalized coronals undergo another type of debuccalization before a coronal, losing Place to become [ʔ]. This process is quite regular, and is found with plain suffixes as well.

(20)

a.	mo-aṅ-še	→	moʔše	'I wonder if he is running'
b.	mahsaṅ-tʰ	→	mahsaʔtʰ	'he isn't taking it away'
c.	du:ciċ-cʰi	→	du:ciʔcʰi	'if he knows'
d.	šubiliċ-do	→	šubiliʔdo	'they say it blazed up'

Assume that the basic motivation for debuccalization is the Obligatory Contour Principle, ruling out two adjacent coronal features (cf. McCarthy 1986, Yip 1988).

(21) OCP-Cor Adjacent [Coronal] features are prohibited.

This constraint dominates IDENT(Cor) to force deletion of the Coronal feature.[5] By contrast, IDENT(Lar) dominates $*ʔ]_\sigma$ to ensure survival of that feature.

(22)

		OCP-Cor	IDENT(Cor)	IDENT(Lar)	*ʔ]σ
a.	moṅ.še	*!			
b.	moh.še		*	*!	
c. ☞	moʔ.še		*		*

With a potential infix, right-alignment is sacrificed to preserve Dorsal (12), but not Coronal (11). This is another example of the vulnerability of coronals, and can be captured by the following ranking (cf. (15)).

(23) IDENT(Dor) » ALIGNR » IDENT(Cor)

(24)

	OCP-Cor	ALIGNR	IDENT(Cor)
a. du.luṅ.ta	*!		
b. ☞ du.lu?.ta			*
c. du.lu.ta.ṅ		*!	

For uvulars, ALIGNR is ranked below IDENT, and suffixal status is sacrificed to preserve consonant features, in this case Dorsal (19). The feature Coronal, however, is less highly valued and it is simply deleted to preserve alignment (24).

4.4. Special status of /c/

A similar but more extreme process explains the apparently exceptional nature of /c/, with infixation in *duqa-**ta**-c-* (12d) unlike the suffixation found with the other coronals (11). The alternative candidate **duqac-**ta**-* ought to be optimal, but independently, a /c/ before a coronal loses its segmental status, with compensatory lengthening of the preceding vowel. This is illustrated first with plain suffixes.

(25)

a.	yoo̤oc-tʰ	→	yoo̤o:tʰ	'he isn't keeping it'
b.	ṡuwac-ti	→	ṡuwa:ti	'in order to dry'
c.	ṡuwac-še	→	ṡuwa:še	'I wonder if it got dry'

For present purposes I attribute this change to OCP-Cor as well, but space limitations prevent exploring the varied effects of the constraint.[6]

(26)

	OCP-Cor	MAX
a. ṡu.wac.ti	*!	
b. ☞ ṡu.wa:.ti		*

Given this pattern, the real alternative to *duqa-**ta**-c-* is **duqa:-**ta**-*, with loss of the segment in violation of MAX. What we find is infixation to prevent loss of the /c/, indicating MAX » ALIGNR.

(27)

	OCP-Cor	MAX	ALIGNR
a. du.qac.ta	*!		
b. du.qa:.ta		*!	
c. ☞ du.qa.ta.c			*

In sum, Kashaya differs from Tagalog because the presence of just any coda is insufficient to cause infixation. What dominates ALIGN is a set of featural constraints — regarding distribution and faithfulness — rather than a simple syllable structure constraint like NOCODA.

5. Infixation of *-t-*

The second infixable allomorph, *-t-*, occurs as a suffix after a vowel, as expected.

(28)	a.	qawa-	qawa-t-	'chew'
	b.	siṡa-	siṡa-t-	'leach'
	c.	pihmi-	pimi-t-	'see in detail'

What makes this allomorph particularly interesting is that it is always infixed before a consonant; but there are two distinct subcases. It occurs as infixed [t] when the stem-final consonant is noncoronal. (All plain stops are aspirated in the coda, so it becomes more specifically [t^{h}].)

(29)	a.	p^{h}anem-	p^{h}ane-t-m-	[p^{h}anet^{h}m-]	'hit with the fist'
	b.	p^{h}i?ya:q-	p^{h}iya-t-q-	[p^{h}iyat^{h}q-]	'recognize'
	c.	p^{h}aċo:q^{w}-	p^{h}aċo-t-q^{w}-	[p^{h}aċot^{h}q^{w}-]	'stab'

When the stem ends in a coronal, *-t-* is infixed and surfaces as [h]. Here /c/ is not special: all coronals induce infixation.

(30)	a.	šuṫat-	šuṫa-h-t-	'twist'
	b.	sihwaṫ-	siwa-h-ṫ-	'sag from being wet'
	c.	cubuš-	cubu-h-š-	'sprout'
	d.	kel-	ke-h-l-	'peer'
	e.	tubic-	tubi-h-c-	'get up'

The fact that /t/ surfaces as [h] before another coronal is due to the same debuccalization illustrated with glottalized coronals in (20). Plain suffixes are given first.

(31)	a.	dali:t-t^{h}	→	dali<u>h</u>t^{h}	'he isn't waving his hand'
	b.	libut-ti	→	libu<u>h</u>ti	'in order to whistle'
	c.	šoyot-še	→	šoyo<u>h</u>še	'I wonder if it's overflowing'
	d.	qap^{h}ut-y	→	qap^{h}u<u>h</u>y	'I just saw him spit'

The essential analysis has been given already for /q/ in (18): plain obstruents debuccalize to [h].

(32)

		MAX	OCP-Cor	IDENT(Cor)	*?]$_{\sigma}$	*h]$_{\sigma}$
a.	li.but.ti		*!			
b. ☞	li.buh.ti			*		*
c.	li.bu?.ti			*	*!	
d.	li.bu.ti	*!				

Taking this effect into account, we see that the constraints proposed above also account for the data in (29) and (30). Note that /t/ does not gratuitously become [h] in the coda, due to faithfulness (33d).

(33)

	IDENT(Lab)	*LAB]$_\sigma$	ALIGNR	IDENT(Cor)
a. pʰa.nem.t		*!		
b. pʰa.neh.t	*!			
c. ☞ pʰa.net.m			*	
d. pʰa.neh.m			*	*!

But /t/ becomes [h] when necessary to satisfy OCP-Cor, which is highly ranked.

(34)

	OCP-Cor	ALIGNR	IDENT(Cor)	*COR]$_\sigma$
a. kel.t	*!			*
b. ket.l	*!	*		*
c. ☞ keh.l		*	*	

Infixation in *pʰane-t-m-* is expected since it avoids the labial coda in **pʰanem-t-*. But debuccalization is necessary to explain why infixation also occurs in *ke-h-l-*. If we had to choose between *kel-t-* and *ke-t-l-* 'before' debuccalization, we would wrongly choose well-aligned **kel-t-*, since the two forms both present a coronal cluster. It is crucial, then, that the surface forms be compared.[7]

Finally, while /q/ often becomes [h] in other contexts (16), this loss of place features is disfavored by IDENT; when infixation can prevent such neutralization, alignment is sacrificed.

(35)

	*DOR]$_\sigma$	IDENT(Dor)	ALIGNR	IDENT(Cor)
a. pʰi.yaq.t	*!			
b. pʰi.yah.t		*!		*
c. ☞ pʰi.yat.q			*	
d. pʰi.yah.q			*	*!

The motivation for this infixation is the same as for *sima-ta-q-* in (19).[8]

6. Consonant-initial suffixes

In addition to the vowel-initial allomorphs in §3 which are simple suffixes, there are also three consonant-initial allomorphs which, unlike *-ta-* and *-t-*, are never infixed. I show in this section that the existing analysis predicts this fact. The first suffix is *-w*, whose position has a trivial explanation: this allomorph combines only with vowel-final roots.

(36)

a.	pihti-	pihti-**w**-	'chip with an ax'
b.	qawi:-	qawi-**w**-	'build (house)'
c.	cise-	cihse-**w**-	'mop (room)'

In this post-vocalic position, there is no prosodic motivation for infixation: it would only worsen the syllable structure (e.g. **piht-**w**-i-*).

A second suffix-only allomorph consisting of a single consonant is *-m*, which has a wider context of occurrence than *-w*. It appears after vowel-final stems, as well as after stems ending in the coronal sonorants /l, n/.

(37)

a.	baqʰa:-	baqʰa-**m**-	'finish'
b.	tolotolo-	tolotolo-**m**-	'have clear true voice'
c.	baʔṫil-	baʔṫil-**m**-	'be too noisy'
d.	šuhwe:n-	šuhwe:n-**m**-	'shake'

Once again there is no prosodic motivation for infixation. After a vowel, the situation is the same as for *-w* (36). After a consonant, a cluster results whether or not the /m/ is infixed. Violation of ALIGNR leads to a disfavored labial coda, so suffixation is preferred (i.e. for the same reason we find **infixation** in *pʰane-**t**-m-*).

(38)

	*LAB]$_\sigma$	ALIGNR	*COR]$_\sigma$
a. ☞ baʔ.ṫil.**m**			*
b. baʔ.ṫim.l	*!	*	

The last consonant-initial allomorph which is always suffixed, *-ʔta*, begins with a two-consonant cluster. Crucially, however, the first consonant is a laryngeal, which by general process in Kashaya merges into a single segment with a preceding (compatible) consonant (Buckley 1994: 68). Specifically, this suffix occurs only after /y/, which merges with /ʔ/ to form glottalized [ẏ].[9]

(39)

a.	duhtay-	dutay-**ʔta**-	[dutaẏta-]	'touch'
b.	muhkʰuy-	mukʰuy-**ʔta**-	[mukʰuẏta-]	'burn up'

Because of this independent phenomenon of Glottal Merger — which can be motivated by DEP ('Do not insert a segment') together with other constraints — the actual outputs reduce the cluster /yʔt/ to [ẏt].

(40)

	DEP	ALIGNR	*COR]$_\sigma$	* ʔ]$_\sigma$
a. du.tay.ʔi.ta	*!		*	
b. ☞ du.taẏ.ta			*	
c. du.taʔ.ta.y		*!		*

The outcome here is very much like that for plain *-ta* after coronals as shown in (11), such as *diṫan-ta-*. It also raises an issue which is relevant to those forms as well: shouldn't the ranking OCP-Cor » ALIGNR favor infixation as in (40c)? This expectation relies on the assumption that the OCP objects only to adjacent coronals, but I argue that this is not the case.

We have seen that, of the Plural Act allomorphs which contain a coronal, only *-t-* is infixed before another coronal. The coronal in this form is also the only one which would become [h] in that context; when a vowel follows the coronal within the suffix, as in *-ta* and *-ʔta*, the /t/ surfaces in the onset and no debuccalization is possible. In other words, infixation occurs only when it will result in debuccalization. It is the loss of place features, and not the mere movement of the consonant, which eliminates the OCP violation. This indicates that infixation in a candidate such as **diṫa-**ta**-n-* has no effect on whether the /t/ of the affix and the final /n/ of the root stand in violation of OCP-Cor; the intervening vowel, which has no consonantal place features, is transparent for purposes of determining whether two adjacent coronals exist. This is quite similar to the situation in Semitic, where restrictions on same-place consonants in the root are unaffected by the fact that realization of the root in a templatic pattern introduces intervening vowels (see

McCarthy 1986, Pierrehumbert 1989). The same cross-vowel violation will hold of other coronals in the representation, but when they occur in the onset, or when they are plain sonorants, debuccalization is independently prevented.

(41)

	OCP-Cor	ALIGNR	*COR]$_\sigma$
a. ☞ di.ṭan.ta	***		*
b. di.ṭa.ta.n	***	*!	

Similarly, (40a,b) have an equal number of coronals, and OCP-Cor does not distinguish them; the decision falls instead to ALIGNR, which prefers suffixation.[10] It is only in a form like *ke-h-l-* (34), where infixation leads to the actual **loss** of a coronal feature, that an OCP violation (found in the candidate **kel-t-*) is eliminated, and infixation thus favored.

An important further issue is why, if the OCP ignores intervening vowels, debuccalization itself does not occur in a form like *p^{h}ane-t-m-* (33). The generalization is that debuccalization is triggered only by strict adjacency of coronals. Space limitations prevent discussion of this question, but it seems to be a matter regarding the formalization of the OCP rather than alignment per se, which is the focus of this paper.

7. Conclusion

Under the analysis given here, infixed *-ta-* and *-t-* are not special among the Plural Acts: ALIGNR has the same relatively low ranking for all allomorphs. The fact that only a subset of forms can be infixed follows from their prosodic and segmental shape. No stipulation of position for particular allomorphs is necessary — an enormous improvement over the complex statements found descriptively (Oswalt 1961) and derivationally (Buckley 1994). While some lexically idiosyncratic choice is unavoidable, this analysis derives the position of the chosen allomorph from a single alignment constraint for the entire suffixal class, plus general phonological principles. Since the outcome of featural processes must be taken into account in positioning the affix, the data strongly support the use of phonological and morphological constraints which refer to surface representations.

Notes

* The data in this paper come from Oswalt (1961, 1990) and Buckley (1994). I would like to thank audience members at BLS and at the Penn Linguistics Colloquium (February 22-23, 1997) for their comments and suggestions, in particular Stuart Davis, Larry Hyman, Sharon Inkelas, Bill Labov, and Rolf Noyer.

[1] There are also irregular pairs, further emphasizing the lexicalized nature of the pattern, e.g. *q̇ahq-/q̇acq-* 'rescue', *ƫa:c-/ƫahy-* 'pour', *ʔaš-/ʔac^{h}ulaq-* 'miss (hitting)' (Oswalt 1961: 177).

[2] More precisely, *-at* occurs after /l, n/ and *-aq* after /l/. Some /l/-final roots in (7) and (8) also occur with the longer variant *-ataq*, apparently a combination of the two suffixes, e.g. *qap^{h}ul-**ataq***- and *muhkul-**ataq***-. Here and elsewhere, some plurals show loss of vowel length or of a 'laryngeal increment' in the root (Oswalt 1961, Buckley 1992, 1994). These changes are unrelated to the properties which determine whether infixation occurs, and are ignored here.

[3] For Smolensky (1993) these are conjoined constraints: NOCODA combined with each of *DOR, *LAB, and *COR. A violation of *DOR&CODA is assessed for each segment which vio-

lates both conditions — if it is a dorsal and also a coda. Here I use the simpler notations in (14). See also Lombardi (1997b) for another approach.

[4] I have rejected an alternative analysis in which there is suffixation in (11) because the Coronal features of the root and affix can be merged into a single multiply linked element. This approach, while quite plausible in itself, predicts suffixation of *-t-* as well, which is wrong (§5).

[5] It is always the coda consonant which debuccalizes, and never the onset. I tacitly assume that there are higher-ranked faithfulness constraints for onsets which prevent debuccalization (and, in fact, almost any other featural change in Kashaya) in the onset. See Beckman (1996), Lombardi (1997a) and references therein.

[6] In particular, a full analysis must explain why /c/ loses its separate status as a segment, while other coronals become [h] or [ʔ]. This difference is surely related to the fact that /c/ becomes [y] in a related context (*cic* → *yic*), and independently, /VyC/ → [V:C]; see Buckley (1994: 138, 302). Plausibly, [V:C] is the preferred outcome for all coronal clusters, but faithfulness to place and laryngeal features prevents full loss of the segment except in the case of plain palatals.

[7] Clusters such as /lt/ and /st/ violate OCP-Cor, but sonorants and fricatives are not permitted to debuccalize, so these violations are tolerated. In (34), however, low ranking of ALIGNR makes it possible to place the stop /t/ in coda position, where its Coronal feature can be deleted.

Another important fact is that even with a root such as *sihwaṫ-* (30b) which ends in a coronal that can debuccalize, we find violation of ALIGNR: *siwa-**h**-ṫ-* rather than **sihwaʔ-**t**-*. As noted by McCarthy and Prince (1995: 364), roots often have higher-ranked faithfulness than affixes. In Kashaya, deletion of the affixal Coronal feature in *-t-* is preferred to deletion of the root Coronal feature in *sihwaṫ-*, even at the expense of right-alignment. A full analysis, then, will include the ranking IDENT-ROOT(Cor) » IDENT-AFFIX(Cor).

[8] I know of two verbs, probably variants of each other, which show infixed [h] but do not end in a coronal: *-bo-**h**-k̓-* 'swell up' and *-bu-**h**-k̓-* 'be swollen' (Oswalt 1990). This [h] may be due to analogy with *-bo-**h**-ś-* 'be puffed up', which has nearly the same meaning and triggers debuccalization of infixed /t/ in the normal way. At any rate, these verbs can be treated as taking an irregular Plural Act form, i.e. underlying /h/. Significantly, the analysis already given predicts that infixation will occur to preserve the Dorsal feature of /k̓/, as in (35c), so that the same ALIGNR constraint is relevant to the proposed *-h-* allomorph.

[9] Since no verb root ends in /w/, it is also possible to say that *-ʔta* occurs after glides. Because the /y/ in *dutaẏta-* is underlyingly a plain sonorant, it does not debuccalize.

[10] Interestingly, the intervening laryngeal [ʔ] in **duta-**ʔta**-y-* (40c) appears to be transparent to the OCP, just as a vowel is. This similar behavior is not surprising, since neither type of segment has consonantal place features.

References

Anderson, Stephen R. 1972. On nasalization in Sundanese. *Linguistic Inquiry* 3.253-268.

Beckman, Jill. 1996. *Positional faithfulness*. Dissertation, University of Massachusetts, Amherst.

Buckley, Eugene. 1992. Kashaya laryngeal increments, contour segments, and the moraic tier. *Linguistic Inquiry* 23.487-496.

____. 1994. *Theoretical aspects of Kashaya phonology and morphology*. Stanford, CA: CSLI, Stanford University.

French, Koleen Matsuda. 1988. *Insights into Tagalog reduplication, infixation and stress from nonlinear phonology*. Dallas: Summer Institute of Linguistics.

Hale, Kenneth. 1973. Deep-surface canonical disparities in relation to analysis and change: an Australian example. *Current Trends in Linguistics* 11.401-458.

Kenstowicz, Michael. 1995. Base-Identity and Uniform Exponence: alternatives to cyclicity. *Current Trends in Phonology: Models and Methods*, ed. by J. Durand and B. Laks. Centre National des Recherches Scientifiques, Paris-X.

Lombardi, Linda. 1997a. Positional faithfulness and voicing assimilation in Optimality Theory. Ms., University of Maryland.

____. 1997b. Why Place and Voice are different: constraint-specific repairs in Optimality Theory. Ms., University of Maryland.

McCarthy, John J. 1986. OCP effects: gemination and antigemination. *Linguistic Inquiry* 17.207-263.

____, and Alan S. Prince. 1986. Prosodic morphology. Ms., University of Massachusetts, Amherst, and Brandeis University.

____, ____. 1990. Foot and word in prosodic morphology: the Arabic broken plural. *Natural Language and Linguistic Theory* 8.209-283.

____, ____. 1993. Generalized alignment. *Yearbook of Morphology 1993*, ed. by Geert Booij and Jaap van Marle, 79-153. Dordrecht: Kluwer.

____, ____. 1995. Faithfulness and reduplicative identity. *University of Massachusetts Occasional Papers in Linguistics* 18.249-384.

Oswalt, Robert L. 1961. *A Kashaya grammar (Southwestern Pomo)*. Dissertation, University of California, Berkeley.

____. 1990. Kashaya dictionary: Letters B and C. Ms., Kensington, CA.

Paradis, Carole, and Jean-François Prunet (eds). 1991. *The Special Status of Coronals: Internal and External Evidence* (Phonetics and Phonology 2). San Diego: Academic Press.

Pierrehumbert, Janet. 1993. Dissimilarity in the Arabic verbal roots. *Proceedings of the Annual Meeting of the North Eastern Linguistics Society* 23.367-381.

Prince, Alan S., and Paul Smolensky. 1993. *Optimality Theory: constraint interaction in generative grammar*. Ms., Rutgers University and University of Colorado at Boulder.

Schachter, Paul, and Fe Otanes. 1972. *Tagalog reference grammar*. Berkeley, CA: University of California Press.

Smolensky, Paul. 1993. Harmony, markedness, and phonological activity. Paper presented at Rutgers Optimality Workshop, Rutgers University, October 22-24.

Wilkinson, Karina. 1988. Prosodic structure and Lardil phonology. *Linguistic Inquiry* 19.325-334.

Yip, Moira. 1988. The Obligatory Contour Principle and phonological rules: a loss of identity. *Linguistic Inquiry* 19.65-100.

The Thetic/Categorical Distinction and Bare Nominals in Spanish*

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1. Introduction

In this paper I argue that the restricted distribution of bare nominals in Spanish is properly treated as a semantic/pragmatic problem. To be specific, since bare nominals in Spanish are inherently WEAK, i.e. they have a cardinal, non-specific reading, they are disallowed in environments that call for STRONG NPs, i.e. those with specific, partitive, or generic readings.[1] Focusing on one-place predicates, I will show that the distribution of Spanish bare nominals is directly related to the THETIC/CATEGORICAL judgment distinction, which is based on the speaker's construal of a given situation (Kuroda 1992). The logical subject of a categorical judgment by definition has a strong construal. Therefore, if a Spanish sentence represents a categorical judgment, its logical subject cannot be represented by a bare nominal. I will also discuss the factors that influence whether a given sentence is interpreted as a categorical vs. a thetic judgment. These include the INFORMATION STRUCTURE of the sentence and whether the sentence involves a stage-level or individual-level predicate. Remaining restrictions on bare nominals are shown to be a result of the interaction between the lexical semantics of certain verbs and the information structure of the sentences in which they occur.

2. Distributional facts

The distribution of bare nominals in Spanish is sensitive to the stage-level/individual-level distinction. Stage-level predicates are state descriptions associated with particular situations or events, e.g. drunk, in the living room, open, etc. Individual-level predicates are stable properties that generalize over situations, e.g. tall, intelligent, a fireman, etc. (Carlson 1977).[2] I will divide the data accordingly in §2.1 and §2.2.

2.1 It has often been claimed that bare nominals in Spanish are disallowed as preverbal subjects under conditions of normal stress and intonation. The type of example that seems to support this claim are given in (1) and (2).
(# = unacceptable in given or assumed context; * = ungrammatical)

(1) #Soldados llegaron.
students arrived-PRET

(2) #Abogados trabajaron allí.
lawyers worked-PRET there

However, very little attention has been paid to the fact that the status of examples like these greatly improves when the context makes it clear that they describe particular situations in progress. For example, the sentences in (3-4) are grammatical despite their use of preverbal bare nominal subjects.
(OM = object marker for specific animate DOs and all IOs; CL = clitic;
IMP = imperfect tense; PRET = preterit tense; CF = contrastive focus; T = topic)

(3) La batalla continuaba. Soldados llegaban al campamento heridos y agotados.
the battle continued-IMP soldiers arrived-IMP to-the camp hurt and exhausted
'The battle continued on. Soldiers arrived to camp hurt and exhausted.

(4) Un viento huracanado inundó el recinto de los primates. Gorilas
a wind hurricane inundated-PRET the enclosure of the primates gorillas
abrazaron a sus crias; orangutanes gritaron estrepitosamente.
hugged-PRET OM thier babies orangutanes screamed-PRET noisily
'A hurricane wind filled the primate enclosure. Gorillas hugged their young;
orangutans screamed noisily.'

In addition, it is well known that when preverbal bare subjects carry contrastive focus stress, the sentences are perfectly grammatical, as shown in (5) and (6).

(5) [SOLDADOS]$_{CF}$ llegaron, no generales.
'SOLDIERS arrived, not generals.'

(6) [ABOGADOS]$_{CF}$ trabajaron allí, no profesores.
'LAWYERS worked there, not professors.'

It seems then, that preverbal bare nominals in Spanish are not ungrammatical. Rather, they are infelicitous in certain contexts.

There are also restrictions on the distribution of postverbal bare nominal subjects, as seen in examples such as (7) and (8).

(7) *Estornudaron estudiantes. (= [6] Contreras 1996: 3)
sneezed-PRET students

(8) Llegaron estudiantes. (= [4a] Contreras 1996: 2)
arrived-PRET students
'Students arrived.'

The sentence in (7) sounds odd in isolation, yet (8) is fine (see also Torrego 1989). However, we will see that the acceptability of examples like (7) and (8) depends on the lexical semantics of the verb and the discourse involved.

2.2 Individual-level predicates disallow Spanish bare nominal subjects in all cases. Consider the examples in (9-10).

(9) a. *Gente es inteligente.
people is intelligent
'People are intelligent.'

b. *Es inteligente gente.
is intelligent people
'People are intelligent.'

(10) *[GENTE]$_{CF}$ es inteligente, no monos. (adapted from [14c] Contreras 1996)
'PEOPLE are intelligent, not monkeys.'

As shown, bare nominals in this case are ruled out whether preverbal or postverbal and whether or not they carry contrastive focus stress.

2.3 To summarize, sentences with stage-level predicates allow preverbal bare nominal subjects when they carry contrastive focus stress and when the context makes it clear that the sentence describes a situation in progress, as shown in (3-6). There are also restrictions on postverbal subjects, as shown in (7-8). In contrast, sentences involving individual-level predicates disallow bare nominal subjects in all cases.

3. Restrictions on bare nominals in individual-level predicates.

The data above reveals two separate problems: On the one hand, we must account for the fact that individual-level predicates disallow bare NP subjects in all cases (cf. 9-10). On the other hand, we must account for the restrictions on the distribution of bare NP subjects among stage-level predicates (cf. 1-8). We will start with individual-level predicates. Before getting to the details, however, it is necessary to give some background on the thetic/categorical distinction and on the semantics of Spanish bare nominals. This is done in the following subsections.

3.1 As stated in §1, the distribution of bare nominal subjects is directly related to the thetic/categorical distinction. In particular, sentences representing categorical judgments preclude the use of a bare nominals as their logical subject. According to Kuroda (1992), the utterance of a sentence must be viewed on two levels: both as a PROPOSITION and as a JUDGMENT. A sentence represents a proposition inasmuch as it bears a truth value with respect to what the facts are. However, Kuroda has argued in his studies of English and Japanese that certain grammatical distinctions do not yield a difference in truth conditions. Rather, they correspond to functional distinctions based on how the cognitive agent perceives of a given situation. These distinctions correspond to different judgment forms.

The notion of categorical judgment is fairly straightforward because of its association with the traditional subject/predicate distinction of Aristotelian logic. The cognitive act involved in a categorical judgment involves two steps: Initially the speaker designates or recognizes something as the logical subject and then predicates a property of it. For example, consider the sentence in (11). As a categorical judgment, the logical subject *Zelda* is recognized as separate from the property *is a Zapatista.* Given this two-step process, categorical judgments are often referred to as DOUBLE JUDGMENTS.

(11) CATEGORICAL JUDGMENT: Recognition of an individual (logical subject) as (Predication) separate from the property predicated of it.

example: [$_{\text{logical subject}}$ Zelda] [$_{\text{predicate}}$ is a Zapatista].

Since in a categorical judgment the speaker picks out a certain entity as the target of predication, the NP representing this entity will have a strong construal. That is, it must be identifiable and distinguishable from others, either as a unique object or class, in which case it has a specific reading, or as a unique set or subset, in which case it has a partitive or generic reading.

The thetic judgment, in contrast, is said to be self-contained; that is, it is equated with the description of a single perception in which the speaker merely recognizes the existence of an entity or a situation. Unlike categorical judgments, thetic judgments have no division of logical subject vs. predicate; there is no entity that is recognized as separate from the general perception of the situation. In this way, weather sentences like *It's raining* in (12) are unambiguous examples of thetic judgments given that there is no referent that could be the logical subject. *There*-constructions in English are also prototypical examples of thetic judgments.

(12) THETIC JUDGMENT: Perception of an event or situation (eventuality). (Description)

examples: [event It's raining].
[event There are dogs in the yard].

There is an important relation between the stage-level/individual-level distinction and the thetic/categorical distinction. Namely, while sentences with stage-level predicates can potentially represent either thetic or categorical judgments, sentences involving individual-level predicates can only represent categorical judgments. Consider the example in (13), which involves the stage-level predicate *is reading a book.*

(13) John is reading a book. (Stage-level predicate: Thetic or Categorical)

Mejías-Bikandi 1993 points out that, as a categorical judgment, the speaker who utters (13) is attributing the property of reading a book to the individual denoted by the expression *John.* In contrast, as a thetic judgment, the speaker is not really saying something about the individual denoted by John; rather he or she is just describing a particular event or state of affairs. Under this interpretation, *John*, in spite of being a grammatical subject, is not a logical subject.

Now compare (13) with (14), which involves the individual-level predicate *is a carpenter.*

(14) John is a carpenter. (Individual-level predicate: Categorical Only)

The sentence in (14) can only represent a categorical judgment. This is because sentences with individual-level predicates do not make reference to any particular situation, which is a primary characteristic of thetic judgments.

The relations among individual-level vs. stage-level, thetic vs. categorical, and weak vs. strong are summarized in Table 1 below. As shown, stage-level predicates can potentially represent either thetic or categorical judgments. In contrast, sentences with individual-level predicates can only represent categorical judgments. Finally, regardless of the predicate-type, the logical subject of a categorical judgment must be strong.

	Weak NP	Strong NP
Stage-level Predicate	THETIC	THETIC/CATEGORICAL
Individual-level Predicate		CATEGORICAL

Table 1.

3.2 I stated earlier that the distribution of Spanish bare nominals is a result of a conflict between their inherently weak interpretation and environments that call for strong NPs. In particular, the fact that Spanish bare nominals cannot be construed as the logical subject of a categorical judgment limits their distribution.

Evidence that Spanish bare nominals can only have a weak interpretation has been given recently in McNally 1995 and Laca 1996, and has also been suggested in earlier work. One way in which the inherent weakness of Spanish bare nominals manifests itself is in the fact that, unlike with English bare nominals, Spanish bare nominals cannot denote kinds. Consider the examples in (15) taken from Laca 1996. The use of the predicate *extinguirse* 'to become extinct', requires reference to kinds. However, as shown in the ungrammatical (15a), the bare nominal *tigres* 'tigers' does not suffice. To get the kind reading, the definite NP *los tigres* must be used, as shown in (15b).

(15) a. *En la India se están extinguiendo tigres. (= [5] Laca 1994 fn.16,
in the India CL are becoming-extinct tigers = [5] McNally 1996)

b. En la India se están extinguiendo los tigres.
in the India CL are becoming-extinct the tigers
'Tigers are becoming extinct in India.'

The inherently weak interpretation of Spanish bare nominals is also reflected in the fact that they must take narrowest possible scope with respect to any other operators in the same clause. Compare (16a) with (16b).

(16) a. Hoy Juana tiene que leer unos artículos. (c or d) (= [9] McNally 1995)
today Juana has that read some articles
'Today Juana has to read some articles.'

b. Hoy Juana tiene que leer artículos. (d only)

c. $(\exists x$: article$(x))$ [$\diamond$ [read (j, x)]]

d. $\diamond$ $(\exists x$: article$(x))$ [read (j, x)]

As shown in (16a), NPs with indefinite determiners, such as *unos artículos* 'some articles' can take either wide or narrow scope with respect to the modal operator and therefore this sentence can be interpreted as either (16c) or (16d). That is to say, *unos artículos* can have either a specific or nonspecific reading. By contrast, the bare nominal *artículos* in (16b) only has the nonspecific reading, i.e. the interpretation in (16d). The same scope effects are seen with negation and intensional predicates.

3.3 With this background on the thetic/categorical distinction and on the semantics of Spanish bare nominals, we can begin to explain the stage-level/individual-level contrast presented in §2. The relevant examples will be repeated below. First of all, recall that sentences with stage-level predicates allow bare nominal subjects, as shown in (17) and (18), while those with individual-level predicates do not, as shown in (19) and (20).

Stage-level Predicates

(17) La batalla continuaba. Soldados llegaban al campamento heridos y agotados.
'The battle continued on. Soldiers arrived to camp hurt and exhausted.'

(18) [SolDAdos]$_{CF}$ llegaron, no generales.
'SOLDIERS arrived, not generals.'

Individual-level Predicates

(19) *Gente es inteligente.
'People are intelligent.'

(20) *[GENte]$_{CF}$ es inteligente, no monos.
'PEOPLE are intelligent, not monkeys.'

Given the relation between predicate-types and judgment forms outlined in the last section, the explanation for the restriction on Spanish bare nominals in individual-level predicates is straightforward. The two-part derivation is as follows (cf. Ladusaw 1994):

1. The logical subject of a categorical judgment must be strong.
Spanish bare nominals are inherently weak.
Therefore, Spanish bare nominals cannot serve as the subject of a categorical judgment.
2. Sentences with individual-level predicates represent only categorical judgments.
It follows that bare nominals cannot serve as subjects of individual-level predicates.

4. Restrictions on bare nominals in stage-level predicates

So far I have accounted for the restriction on bare nominals in sentences with individual-level predicates. However, the data presents two additional puzzles, which involve restrictions on Spanish bare nominals among sentences with stage-level predicates.

First, recall that speakers find sentences like (21) and (22) unacceptable, at least in isolation. It is only when context is added so that the sentence describes a situation in progress, as in (17) above, or when the preverbal subject carries contrastive focus, as in (18), that they become acceptable.

(21) *Soldados llegaron.
soldiers arrived-PRET

(22) *Soldados trabajaron.
soldiers worked-PRET

I will argue that the categorical/thetic distinction accounts for these effects as well. That is, in isolation, sentences such as (21-22) are interpreted as categorical judgments as a result of the default TOPIC-COMMENT information structure which is assigned to them. Since sentences that represent categorical judgments preclude the

use of bare subjects (as we saw in §3), (21-22) are ruled out. In contrast, the context and information structure in (17) and (18) allow them to be interpreted as thetic judgments, in which case the bare nominal subject is licensed.

Second, we must account for the distinction between (23) and (24) below. Recall that, in isolation, postverbal bare subjects are ruled out with *estornudar* 'sneeze', yet they are fine with *llegar* 'arrive'.

(23) *Estornudaron estudiantes.
sneezed-PRET students

(24) Llegaron estudiantes.
arrived-PRET students
'Students arrived.'

Unlike the restriction on preverbal bare subjects shown in (21-22) above, the discrepancy in (25-26) is not due to the thetic/categorical distinction. In fact, it turns out that both examples represent thetic judgments. Rather, I will argue that the unacceptability of (23) is a result of a conflict between the lexical semantics of *estornudar* and the PRESENTATIONAL information structure associated with this sentence. I begin in §4.1 with a discussion of the relationship that pragmatic and contextual factors have with word order.

4.1 In every language, speakers use different grammatical structures under different communicative circumstances (Lambrecht 1994). This grammatical encoding of discourse and contextual information in natural language is referred to here as INFORMATION STRUCTURE, which I will take to be a separate component of grammar.

For example, consider the discourse in (25). The sentence in (25a) conforms to the well-known TOPIC-COMMENT relation, which is a relation of aboutness between the pragmatically presupposed subject referent and the proposition expressed by the sentence. In other words, this sentence takes a familiar or active discourse referent as its subject, i.e. *un hombre* 'one of the men', and predicates a property of it. Although different word orders are possible in Spanish, a topic-comment interpretation is only viable in sentences with preverbal subjects. The comparison of (25a) with (25b) illustrates this point. If *un hombre* is postverbal, as shown in (25b), the topic-comment interpretation is not available.

(25) Había varios hombres en el bar.
there-were-IMP several men in the bar
'There were several men in the bar.'

a. [Un hombre]$_T$ estaba fumando.
one man was-IMP smoking
'One of the men was smoking.'

[...] b. #Estaba fumando un hombre.
'A man was smoking.'

Following Lambrecht 1994 among others, I will assume that topic-comment sentences are the unmarked or default sentence-type with respect to the discourse. As Lambrecht puts it 'The topic-comment articulation is [...] communicatively speaking the most useful pragmatic articulation. It is therefore the one to which speakers will most naturally resort for the pragmatic construal of isolated sentences'

(1994:132). On this view, speakers will assign the topic-comment information structure to sentences with the SV(O) word order in neutral contexts.

Two additional sentence types involve non-topical subjects: PRESENTATIONAL and EVENT-REPORTING sentences. As pointed out by Suñer 1982, among others, the function of PRESENTATIONAL sentences is to introduce (or reintroduce) a 'new' or inactive referent usually for the purpose of making it the topic of predication in subsequent discourse. This is shown in (26a). In this way, the verb involved expresses existence, appearance, emergence, etc. Furthermore, sentences with the presentational function have postverbal subjects. As shown in (26b), the preverbal subject in this context is infelicitous.

(26) a. De repente apareció una mujer. Era alta, guapa, y misteriosa.
of sudden appeared-PRET a woman was-IMP tall attractive and mysterious
'Suddenly a woman appeared. She was tall, attractive and mysterious.'

b. #Una mujer apareció de repente. [...]
'A woman appeared suddenly.'

In contrast to (26a), the function of the EVENT-REPORTING sentence in (27) is simply to describe a situation or event without focussing on any particular entity (Lambrecht 1994:144). Furthermore, in this case the grammatical subject is preverbal, although non-topical.

(27) El sitio estaba como siempre. Un hombre estaba fumando, una canción
the place was-IMP like always a man was-IMP smoking, a song
triste sonaba en la radio, y yo trabajaba de camarero.
sad sounded-IMP on the radio and I-worked-IMP of waiter
'The place was like always. A man was smoking, a sad song was playing on the radio, and I was tending bar.'

Thus, although the second sentence in (27) is identical to (25a) on the surface, the two differ with respect to information structure.

The three-way contrast among topic-comment, presentational, and event-reporting sentences is also found in Mejías-Bikandi 1993, as shown in (28a-c).[3]

(28) a. [Un tren]$_T$ llegaba al andén. (Topic-comment)
a tren arrived-IMP to-the platform
'Trains (kind) used to arrive at the platform.'

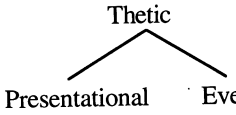
b. Al andén llegó un tren. (Presentational)
to-the platform arrived-PRET a train
'A train arrived at the platform.'

c. Un tren llegaba al andén. (Event-reporting)
a tren arrived-IMP to-theplatform
'A train was arriving at the platform.'

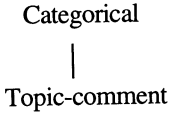
4.2 There is a clear correlation between the topic-comment sentences and the categorical judgment on the one hand, and between the presentational and event-reporting sentences and the thetic judgment on the other hand. To be specific, the

topic NP in a topic-comment structure bears a pragmatic relation of aboutness to the proposition expressed by the sentence. Thus, the topic NP is recognized as 'separate' from the proposition predicated of it in the same way the logical subject of a categorical judgment is recognized as a separate entity. In addition, the pragmatically presupposed nature of topics make them necessarily strong, i.e., they have either specific, partitive, or kind readings. In the case of presentational and event-reporting sentences, both represent thetic judgments since neither type adheres to the traditional subject-predicate distinction. That is to say, presentationals merely express the existence of an entity (cf. 28b) while event-reporting sentences describe an eventuality (28c). In this way, following Sasse 1987 and Lambrecht 1994, I will claim that the categorical and thetic judgments are superordinate categories for these information structures, as illustrated in (29a-b) below.

(29) a.



b.



4.3 We can now account for the discrepancy between examples (21) and (17), repeated below as (30a) and (30b) respectively.

(30) a. #Soldados llegaron.
'Soldiers arrived.'

b. La batalla continuaba. Soldados llegaban al campamento heridos y agotados.
'The battle continued on. Soldiers were arriving to the camp hurt and exhausted.'

The sentence in (30a) has a preverbal subject, which on the face of it means it should be compatible with either the topic-comment or the event-reporting function. However, given the lack of context, speakers will assign the default topic-comment information structure to the sentence, which represents a categorical judgment. Since the inherent weakness of Spanish bare nominals precludes their use as subjects of categorical judgments, (30a) is unacceptable. Yet once the appropriate context is supplied for an event-reporting interpretation, a type of thetic judgment, the preverbal bare subject becomes acceptable, as is shown in (30b). This is because thetic judgments do not require strong subjects.

4.4 As mentioned earlier, the discrepancy between (23) and (24), repeated below as (31a-b) respectively, is a result of the interaction between the presentational sentence function and the lexical semantics of the verbs involved. Recall that without context (31a-b) will be interpreted as presentationals given their postverbal subjects. This creates a problem in the case of (31a) because the verb *estornudar* 'sneeze' does not connote existence, appearance, or emergence, as is required in a presentational sentence. I propose that it is for this reason that sentence in (31a) sounds odd. In contrast, the ideas of appearance and emergence are central to the lexical semantics of *llegar* 'arrive', which is why there is no such conflict in (31b).

(31) a. #Estornudaron estudiantes.
sneezed students
'Students sneezed.'

b. Llegaron estudiantes.
arrived students
'Students arrived.'

5. A Syntactic Approach

Before concluding, I will discuss the drawbacks of trying to account for these data using a purely syntactic approach.

5.1 Contreras (1996) argues that the bulk of the restrictions on the distribution of bare nominals are a result of head government violations. To be specific, he proposes that bare nominals are quantifier phrases with an empty head position, as shown in (32).[4] Following Rizzi 1990, the empty head position requires proper government to be formally licensed.

(32) [QP [Q *e*] NP]

On this view, bare nominals in object positions are predicted to be grammatical since they are licensed by the verb or preposition that governs them. By the same token, bare nominals in ungoverned positions such as preverbal subjects as well as postverbal subjects in adjoined positions are predicted to be ungrammatical.

5.2 There are three problems with this analysis. First, it does not account for examples such as (30b) *Soldados llegaban al campamento heridos y agotados* and (33) below, which are grammatical despite their use of bare nominals in ungoverned positions (cf. McNally & Fontana 1994).

(33) La cosecha$_i$ [S [VP [V´ la$_i$-destruyeron t_i] langostas]] (= [22a] Suñer
the harvest obj-cl destroyed locusts 1982: 213)
'As for the harvest, locusts destroyed it.'

Secondly, with this approach, we would predict sentences such as (34) and (35) to be grammatical given that the bare nominal objects are governed by the verb. Yet they are ungrammatical.

(34) *Pedro [V´ detesta salmón]. (cf. Pedro detesta el salmón.)
(Pedro hates salmon.)

(35) *Pedro [VP [V´ come salmón] [AP crudo]]. (cf. Pedro come el salmón crudo.)
(Pedro eats salmon raw.)

Finally, this syntactic approach cannot explain the discrepancy between the acceptability of bare nominal subjects in stage-level as opposed to individual-level predicates (§2).

6. Conclusion

I have shown that the distribution of bare nominals in Spanish is due to a clash between their inherent weak interpretation and environments that require strong NPs. Sentences that represent categorical judgments disallow bare nominals because their logical subjects must be strong. Thetic judgments, in contrast, have no logical subject and do not place restrictions on bare nominals. Since sentences with individual-level predicates always represent categorical judgments, it follows that bare nominals do not occur as the subjects of individual-level predicates. Sentences with stage-level predicates only disallow Spanish bare nominals when they represent categorical judgments. Whether or not a sentence represents a categorical vs. thetic judgment depends on the information structure involved. If the sentence has a topic-comment structure, it represents a categorical judgment. Presentational and event-reporting sentences, in contrast, represent thetic judgments. Finally, restrictions on postverbal bare nominals in isolated examples sometimes depends on the extent to which the lexical semantics of the verb involved are compatible with the discourse function of the sentence, as we saw with *estornudar* 'sneeze' and *llegar* 'arrive' in (33a-b).

Endnotes

* I would like to thank John Moore, Farrell Ackerman, Chris Barker, and Raúl Aranovich for valuable comments and discussion. All errors are my responsibility.

[1]. For further discussion of the weak/strong distinction, see Milsark 1974, Carlson 1977, Diesing 1992, Ladusaw 1994 and Kratzer 1995.

[2]. See references in footnote 1 above as well as Krifka et. al. 1995 for discussion of the stage-level/individual-level distinction.

[3]. Mejías-Bikandi 1993 does not discuss these differences in terms of information structure, however.

[4]. This does not apply to predicate nominals, e.g. *Juan es abogado*.

References

CARLSON, GREGORY N. 1977. *Reference to kinds in English.* Ph.D. dissertation University of Massachussetts, Amherst.

CONTRERAS, HELES. 1996. Sobre la distribución de los sintagmas nominales no predicativos sin determinante. In I.Bosque, ed., *El sustantivo sin determinación. La ausencia de determinante en la lengua española.* Madrid: Visor Libros.

DIESING, MOLLY. 1992. *Indefinites.* Cambridge: The MIT Press.

KRATZER, ANGELICA. 1995. Stage-level and individual-level predicates. In G. Carlson and J. Pelletier, eds., *The Generic Book.* Chicago: University of Chicago Press, 125-175.

KRIFKA, MANFRED, J. PELLETIER, G. CARLSON, A. TER MEULEN, G. CHIERCHIA, AND G. LINK. 1995. Genericity: An Introduction. In G. Carlson and J. Pelletier, eds., *The Generic Book.* Chicago: University of Chicago Press. 1-124.

KURODA, S.-Y. 1992. *Japanese syntax and semantics.* Dordrecht: Kluwer.

LACA, BRENDA. 1996. Acerca de la semantica de los "plurales escuetos" del español. In I. Bosque, ed., *El sustantivo sin determinación. La ausencia de determinante en la lengua española.* Madrid: Visor Libros.

LADUSAW, WILLIAM. 1994. Thetic and categorical, stage and individual, weak and strong. *SALT* 4.

LAMBRECHT, KNUD. 1994. *Information structure and Sentence form.* Cambridge: Cambridge University Press.

MCNALLY, LOUISE. 1995. Bare plurals in Spanish are interpreted as properties. ms. Universitat Pompeu Fabra.

MCNALLY, LOUISE & JOSEP FONTANA. 1994. Unaccusativity and the distribution of bare plurals in Spanish and Catalán. *The 68th Annual LSA Meeting*, New Orleans.

MEJÍAS-BIKANDI, ERRAPEL. 1993. The nature of the stage/individual-level distinction and its syntactic reflex: Evidence from Spanish. In J. Mead, ed., *WCCFL* 11, 326-340.

MILSARK, GARY. 1974. *Existential sentences in English.* Ph.D. dissertation. MIT.

RIZZI, LUIGI. 1990. *Relativized Minimality.* Cambridge: MIT Press.

SASSE, HANS-JÜRGEN. 1987. The thetic/categorical dinstinction revisited. *Linguistics* 25, 511-580.

SUÑER, MARGARITA. 1982. *Syntax and semantics of presentational sentence types.* Georgetown University Press, Washington D.C.

TORREGO, ESTHER. 1989. Unaccusative-unergative alternations in Spanish. *MITWPL* 10.

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VP (and TP) Movement and Verbal Morphology

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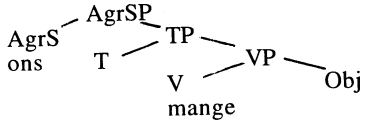
1. Introduction

In the GB framework, it has been argued that verbs obtain their morphology by successive cyclic head to head movement:

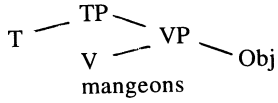
(1) Syntactic Model GB



Under this view, the French verb *mange* is taken from the lexicon without a verbal morphology and moves to AgrS to pick up the inflections.

Departing from this standard view, Chomsky (1993) argues that verbs are taken from the lexicon already fully inflected as shown in (2). Fully inflected verbs in turn move to the functional heads, which are a bundle of features, to enter into the checking relation with the v features of functional heads.

(2) Lexical Model Minimalist (1993,5)



In this paper, I will, however, show that Korean VP movement construction poses a problem to both syntactic and lexical approaches and I will propose a third view of the verbal morphology. It will be shown that my proposal neatly solves the problem and that it naturally accounts for variations found in VP movement across languages.

2. VP vs. TP movement in Korean

As with other languages, usually only one verb shows up in a sentence in Korean as in (3).

(3)	John-i	computer-lul	sa-ss-ta
	-Nom	-Acc	buy-Past-Mood

John bought a computer.

There are, however, sentences where two identical verbs appear as shown in (4) and (5).

(4) computer-lul **sa**-ki-nun John-i **sa-ss**-ta
-Acc buy-Nominal-Con[1] -Nom buy-T-M
Indeed, the fact is that John bought a computer, but...

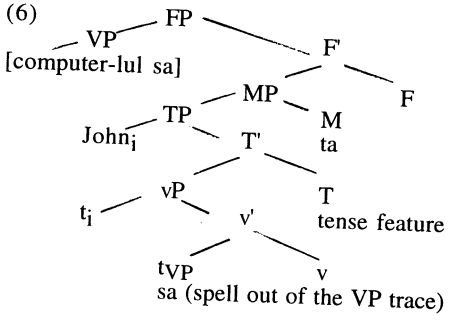
(5) John-i computer-lul **sa-ss**-ki-nun **sa-ss**-ta
-Nom -Acc buy-T-Nominal-Con buy-T-M
Indeed, the fact is that John bought a computer, but...

In example (4) and (5),the first appearing verb *sa* (buy) is followed by a nominalizer *ki* and a (contrastive) focus marker *nun,* and interestingly an identical verb to the first one appears again with the tense and mood markers.

I propose that in (4) and (5), VP and TP has respectively moved to the spec of FocusP before spell out, and the reappearance of verbs *sa* 'buy' is due to the otherwise stranded tense and mood morphemes (cf. Nishiyama & Cho 1996). The structure of the VP and TP movement is given in (6) and (7) respectively.

2.1 VP Movement

(6)

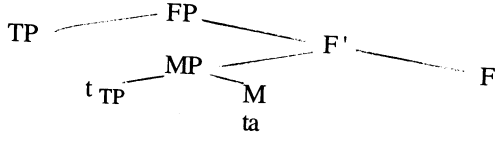


In (6), VP *computer-lul sa* moves to the highest spec position, namely spec of the Focus phrase before spell out, leaving its copy behind. The copy of the trace, namely the verb *sa*, then is spelled out to support the tense morpheme. This is why we have two identical verbs in the same clause[2].

2.2 TP Movement

Analogously to the VP movement, the whole TP has moved to the spec of FP in (7), and this movement leaves the bound mood and tense morphemes unsupported:

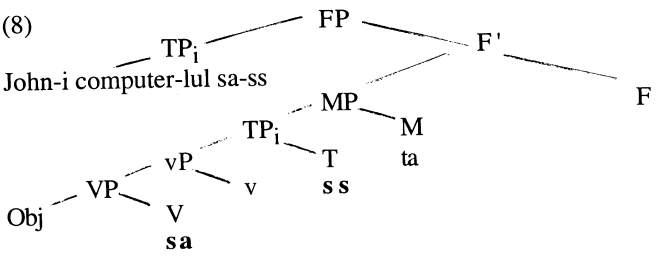
(7)



In this case also, the head of the copy, namely T, is spelled out to support the Mood morpheme. This solves a problem of the mood morpheme. However, being a

bound morpheme as well, the tense morpheme has to be supported by something. Therefore, the next head, the verb *sa* is spelled out again:

(8)



That is, the tense is spelled out to support a stranded mood morpheme and the verb is spelled out again to support the spelled out tense morpheme.

In sum, under my proposal nothing is special in this construction. VP or TP undergoes a movement leaving a copy of them behind and some part of the copies, usually verb, are spelled out to rescue the otherwise stranded morphemes. This is why we see two identical verbs in the same clause.

2.3 Evidence

There are at least four pieces of evidence to support my claim.

● Tense Specification

First, the tense specification on the verb itself demonstrates a difference between (4) and (5). The fact that the verb in (5) contains a tense marker indicates that T projection has moved. On the other hand, that the tense marker does not appear in (4) suggests that it is quite likely that it is a VP which undergoes movement in (4).

● Stranded Subject

The second and much stronger piece of evidence is that the subject can be stranded when the tense is not specified on the first verb, while it cannot when the first verb contains a tense marker as shown in (4) and (5)'.

(4)	[computer-lul sa-ki] nun	John-i	sa-**ss**-ta.
	computer-Acc buy-ki-Con	-Nom	buy-Past-M
	Indeed, the fact is that John bought a computer, (but he did not pay).		
(5)'	*computer-lul sa-**ss**-ki-nun	John-i	sa-**ss**-ta.
	computer-Acc buy-T-ki-Con	-Nom	buy-Past-M
	Indeed, the fact is that John bought a computer, (but he did not pay).		

It is obvious that the unacceptability of (5)' results from the fact that there is no position where the subject *John-i* can sit since the whole TP is extracted. If (4) is an instance of TP movement, (4) also should be as unacceptable as (5)'. However, (4) is perfect. This can be easily accounted for if it is a VP which has moved in (4). In fact, (4) is derived when the VP undergoes a movement to the position higher than TP.

● Adverb Placement

Thirdly, (4) and (5) show a contrast in adverb placement. Sentential adverbs can appear between the extracted element and its copy in both cases:

(10) [computer-lul sa-ki] nun amato John-i sa-**ss**-ulkel. VP
computer-Acc buy-ki-Con probably -Nom buy-Past-M
Probably, John bought a computer, (but probably he did not pay).

(11) [John-i computer-lul sa-**ss**-ki-nun] amato sa-**ss**-ulkel. TP
-Nom -Acc buy-Past-ki-Con probably buy-Past-M
Probably, John bought a computer, (but probably he did not pay).

The sentential adverb *amado* can intervene the extracted elements and the verb regardless whether the first appearing verb in the sentence is tensed or not, as shown above. Non-sentential adverbs, however, can appear between the extracted element and its copy only when the first verb does not contain a tense morpheme:

(12) [computer-lul sa-ki] nun John-i cincca sa-**ss**-ulkel. VP
computer-Acc buy-ki-Con -Nom really buy-Past-M
Indeed, John really bought a computer, (but he did not pay).

(13) *[John-i computer-lul sa-**ss**-ki-nun] cincca sa-**ss**-ulkel. TP
-Nom -Acc buy-Past-ki-Con really buy-Past-M
Indeed, John really bought a computer, (but he did not pay).

In (13), the first verb contains a tense morpheme and this sentence with a non-sentential adverb is unacceptable. This is exactly what my proposal predicts.

The position of sentential adverbs is presumably very high: higher than the (base) position of the subject. Let us then assume that sentential adverbs merge to M' in Korean. Sentential adverbs then can be left behind regardless of whether VP or TP undergoes a movement, because in both cases there is a place where sentential adverbs can stay as in (14) and (15).

(14) [[$_{VP}$] [$_{MP}$ sentential adverbs [$_{TP}$ Subj]]] VP movement
(15) [[$_{TP}$] [$_{MP}$ sentential adverbs [$_{TP}$ Subj]]] TP movement

This is why (4) and (5) are both good. On the other hand, the position of non-sentential adverbs is lower than the sentential adverbs, i.e. lower than MP. Let us then assume that non-sentinel adverbs merge to vP:

(16) [[$_{VP}$] [$_{MP}$ [$_{TP}$ Sub NS adverb [$_{vp}$]]]]] VP movement
(17) [[$_{TP}$] [$_{MP}$]]]] TP movement

In the case of VP movement, there is still a position where non-sentential adverbs can sit, i.e. vP adjoined position as in (16). However, when TP is extracted, there is no position that the non-sentential adverbs can sit, hence non-sentential adverbs can not appear between the extracted TP and its copy. The unacceptability of (13) and the acceptability of (12) then strongly supports my proposal that it is a VP which has moved in (4) and it is a TP in (5).

Finally, the same point can be made by the distribution of the stranded quantifiers:

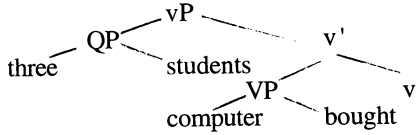
● Standed Quantifier

Following Sportiche (1988), let us assume that we get (18a) when the whole QP undergoes movement from (19). On the other hand, if only NP moves and the quantifier *se-myong* stays in the base position, we get (18b). In (18), the so called stranded quantifiers *se-myong* then designates the base position of the subject since it stays in si-tu, namely in the spec of vP:

(18) a. se-myong-uy haksaengtul-i computer-lul sassta
tree-CL-Gen students-Nom -Acc bought
Three students bought a computer

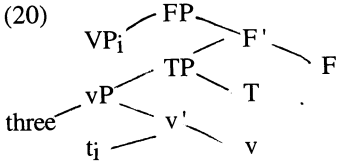
b. haksaengtul-i se-myong computer-lul sassta.
students-Nom three-CL -Acc bought
Three students bought a computer.

(19)



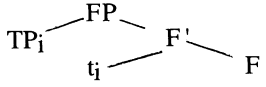
Our prediction is then that when the first verb does not contain a tense morpheme that is, when it is an instance of VP movement, stranded quantifier can appear between the extracted VP and the spelled-out copy verb while this is not allowed when the first appearing verb has a tense marker. This is because when the VP undergoes movement, it does not affect the subject position (the spec of small vP) and therefore the subject can just sit there as in (20).

(20)



On the other hand, when the whole TP undergoes a movement, the small vP moves along with it, hence there is no subject position available as in (21).

(21)



This prediction is actually born out:

(22) haksaengtul-i [computer-lul sa-ki] nun <u>se-myong</u> sa-**ss**-ta. VP
students-Nom computer-Acc buy-ki-Con three-CL buy-Past-M
Indeed, three students bougt a computer (but they never use it).

(23) *[haksaengtul-i computer-lul sa-**ss**-ki] nun se-myong sa-**ss**-ta. TP
students-Nom -Acc buy-T-ki-Con three-CL buy-Past-M
Indeed, three students bougt a computer (but they never use it).

In (22), the first verb does not have a tense marker in it and the stranded quantifier can intervene between the extracted element and the verb. On the other hand, in (23), the first verb does have a tense marker and the stranded quantifier is not allowed as predicted.

The conclusion so far is then that when the first verb does not contain a tense marker, it's an instance of VP movement (24) while when the first verb does contain a tense marker, it is an instance of TP movement (25).

(24)	[Obj **Verb**]	Subject	Verb-Tense-Mood	**VP**
(25)	[Subj Obj **Verb-Tense**]		Verb-Tense-Mood	**TP**

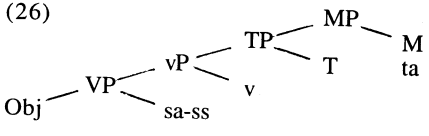
This conclusion, however, poses a serious problem to both lexical and syntactic approaches of the verbal morphology.

III. Lexicalist view and Korean Verbal inflection

Under the lexicalist view, the whole inflected verb *sa-ss* (buy-Past) is always taken from the lexicon at the beginning of the derivation. The lexical approach, therefore, predicts that the verb in the spec of Focus phrase should have the same form (i.e. *sa-ss*) regardless of whether it is an instance of VP or TP movement. To make it clear, let us look at the derivation of (4) and (5).

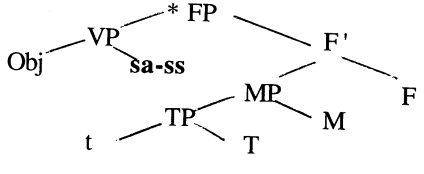
At the beginning of the derivation, the inflected verb *sa-ss* (buy-Past) is taken from the lexicon both in (4) and (5) as in (26). In other words, (4) and (5) share the exact same structure. This is because (4) and (5) are derived from the same numeration and the only difference between them is which category undergoes a movement.

(26)



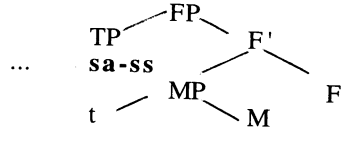
From (26), when the VP undergoes a movement, (26) results in (27):

(27)



On the other hand, when the TP undergoes a movement, (26) results in (28):

(28)

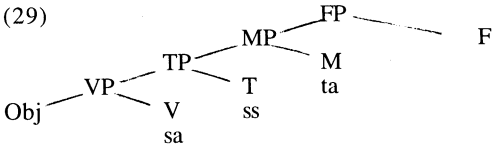


Accordingly, the lexical view of the morphology predicts that the first verb in the extracted position contains a tense marker regardless of whether VP or TP undergoes a movement, and this is not true in Korean. The conclusion for the time being, therefore seems to be that the lexical view of the verbal morphology (Chomsky 1993, 1995) is not appropriate for accounting for Korean Predicate level focus movement. In particular, the fact that the verb from in the head (of the chain) position and the copy position is different clearly shows that tense morphemes are independent of the verbs and are taken from the lexicon by themselves.

IV. Syntactic View and AgrS

On the other hand, Syntactic view of verbal morphology seems to account for the different verb forms in VP and TP extraction cases very naturally. Under the syntactic approach, a bare verb and T is separately taken out from the lexicon:

(29)



From (29), if VP undergoes a movement, that maximal projection does not contain a tense projection, hence the verb does not contain a tense specification . On the other hand, if TP undergoes a movement, the verb gets a tense specification since the extracted projection contains a tense morpheme.

Based on this observation, one might conclude that syntactic approach of the verbal morphology is more superior to the lexical approach at least for the language like Korean. The distribution of the AgrS morpheme *si*, however, demonstrates that this is not quite true. Korean AgrS *si* indicates the speaker's respect for the subject, and this (spec head relation) is obligatory. Now, let us look at the distribution of AgrS morpheme *si* in the extracted VP:

(30)	computer-lul	sa-**si**-ki-nun	halmoni-ga	sa-**si**-oss-ta
	-Acc	buy-Hon-ki-Con	grandmother-Nom	buy-Hon-T-M
(31)	??/*computer-lul	sa-ki-nun	Halmoni-ga	sa-si-oss-ta
	-Acc	buy-ki-Con	grandmother-Nom	buy-Hon-T-M

My grandmother indeed bought a computer (buy she never use it).

Even though the first verb in (30) does not contain a tense morpheme, hence (30) is an instance of VP movement, AgrS morpheme shows up in the first verb and the appearance of *si* is obligory as the unacceptability of (31) suggests.

To sum up, when VP undergoes a movement, tense morpheme cannot shows up whereas AgrS morpheme can. This is very problematic to syntactic approach of the verbal morphology. A tense morpheme does not show up in VP extraction, since the category in the spec of F is smaller than a TP. Given that VP is also smaller than AgrSP (if you posit AgrSP), Syntactic view wrongly predicts that AgrS morpheme should not appear in the Verb in the extracted position[3]. Hence we are in the dilemma.

V. Proposal

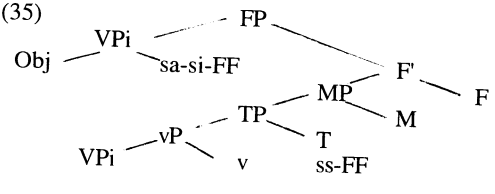
To solve this dilemma, I propose that Verbs and Ts (head of TP) are taken from the lexicon with formal features (mainly tense and Agr features) as in (32) and that either a tense feature of verbs or that of Ts can be overtly realized[4] as shown in (33) and (34).

(32) sa-FF(e.g. tense, Agr features), T-FF(e.g. tense, Agr feature
(33) sa-ss T-FF First group
(34) sa-FF T-ss Second group

If a tense feature of verbs is overtly realized as in (33), the result would be the same as the inflected verbs being taken out of the lexicon. The difference, however, is that to spell out the tense feature of T is not the only option under my proposal whereas it is the only option allowed under the Lexicalist view. On the other hand, if a tense feature of T is spelled out as in (34), it would look as if a tense morpheme heads a TP, but the difference from the head-adjunction view (syntactic view) is that the verbs down below also have a tense feature which has to be checked off hence moves. Under my proposal, languages are not drastically different from each other. In all languages, verbs move up to T to check off the their tense features. They just differ in whether it is a tense feature of the verb or T that are realized.

I claim that Korean belongs to the case where a tense feature of T is spelled out and as for the Agr feature, I propose that Agr feature of the verb is spelled out unlike the tense feature as shown in (35).

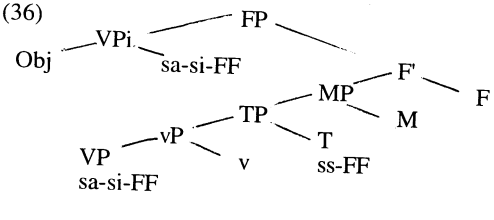
(35)



VP movement

Accordingly, at the time when the VP undergoes a movement the verb already contains an agreement marker in it but does not have a tense morpheme even though it does have a tense feature. In (35), VP has moved, but the Agr feature of the verb is already spelled out, thus we get *si* in the fronted verb but we cannot see the tense morpheme there because the spell out site of the tense feature is T (the head of TP) in Korean. Like other examples, the copy of the verb which is *sa-si* is spelled out in the copy position after VP movement. This is why we get the double occurrence of *si* in (30):

(36)



VP movement

Summing up, under my proposal, the verb from *sa-si* in the fronted VP in (4) is just a result of the differentiated spell out of the features: namely, only the Agr feature of the verb is spelled out, leaving the tense feature of the verb unaffected.

VI. Variations across languages

In the previous section, I have shown that my proposal of verbal morphology offers a natural account for the different verb forms in the fronted VP and TP in Korean. In this section, I will show that it furthermore provides a natural tool to explain the variations found in VP movement among languages.

Data first. In Korean, after the VP movement, the copy of the VP may be spelled out as has been shown, but *do*-support is also an option:

(37) a. computer-lul sa-ki-nun John-i hae-ss-ta K
-Acc buy-ki-Con -Nom buy-T-M
b. computer-lul sa-ki-nun John-i sa-oss-ta
-Acc buy-ki-Con -Nom buy-T-M
Indeed, the fact is that John bought a computer, (but he did not pay).

In English and Japanese, however, only *do*-support is available:

(38) a. computer-o kai- wa John-ga *ka-ta. J
-Acc buy- Con -Nom buy-Past-but
b. computer-o kai- wa John-ga si-ta.
-Acc buy- Con -Nom do-Past-but
Indeed, the fact is that John bought a computer, (but he did not pay).

(39) a. *Buy a computer John bought.
b. Buy a computer John did.

That is, both spell-out of the copy and do-support option are available in Korean whereas only do-support is possible in Japanese and English:

(40) VP movement
a. Korean: spell-out of the copy, do support
b. Japanese, English: do support

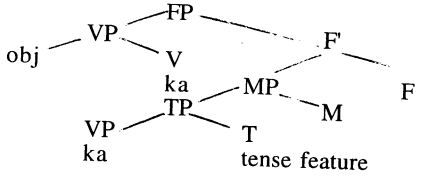
I argued that the copy of the VP trace is spelled out to support the otherwise stranded tense morpheme. The same job can be done just by inserting a dummy verb *do* to T. This is why both *do* support and spell-out of the trace option are available in Korean. Given this, Why then would Japanese and English be different from Korean? In principle, English and Japanese also have to allow the spell-out of the copy option in addition to *do*-support. This variation across languages straightforwardly follows from my proposal: Languages can vary regarding to the spell-out site of the tense feature (that is, whether the tense feature of T or that of the verb is spelled out). In other words, under my proposal, some languages realize its tense feature in the verb position while some languages realizes it in the T (the head of TP). The typological difference above then is due to the different spell-out position of the tense feature in languages.

In particular, I argue that Unlike Korean, what is overtly realized is the tense feature of a verb in Japanese and English as in (41).

(41) a. Korean: Verb-features T-TM
b. English, Japanese: Verb-TM T-features

With this assumption, let us consider the construction again. In (38), the Japanese verb *ka* in the focus position does not have a tense morpheme, which in turn means that verbs without a tense feature is taken from the lexicon, since it is the tense feature of V which is overtly realized if there is any in Japanese. Therefore, absence of the tense morpheme means absence of the tense feature in Japanese, unlike Korean. This explains why the spell out of the copy option is not available in Japanese VP focus movement:

(42)



After the VP has move into the spec of FP, the verb *ka(w)* in the copy position, in principle, can be spelled out to support the T as it does in Korean. However, the verb *ka(w)* in (42) does not have a tense feature to enter into the checking relation with T, hence the tense feature of T cannot be checked off. This unchecked tense feature of T causes the derivation to crash. This is why spell-out of the copy option is not allowed in Japanese and English. The only option available is then *do* support, and the tense feature of T is deleted by the checking relation with the tense feature of *do*.

The conclusion is then that in the case of VP movement, only the *do* support option is available in a language where a tense feature of the verb is spelled out in that language.

VII. Conclusion

In this paper, I have shown that once VP (or TP) undergoes a focus movement leaving stranded morphemes behind, one of two actions has to be taken in Korean: spell out of the copy or *do* support.

The optional nature of *do* Support implies that *do* Support may not necessarily be the last resort unlike the standard assumption, since *do* support is available even when verb movement is not blocked in the Predicate Focus construction. On the other hand, presence of duplicated verbs in this construction strongly argues for copy theory of movement.

In addition, my analysis of the Predicate Focus Construction is shown to have important implication for the verbal morphology. Contrary to Chomsky (1993), the different verb forms found in VP (V) and TP focus movement (V+Tense) suggests that the tense morpheme may not be selected with the verb at the beginning of the derivation but it is taken separately from the verb, i.e. the tense morpheme is under T. To account for this under the feature checking theory of verb movement, I proposed that not the inflected verbs but verbs with features are taken out from the lexicon and features of either verb or T can be spelled out. It

turned out that Korean belongs to the case where the tense morpheme of T is spelled out.

In addition to the different verb forms in VP and TP movement, the systematic difference among languages as to the (un)availability of spell out of the copy option in VP focus movement is derived from whose tense feature of the two (verb and T) is spelled out: if the tense feature of the verb is spelled out (instead of the tense feature of T) in a language, spell out of the copy is not available in the VP focus movement in that language.

Footnotes

* This paper has enormously benefited from the comments of Chris Collins, Molly Diesing, John Whitman, Michelle Degraff, Satoshi Tomioka, John Bowers, Sally MacConell Ginet, Abby Cohn, Sabine Iatridou, Kunio Nishiyama, Caterina Donati, and HeeDon Ahn. Most of all, I thank Chris Collins, John Whitman, and Molly Diesing for a careful reading of an earlier draft. Of course, all the remaining inadequacies are my own.

1. Con = Contrastive Focus Marker
2. Of course the whole copy of VP can be spelled out:

(i) ?[computer-lul sa]-ki-nun John-i [computer-lul sa]-ss-ta
-Acc buy-Nominal-Con -Nom -Acc buy-T-M
Indeed, the fact is that John bought a computer, but...

To spell out only the head of the copy (namely verb) as in (4) is, however, more felicitous in the discourse than to spell out the whole copy as in (1). This seems to be because only the verb is necessary to be spelled out, given that the purpose of spelling out the copy is to support the tense morpheme. Therefore, to spell out the object with the verb results in marginality.

3. This fact is even more problematic under the minimalist program (Chomsky 1995) where AgrS and T are supposed to head the same projection.
4. More generally speaking, features, in principle, can be spelled out in any position.

References

Bobaljik Jonathan. 1994 What does Adjacency Do? *MIT Working Paper in Linguistics 22.*
Chomsky, Noam. 1976. Conditions on Rules of Grammar. *Linguistic Analysis* 2.4
Chomsky, Noam. 1993. A Minimalist Program for Linguistic Theory. in *Current Studies in Linguistics 24.*
Chomsky, Noam. 1995. *Minimalist Program.* MIT Press.
Collins, Chris. 1995. Ch.4. Cross Linguistic Variation. Ms., Cornell University.
Collins, Chris. 1997. *Local Economy.* MIT Press.
Dekydspotter, L.P. 1995. *Null Operator-Variable Structures, Predication and the Interpretive Interface.* Cornell Dissertation.
Hoji, Hajime, et al. 1989. NP Movement in Japanese. *WCCFL VIII.*
Iatridou Sabine & Spyridoula Valokosta. 1995. Pseudoclefts Corsslinguistically. MS., University of Pennsylvania.
Jackendoff, Ray. 1972. *Semantic Interpretation in Generative Grammar.* MIT Press.

Kang, MyoungYoon. 1988. *Topics in Korean Syntax.* MIT Dissertation.
Koopman, Hilda. 1984. *The Syntax of Verbs.* Foris, Dordrecht.
Lasnik, Howard. 1994. Verbal Morphology: Syntactic Structures Meets the Minimalist program. Ms. University of Conneticut.
Lefevre, C. 1990. On the Interpretation of Predicate Cleft. *The Linguistic Review 6.* 169-194
Nishiyama, Kunio. 1994. Predicate Clefts. Ms., Cornell University.

Rooth, Mats. 1985. *Association with Focus.* Umass Dissertation.
Selkirk, Elisabeth. 1984. *Phonology and Syntax: The Relation between Sound and Structure.* MIT Press.
Tsai, Wei-tien Dylan. *On Economizing the Theory of A-Bar Dependencies.* MIT dissertation.
Whitman, John. 1982. Configurationality Parameters. Ms., Harvard University.
Yoon, James H. Korean Verbal Inflection and Checking Theory. 1994. *MIT Working papers in Linguistics 22*, 251-270. MIT Press.

Pragmatic binding: Demonstratives as anaphors in Dutch

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Abstract

In Dutch, demonstrative pronouns can be used as anaphors, contrasting with personal pronouns. It is argued that this use of the demonstrative pronoun picks out a nontopical antecedent, whereas the personal pronoun is used to pick out a topical antecedent.

1. Introduction

This article is part of an ongoing investigation of the typology of reference-tracking devices. One of the overarching hypotheses that has emerged from this work is that there is a strong correlation between the use of marked reference-tracking devices and the domain that includes the reference in question and its antecedent. The overarching hypothesis can be formulated as in (1):

(1) In the most local domain (e.g. the arguments of a single predicate), it is expected that noun phrases will be noncoreferential, and coreferentiality is most likely to be marked here. In the most global domains (e.g. across clause and sentence boundaries), it is expected that referential continuity will be maintained, and noncoreferentiality or unexpected coreferentiality is more likely to be marked. Precise cutoff points will vary from language to language.

Some simple examples illustrating this generalization follow.

Many languages have marked reflexive pronouns (REFL) to indicate coreference. These occur in the most local domain, and the degree to which they extend beyond the most local domain varies from language to language. In English, for example, reflexive pronouns are found (roughly) for arguments within the clause, but not for adjuncts or across clause boundaries, even non-finite clause boundaries, as in (2)–(4):

(2) John saw himself (REFL) in the mirror.
(3) John saw a snake behind him.
(4) John asked Mary to make him some tea.

In Russian, obligatory reflexivization includes not only arguments within the clause, but also adjuncts, and can optionally extend across infinitival clause boundaries, as in (5)–(7), the Russian translations of (2)–(3):

(5) Vanja uvidel sebja (REFL) v zerkale.
(6) Vanja uvidel za soboj (REFL) zmeju.
(7) Vanja poprosil Mašu vskipjatit´ sebe (REFL)/emu čaj.

The second part of hypothesis (1) can be illustrated by the complementary distribution that sometimes obtains in French between the subjunctive and the infinitive across a clause boundary. Coreference across the clause boundary, the more expected situation, involves the infinitive with no overt subject of its own, as in (8); noncoreference requires a finite verb form with an expressed subject, as in (9):

(8) Je veux partir.
'I want to leave.'
(9) Je veux que tu partes.
'I want you to leave (lit. that you leave).'

In Russian, where there is coreference between the subject of certain adverbial clauses and the subject of the main clause, a nonfinite verb form (converb, gerund) may optionally be used in the adverbial clause, and this verb form has no overt subject of its own; compare (10) and (11):

(10) Kogda on kupil bilet, Vanja sel v avtobus.
'When he had bought a ticket, Vanya entered the bus.'
(11) Kupiv bilet, Vanja sel v avtobus.
'Having bought a ticket, Vanya entered the bus.'

Where there is no coreference, as in (12), it is necessary to specify the referent of the subject of the adverbial clause:

(12) Kogda papa kupil bilet, Vanja sel v avtobus.
'When Father had bought a ticket, Vanja entered the bus.'

2. Demonstrative pronouns as anaphors

Against the background of the general hypothesis presented in section 1, more specifically its second part relating to global domains, I wish to examine a phenomenon found in a number of European languages, whereby, under certain circumstances, demonstrative pronouns are used instead of the usual personal pronouns. To look forward a little, I will claim that the use of the more marked demonstrative pronoun indicates a less expected antecedent. Examples are presented below from Russian ((13), from Kibrik 1990: 230), German ((14)–(15)), Afrikaans ((16)–(17), from Donaldson 1993: 100, 139, 145), and Dutch ((18)–(22)):

(13) Graf dal baronu pošč eninu, a tot vyzval ego na duèl'.
'The Count$_i$ gave the Baron$_j$ a slap on the face, and HE$_j$ challenged him$_i$ to a duel.'

In Russian example (13), the use of the demonstrative—Russian has only the distal demonstrative *tot* 'that' in this use—rather than the personal pronoun *on* 'he' indicates that the antecedent is not the Count but the Baron. This example also introduces some notational conventions that I will use below in the English translations: identical subscript letters indicate coreference; an English pronoun in small capitals indicates a demonstrative in the original.

In such examples, German uses the neutral demonstrative (stressed) *der*, rather than the personal pronoun series *er* 'he', etc.; a rich set of German data is, incidentally, presented in Zifonun et al. (in press). Example (15) below is from a short story (*Spiel auf Leben und Tod*) by the contemporary writer Gerd Prokop:

(14) Sie begrüßte ihre Freunde und deren Kinder.
'She greeted her friends$_j$ and THEIR$_j$ children.'

(15) Smiley zeigte auf einen „Tattoo-Duell-Saloon", wo der Gewinner des Duells den Unterlegenen nach seinem Geschmack und auf dessen Kosten verzieren oder wahrscheinlicher verunzieren lassen konnte.
'Smiley indicated a "tattoo duel saloon", where the winner$_i$ of the duel could have the loser$_j$ decorated, or more likely disfigured, according to his$_i$ taste and at HIS$_j$ expense.'

Note that the English translation of the crucial part of (15) is virtually meaningless, since English lacks the contrast between this use of personal and demonstrative pronouns; in English one would have to say something like 'according to the winner's taste and at the loser's expense'. In German, however, the distinction between personal and demonstrative pronoun is strong enough to force the minimal contrast in (15).

In Afrikaans the contrast is between the demonstrative *dié* 'this, that' and the personal pronoun series *hy* 'he', etc.:

(16) Koos en Jan en dié se pa
'Koos and Jan$_j$ and HIS$_j$ father'
(17) Gerrit is met Koos en dié se pa na die vendusie.
'Gerrit has gone with Koos$_j$ and HIS$_j$ father to the auction.'
(18) Hierdie tentdorp huisves plaaswerkers wat oor die brug na veiligheid geneem is voordat die oorspoel is.
'This tent town houses farm-workers who were taken to safety over the bridge$_j$ before IT$_j$ was flooded.'

Since Dutch will form the database for the body of this article, I will give the Dutch forms in somewhat more detail. On the one hand, we have ordinary personal pronouns, such as *hij* 'he', *hem* 'him', *zijn* 'his'. On the other hand, one can use either the proximal demonstrative *deze* 'this', or the distal demonstrative *die* 'that'. In this use of the demonstratives, there seems to be no semantic distinction between the two series of demonstratives, unlike, for instance, in reference-tracking use of demonstrative adjectives in Dutch (Kirsner and van Heuven 1988). Rather, the difference is one of register, distal *die* being preferred in the spoken language, proximal *deze* in the written language. This distribution is noted in the earlier linguistic literature (e.g. Geerts et al. 1984: 219), and is consistent with my own data. There is one exception to this distribution: proximal *deze* lacks an inflectional genitive of its own, and in the written language the genitive of *die*, namely *diens*, is used; such inflectional genitives are not usual in contemporary spoken Dutch, so that in this particular reference-tracking usage *diens* is just as much a marker of written style as is *deze*. Since the bulk of my Dutch database consists of sentences involving singular male human beings, for reasons to be given below, the above summary gives only forms appropriate for masculine singular reference. Simple, made-up examples illustrating the Dutch forms follow:

(19) Wim zag Piet en zijn vriend.
'Wim$_i$ saw Piet$_j$ and his$_{i,j}$ friend.'
(20) Wim zag Piet en diens vriend.
'Wim$_i$ saw Piet$_j$ and HIS$_j$ friend.'
(21) Wim en Piet en zijn vriend
'Wim$_i$ and Piet$_j$ and his$_{i,j}$ friend'

(22) Wim en Piet en diens vriend
'Wim$_i$ and Piet$_j$ and HIS$_j$ friend'

Before turning to the analysis of the personal/demonstrative pronoun opposition, one caveat is in order. In a number of European languages, distal and proximal demonstrative pronouns are used as reference-tracking discriminators in a way paralleling English *the former* versus *the latter*, as in the following Italian example (Lepschy and Lepschy 1988: 127):

(23) Considerate Manzoni e Leopardi: questi fu il maggior poeta, quegli il maggior prosatore dell'Ottocento.
'Consider Manzoni and Leopardi: the latter (lit. this) was the greatest poet, the former (lit. that) the greatest prose writer of the nineteenth century.'

This distinction is NOT the distinction that is at issue in this paper. In the phenomenon discussed in this paper, none of the relevant languages uses the difference between proximal and distal demonstratives to express a difference in antecedent. Russian uses only the distal demonstrative. German uses only the neutral demonstrative. Afrikaans uses its only noncompound demonstrative series. Dutch uses both proximal and distal demonstrative series, but without a semantic distinction between them.

On the basis of the Russian, German, Afrikaans, and Dutch examples presented so far, but more especially on the basis of the more detailed Dutch data to be presented in section 3, I suggest the hypothesis in (24) to account for the distinction between personal pronouns and demonstrative pronouns in reference-tracking usage in these languages:

(24) The demonstrative is used where there are two potential antecedents for a pronoun in the relevant position. Use of the demonstrative excludes one of the possible antecedents. This use of the demonstrative is an anaphor, in the narrow sense, since it requires an antecedent in the linguistic context; indeed, more accurately, it requires two "antecedents", one of which is excluded, the other actualized. The demonstrative is the marked choice. Since it establishes coreference within a global domain, it must establish less expected coreference.

(A slight amendment to hypothesis (24), at least with respect to Dutch, will, incidentally, be suggested in section 4.)

The hypothesis in (24) is fine as far as it goes, but it leaves one crucial question answered: How does one determine which of two potential antecedents is less expected (and thus expressible with the demonstrative)? In practice, a somewhat more easily testable version of the same question is: How does one identify the "excluded antecedent"? There are at least three plausible hypotheses:

a) The excluded antecedent is subject. (grammatical relation)
b) The excluded antecedent is the leftmost noun phrase, or at least is not the rightmost noun phrase. (linear order)
c) The excluded antecedent is the highest in topicality. (pragmatic role)

It should be noted at the outset that there is no requirement that the choice among (a)–(c) should be the same for all languages. In Russian, for instance, to the extent that the construction has been discussed in this much detail, hypothesis (a) has been preferred, as in Kibrik (1990), and there is evidence in favor of this assumption. If one topicalizes a nonsubject noun phrase by preposing it, as in (25), then the subject remains the best candidate for the excluded noun phrase, and the demonstrative pronoun continues to refer back to the nonsubject:

(25) Vanju uvidel Petja, nò tot ubežal.
'Petya saw Vanya$_j$, but HE$_j$ ran away.'

In the literature on German, hypothesis (b) has generally been maintained, as in Fillmore (1975) and Zifonun et al. (in press). In section 3, however, I will suggest that hypothesis (c) is correct for Dutch, i.e. that in Dutch the relevant anaphoric distinction is pragmatically conditioned.

Incidentally, perhaps the most explicit claim concerning the distinction in Dutch is that made by Kozinsky and Polinsky (1993: 213), primarily on the basis of elicited material:

> Dutch has argument and possessive pronouns (originally demonstratives) that indicate that their antecedent is not subject and/or topic, in other words, they instruct the hearer to disregard the most obvious antecedent. ... We do not have enough data to claim that *deze* type pronouns are controlled exclusively by DO [direct object—BC]. However, DO is preferred over a non-term.

The authors are diffident in choosing between a grammatical relation and a pragmatic role solution, although they suggest that direct object is the best controller for the demonstrative anaphor. While the detailed data to be presented in section 3 do not provide direct confirmation of this, it is perhaps not difficult to see how such a pattern could arise in elicited data, where it is hard to control for topicality—subjects tend to be interpreted as topics, in the absence of clear indications to the contrary—and where, if the subject is interpreted as topic and thus as "excluded antecedent", the direct object is probably the next best choice as antecedent for the demonstrative, whether on a hierarchy of grammatical relations or one of degrees of topicality.

3. Demonstratives as anaphors in Dutch

In this section, the body of the analytical part of the article, I will examine in greater detail the use of demonstrative pronouns as anaphors in Dutch, with emphasis on written Dutch. The choice of (written) Dutch is not entirely random. First, this use of the demonstrative pronouns seems to be particularly frequent in Dutch. While I have not done a detailed statistical study to justify this, my impression from reading Dutch, German, and Russian is that reading even a few pages of Dutch will generate at least one example, while reading a German novel of a couple of hundred pages may be needed to generate a similar-sized corpus of examples, with Russian generating even fewer examples than German per similar amount of text. Second, the use of pronominal *deze* in written Dutch is almost exclusive to this use, whereas the corresponding German, and even spoken Dutch, forms have the disadvantage that they have a tendency, in colloquial language, to be substituted for personal pronouns in a much wider range of circumstances. (This extension of

usage does not apply to Russian *tot*, but as noted Russian has the disadvantage of generating the smallest corpus of examples.) Thus, of the three languages Dutch, especially in its written form, is the one that most readily generates a sizable corpus of reliable examples.

There turns out to be a third reason, specific to the main corpus of which I have made use, namely the monograph on Erasmus by the famous Dutch historian Jan Huizinga (Huizinga 1936); examples taken from this source are marked "H" after the Dutch text. Much of Huizinga's account is taken up with interactions between Erasmus and other men, such as a publisher, a polemic adversary, and—somewhat to the chagrin of the reader expecting to find unconditional endorsement of the Netherlands' culture hero—someone from whom Erasmus is trying to beg free lodging or a free meal. This work is thus replete with examples of just the kind we are looking for.

Many examples are, of course, ambivalent in deciding among the three hypotheses (a)–(c) presented in section (2), and indeed this is to be expected, given that topics tend to be subjects and to occur towards the beginning of the clause. Thus, in (26) one could argue that the demonstrative *diens* takes as its actual antecedent *Augustijn Caminade*, rather than *hij* (which in turn refers back to Erasmus), because it is a nonsubject contrasting with the subject *hij*, or because the actual antecedent occurs to the right of the excluded antecedent *hij*, or because the actual antecedent is not topic:

(26) Herhaaldelijk drijft de vrees voor de pest hem voort: in 1500 uit Parijs naar Orléans, waar hij eerst inwoont bij Augustijn Caminade, doch verhuist, zodra een van diens kostjongens ziek wordt. (H)
'Repeatedly fear of the plague drives him$_i$ [=Erasmus] away: in 1500 from Paris to Orleans, where he$_i$ resides first with Augustijn Caminade$_j$, but moves as soon as one of HIS$_j$ boarders falls sick.'

One of the advantages of a rich corpus is that it provides sufficient examples where these three factors can be disentangled. But before going on to such examples, one other point should be established. Although Dutch allows the use of demonstrative pronouns to establish coreference with a less preferred antecedent, it does not require their use, i.e. there are examples where a personal pronoun can be used to refer back to a less preferred antecedent, as in (27):

(27) Als Erasmus naar Haarlem gaat, om Willem Harmens op to zoeken, is het, om ook hem tot graecus te maken ... (H)
'When Erasmus$_i$ goes to Haarlem to seek out Willem Harmens$_j$, it is in order to make him$_j$ too a Greek scholar.'

It should, however, be noted that at least in Huizinga's writing, it is more usual to make use of the demonstrative pronoun where it is possible. This may well be true for Dutch, at least written Dutch, in general, thus accounting for the high rate of usage of the construction. And native-speaker reactions to made-up or out-of-context examples suggest that there is a noticeable tendency for personal pronouns to be taken as referring back to the preferred antecedent.

There are, however, examples where the excluded antecedent is not a subject. Consider, for instance, (28):

(28) Het zou unjuist zijn, Erasmus daarom tot voorloper van de moderne geest in het algemeen te willen stempelen. Aan tal van diens ontplooiingen is hij te enen male vreemd geweest. (H)
'It would be unjust to want for this reason to stamp Erasmus$_i$ as the precursor of the modern spirit$_j$ in general. To several of ITS$_j$ developments he$_i$ was completely foreign.'

The excluded antecedent for the demonstrative pronoun is the direct object of the preceding sentence, *Erasmus*. The actual antecedent of the demonstrative is *de moderne geest* 'the modern spirit', which is part of a genitive attribute. Thus it is clearly not necessarily the case that the excluded antecedent be a subject, although example (28) leaves open whether the determining factor is the linear order of noun phrases. We might also note that the demonstrative does not select the direct object *Erasmus* as its preferred actual antecedent, although here such an interpretation would make no sense.

Example (29) can take us further in disentangling the various factors that might distinguish personal from demonstrative pronouns; this example comes from a passage clearly dealing with Erasmus as topic:

(29) Eppendorffs vijandschap prikkelde Erasmus zo, dat hij overal diens machinaties en spionnen zag... (H)
'Eppendorff's$_j$ hostility irritated Erasmus$_i$ so much that he$_i$ saw HIS$_j$ machinations and spies everywhere...'

In (29), the excluded antecedent is *Erasmus*, which is neither subject (in fact, it is direct object), nor leftmost (or nonrightmost) noun phrase of the preceding clause, in fact it is its rightmost noun phrase. Thus, in (29) the fact that *Erasmus* is topic is the only reason for its treatment as the excluded antecedent, leaving *Eppendorff* as the actual antecedent of the demonstrative pronoun. Note, incidentally, that the topic–comment structure of (29) is clear enough to pre-empt any tendency there might be to take a direct object as the actual antecedent of the demonstrative pronoun.

The following examples provide further evidence of actual antecedents other than the direct object for the demonstrative pronoun. In (30) and (31), the actual antecedent is a possessive genitive:

(30) Beatus Rhenanus wist later, uit Erasmus' mond ongetwijfeld, te vertellen, hoe deze, terstond na aankomst te Venetië naar de drukkerij gegaan, daar lang had moeten wachten.
'Beatus Rhenanus was later able, undoubtedly from Erasmus'$_j$ mouth, to say how HE$_j$, having gone to the press immediately upon arrival in Venice, had had to wait there for a long time.'

(31) Juist in die dagen schrijft Erasmus aan een van Luthers medestanders, Johannes Lang, zeer gunstig over diens werk.
'Precisely around that time Erasmus writes very positively to one of Luther's$_j$ supporters, Johannes Lang, about HIS$_j$ work.'

(Out of linguistic and cultural context, the demonstrative pronoun in (31) could also be taken to refer to Johannes Lang, the corresponding noun phrase being part of an argument prepositional phrase.) Example (32) shows a noun phrase (*Froben*)

forming part of an adjunct prepositional phrase as the actual antecedent; the excluded antecedent is a possessive genitive:

(32) Doch het naaste doel van zijn reis was, om in Bazel bij Froben zelf de druk te gaan bezorgen van de talrijke werken, oude en nieuwe, die hij voor deze meebracht, ...
'But the immediate goal of his_i [=Erasmus'] journey was to go and, at Froben's$_j$ in Basel, take care of the printing of the innumerable works, old and new, that he_i had brought for HIM_j.'

The conclusion towards which these data lead is thus that the excluded antecedent of an anaphoric demonstrative pronoun is the topic, and that any other noun phrase can be its actual antecedent. Further confirmation of this can be found from some elicited data. In Dutch, preposing of a nonsubject noun phrase indicates contrast, not topic. In (33)–(34), the postposed unstressed pronoun *hij* 'he' remains as topic, while *de jongen* 'the boy' is contrastive:

(33) De jongen heeft hij niet gezien, want hij was binnen.
'The boy_j he_i didn't see, because $he_{i>j}$ was inside.'
(34) De jongen heeft hij niet gezien, want die was binnen.
'The boy_j he_i didn't see, because HE_j was inside.'

Our expectation, which is borne out, would thus be that the personal pronoun can refer to either noun phrase, but with a preference for referring back to the topic (and, incidentally, subject) *hij*, while the demonstrative pronoun would have to refer back to the nontopic, *de jongen*. Note that examples of this kind exclude the possibility of linear order as the sole conditioning factor.

The examples discussed so far have all involved two potential antecedents for an anaphoric demonstrative pronoun, one of which is excluded and one of which is actualized. A greater number of participants is, of course, possible, as is illustrated in some of the following examples. The passage reproduced in (35) is about Stunica.

(35) Van 1516 af stond al het potje te vuur van een Spaans theoloog aan de universiteit te Alcalá, Diego Lopez Zuñiga of in het Latijn Stunica. Het betrof de Annotaties op de uitgave van het Nieuwe Testament, „een tweede Lee", zei Erasmus. Eerst had kardinaal Ximenes de publicatie verboden, maar na diens dood kwam zij los, in 1520. Enige jaren bleef Stunica Erasmus met zijn kritiek vervolgen, tot diens grote ergernis; tenslotte kwam er, waarschijnlijk naarmate Erasmus conservatiever werd, een toenadering en een welwillende houding van Stunica's zijde.
'Starting in 1516 punishment was being prepared in reserve, from a Spanish theologian at the University of Alcalá, Diego Lopez Zuñiga or in Latin $Stunica_i$. It concerned the Annotations to the edition of the New Testament, "a second Lee", said Erasmus. At first Cardinal $Ximenes_j$ had forbidden the publication, but after HIS_j death it came out, in 1520. For some years $Stunica_i$ continued persecuting $Erasmus_k$ with his_i criticism, to HIS_k great annoyance; in the end, probably as Erasmus became more conservative, there came about a rapprochement and a sympathetic attitude from Stunica's side.'

Two other participants are introduced, Cardinal Ximenes and Erasmus. References back to Stunica are consistently by means of personal pronouns, those to either of the others just as consistently by means of demonstrative pronouns.

Another factor that needs to be introduced to complete the discussion is what happens when one has continuing reference back to an antecedent that is first referred back to by means of a demonstrative pronoun. Two strategies seem to be available. First, one can "reset" the anaphors back to personal pronouns, as in (32), where Erasmus is first referred back to, in the second sentence, as *deze*, and then in the third sentence as *hij*:

(36) Eschenfelder had Erasmus gevraagd, hem een psalmverklaring te willen wijden (de vorm, die Erasmus in de laatste jaren meermalen koos). In het eind van 1535 herinnerde deze zich dat verzoek. Hij wist niet meer, of Eschenfelder een bepaalde psalm had aangegeven; ... (H)
'Eschenfelder$_i$ had asked Erasmus$_j$ to dedicate a psalm to him$_i$ (the form that Erasmus chose several times in his last years). At the end of 1535 HE$_j$ remembered that request. He$_j$ no longer knew if Eschenfelder had indicated a particular psalm; ...'

This same strategy is found in (37), where the means of reference back to *Luther* shifts from *diens* to *zijn*:

(37) Hij voor zich kent Luther niet; hij heeft diens geschriften nog slechts vluchtig ingezien, maar iedereen prijst zijn levenswandel. (H)
'He$_i$ [=Erasmus] for himself does not know Luther; he$_i$ has only fleetingly glanced at HIS$_j$ writings, but everyone praises his$_j$ life style.'

However, it is also possible to continue with the demonstrative, as in (38), where reference back to *Aldus* is consistently by means of *diens*:

(38) Wat hem tot Aldus trok, was zonder twijfel, naast de beroemdheit van diens zaak, zijn verliefdheid op diens mooie typen, „die allerfraaiste lettertjes, vooral die hele kleintjes." (H)
'What drove him$_i$ [=Erasmus] to Aldus$_j$ was without doubt, beside the fame of HIS$_j$ business, his$_i$ love of HIS$_j$ beautiful typefaces, "the prettiest letters, especially the real small ones".'

I do not have enough relevant examples to establish what factors may favor either of these choices. The resetting to the personal pronoun could of course simply reflect the fact that, in Dutch, personal pronouns are always possible; compare the discussion of example (27). It would be interesting, however, to examine if the difference might not reflect subtle differences in assignment of degrees of topicality to noun phrases.

The existence of different strategies for continuing reference back to an antecedent, coupled with the fact that the overall system makes only a binary distinction (personal versus demonstrative pronoun), can lead to ambiguity where more than two participants are involved. Consider, for instance, example (39):

(39) In oktober was Erasmus te Oxford, waar het hem aanvankelijk niet aangenaam leek, doch waarheen Montjoy hem zou volgen. Hij was aanbevolen aan John Colet, die vriendelijk verklaarde, geen aanbeveling meer nodig te hebben; hij kende Erasmus reeds uit diens brief aan Gaguin, in diens historiewerk, en had een hoge dunk van zijn geleerdheid. (H)
'In October Erasmus was in Oxford, where at first things did not please him, but where Montjoy was to follow him. He was recommended to John Colet$_i$, who explained in a friendly manner that he$_i$ no longer needed a recommendation; he$_i$ already knew Erasmus$_j$ from HIS$_j$ letter to Gaguin$_k$, in HIS$_k$ history work, and had a high opinion of his learning.'

The topic of the immediately relevant part, following the semicolon of the last sentence, is John Colet. The first occurrence of *diens* refers back to the less preferred antecedent, i.e. the letter is Erasmus'. From the broader context—linguistic, perhaps also in part also real-world—it is clear that the second *diens* refers back to *Gaguin*, i.e. Gaguin is the author of the history work referred to. However, out of context, there is nothing to prevent this second *diens* from being taken as referring back to Erasmus, and this is the interpretation typically assigned when the example is presented out of context.

4. Conclusion and prospects

In this paper, I have tried to argue that the use of demonstrative pronouns as anaphors in Dutch is conditioned pragmatically, by means of topic–comment structure, with the demonstrative excluding as antecedent the topic and requiring some nontopical actual antecedent. While I have used a substantial database in order to illustrate this claim, there is of course much more that could be done to strengthen (and perhaps modify—or even overturn?) it, for instance by collecting an even larger corpus of crucial examples to which real quantitative analysis can be applied. I leave this as a task for future research.

One obvious question that arises is: How does this Dutch phenomenon fit into the general background of reference-tracking devices? It shows clear similarities to some other reference-tracking devices, but is probably not identical to any of the better-known types. For instance, the use of the demonstrative pronoun might be compared with the use of stressed pronouns in English, as a means of indicating a less expected antecedent. But there is a crucial difference, as can be seen in example (40), where italics indicates emphasis:

(40) Wim sloeg Piet, en toen sloeg *die hem*.
'Wim$_i$ hit Piet$_j$, and then *HE*$_j$ hit *him*$_i$.'

In the English version, both pronouns receive emphasis, indicating that for each pronoun there is a change of grammatical relation/semantic role relative to the first clause. In the Dutch version too, both pronouns receive emphasis. However, only one of the pronouns is demonstrative, namely the one referring back to the nontopical antecedent of the first clause. The pronoun referring back to the topic of the first clause is emphatic, but a personal pronoun, i.e. in Dutch the emphatic/nonemphatic distinction does not coincide exactly with the demonstrative/personal pronoun distinction.

A close parallel might seem to be obviation in Algonquian languages. The demonstrative pronouns would correspond to obviative marking, the personal pro-

nouns to proximate; one would even the striking parallel possibility of "resetting" to proximate after use of the obviative to refer to a participant. The main difference would be that Dutch has no inflectional morphology marking the distinction. But some further examples from Dutch suggest that there may be a more important difference. In the examples considered so far, there have always been (at least) two potential antecedents, one excluded (on the basis of high topicality), the other actualized. Data presented by Geerts et al. (1984: 218)—example (41) below)—and confirmed by an example from the newspaper *Trouw* (17 September 1993) in the Nijmegen corpus—example (42) below)—suggest that it is possible to use the demonstrative pronoun as an anaphor even in the absence of an excluded antecedent, provided the antecedent is low in topicality; in (41)–(42), the antecedent is focus:

(41) Toen spraak de minister van Justitie. Deze hield staande dat de gevangenisoverheid geen schuld had aan de ontsnapping van de misdadigers.
'Then the Minister of Justice$_j$ spoke. HE$_j$ maintained that the prison authorities bore no responsibility for the escape of the criminals.

(42) Nadat gekozen is verdwijnt degene die is afgewezen uit beeld. Vervolgens wordt een andere patient of diens vertegenwoordiger aan het publiek voorgesteld.
'After the choice has been made, the one who has been rejected disappears from the picture. Thereupon another patient$_j$ or HIS$_j$ representative is introduced to the public.'

In Algonquian languages, it is not possible to have an obviative in a discourse segment in which there is no proximate. In conclusion, then, the Dutch construction shares obvious similarities with other, better described phenomena, but also seems to have some interesting properties of its own.

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References

Donaldson, Bruce C. 1993. A grammar of Afrikaans. Berlin/New York: Mouton de Gruyter.

Fillmore, Charles J. 1975. Santa Cruz lectures on deixis 1971. Bloomington: Indiana University Linguistics Club.

Geerts, G., W. Haeseryn, J. de Rooij, and M. C. van den Toorn (eds.). 1984. Algemene Nederlandse spraakkunst. Groningen: Wolters-Noordhoff; Leuven: Wolters.

Huizinga, J. 1936. Erasmus. 3rd edn. Haarlem: Tjeenk Willink.

Kibrik, Andrej. 1990. Tipologija sredstv oformlenija anaforičeskix svjazej. Cand. Phil. dissertation, Institute of Linguistics, Academy of Sciences of USSR, Moscow.

Kirsner, Robert S. and Vincent J. van Heuven. 1988. The significance of demonstrative position in Modern Dutch. Lingua 76: 209–248.

Lepschy, Anna Laura and Giulio Lepschy. 1988. The Italian language today. 2nd edn. New York: New Amsterdam Books.

Kozinsky, Isaac & Maria Polinsky. 1993. Causee and patient in the causative of transitive: coding conflict or doubling of grammatical relations? Causatives and transitivity, ed. by Bernard Comrie & Maria Polinsky,177–240. Amsterdam: John Benjamins.

Zifonun, Gisela, Ludger Hoffmann, and Bruno Strecker. In press. Grammatik der deutschen Sprache. Berlin/New York: Walter de Gruyter.

Diagnosing illness across languages: The role of interpreters in medical discourse.

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Recent research on medical discourse has focused on the problematic nature of talk between physicians and patients (cf. Freeman 1987, Ong et. al. 1995). Power relations inside the medical institution inform the medical interview, at all levels; the typical social, economic, and educational differences between doctors and patients, as well as their relative positions of authority within the institution, have been shown to influence the diagnosis and recommended treatment of illnesses (Fisher 1995, Hein and Wodak 1987, Waitzkin 1991, inter alia). Clinical visits where an interpreter is needed represent an especially problematic area of clinical discourse; in interpreted discourse, the patient and physician must deal with an added 'barrier' to communication, the linguistic barrier. In addition to the potential complications of communication related to the differing goals and expectations of physicians and patients, there is the added difficulty of communicating through an intermediary, who brings his or her own frame of reference, as well as linguistic skills at interpreting, to the interaction.

There has been a recent, significant increase in patients who need interpreters when visiting their physician. According to the 1990 census, there are 14 million people in the United States who have limited or no English proficiency. The co-indexing of non-English language competence with recent immigration, recent immigration with poverty, and poverty with severe illness means that, for the majority of the non-English speaking patient population, the effective delivery of health care is both critical and compromised. The necessary presence of an interpreter makes clinical discourse linguistically (and often socially) complicated for non- or limited English speaking patients (Bendix 1988, Buchwald et. al. 1993, Woloshin et. al. 1995). Many physicians feel that language barriers are not eliminated, but are rather replaced by other (usually lexical) barriers, when interpreters are used (Ebden et. al. 1988, Vasquez and Javier 1991). Hospital based interpreters, on the other hand, see interpreting as an opportunity. They view themselves as potential 'ambassadors', patient advocates as well as linguistic bridges between doctors and patients (Haffner 1992). They argue that the job of the interpreter goes beyond the strict translation of utterances, and that their knowledge of the social realities of immigrants' lives and cultures gives them insights into reported symptoms that are crucial to diagnosing illnesses and treating them appropriately.

This paper looks at the effects of (Spanish-English) interpretation on medical interviews, specifically asking the questions, 'what are the effects of interpretation on clinical discourse?', and 'what is the role that interpreters play within clinical conversations?'. The data were collected at the General Medical Clinic of a large, public, county-run hospital in Northern California between April and October, 1997. All of the data come from tape-recordings and observations of clinic visits where a professional, hospital based Spanish interpreter was used for communication between a Spanish monolingual patient and an Non-Spanish speaking physician. Three major findings are reported: 1) interference in professionally interpreted cross-linguistic conversations comes overwhelmingly at the pragmatic (inferencing), and not the semantic (propositional) level, a fact which is significant for the process of diagnosing illnesses; 2) 'interpreter' is not a role

that is sanctioned inside medical interviews; and 3) the turn-taking mechanisms for interpreted conversations are largely infelicitous when compared to same-language interactions. All of these findings are mutually reinforcing: role confusion (2) leads to interruption of discourse (3), and interruptions (3) lead to pragmatically strange conversations (1). I address these findings in order, then, with the understanding that the progression is apparent, and not causal.

The first finding is that pragmatic interference results in many of the clinical misunderstandings in interpreted discourse. The process of diagnosis, especially in general or internal medicine, is essentially one of the co-construction of the 'story' of an illness (Schechter et. al. 1996). Patients provide physicians with an account of 'what is wrong', either on their own or in response to specific questions, and physicians take the *relevant* facts, throwing away the irrelevant ones, and through this process create a diagnosis (Fisher 1983, Mishler 1984). Gricean maxims of relevancy in the clinic are essential, especially given the time constraints on physicians in a public institution: often they are given no more than 15 minutes of actual consultation time. So if a physician asks, 'How long have you been ill?', and the patient's response is, 'Since my brother moved in with us', there had better be, from the patient's point of view, a logical connection between the illness and the brother moving in, because it is almost certain that the physician will not only assume this connection, but will immortalize it in the chart notes which will follow the patient forever (cf. Cicourel 1981, 1983, Garfinkel 1967, Smith 1996).

When an interpreter is present during the medical interview, the process of diagnosis must happen through the interpreter; this means that, whatever is said by the physician or the patient must be conveyed through the interpreter. Almost without exception, the interpreter's contributions to the conversation are viewed as being equivalent, in both referential meaning and in the inferences that can be drawn from them, to the contributions of the speaker who is being interpreted. This equivalence, however, is only partial, though not because interpreters are incompetent. Rather, there are two reasons why interpreters' utterances are not, nor can they be, perfectly equivalent to those of the speakers whom they are representing. First is that absolute equivalency is impossible to attain for two utterances in two different languages, a fact universally recognized by all students of interpretation (Nicholson 1992). Second, the real-time 'question and answer' pattern that is typical for medical interviews is lost- there is a significant temporal, as well as linguistic, lag between what is said to a physician/patient, and what is eventually conveyed through the interpreter. This lag leads, at times, to the loss of relevance of some utterances, and strange or unintended interpretations of other. Excerpt 1 shows exactly how the act of interpretation causes the relevance of some utterances to be lost:

Excerpt 1: (D = Doctor, I = Interpreter, P = Patient)

D: Ok, right. And how long has this been going on for?

I: ¿Y por cuanto tiempo le ha venido sucedir esto?
And for how long has this been happening to you?

P: Pues, yo traté de decirle al doctor de, de hace mas, cuatro cinco visitas para atras
Well, I tried to tell the doctor, more than, four five visits ago

I: mm-hm.

P: que ya me estabe sucediendo. Pero, que no sé si él me entendía o no.
that it was already happening to me. But, what I don't know is if he understood or not.

I: Pero, hace, hace cuando le comenzó a, a sucedir esto?
But, since, since when did this begin to happen to you?

P: Más o menos como un año, yo creo.
More or less about a year, I think.

I: About a year.

D: Ok. (9 second pause). And it goes away by itself?

Just before the dialogue in this excerpt, the patient has just reported, through the interpreter, that his eyes burn periodically, as if they had 'chili' in them. The physician asks how long the symptoms have been occurring. The interpreter chooses not to interpret a response which is in fact clinically, pragmatically relevant, which is that they have been occurring, *and the patient has been reporting them*, for over a year. Instead, she reiterates the physician's question, 'but how long?', looking for a directly temporal answer, which she takes to be more directly relevant. This is partly an attempt by the interpreter to keep patients 'on track'; interpreted visits take nearly twice as long as uninterpreted visits, and one of the reasons this interpreter is so popular with physicians is because she is extremely fast.

In this case, however, keeping the patient on track results in a mis-assessment of the importance of the symptom. To the physician, a symptom that the patient has had for over a year, but which he only now chooses to report on, is far less serious, and more importantly, far less *credible* than one which the patient has been complaining of continuously for over a year. The physician then asks the patient the question, 'does it go away by itself?', which means, 'is the disease self-limiting, and do I need to treat you for it?', which is a typical question for a symptom that is not considered serious. To the patient, the question implies that the physician does not take the symptom seriously; he could easily repeat, at the next visit, the same lament, that he does not even know if the physician understood him. Remember that the only verbal information that the physician and the patient receive comes from the interpreter herself, and that the responses they receive from her can be, and are necessarily, assumed to be a reasonably complete version of what was said in the other language. The interpreters choices of what to interpret and what not to interpret are essentially invisible; strange or odd statements are almost always attributed to the interpretee (cf. Bendix 1988).

This excerpt is also an example of the second finding, which is the 'role confusion' of interpreters in interpreted discourse. The role of 'interpreter' is not conversationally available for the hospital-based interpreter; by that I mean that the interpreter virtually never injects meta-commentary, either on the process of interpretation or as a participant in the conversation. Even though the interpretation of meaning is by no means an easy task, interpreters will struggle to interpret incoherent and patently strange comments, rather than make themselves 'visible'

within the conversation. On a purely linguistic level, there is no 'neutral' pronoun in English- the interpreter must either report speech, or produce it as her own. Socially, the interpreter is again forced to choose how to ally herself— if both speakers talk at once, she will choose one of them to interpret, effectively silencing the other.

In excerpt 1, we see that interpreter neutrality is difficult on a more conversational level, as well. The interpreter essentially is acting as a surrogate for the doctor in this instance, determining the clinical relevance of facts and interpreting them on the basis of this determination. There is no 'neutral stance'; the interpreter is an informational gatekeeper. One could say that this example is in fact 'lexical interference', because there are words that were simply not interpreted by the interpreter. What is significant about this excerpt for this analysis is that it is the diagnostic process that is being disrupted, *not* the confusion of lexical meanings, and this disruption is a function of the interpreter's conversational role as something more than a neutral conversational 'pivot'.

In excerpt 2, the lack of an appropriate, sanctioned role for an interpreter inside the conversation is even clearer:

Excerpt 2: (D = Doctor, I = Interpreter, P = Patient)

D: Ok, did you bring your peak flow meter with you? (1.5 second pause). That meter with the little red dial?

I: Eh, trajo, lo unao, un:, como meter?
Eh, did you bring, the uh, a, like, meter?

--> I-I-don't know what you're talking about (softly).

D: You have something at home, it looks like THIS.

I: Ud. tiene [algo en su casa]
You have [something in your home]

P: [xxxx]

D: And it has a little:=

I: =que parece=
=that looks like=

D: =a [red piece]

I: [como asi]
[like this]

D: that goes up and down?

I: Y tiene: una:, partecita roja que va arriba y abajo.
And it has: a: little red piece, that goes up and down.

One hallmark of a legitimated conversational role is the right to question what has just been said. In this excerpt, the physician asks the patient a question about a device which the interpreter is unable to interpret, because she has no idea what it is. The physician, however, takes the interpreter's comment, 'I don't know what you're talking about', to be coming from the patient, even though the patient has not at this juncture said anything in response to the question. The physician does not even address the interpreter, but rather continues to talk to the patient. What is significant about this excerpt is not only that it brings to the fore the difficult conversational position of the interpreter, but also that this is the only example in all of my data of an interpreter saying, 'I don't know what you mean'.

The final finding, that of turn-taking interference, is more easily demonstrated with a quantitative analysis of the transcripted data. The process of interpretation, if it is simultaneous, necessarily means that the interpreter will be speaking while the person she is interpreting for is speaking, and in a different language. The same is true for consecutive interpretation, except that in these cases the interpreter, in lieu of responding to the last utterance of her interlocutor, will begin talking in a language this interlocutor doesn't understand. Table 1 is an analysis of the patterns of overlaps (speakers speak simultaneously), interruptions (one speaker begins talking before another is finished; the overlapped speaker stops talking before his or her utterance is finished), and latches (one speaker begins talking just as another speakers stops talking, with no silence in between the two utterances) possible within an interpreted conversation:

TABLE 1: Possible patterns of interruption in interpreted discourse.

Speaker on the left overlaps (>), latches (=), or interrupts (#) right-hand speaker				
	Patient	Doctor	Interpreter Spanish	Interpreter English
Patient	*	4	1	3
Doctor	4	*	3	1
Int. Spanish	1	2	*	*
Int. English	2	1	*	*

1) Conversational overlaps, interruptions, and latches (same lg.):

Is >,#,= P, P >,#,= Is

Ie >,#,= D, D >,#,= Ie

2) Interpretation overlapping, latching, or interrupting to interpret (quasi-simultaneous interpretation in progress):

Ie >,#,= P, Is >,#,= D

3) Overlapping <u>over</u> interpretation, interrupting or latching interpretation:

P >,#,= Ie, D >,#,= Is

4) "Blind" overlaps, interruptions, or latches (speaking different languages):

P >,#,= D, D >, #,= P

Because the interpreter can have conversations with the patient in Spanish, and with the physician in English, we can say that, in a sense, there are 3 participants in the conversation, but 4 participant roles: the patient, the doctor, the interpreter when she is speaking in Spanish, and the interpreter when she is speaking in English. Within the conversation, then, patterns of turn-taking can be classified as they in Table 1: the types of interference are interruptions, overlaps, and latches. Interruptions are the most intrusive and potentially disruptive, as they take the floor from a speaker in the middle of his or her utterance, as judged by syntactic and intonational cues. The relevant categories are turn taking mechanisms within the same language (type 1), and turn taking mechanisms across languages (types 2-4). Type 2 is the interpreter interrupting, overlapping, or latching on to a speaker's turn, in another language: this is, in effect, simultaneous, or quasi-simultaneous interpretation. Type 3 is the reverse: the patient or the physician interrupting the interpreter while she is talking in another language. Type 4 is the most potentially disruptive type of interference, between the patient in Spanish and the physician in English, because neither participant knows what the other is saying, and consequently has no idea what he or she is overlapping or interrupting.

An analysis of this type could be performed on an interaction, tallying all of the different possible overlaps, latches, and interruptions. Table 2 shows the results of tallying up the analyses of five different, professionally interpreted conversations. The left-hand speaker in each column heading (P, D, Is, or Ie, representing the Patient, the Doctor, the Interpreter speaking in Spanish, or the interpreter speaking in English) is counted as interfering with the speaker on the right. Thus, the first column tallies the number of times, in five visits, the patient overlaps, latches or interrupts the interpreter while the interpreter is speaking in Spanish; the second column represents the number of times the Interpreter, speaking in Spanish, overlaps, latches or interrupts the patient (who speaks exclusively in Spanish); the third column represents the number of times the physician interferes with the interpreter while he or she is speaking in English; etc.

TABLE 2

Total interruptions (#), overlaps (>), and latches (=), for all visits:

P - Is (1)	Is - P (1)	D - Ie (1)	Ie - D (1)	Ie - P (2)	Is - D (2)	P - Ie (3)	D - Is (3)	P - D (4)	D - P (4)
Visit 6:									
# 9 > 5 = 1	# 2 > 2 = 0	# 1 > 3 = 0	# 0 > 0 = 0	# 3 > 11 = 0	# 2 > 1 = 1	# 3 > 2 = 0	# 1 > 0 = 1	# 1 > 2 = 0	# 1 > 1 = 0
15	**4**	**4**	**0**	**14**	**4**	**5**	**2**	**3**	**2**
Visit 28:									
# 13 > 6 = 3	# 5 > 2 = 2	# 6 > 0 = 0	# 0 > 3 = 0	# 13 > 24 = 3	# 0 > 1 = 1	# 5 > 18 = 0	# 0 > 4 = 1	# 1 > 5 = 0	# 7 > 4 = 1
22	**9**	**6**	**3**	**40**	**2**	**23**	**5**	**6**	**12**
Visit 48:									
# 5 > 1 = 3	# 6 > 1 = 0	# 10 > 4 = 1	# 6 > 1 = 1	# 12 > 3 = 1	# 2 > 2 = 0	# 4 > 7 = 0	# 2 > 1 = 1	# 1 > 0 = 0	# 1 > 0 = 0
9	**7**	**15**	**8**	**16**	**4**	**11**	**4**	**1**	**1**
Visit 49:									
# 0 > 6 = 5	# 2 > 7 = 2	# 0 > 2 = 4	# 0 > 2 = 2	# 7 > 4 = 5	# 2 > 11 = 6	# 2 > 2 = 0	# 4 > 4 = 2	# 0 > 1 = 0	# 0 > 0 = 1
11	**11**	**6**	**4**	**16**	**19**	**4**	**10**	**1**	**1**
Visit 50:									
# 13 > 7 = 5	# 9 > 2 = 0	# 2 > 1 = 0	# 2 > 1 = 0	# 27 > 5 = 5	# 10 > 5 = 7	# 19 > 6 = 2	# 3 > 2 = 0	# 4 > 2 = 1	# 3 > 0 = 1
25	**11**	**3**	**3**	**37**	**22**	**27**	**5**	**7**	**4**
TOTALS									
# 40 > 25 = 17	# 24 > 14 = 4	# 19 > 10 = 5	# 8 > 7 = 3	# 62 > 47 = 14	# 16 > 20 = 15	# 33 > 35 = 2	# 10 > 11 = 5	# 7 > 10 = 1	# 12 > 5 = 3
82	**42**	**34**	**18**	**123**	**51**	**70**	**26**	**18**	**20**

In the five conversations analyzed so far, interpreters are interrupting patients to interpret far more often than they are interrupting physicians. Patients, on the other hand, are interrupting interpreters during Spanish conversations, and to talk over the act of interpretation. In the one case where a physician was interrupted more than the patient in an interview (Conversation 49), we see that in fact the interruptions were mostly overlaps; the patient is still more frequently interrupted than the physician. Far from being patient advocates, interpreters are being patient interrupters. Appendix A (Table 3) shows the same data, represented in bar graph form.

What we learn from this is that, as a discourse process, medical interpreting is immensely complex. The interpretation of pragmatic as well as semantic content requires a delicate balance between roles of advocacy and fidelity, or between creative and literal interpretation. There are numerous constraints on the ways in which this process is carried out; time constraints in the clinic, a shortage of interpreters, and a misunderstanding of the process of interpretation by those who use interpreters, all seem to add to the difficulties in medical interpreting. Before recommendations can be made regarding the use of interpreters in clinical settings, the interplay between the process of diagnosis and the process of interpretation will first need to be explored more fully; the findings presented here are only intended as a rough guide to what approach such an exploration might take.

References:

Baker, David W., Ruth M. Parker, Mark V. Williams, Wendy C. Coates, and Kathryn Pitkin. 1996. Use and effectiveness of interpreters in an emergency room department. Journal of the American Medical Association 275(10):783-788.

Bendix, Edward. 1988. Metaphorical and literal interpretations: cross-cultural communication in medical settings. CUNYForum 13:1-16.

Buchald, Debra, Caralis V. Panagiota, Francesca Gany, Eric J. Hardt, Marjorie Muecke, and Robert W. Putsch III. 1993. The medical interview across cultures. Patient Care April 15, 1993:141-166.

Cicourel, Aaron V. Language in medicine. In Charles A. Ferguson and Shirley Brice Heath, eds. Language in the USA:407-429. New York: Cambridge University Press.

Cicourel, Aaron V. 1983. Hearing is not believing: language and the structure of belief in medical communication. In Sue Fisher and Alexandra Dundas Todd, eds. The social organization of doctor-patient communication:221-240. Washington, DC: Center for Applied Linguistics.

Ebden, Phillip, Arvind Bhatt, Oliver J. Carey, Brian Harrison. 1988. The bilingual consultation. The Lancet 1988(1):347.

Fisher, Sue. 1983. Doctor talk/ patient talk: how treatment decisions are negotiated in doctor-patient communication. In In Sue Fisher and Alexandra Dundas Todd, eds. The social organization of doctor-patient communication:135-158. Washington, DC: Center for Applied Linguistics.

Fisher, Sue. 1995. Nursing wounds: nurse practitioners, doctors, women patients and the negotiation of meaning. New Brunswick, NJ: Rutgers University Press.

Freeman, Sarah H. 1987. Verbal communication in medical encounters: an overview of recent work. Text 7(1):3-18.

Garfinkel, Harlold. 1967. Studies in ethnomethodology. Cambridge: Polity Press.

Haffner, Linda. 1992. Translation is not enough: interpreting in a medical setting. in Cross Cultural Medicine- A Decade Later [Special Issue]. The Western Journal of Medicine 157(3):255-259.

Hein, Norbert and Ruth Wodak. 1987. Medical interviews in internal medicine: some results of an empirical investigation. Text 7(1):37-65.

Mishler, Elliot G. 1984. The discourse of medicine: dialectics of medical interviews. New Jersey: Ablex Publishing Company.

Nicholson, Nancy Schweda. 1992. Linguistic theory and simultaneous interpretation: semantic and pragmatic considerations. Babel 38(2):90-100.

Ong, L. M. L., J. C. J. M. de Haes, A. M. Hoos and F. B. Lammes. 1995. Doctor-patient communication: a review of the literature. Social Science and Medicine 40(7):903-918.

Schechter GP, Blank LL, Godwin HA, LaCombe MA, Novack DH, Rosse WF. 1996. Refocusing on history-taking skills during internal medicine training. American Journal of Medicine 101:210-216.

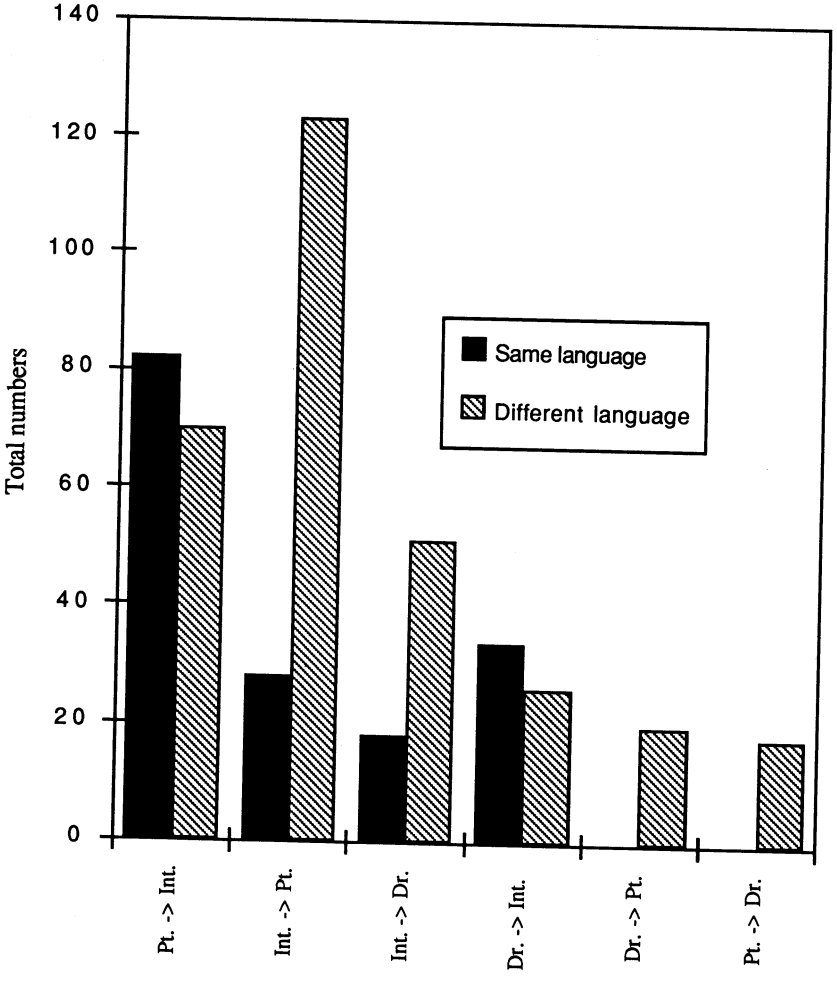
Smith, Robert C. 1996. The patient's story: integrated patient-doctor interviewing. Boston, New York, London, Toronto: Little, Brown and Company.

Vasquez, Carmen, and Rafael A. Javier. 1991. The problem with interpreters: communicating with Spanish-speaking patients. Hospital and Community Psychiatry 42:163-165.

Waitzkin, Howard. 1991. The politics of medical encounters: How patients and doctors deal with social problems. New Haven and London: Yale University Press.

Woloshin, Steven, Nina A. Bickell, Lisa M. Schwartz, Francesca Gany, and Gilbert Welch. 1995. Language barriers in medicine in the Unites States. Journal of the American Medical Association 273(9):724-728.

Appendix A (Table 3): Total interruptions, overlaps, and latches for 5 conversations



Predicative demonstratives

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1. Introduction

Demonstratives are commonly subdivided into demonstrative pronouns, which substitute for a NP, and demonstrative determiners, which modify a noun. In this paper I argue that many languages have, in addition, a particular class of *predicative demonstratives*. Predicative demonstratives occur in the topic position of identificational sentences with a predicate nominal.[1] I call them predicative demonstratives because they are especially common in nonverbal clauses, where they are often glossed as 'this/that is' (e.g. Dayley 1989:145; Carlson 1994:241). Two initial examples from Karo Batak (a) and Tümpisa Shoshone (b) are given in (1):

(1) a. Énda kampuh.
This sarong
'This is a sarong.' (Woollans 1996:123)
b. Asü hipikkahni.
That is bar
'That's a bar.' (Dayley 1989:145)

Predicative demonstratives are usually considered demonstrative pronouns in subject function. Challenging this view, I argue that in many languages the demonstratives in identificational sentences constitute a particular grammatical class of demonstratives that is distinct from the class of demonstrative pronouns. My hypothesis is based on three different observations: first, the demonstratives in identificational sentences are often phonologically distinct from demonstrative pronouns; second, they frequently have particular morphological features; and third, their syntactic behavior often differs from the syntactic behavior of the demonstrative pronouns that function as subjects in other syntactic constructions. If the demonstratives in identificational sentences have a particular phonological form, or if their morphological or syntactic features are different from demonstratives that occur in other contexts, I assume that there is a particular class of predicative demonstratives in the language.

It must be emphasized that, although many languages distinguish predicative demonstratives from demonstrative pronouns, it is by no means unusual that a language uses the same demonstratives in identificational sentences as in other syntactic contexts. In English, for instance, the demonstratives in identificational sentences have the same phonological form and the same morphosyntactic properties as the demonstrative pronouns that occur in other constructions, and thus I assume that English does not have a particular class of predicative demonstratives. To put it another way, predicative demonstratives are not simply the demonstratives that occur in the topic position of identificational sentences; rather, they are defined as a particular grammatical class of demonstratives with specific phonological, morphological, and/or syntactic properties that are distinctic from those of demonstrative pronouns. If the demonstratives in identificational sentences have the same grammatical features as the demonstratives in other syntactic contexts, there is no evidence for a categorical distinction between predicative demonstratives and demonstrative pronouns in the language.

My study is organized as follows: Section 2 presents the evidence for the central hypothesis of this paper, that many languages employ a particular class of predicative demonstratives distinct from demonstrative pronouns. Section 3 shows, in addition, that predicative demonstratives provide the historical source for the

development of certain nonverbal copulas. My analysis challenges previous studies in which it is claimed that nonverbal copulas derive from an anaphoric demonstrative pronoun (e.g. Li and Thompson 1977; Schuh 1983; Devitt 1994)

2. Evidence for a particular class of predicative demonstratives

2.1. Phonological evidence

In many languages the demonstratives that occur in the topic position of identificational sentences have a different phonological from than the demonstratives that occur in other syntactic contexts. I take this as one piece of evidence for my hypothesis that the demonstratives in identificational sentences are often categorically distinct from the demonstrative pronouns. Examples from Supyire, Izi, Ponapean, Karo Batak, and Kilba are given below.

The predicative demonstratives in Supyire (2) differ from the demonstrative pronouns in that the latter have an initial nasal consonant which does not occur with the predicative demonstratives. (2) shows the full paradigms of the demonstrative pronouns and the predicative demonstratives, and it provides two sentences that show the two types of demonstratives in context: *ŋ̀gé* in (2a) is a demonstrative pronoun, while *ké* in (2b) functions as a predicative demonstrative in a nonverbal clause.

(2)

	pronoun		predicative	
NC1	ŋ̀gé (sg)	m̀píí (pl)	we (sg)	pii (pl)
NC2	ŋ̀ké (sg)	ɲ̀je (pl)	ke (sg)	ye (pl)
NC3	ǹdé (sg)	ɲ̀cíí (pl)	le (sg)	cii (pl)
NC4	nté		te	
NC5	m̀pé		pe	(Carlson 1994:159-161)

a. Mu à pyi a ŋ̀ké cé la?
you perf past perf DEM.G1S know Q
'Did you know this/that one?' (Carlson 1994:190)

b. Ku ké.
it(G2S) here.is(G2S)
'Here/there it is.' (Carlson 1994:241)

In Izi (3), demonstrative pronouns begin with a rounded mid back vowel and they have at least two syllables. By contrast, the predicative demonstratives *wáà* and *nóò* begin with a consonant and consist of only one syllable (the double consonants indicate a long vowel carrying a particular tone).

(3)

	pronoun	predicative
'that'	òno / òno!ya	wáà
'this'	ọ̀wá / ọ̀wána	nóò
'that (other)'	ọ̀phúù / ọ̀phúnà	-- (Meier et. al. 1975:150-1, 264-5)

a. á zọ́hä ke ̣ òno.
one forget one that
'...one should forget that one.' (Meier et. al. 1975:168)

b. wáà ké ọ́kpọ́bé ọ̀nyà mù.
this true friend mine
'This is (for) my true friend.' (Meier et. al. 1975:166)

In Ponapean (4), demonstrative pronouns have an initial bilabial nasal, which is replaced by a high front vowel if a demonstrative occurs in the topic slot of an identificational sentence, that is, if it is used as a predicative demonstrative.

(4)

	pronoun		predicative	
near S	met (sg)	metakan (pl)	iet (sg)	ietakan (pl)
near H	men (sg)	menakan (pl)	ien (sg)	ienakan (pl)
away S/H	mwo (sg)	mwohkan (pl)	io (sg)	iohkan (pl) (Rehg 1981:143-54)

a. Met pahn mengila.
'This will wither.' (Rehg 1981:143)

b. Io sounpadakho.
'There is that teacher.' (Rehg 1981:143)

In Karo Batak (5), *éna, ah,* and *oh* are used as predicative demonstratives in nonverbal clauses, while *énda* and *é* function as demonstrative pronouns.

(5)

	pronoun	predicative
'this'	énda	éna
'that'	é	ah / oh (Woollans 1996:122-123)

a. É la kubegi.
that not I.hear
'I didn't hear that.' (Woollans 1996:123)

b. Ah motorta.
that vehicle.our
'There's our vehicle.' (Woollans 1996:123)

Finally, in Kilba (6), predicative demonstratives are monosyllabic, while demonstrative pronouns consist of two or more syllables.

(6)

	pronoun	predicative
proximate	(nɔ́)nɔ́nna	ná
distal	(nà)ndándà	ndá
removed	(ŋgə̀)ŋgɔ́ŋgà	ŋgá (Schuh 1983:315-317)

a. Kə̀tə̀ŋ nà.
'It's a sheep.' (Schuh 1983:318)

b. (no example including a demonstrative pronoun is given in Schuh 1983)

Note that the predicative demonstratives in these examples show the same deictic distinctions as the demonstrative pronouns: the distinction between proximate and distal reference, for instance. This is an important fact, because it shows that predicative demonstratives are genuine deictic expressions; they are not just existential markers like the expletives *it* and *there* in English. In fact, predicative demonstratives are especially common in face-to-face conversations, where they are often accompanied by a pointing gesture. As pointed out in several studies, one of the most common uses of predicative demonstratives is in answer to questions such as 'Who' or 'What is this?' (e.g. Schuh 1983; Carlson 1994). An example from Modern Hebrew is given in (7).

(7)

Mi ze?	Ze aba sheli.
who this	this father mine
'Who is this?'	'This is my father.' (Informant)

2.2. Morphological evidence

There are a number of languages in my language sample in which predicative demonstratives have the same demonstrative stems as demonstrative pronouns, but differ in their morphological behavior. Examples from Nunggubuyu, Tümpisa Shoshone, Ambulas, French, and German are given below.

In Nunggubuyu (8), demonstrative pronouns take two noun class markers, one that is prefixed and another one that follows the demonstrative stem. Unlike the demonstrative pronouns, the predicative demonstratives only occur with one noun class marker, namely the one that is suffixed. The examples in (8) show the masculine, singular forms; like all other demonstrative forms, they can be expanded by certain morphemes such as the marker for anaphoric reference *-yuŋ* in (8a).

(8)

	pronoun	predicative
proximate	na:-ʔ-gi	ya-gi
immediate	na:-da-gi	da-gi
distant	nu:-ʔwa:-gi	yuwa-gi
anaphoric	nu:-ʔba-gi	ba-gi (Heath 1984:272-274)

a. niyaŋgi buguni nu:-ʔba-gi-yuŋ
he went to there (Anaph) that one (Msg Anaph)
'That man went there.' (Heath:1980:160)

b. ya:-gi na-walyi-ŋuŋ
this-Msg Msg-male-HumSg
'Here is the man.' (Heath 1984:278)

In Tümpisa Shoshone (9), demonstrative pronouns take number and case suffixes, and they may occur with the proximate marker *s-*, if they refer back to the most topical NP in the previous discourse. By contrast, predicative demonstratives are unmarked for number; they take a particular case suffix *(-sün);* and they never occur with the proximate prefix *s-*, that is, predicative demonstratives are only used in the obviative form.

(9)

		pronoun		predicative
		subj	obj	
this here	sg	(s)-i-tü	(s)-i-kka	i-sü(n)
	du	(s)-i-tungku	(s)-i-tuhi	
	pl	(s)-i-tümmü	(s)-i-tümmi	
this nearby	sg	(s)-e-tü	(s)-e-kka	e-sü(n)
	du	(s)-e-tungku	(s)-e-tuhi	
	pl	(s)-e-tümmü	(s)-e-tümmi	
that visible	sg	(s)-a-tü	(s)-a-kka	a-sü(n)
	du	(s)-a-tungku	(s)-a-tuhi	
	pl	(s)-a-tümmü	(s)-a-tümmi	
that invisible	sg	(s)-u-tü	(s)-u-kka	u-sü(n)
	du	(s)-u-tungku	(s)-u-tuhi	
	pl	(s)-u-tümmü	(s)-u-tümmi	
neutral	sg	ma-tü	ma-kka	ma-sü(n)
	du	ma-tungku	ma-tuhi	
	pl	ma-tümmü	ma-tümmi (Dayley 1989:137-138)	

a. U punikka setü.
it see this
'This one saw it.' (Dayley 1989:141)
b. Esü nahim pungku.
This our (dl) pet
'This is our pet.' (Dayley 1989:145)

In Ambulas (10), *kén* and *wan* are used as predicative demonstratives in nonverbal clauses. The demonstrative pronouns involve the same demonstrative forms, but *kén* and *wan* are combined with the personal pronouns, yielding complex pronominal forms, which are differentiated for gender and number.

(10)

	pronoun			predicative
proximate	dé-kén (m.sg)	bé-kén (pl)	de-kén (du)	kén
	lé-kén (f.sg)			
distal	dé-wan (m.sg)	bé-wan (pl)	de-wan (du)	wan
	lé-wan (f.sg) (Wilson 1980:55-57)			

a. wu-na kayékni dé-wan.
I-pos reflection he-that
'My reflection is that.' (Wilson 1980:157)
b. Kén bakan walkamu taalé.
this just little place
'This is just a little place.' (Wilson 1980:454)

In French (11), the demonstrative that is primarily used in identificational sentences is the particle *ce*. *Ce* is a predicative demonstrative with different morphological features than the demonstrative pronouns *celui* and *celle;* the latter inflect for gender and number, while *ce* is uninflected.

(11)

	pronoun		predicative
proximate (m)	celui-(ci) (sg)	ceux-(ci) (pl)	ce
proximate (f)	celle-(ci) (sg)	celles-(ci) (pl)	
distal (m)	celui-(là) (sg)	ceux-(là) (pl)	
distal (f)	celle-(là) (sg)	celles-(là) (pl) (Calvez 1993:62-65)	

a. Donne-moi ce livre-là et garde celui-ci pour toi.
give me this book and keep this one for you
'Give me that book and keep this one for you.' (Calvez 1993:63)
b. C'est Paul.
this-is Paul
'It's Paul.' (Calvez 1993:64)

Finally, German uses the demonstrative *das* in the topic position of identificational sentences. The predicative demonstrative *das* is homophonous with the neuter, singular, nominative/accusative form of the demonstrative pronouns, but its morphological behavior is rather different. Demonstrative pronouns agree in gender and number with their reference object (12a). By contrast, the predicative demonstrative *das* does not agree with its semantic antecedent. In (12b) the antecedent of the predicative demonstrative *das*, *eine junge Frau* 'a young woman', has feminine gender; the sentence would be ungrammatical if *das* were a demonstrative pronoun. The reason why (12b) is acceptable is that the predicative demonstrative *das* is unspecified for

gender and number, and hence it is compatible with a semantic antecedent of any gender and number.

(12)

	pronoun				predicative
NOM	der (m.sg)	die (f.sg.)	das (n.sg)	die (pl)	das
GEN	dessen (m.sg)	deren (f.sg)	dessen (n.sg)	deren (pl)	
DAT	dem (m.sg)	der (f.sg)	dem (n.sg)	denen (pl)	
ACC	den (m.sg)	die (f.sg)	das (n.sg)	die (pl)	

a. Siehst du den roten Pullover? Der gefällt mir.
see you this (m) red (m) sweater this (m) like me
'Do you see this red sweater? I like it/this one.'

b. Peter traf eine junge Frau im Zug. Das war meine Schwester.
Peter met a (f) young (f) woman in-the train that (n) was my sister (f)
'Peter met a young woman on the train. She/that was my sister.'

2.3. Syntactic evidence

Finally, predicative demonstratives frequently differ from demonstrative pronouns in their syntactic behavior. Traditionally, predicative demonstratives are considered demonstrative pronouns that function as subjects. There are, however, a number of languages in my language sample where predicative demonstratives do not behave like ordinary demonstrative pronouns that function as subjects in other syntactic constructions.

To begin with, demonstrative pronouns functioning as subjects may be marked for nominative case. Most languages in my language sample do not have any overt case marking; but there is one language, Tümpisa Shoshone, in which demonstrative pronouns take a particular nominative suffix, if they are used as subjects (13a). Predicative demonstratives, though regarded as subjects, occur with a different case marker, *-sü(n)* (13b), which otherwise never occurs with a demonstrative form. In other words, the predicative demonstratives in Tümpisa Shoshone do not have the usual coding properties of demonstrative pronouns that function as subjects in other syntactic constructions.

(13) a. s-a-tü pai tsainnaanai'ih.
that (prox-dem-nom.sg) water-o hold-continuative-in motion
'She's carrying water.' (Dayley 1989:83)

b. A-sü hipikkahni.
that is (dem-case) bar
'That's a bar.' (Dayley 1989:145)

Furthermore, demonstrative pronouns that function as subjects usually control verb agreement, if there is any verb agreement in the language (e.g. Keenan 1976:316). There are, however, three languages in my language sample, German (14a), Dutch (14b), and French (14c), where the copula in identificational sentences does not agree with the subject if the subject is a demonstrative. In these languages, the copula agrees in number and person with the following predicate nominal rather than with the preceding subject. If the subjects in (14) were nouns or personal pronouns, or if the demonstratives functioned as subjects in other syntactic constructions, the verb would agree with the subject NP; it is only in identificational sentences with a demonstrative subject where verb agreement is not controlled by the subject.

(14) a. Das sind meine Eltern.
that.sg are my.pl parents
'These are my parents.'

a'. Das bin ich.
that.sg am I
'That's me.'

b. Dit zijn goede boeken.
this.sg are good books
'These are good books.' (Shetter 1994:37)

c. Ce sont de vers, ce n'est pas de la prose.
that.sg are art verses it/this neg-is neg art prose
'They (these) are verses; they are not (this is not) prose.' (Calvez 1993:64)

Finally, there are languages in which predicative demonstratives and demonstrative pronouns behave differently if they occur with a coreferential NP in the previous discourse. An anaphoric demonstrative pronoun usually agrees with its semantic antecedent, if their is any agreement marking between pronouns and antecedent NPs in the language. By contrast, if a predicative demonstrative occurs with a coreferential NP, it does not always agree with its semantic antecedent. Consider the following examples from Spanish (15) and Modern Hebrew (16).

(15) a. Ese es mi padre.
this (m.sg) is my father (m)
'That's my father.' (Informant)

b. Esa es mi madre.
this (f.sg) is my mother (f)
'That's my mother.' (Informant)

(16) a. Ze aba sheli.
this (m.sg) father (m) my
'This is my father.' (Informant)

b. Zot ima sheli.
this (f.sg) mother (f) my
'This is my mother.' (Informant)

The demonstratives in (15) and (16) inflect for gender and number, but they do not agree with their semantic antecedent; rather they agree with the predicate nominal in the same clause. That the agreement features of the predicative demonstratives are controlled by the predicate nominal is shown in the following example from Spanish (17), where the semantic antecedent and the predicate nominal have different genders. The predicative demonstrative *ese* has the same gender as the predicate nominal, *mi padre* 'my father', both are masculine; but its gender does not match the gender of its semantic antecedent, *esa persona* 'a person', which is feminine.

(17) Ves esa persona allá? Si, ese (*esa) es mi padre.
see.2sg this (f.sg) person (f) there yes this (m.sg) (*f.sg) is my father (m)
'Did you see this person? Yes, that was my father.' (Informant)

3. The reanalysis of predicative demonstratives as nonverbal copulas

Crosslinguistically, demonstratives provide a common historical source for the development of a wide variety of grammatical markers. For instance, demonstrative pronouns very frequently develop into relative and third person pronouns, and demonstrative determiners are often reanalysed as definite articles and noun class markers (e.g. Greenberg 1978; Lehmann 1982; Harris and Campbell 1995; Diessel 1997). Li and Thompson (1977) have furthermore shown that demonstratives are also

frequently reanalysed as nonverbal copulas. More specifically, they argued that nonverbal copulas derive from anaphoric pronouns, either from anaphoric personal pronouns or from anaphoric demonstrative pronouns. Subsequent studies by Schuh (1983), Eid (1983), Gildea (1993), and Devitt (1994) supported their finding.

In this section I argue that Li and Thompson's analysis is only partially correct. I agree with their hypothesis that nonverbal copulas often develop from a third person pronoun; but I do not believe that nonverbal copulas based on demonstratives develop from an anaphoric demonstrative pronoun. Before I discuss the development of nonverbal copulas from demonstratives, I will briefly describe the mechanism by which personal pronouns develop into copulas. The mechanism is shown in (18).

(18) [NP NP] / [NP_i (PRO_i NP)] ⇒ [NP_i COP_i NP]

Li and Thompson argued that the reanalysis of an anaphoric pronoun as a nonverbal copula originates from a construction that involves a topicalized NP and a nonverbal clause with an anaphoric subject pronoun. Since the topicalized NP and the pronominal subject are coreferential they usually agree, if there is any agreement marking in the language. When a nonverbal clause with a preceding topic is routinely used to express an identity relation between the topicalized NP and the predicate nominal, the topicalized NP is eventually renalysed as the subject and the anaphoric pronoun as the copula of a new type of identificational sentence. Li and Thompson based their analysis on evidence from a number of languages including Modern Hebrew where the reanalysis of personal pronouns as copulas is very recent; so recent, indeed, that their status as copulas is not immediately obvious. Consider the following examples.

(19) a. ha-sha'on$_i$ hu$_i$ matana.
the-clock (m.sg) is/he (m.sg) present (f.sg)
'The clock is a present.' (Glinert 1989:189)

b. Hevrat$_i$ bóing hi$_i$ taagid anaki.
company (f.sg) Boeing is/she (f.sg) corporation (m.sg) giant
'The Boeing company is a giant corporation.' (Glinert 1989:158)

In (19), *hu* and *hi* agree with the preceding NP, which is either the subject or the topicalized NP of a nonverbal clause. If the initial NP is the subject, *hu* and *hi* would be copulas; but if it is a topicalized NP, *hu* and *hi* would function as pronouns. Following a study by Berman and Grosu (1976), Li and Thompson argue that *hu* and *hi* are copulas in these examples. They present several arguments in support of their view: First, they point out that the NP preceding *hu* and *hi* can be a first or a second person pronoun as shown in (20):

(20) ani / ata / hu hu hašoter.
I / you / he he the policeman
'I am / you are / he is the policeman.' (Berman & Grosu 1976:271)

If *hu* were a pronoun in this example, the sentence would be ungrammatical, because pronominal *hu* and *hi* have to agree with their antecedent. Second, a topicalized NP is usually separated from the following clause by an intonational break. Since *hu* and *hi* follow the sentence-initial NP without a pause, the initial NP must be the subject rather than a topicalized NP that is resumed by a pronoun. And third, the predicate nominal of an identificational sentence like in (21a) can be

questioned (21b), while it is not possible to question the postverbal NP of a sentence with a topicalized (i.e. left-dislocated) NP as shown in (22).

(21) a. moše hu xayal.
Moshe he soldier
'Moshe is a soldier.' (Berman & Grosu 1976:277)

b. ma hu moše?
What he Moshe
'What is Moshe?' (Berman & Grosu 1976:277)

(22) a. moše, hu ohev et rivka.
Moshe, he loves ACC Rivka
'Moshe, he loves Rivka.' (Berman & Grosu 1976:277)

b. * et mi moše, hu ohev?
ACC whom Moshe, he loves
* 'Who is such that Moshe, he loves her.' (Berman & Grosu 1976:277)

Thus far, I agree with Li and Thompson's analysis that nonverbal copulas are derived from personal pronouns such as *hu* and *hi* in Modern Hebrew. However, I disagree with their claim that a nonverbal copula based on a demonstrative is derived from an anaphoric demonstrative pronoun. In contrast to their view, I maintain that nonverbal copulas based on demonstratives derive from a predicative demonstrative in a nonverbal clause.

Crucial evidence for my hypothesis comes from Modern Hebrew. Modern Hebrew has not only copulas that are derived from personal pronouns, but also nonverbal copulas that are based on a demonstrative source: *ze* (m), *zot* (f), and *éle* (pl). Like the nonverbal copulas that developed from personal pronouns, the nonverbal copulas that are based on demonstratives are still used with their original function; that is, apart from their usage as copulas, they are still used as demonstratives. If *ze, zot,* and *éle* are used as demonstratives, they function either as demonstrative pronouns or as predicative demonstratives. Demonstrative pronouns and predicative demonstratives have the same form, but they differ in their agreement behavior: anaphoric demonstrative pronouns agree in gender and number with a NP of the previous discourse, while predicative demonstrative agree with the predicate nominal that follows. Consider the following examples.

(23) a. Ten li kasda$_i$ aHéret, ani sane et zot$_i$.
give me helmet (f.sg) other I hate ACC this (f.sg)
'Give me another helmet, I hate this (one).' (Glinert 1989:100)

b. Zot$_i$ ha-siba$_i$.
that (f.sg) the-reason (f.sg)
'That is the reason.' (Glinert 1989:171)

The demonstrative pronoun *zot* at the end of (23a) agrees with a noun in the preceding clause, while the predicative demonstrative at the beginning of (23b) agrees with the predicate nominal that follows. (24) shows a demonstrative that is used as a copula.

(24) ha-báyit shelHa zot$_i$ dugma$_i$ tova.
the-house (m.sg) your is/this (f.sg) example (f.sg) good
'Your house is a good example.' (Glinert 1989:189)

In this example, the nonverbal copula *zot* does not agree with the preceding subject, *ha-báyit* 'the house', rather it agrees with the predicate nominal, *dugma* 'example', that follows. Since this is parallel to the agreement pattern of the predicative demonstrative in (23b), I conclude that the *zot*-copula is derived from a predicative demonstrative in a nonverbal clause, rather than from an anaphoric demonstrative pronoun as previous studies have claimed. (25) shows the mechanism by which a nonverbal copula derives from a predicative demonstrative.

(25) [NP] [PRED-DEM$_i$ NP$_i$] ⇒ [NP COP$_i$ NP$_i$]

(25) differs from (18), which shows the development of nonverbal copulas from personal pronouns, in two ways: first, the demonstrative/copula in (25) does not agree with the preceding subject, but rather with the predicate nominal that follows; and second the reanalysis of a predicative demonstrative as a copula occurs in a construction that is formed from two intonation units in discourse, a topical NP and a nonverbal clause that merge into one construction, rather than from a sentence with a topicalized (i.e. left-dislocated) NP.

Additional support for my analysis comes from languages in which predicative demonstratives and demonstrative pronouns have different forms. If there is a nonverbal copula based on a demonstrative in such a language, the nonverbal copula is usually homophonous with the predicative demonstrative in a nonverbal clause, while differing from the demonstrative pronouns. Two examples from Kilba (25) and Ambulas (26) are given below. In both languages the nonverbal copula (25a-26a) has the same form as the predicative demonstrative (25b-26b), while the demonstrative pronouns are phonologically or morphologically different (the forms are given in (6) and (10) above).

(25) a. ùsman Kilba ná.
Usman Kilba this
'Usman is a Kilba' (Schuh 1983:321)

b. Kə̀tə̀ŋ ná.
sheep this
'It's a sheep.' (Schuh 1983:318)

(26) a. kus mayéra wan kapéredi mu.
Sorcery that very.bad thing
'Sorcery is a very bad thing.' (Wilson 1980:159)

b. Wan kiyadé-na kayékni.
this who-pos reflection
'Whose reflection is that.' (Wilson 1980:157)

4. Conclusion

In this paper, I have presented data from a wide variety of languages in which the demonstratives in identificational sentences are phonologically, morphologically and/or syntactically different from demonstrative pronouns. Based on these data, I have argued that many languages have a separate grammatical class of predicative demonstratives that is distinct from demonstrative pronouns. In the second part of this paper, I have shown that predicative demonstratives provide the historical source for the development of certain nonverbal copulas. My analysis challenges previous studies that claimed that nonverbal copulas based on demonstratives derive from an anaphoric demonstrative pronoun.

NOTES

[1] Hengeveld (1992) presents a typology of non-verbal predications, including both predicate nominals and predicate adjectives. My study is confined to sentences with predicate nominals, because most grammars that I consulted do not provide enough information to determine whether the demonstratives in sentences with a predicate adjective are like predicative demonstratives or like the demonstrative pronouns that occur in sentences with a verbal predication.

REFERENCES

Berman, Ruth A. and Alexander Grosu. 1976. Aspects of the copula in Modern Hebrew. Studies in Modern Hebrew syntax, ed. by Peter Cole, 265-285. North Holland, Amsterdam.

Calvez, Daniel J. 1993. French reference grammar. Lincolnwood: National Textbook Company.

Carlson, Robert. 1994. A grammar of Supyire. Berlin and New York: Mouton de Gruyter.

Dayley, Jon D. 1989. Tümpisa (Panamint) Shoshone grammar. Berkeley, Los Angeles and Oxford: University of California Press.

Devitt, Dan. 1994. Copula constructions in cross-linguistic and diachronic perspective. Buffalo, NY: SUNY Buffalo dissertation.

Diessel, Holger. 1997. The diachronic reanalysis of demonstratives in cross-linguistic perspective. Chicago Linguistics Society 33.

Eid, Mushira. 1983. The copula function of pronouns. Lingua 59.197-207.

Gildea, Spike. 1993. The development of tense markers from demonstrative pronouns in Panare (Cariban). Studies in Language 17.53-74.

Glinert, Lewis. 1989. The grammar of Modern Hebrew. Cambridge: Cambridge University Press.

Greenberg, Joseph H. 1978. How does a language acquire gender markers, vol. 3, ed. by Joseph H. Greenberg, Charles A. Ferguson, and Edith A. Moravcsik, 48-82. Stanford: Stanford University Press.

Harris, Alice L. and Lyle Campbell. 1995. Historical syntax in cross-linguistic perspective. Cambridge: Cambridge University Press.

Heath, Jeffrey. 1980. Nunggubuyu deixis, anaphora, and culture. Chicago Linguistics Society 14.151-166.

Heath, Jeffrey. 1984. Functional grammar of Nunggubuyu. Canbera: Australian Institute of Aboriginal Studies.

Hengeveld, Kees. 1992. Non-verbal predication. Theory, typology, description. Berlin and New York: Mouton de Gruyter.

Keenan, Edward L. 1976. Towards a universal definition of 'subject'. Subject and topic, ed. by Charles N. Li, 305-333. New York: Academic Press.

Lehmann, Christian. 1982. Thoughts on grammaticalization: a programmatic sketch. Köln: Institut für Sprachwissenschaft.

Li, Charles N. and Sandra A. Thompson. 1977. A mechanism for the development of copula morphemes. Mechanisms of syntactic change, ed. by Charles N. Li, 419-444. Austin: University of Texas Press.

Meier, Paul and Inge Meier and John Bendor-Samuel. 1975. A grammar of Izi. A publication of the Summer Institute of Linguistics of the University of Oklahoma. Norman.

Rehg, Kenneth L. 1981. Ponapean reference grammar. Honolulu: The University of Hawaii Press.

Schuh, Russel G. 1983. Kilba equational sentences. Studies in African Linguistics 14.311-327.

Shetter, William Z. 1994. Dutch: an essential grammar. London and New York: Routledge.

Wilson, Patricia R. 1980. Ambulas grammar. Ukarumpa, Papua New Guinea: Summer Institute of Linguistics. Ukarumpa.

Woollans, Geoff. 1996. A grammar of Karo Batak, Sumatra. Canberra: The Australian National University.

MORPHOLOGICAL CORRESPONDENCE IN KINANDE REDUPLICATION*

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0. Introduction

Most work on reduplication since McCarthy & Prince (1986) has focussed on the way prosody constrains reduplicative patterns. However, recent work by Downing (to appear, 1997), McCarthy & Prince (1994) and Urbanczyk (1995) has argued that the prosodic and segmental shape of reduplicants (REDs) is often best accounted for by proposing that reduplicants are subject to morphological constraints as well as prosodic ones. In this paper I argue, in section 1, that verbal reduplication in KiNande is best analyzed by defining the RED as a morphological constituent, the Canonical Verb Stem. Once REDs in KiNande are defined morphologically as Canonical Verb Stems, I will show that otherwise puzzling restrictions and variations in the realization of RED receive a straightforward explanation. One restriction is that only derived longer stems can be reduplicated using the regular Canonical Stem pattern; underived longer stems have restrictions on reduplication. In section 2, I will argue that this pattern may be accounted for by proposing that morphological correspondence constraints optimize the Canonical Stem RED only if the morphological parse of RED matches the morphological parse of the same segments in the Base. Another restriction is that Kinande verb stems with two possible causative forms (this is a lexical property of stems) may also have two reduplicated forms of the RED of the longer causative. But verbs with only the longer causative have only one reduplicated form of the longer causative. In section 3, I argue that this may be accounted for by output-output constraints requiring the Canonical Stem defined by RED to match an output listed allomorph of the Base causative verb stem.

1. The Canonical Verb Stem

1.1. Arguments for the Canonical Stem

In KiNande, as in many Bantu languages (see Downing, to appear), the verbal reduplicant is two syllables long and ends in a fixed vowel /a/ (the reduplicated form means to do the action of the verb here and there, or quickly):

(1) KiNande Verbal Reduplication (Mutaka & Hyman 1990; eri- is the infinitive prefix; the reduplicant is underlined)

	Stem	Reduplicated Form	Gloss
(a)	*Consonant-initial:*		
	eri-huma	eri-huma=huma	'to beat'
	eri-hum-ir-a	eri-huma=humira	'to beat for'
	eri-hum-an-a	eri-huma=humana	'to beat each other'
	eri-hum-ir-an-a	eri-huma=humirana	'to beat for each other'
(b)	erí-tuma	erí-tuma=tuma	'to send'
	erí-tum-ir-a	erí-tuma=tumira	'to send to'
	erí-tum-an-a	erí-tuma=tumana	'to send each other'
	erí-tum-ir-an-a	erí-tuma=tumirana	'to send to each other'

The prefixal position of RED and its fixed disyllabic length are familiar prosodic conditions on reduplication, and can be accounted for by the constraints in (2):

(2)
(a) **Contiguity**: RED (R) corresponds to a contiguous substring of Base (B).
(b) **Anchoring**: The initial element in R is identical to the initial element in B.
(c) **Align RED (Align**; adapted McCarthy & Prince 1993a,b):
Align (RED, R; Stem, L)
The reduplicant subcategorizes for a following Stem.
(d) **RED=Foot** (adapted McCarthy & Prince 1993b):
The left and right edges of RED must coincide, respectively, with the left and right edges of a bisyllabic (morphological) foot.[1]
OUTRANKS
(e) **MAX B-R**: Every element of the RED has a correspondent in the Base.

The RED includes only the first two syllables of the stem due to the constraints in (2a,b,d,e) (McCarthy & Prince 1993b, pp 62-63, figs. (110), (111)). The prefixal position of the reduplicant is made optimal by the alignment constraint in (2c).

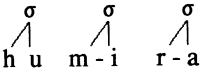
It is more problematic, however, to account for why the second Base vowel does not always have a correspondent in the RED, but is replaced by the fixed vowel /a/. In their original analysis of KiNande reduplication, Mutaka & Hyman propose that the Morpheme Integrity Constraint (MIC) in (3) blocks the second Base vowel from appearing in the RED:

(3) **Morpheme Integrity Constraint** (Mutaka & Hyman 1990; fig (22))
Mapping of a melody to a reduplicative template takes place *by morpheme*. If the whole of a morpheme cannot be successfully mapped into the bisyllabic reduplicative template, then none of the morpheme may be mapped.

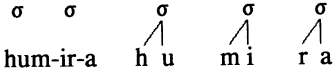
As shown in the derivation in (4), the second stem vowel may not copy in longer stems, because this would always split up a suffixal morpheme (in (4), this morpheme is the benefactive suffix /-ir-/) in violation of the MIC (hyphens indicate morpheme breaks). The unmapped portion of the copied stem deletes by Stray Erasure (Itô 1986) and the fixed /a/ is inserted by default:

(4) Derivation of -huma=humira (adapted Mutaka & Hyman 1990; fig. (44))

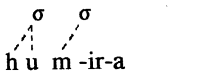
a. input representation

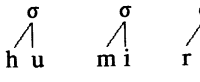


b. affixing (trochee) and copying



c. left to right mapping (respects MIC)





d. /a/ inserted by default

huma=humira

The problem with this analysis is that /a/ is arguably not the phonological default vowel in KiNande.[2] As Archangeli (1984, 1988) argues, the phonological default vowel in a language is typically the one that surfaces in epenthesis contexts. If /a/ were the default vowel in KiNande, we would expect it to be the epenthetic vowel which would occur to eliminate closed syllables in borrowed words, for example (KiNande has strictly CV syllable structure). But as shown in (5), generally front vowels, never /a/, eliminate closed syllables in French borrowings:

(5) French borrowings into KiNande (Larry Hyman, Ngessimo Mutaka, p.c.)

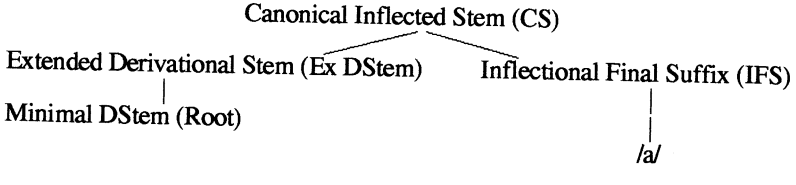
(a)	a-masini	'machine'	
(b)	kamutsere	'magistrate'	(French 'commissaire')
(c)	omu-sofere	'chauffeur'	
(d)	e-sosote	'sock'	(French 'chaussette')
(e)	e-supu	'soup'	

The epenthetic vowel in Bantu languages is typically a front vowel, in fact. For example, Kiyomi & Davis (1992) argue that /i/ is the epenthetic vowel in SiSwati, and Odden (1996) argues /i/ is epenthetic vowel in Kikerewe.

If /a/ is not the phonological default vowel, then some other explanation for its occurrence in the final position in RED must be found. To account for a similar Kikuyu reduplication pattern, Peng (1991) proposes that the /a/ is phonologically prespecified to fill the second vowel slot in the template. But this implies that the fact that /a/ and not some other vowel occurs in the second syllable is unpredictable and arbitrary. However, I propose (see, too, Downing 1997, to appear) that /a/ is inserted because it is the morphological default vowel. Indeed, what is striking about the form of RED is that it resembles a canonical two-syllable Bantu verb stem (Doke 1943, 1954), ending with the default Final Vowel morpheme /a/.

The requirement that the RED resemble a Canonical Verb Stem (CS) is formalized by the constraint in (6):

(6) **RED=CS:** RED is a Canonical Stem (CS) as defined below (this representation of verb stem structure follows Myers 1987):



The representation in (6) is proposed as a morphological well-formedness constraint on the shape of RED. This constraint is satisfied iff (a) the RED is morphologically parsed and contains two constituents, the DStem (which minimally dominates the Minimal DStem (Root) but may also dominate optional derivational suffixes and the Inflectional Final Suffix; and (b) the RED ends in /a/, the morphological default inflectional final suffix.

The Canonical Stem analysis, then, straightforwardly solves both problems the fixed /a/ pattern raises. The second vowel of the base does not occur in RED, because the second RED vowel must be identifiable as an Inflectional Final Suffix (IFS).[3] The vowel /a/ occurs in the reduplicant because it is the default IFS.

1.2. A potential problem with the Canonical Stem analysis

The Canonical Stem analysis of KiNande reduplication predicts that the RED in KiNande should always end with the IFS /a/. But, as shown in (7a), if a disyllabic stem ends with some other IFS - like subjunctive /-e/ - then that IFS vowel also occurs in the RED. However, /a/ does occur in RED of longer stems, as shown in (7b):

(7) Subjunctive verbs (Mutaka & Hyman 1990, pp 93-94; figs. (47-48))

(a) *Two-syllable stems*

Stem	Reduplicated form	Gloss
tú-húm-è	tú-húme=humè	'let's beat'
tu-túm-ê	tu-tume=túmê	'let's send'
tú-sw-er-è	tú-swere=swerè	'let's grind for'

BUT

(b) *Longer stems*

tú-húm-ir-è	tú-húma=humirè *tú-húme=humire	'let's beat for'
tu-tum-ír-ê	tu-tuma-tumírê *tu-tume=tumírê	'let's send to'

Mutaka & Hyman's (1990) MIC analysis predicts that the Final /-e/ in (7a) should be copied: the subjunctive suffix may be fit into RED without splitting it. What I will argue in this section is that the Canonical Stem analysis is equally able to handle these facts.

The crucial observation motivating my analysis is that the final vowel is only copied in two-syllable stems. That is, it is optimal to copy the Final Vowel of the Base iff Base is same size (two syllables) as the RED, since in this case a perfect match between the RED and the Base may be achieved. RED=CS (6) is only satisfied (and SDEP violated) if copying the entire Base violates the maximality condition on RED, so a perfect match between RED and the Base is not possible. As shown by the tableau in (8), simply ranking MAX (2e) above RED=CS (6) derives exactly this result:

(8) Tableau exemplifying subjunctive analysis[4]

		RED=Ft	>> MAX	>> RED=CS	>> SDEP
(a)	√ tu-**hume**=hume	√	√	*	√
(b)	* tu-**huma**=hume	√	*!	√	*
(c)	√tu-**huma**=humire	√	*	√	*
(d)	*tu-**hume**=humire	√	*	*!	*
(e)	*tu-**humi**=humire	√	*	*!	√
(f)	*tu-**humire**=humire	*!	√	*	√

To sum up, in this section I have shown that Canonical Stem best explains why fixed /a/ regularly occurs in the second syllable of the RED. I have also shown that ranking MAX above the RED=CS constraint straightforwardly explains why only two-syllable Base stems regularly violate the Canonical Stem constraint.

There is no need to appeal to the MIC to explain this pattern. In the next two sections, I will look at data that is problematic for the MIC analysis, and show that the Canonical Stem analysis extends to these cases, too.

2. Morphological Correspondence between RED and Base

The first problem I will discuss is why only derived longer stems can be reduplicated by the regular Canonical Stem pattern. As shown in (9), underived longer stems show variation in reduplication, with only a few following the Canonical Stem pattern (9a), others showing total reduplication (9b), while many do not reduplicate at all (9c) (Mutaka & Hyman (1990), fig (75)):[5]

(9) Reduplication of underived polysyllabic verb stems

(a)	eri-gambul-a	eri-gamb-a=gambul-a	'to talk'
	eri-goner-a	eri-gona=gonera	'to neglect'
	erí-lender-a	erí-lenda=lendera	'to walk'
(b)	erí-bindul-a	erí-bindula=bindula	'to change'
		*erí-bind-a=bindula	
	eri-guluk-a	eri-guluka=guluka	'to fly'
	erí-birikir-a	erí-birikira=birikira	'to call'
(c)	erí-bugul-a	NONE	'to find'
	erí-balik-a	NONE	'to jump'

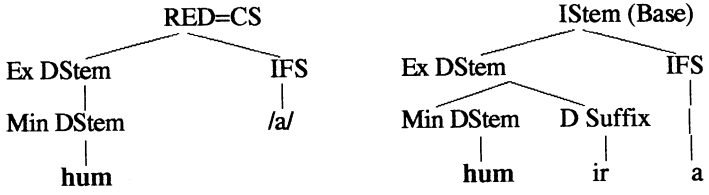
This restriction is by no means confined to KiNande. The disyllabic Canonical Stem form of RED is also not possible for underived polysyllabic stems in other Bantu languages, like SiSwati (Downing 1997) and KiKerewe (Odden 1996).

Informally, the restriction seems to be that the bisyllabic Canonical Stem is only a possible realization of RED if it matches an actual verb stem of the language which is derivationally related to the stem of the Base. To account for this restriction, I propose that the Canonical Stem pattern of reduplication is only possible in these languages if RED satisfies the morphological correspondence constraint in (10):

(10) **MDEP**: The DStem of RED corresponds to the DStem of the Base.

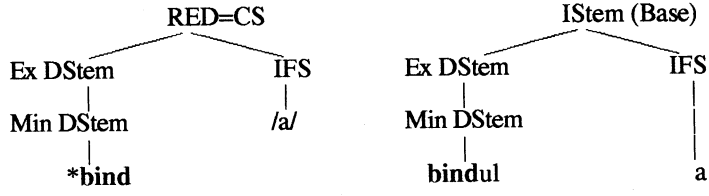
MDEP is satisfied iff the segments parsed into the DStem of RED are identical to (all the) segments parsed into the DStem of the Base. The representations below show that Canonical Stem reduplication for longer derived stems satisfies MDEP (11), while Canonical Stem reduplication for longer underived stems violates MDEP (12):

(11) Structure reduplicated stems (e.g., (1a)) with CS RED: MDEP satisfied



BUT

(12) Structure reduplicated stems (e.g., (9b)) with no CS RED: MDEP violated



MDEP must be highly ranked, along with RED=Ft, in order to disfavor a bisyllabic Canonical Stem (CS) RED when MDEP is violated. This is shown by comparing the tableau in (13) evaluating a stem like that in (11) for which a CS RED is optimal, with the tableau in (14) evaluating a stem like that in (12) for which a CS RED is non-optimal:

(13) CS RED (a) is optimal output

/-hum-ir-a/	MDEP	RED=Ft	>>MAX	>> RED=CS	>>SDEP
(a) √**hum**+**a**=hum+ir-a	√	√	*	√	*
(b) ***hum**+**i**=hum+ir-a	√	√	*	*!	√
(c) ***hum**+**ira**=hum+ir-a	√	*!	√	√	√

(14) CS RED (a) is non-optimal output; rather, total reduplication (c) is

/-bindul-a/	MDEP	>> RED=Ft	>>MAX	>> RED=CS	>>SDEP
(a) ***bind**+**a**=bindul-a	*!	√	*	√	*
(b) ***bind**+**u**=bindul-a	*!	√	*	*	√
(c) √**bindul**+**a**=bindul-a	√	*	√	√	√

The ranking of MDEP must be variable in KiNande, though, to account for the variation in reduplication for underived longer stems shown in (9).[6] If both must be satisfied by the optimal candidate, then reduplication is blocked, as for verbs like in (9c). If MDEP >> RED=Ft, as shown in (14), total reduplication is optimal. If RED=Ft >> MDEP, partial reduplication is optimal, as for verbs like in (9a).

To sum up this section, I have shown that proposing that RED has the morphological structure of a verb stem allows us to account for why underived

polysyllabic stems do not always take the CS RED: it only occurs if it is an actual verb stem and morphologically related to the Base stem. MDEP (10) optimizes REDs in which the morphological parse of corresponding segments in RED and the Base is identical, making partial reduplication of underived polysyllabic stems non-optimal.

The MIC (3) also predicts that underived polysyllabic stems should not follow the bisyllabic reduplication pattern, since that would violate the MIC. But the MIC has trouble explaining the form of REDs when reduplication is not blocked. It wrongly predicts that (14b), rather than (14a), should be the optimal form of the RED if the MIC is exceptionally violated in longer underived stems, since only the MIC blocks copying the second stem vowel.[7] Mutaka & Hynan's (1990) analysis also cannot explain why total reduplication is a possible variant to bisyllabic reduplication. In the prosodic theory of reduplication they adopt, it is impossible to capture what these variants have in common, since total reduplication has a morphological template, while partial reduplication has a prosodic template. However, as shown in (14), the Canonical Stem analysis predicts that if MDEP is ignored, the Canonical Stem candidate (14a) is more optimal than faithful copy of the first two syllables. The analysis also correctly predicts that, if RED=FT is ignored, total reduplication (14c) should be a possible variant for longer underived stems, since, like (14a), it satisfies both RED=CS and MDEP.

3. Morphological correspondence in Causative Stems

Defining RED as a Canonical Stem also helps solve puzzles for Mutaka & Hyman's (1990) analysis of causative stem reduplication. As they show, there are three basic problems raised by causative reduplication. First, as shown in (15), the causative suffix /-y-/ may occur in REDs of some causative stems in violation of contiguity (and the non-causative Canonical Stem is often a variant form of RED):

(15) KiNande causative suffix reduplication (Mutaka & Hyman 1990, fig. (57))

	Stem	Reduplicated Form	Gloss
(a)	eri-gul-y-a	eri-gulya=gulya *eri-gula=gulya	'to sell'
	eri-gul-ir-y-a	eri-gula=gulirya eri-gulya=gulirya	'to sell to'
	eri-gul-ir-an-y-a	eri-gula=guliranya eri-gulya=guliranya	'to sell to each other'
(b)	erí-bul-y-a	erí-bulya=bulya *erí-bula=bulya	'to ask'
	erí-bul-ir-y-a	erí-bula=bulirya erí-bulya=bulirya	'to ask for'
	erí-bul-ir-an-y-a	erí-bula=buliranya erí-bulya=buliranya	'to ask for each other'

However, as shown in (16), the causative suffix /-y-/ only occurs in the RED if that variant of the causative is possible for the Base stem. Otherwise, the RED may only have the form of the non-causative Canonical Stem :

(16) Restrictions on causative reduplication (Mutaka & Hyman, figs (62)-(65))

Causative /-y-/ may not reduplicate if shorter causative not possible for Base stem

(a)	eri-huma	'to beat'	eri-hum-is-y-a	'to cause to beat'
			*eri-hum-y-a	
	erí-tuma	'to send'	erí-tum-is-y-a	'to cause to send'
			*erí-tum-y-a	
(b)	eri-huma=humisya		*eri-humya=humisya	
	erí-tuma=tumisya		*erí-tumya=tumisya	

BUT *Causative /-y-/ may reduplicate if shorter causative is possible for Base stem*

(c)	eri-genda	'to go'	eri-gend-y-a	'to cause to go'
		OR	eri-gend-es-y-a	
	eri-heka	'to carry'	eri-hek-y-a	'to cause to carry'
		OR	eri-hek-es-y-a	
(d)	eri-genda=gendesya	AND	eri-gendya=gendesya	
	eri-heka=hekesya	AND	eri-hekya=hekesya	

A final problem is why the causative /-y-/ can reduplicate, in violation of contiguity, while the passive /-w-/ cannot, even though both morphemes are glides and both are restricted to occur after the final consonant in the inflectional stem. As shown in (17), the RED of passive stems is always a non-passive Canonical Stem:

(17) KiNande passive suffix reduplication (Mutaka & Hyman, fig. (56))

	Stem	Reduplicated form	Gloss
(a)	eri-hum-w-a	eri-humwa=humwa	'to be beaten'
		*eri-huma=humwa	
	eri-hum-ir-w-a	eri-huma=humirwa	'to be beaten for'
		*eri-humwa=humirwa	
	eri-hum-ir-an-w-a	eri-huma=humiranwa	'to be beaten for each other'
		*eri-humwa=humiranwa	
(b)	erí-tum-w-a	erí-tumwa=tumwa	'to be sent'
		*erí-tuma=tumwa	
	erí-tum-ir-w-a	erí-tuma=tumirwa	'to be sent to'
		*erí-tumwa=tumirwa	
	erí-tum-ir-an-w-a	erí-tuma=tumiranwa	'to be sent to each other'
		*erí-tumwa=tumiranwa	

As Mutaka & Hyman note, these characteristics of causative reduplication are all problematic for their analysis. The MIC blocks copying a monosegmental morpheme which is outside the two-syllable window of left-to-right mapping, so intervening morphemes cannot be skipped to attain the causative. Even if we allow the mapping principle to be violated for the causative, we can not explain why this is not also possible for passives. Finally, it is not clear how to allow mapping to be violated for the causative iff the resulting RED matches a possible realization of the causative stem for the Base.

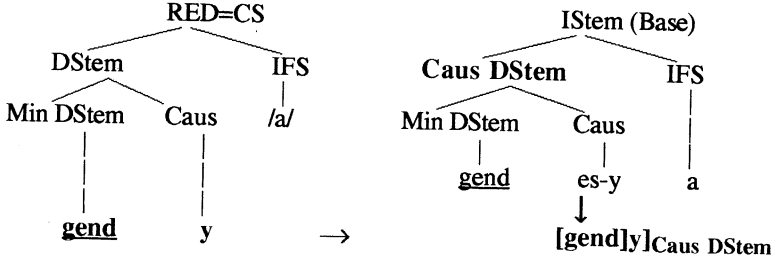
But in a theory where the RED is defined as a verb stem, these morphological correspondence conditions can be more readily formalized. The crucial observation motivating my analysis is that, as Mutaka & Hyman note, the shorter /-y-/ form of the causative is non-productive (lexicalized), while the longer form of the causative (/-isya/) and the passive are both productive. To account for this contrast, I propose, following work like that of Anshen & Aronoff (1988) and

Aronoff (1976), that the unproductive shorter form of the causative must be a listed allomorph of causative DStems, while the productive longer form of the causative and the passive are not listed. The unifying generalization for the data in (15)-(17) can now be formalized by the output-output correspondence constraint in (18):[8]

(18) **DEP O-O:** The RED DStem ouput must correspond to an output listed allomorph of the DStem of the Base.

This constraint is always satisfied by a non-derived RED DStem candidate (modulo MAX satisfaction; see (20), below), because, I assume, the Minimal DStem is a listed allomorph of every Extended DStem derived from it. As shown in (19), this constraint is also satisfied when RED matches the shorter causative DStem iff the Base Causative DStem has the shorter causative as a listed allomorph.

(19) Causative Reduplication Correspondence Effects: DEP O-O satisfied



As we can see in (19), the shorter causative DStem RED is optimal because it satisfies DEP O-O: the segments in the RED output correspond to the segments in the output of a listed allomorph of the Causative DStem of the Base. However, DEP O-O is violated if RED is a passive DStem, since bisyllabic passives are not listed allomorphs of the Base DStem. And, of course, a longer causative DStem will never be an optimal form of RED since it would violate the two-syllable maximum. The tableau in (20) exemplifies the analysis:

(20) Exemplificatory tableau for causative reduplication

	MDEP	RED=FT	DEP O-O	>> MAX	>> RED=CS	>> SDEP
(a) √**gulya**=gulya	√	√	√	√	√	√
(b) ***gula**=gulya	√	√	√	*!	√	*
(c) ***gula**=gulirya	√	√	√	*!*	√	*
(d) √**gulya**=gulirya	√	√	√	*	√	**
(e) √**huma**=humisya	√	√	√	*	√	*
(f) ***humya**=humisya	√	√	*!	*	√	*
(g) ***genda**=gendesya	√	√	√	*!*	√	*
(h) √**gendya**=gendesya	√	√	√	*	√	*
(i) ***gendesya**=gendesya	√	*!	*	√	√	√

In (20), notice that the non-derived RED DStem candidates (20b, c, e, g) always satisfy DEP O-O, since I am assuming that the MinDStem is a listed allomorph of all DStems derived from it. In the first pair of candidates, however, candidate (20a) is optimal (and the non-derived DStem candidate (20b) is not), because, as discussed in section 1.2, above, it is always optimal to satisfy MAX by copying the entire Base when the Base is disyllabic. The analysis chooses the shorter causative DStem candidate (20d) as optimal in the next set as well. But the MinDStem candidate (20c) is clearly a near-optimal variant, since it only incurs one more MAX violation than (20d). Further, (20c) satisfies Uniform Exponence (Downing 1997, Kenstowicz, to appear), since it would be the form of RED which would be optimal for all other stems derivationally related to this one, thus minimizing differences in the realization of REDs for that DStem. In the next candidate set (20e,f), in constrast, only the non-causative RED (20e) is optimal since (20f) is not a listed allomorph of that Base DStem. The final candidate set also has two variants, since the Base DStem has a shorter causative (20h) as a listed allomorph. However, the longer causative (20i) is not a possible form of RED because it violates RED=Ft.

4. Conclusion

In sum, I have argued that the fixed final /a/ in Bantu verbal reduplicants is best explained by proposing the RED must meet a morphological constraint in addition to a prosodic one: it must sound like a Canonical Verb Stem. While /a/ is phonologically unpredictable and marked in this context, morphologically it is the regular inflectional final suffix for verb stems, so it is morphologically predictable that /a/ should fill the Final Vowel slot in the RED. Proposing that RED is a verb stem with internal morphological constituency also explains why some verbs cannot take the Canonical Stem RED pattern. Since RED sounds like a regular verb stem, the expectation is that it should be an actual verb stem which is morphologically related to the Base for reduplication. When this expectation fails, the Canonical Stem RED pattern is non-optimal. Finally, I have argued that proposing that RED is a verb stem also explains the morphological conditions on causative reduplication in KiNande. Since RED is a DStem, it may be constrained to match a listed allomorph of a Causative Base DStem. These morphological constraints on the occurrence of the suffix in RED are plausible if RED must sound like a Canonical Verb Stem. But they would simply be ad hoc stipulations in a theory where REDs are defined to have only prosodic, but not morphological, constituency.

NOTES

* All KiNande data discussed in this paper are from Mutaka & Hyman (1990) and Mutaka (1994). I would like to thank Ngessimo Mutaka and Larry Hyman for helpful comments on the data and analysis, as well as George Bergman, Sharon Inkelas, Orhan Orgun, Doug Pulleyblank and Donca Steriade. Any errors of fact or interpretation are, of course, my own responsibility.

[1] See Crowhurst (1992) for a discussion of distinctions between stress feet and "morphological feet" like the one defining RED in this analysis.

[2] But see Schlindwein (1987) for an alternative view.

[3] **RED=CS >> SDEP** optimizes having fixed /a/ in the second syllable of the reduplicant over copying the second syllable of the base. (**SDEP**: Every segment of RED must have a correspondent in the Base.)

[4] As pointed out to me by Sharon Inkelas and Orhan Orgun, it is important to note that I am interpreting MAX categorically in the tableaux, so that both (8c) and (8e) violate MAX equally, even though the segments of RED (8e) more closely match the segments of the Base. However, McCarthy & Prince (1995) also seem to assume that MAX violations are incurred only when the number of segments is different in the RED compared to the Base. The quality of the corresponding segments is evaluated by other constraints, like SDEP. Because all segments of RED (8e) match their correspondents in the Base while those of (8c) do not, SDEP is violated in (8c) but not (8e). But SDEP is too lowly ranked to optimize a better match if two candidates have the same number of segments but neither satisfies MAX.

[5] According to Mutaka & Hyman, out of some 200 polysyllabic underived verb stems, only 29 follow the regular Canonical Stem reduplication pattern shown in (1) and (9a), while 108 have the total reduplication pattern shown in (9b), and 77 do not reduplicate, like those in (9c).

[6] It is beyond the scope of this paper to address the theoretical problems raised by variable rankings in OT, but the interested reader will find an insightful discussion of this issue in Nagy (1996) and Nagy & Reynolds (1996).

[7] Mutaka & Hyman mention in fn 31 that one would expect /a/ since stems typically end in /a/, but this does not follow from anything in their analysis.

[8] See work like Benua (1996), Buckley (1995), Downing (1997), Kenstowicz (to appear), McCarthy & Prince (1995) and Steriade (1995, 1997) for other arguments in favor of output-output correspondence. But see, too, Hale et al. (1997) for a critique of some of these output-output correspondence analyses.

REFERENCES

Anshen, Frank & Mark Aronoff. 1988. Producing morphologically complex words. Linguistics 26, 641-655.

Archangeli, Diana. 1984. Underspecification in Yawelmani phonology and morphology. Ph.D. dissertation, Massachusetts Institute of Technology.

Archangeli, Diana. 1988. Aspects of underspecification theory. Phonology 5, 183-207.

Aronoff, Mark. 1976. Word formation in generative grammar. Cambridge, MA: The MIT Press.

Benua, Laura. 1996. Transderivational identity: phonological relations between words. Paper presented at Rutgers University, January 30, 1996.

Buckley, Eugene. 1995. Cyclicity as correspondence. Paper presented at the University of Pennsylvania, September 22, 1995.

Crowhurst, Megan J. 1992. Minimality and foot structure in metrical phonology and prosodic morphology. Bloomington, Indiana: IULC.

Doke, C.M. 1943. Outline grammar of Bantu. Distributed [1982] as Communication No. 12, Dept. of African Languages, Rhodes University, Grahamstown, Rep. of South Africa.

Doke, C.M. 1954. The southern Bantu languages. Published for the International African Institute. London: Oxford University Press.

Downing, Laura J. 1997. Correspondence effects in SiSwati reduplication. Studies in the Linguistic Sciences 25, 1 [spring 1995], 17-35.

Downing, Laura J. to appear. Verbal reduplication in three Bantu languages. In Harry van der Hulst, René Kager & Wim Zonneveld, eds. The prosody-morphology interface. Cambridge: Cambridge University Press.

Hale, Mark, Madelyn Kissock & Charles Reiss. 1997a. Evaluating the empirical basis for Output-Output Correspondence. Paper presented at BLS 23, February 14-17, 1997.

Itô, Junko. 1986. Syllable theory in prosodic morphology. Ph.D. dissertation, University of Massachusetts, Amherst.

Kenstowicz, Michael. to appear. Base-Identity and Uniform Exponence: alternatives to cyclicity. In J. Durand and B. Laks, eds. Current trends in phonology: models and methods. Paris: CNRS and Salford: University of Salford Publications.

Kiyomi, S. & S. Davis. 1992. Verb reduplication in Swati. African Languages and Cultures 5, 113-124.

McCarthy, John & Alan Prince. 1986. Prosodic morphology. ms. University of Massachusetts, Amherst, and Brandeis University.

McCarthy, John & Alan Prince. 1994. The emergence of the unmarked: optimality in prosodic morphology. NELS 24, 333-379.

McCarthy, John & Alan Prince. 1995. Faithfulness and reduplicative identity. UMOP 18, 249-384.

Mutaka, Ngessimo M. 1994. The Lexical Tonology of Kinande. Munich: LINCOM Europa.

Mutaka, Ngessimo & Larry M. Hyman. 1990. Syllables and morpheme integrity in Kinande reduplication. Phonology 7, 73-120.

Myers, Scott. 1987. Tone and the structure of words in Shona. Ph.D. dissertation, University of Massachusetts, Amherst.

Nagy, Naomi. 1996. Language Contact and Language Change in the Faetar Speech Community. Ph.D. dissertation, University of Pennsylvania.

Nagy, Naomi & Bill Reynolds. 1996. Optimality theory and variable word-final deletion in Faetar. Language Variation and Change 8.2.

Odden, David. 1996. Patterns of reduplication in Kikerewe. OSU Working Papers in Linguistics 48, 111-149.

Peng, Long (Bruce). 1991. Swati and Kikuyu reduplication: evidence against exhaustive copy. SAL 22, 45-72.

Schlindwein, Deborah. 1987. P-bearing units: a study in KiNande vowel harmony. NELS 17, 551-567.

Steriade, Donca. 1995. Positional neutralization. ms., UCLA.

Steriade, Donca. 1997. Similarity and lexical conservatism in surface analogy. Paper presented at UBC Linguistics Dept. colloquium, March 25, 1997.

Urbanczyk, Suzanne. 1995. Morphological templates in reduplication. NELS 26.

French liaison as phonological realization of morphosyntactic relationships

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1. INTRODUCTION.* In French there are two types of word-final consonants: fixed and latent. Fixed consonants are always pronounced, whereas latent consonants are pronounced only when the following word starts with a vowel, a phenomenon known as liaison. This is illustrated in (1), where the consonants that are pronounced are underlined, and unpronounced consonants are enclosed in angled brackets. The first example in (1b) is a case of liaison (examples taken from Tranel 1995:799):[1]

(1) a. *net avantage* 'clear advantage' *net défaut* 'clear defect'

b. *petit avantage* 'small advantage' *peti<t> défaut* 'small defect'

In the least elevated and most conversational style of discourse in French, traditionally called *conversation familière* or Style I, where the basic or obligatory contexts of liaison are found, and where speakers show reliable intuitions, there are clear differences in obligatoriness or frequency of liaison depending on the grammatical category of the words containing the liaison consonant. Previous analyses of French liaison do not seem to be able to capture these differences in distribution, and we will propose an alternative solution to the problem, based on the morphosyntactic relationships holding among the elements in liaison environments. In particular, it will be argued that obligatory liaison occurs only between two words α and β when α is a functional head in an agreement relationship with the following lexical element, and when α and β are in the same X^0 in syntax.

2. DISTRIBUTION OF LIAISON. That not all words with floating consonants make liaison with the same degree of frequency has been previously acknowledged in the literature, based on observations of native intuitions or of recorded data (Selkirk 1972, De Jong 1990). In this section I will present the differences in obligatoriness or frequency of liaison in conversational style in French:

2.1. OBLIGATORY LIAISON. We find obligatory liaison in the following contexts (the symbol '‿' indicates liaison):

- Between a determiner and a noun or adjective:

(2) a. *les⌒amis*
the friends

b. *des⌒ennemis*
indef. enemies
'(some) enemies'

c. *un⌒arbre*
a tree

d. *les⌒aimables marchands*
the friendly merchants

- Between a demonstrative and a noun or adjective:

(3) a. *cet⌒effort*
this effort

b. *ces⌒amis*
these friends

- Between a possessive adjective and a noun or adjective:

(4) a. *mon⌒oeil*
my eye

b. *ton⌒écriture*
your writing

c. *nos⌒oppresseurs*
our oppressors

d. *leurs⌒effets*
their effects

- Between a numeral or quantifier and a noun or adjective:[2]

(5) a. *vingt-trois⌒oignons*
twenty-three onions

b. *trente-deux⌒assauts*
thirty-two attacks

c. *trois⌒ingénieurs*
three engineers

d. *plusieurs⌒autres enfants*
several other children

e. *aucun⌒officier*
no officer

f. *quelques⌒expériences*
a few experiences

- Between certain adjectives and following nouns:[3]

(6) a. *le petit⌒avantage*
the little advantage

b. *de beaux⌒artichauts*
beautiful artichokes

c. *un grand⌒arbre*
a tall tree

d. *un bon⌒avocat*
a good lawyer

- Between object clitics and verbs:

(7) a. *Il vous⌒a donné la réponse*
he you has given the answer
'He has given you the answer'

b. *Je les⌒écoute*
I them listen to
'I listen to them'

c. *J'en⌒ai plusieurs*
I-of it have several

- Between a verb and a following subject or oblique clitic:

(8) a. *Sont⁀-ils arrivés?*
have they arrived?

b. *Allons⁀-y tous ensemble*
go-there all together
'Let's go there all together'

c. *Est⁀-elle allée à Paris?*
is she gone to Paris?

d. *Ont⁀-elles accepté?*
have they accepted?

- Between a subject clitic and a following verb:

(9) a. *Ils⁀ont acheté*
they have bought

b. *Vous⁀avez fini*
you have finished

c. *Nous⁀avons déjà mangé*
we have already eaten

2.2. FREQUENT LIAISON. Liaison is frequent but not obligatory in the following contexts:

- Between monosyllabic prepositions and a determiner:[4]

(10) a. *dans⁀une salle publique*
in a room public

b. *sans⁀aucune ami*
without any friend
'without friends'

- Between a monosyllabic degree adverb and a following adjective:

(11) a. *très⁀incommode*
very uncomfortable

b. *bien⁀avantageux*
very advantageous

c. *plus⁀âgée*
more old

d. *fort⁀intéressante*
very interesting

- Between a monosyllabic auxiliary and a verb:[5]

(12) a. *Jeanne est⁀allée voir le résultat*
Jean has gone to see the result

b. *Je suis⁀arrivée trop tôt*
I have arrived too soon

c. *Ils sont⁀entrés dans la salle*
they have entered in the room

d. *Les commerçants ont⁀augmenté touts les prix*
the merchants have all raised the prices

- Between monosyllabic forms of the copula *être* and a predicate:

(13) a. *Il est⁀ insupportable que tu y ailles tout seul*
It is unbearable that you there go all alone

b. *Nous sommes⁀ impatients de vous voir à Paris*
we are impatient of you see in Paris
'We are anxious to see you in Paris'

2.3. RARE LIAISON. Liaison is rare with polysyllabic forms of the categories mentioned in the preceding section, i.e., prepositions, degree adverbs, auxiliaries and copulas. The symbol '/?' indicates the low frequency of occurrence of liaison:

(14) a. *pendant /? une semaine*
during one week

b. *depuis/? un an*
since one year

c. *assez /? intimes*
rather intimate

d. *vraiment /? idiot*
truly idiotic

e. *Vous avez /? étonné tout le monde*
you have surprised everybody

f. *Les soviétiques auraient /? annoncé la fin des négociations*
the Soviets would have announced the end of the negotiations

g. *Les mères seront /? impatientes de voir leurs fils*
the mothers will-be anxious to see their children

2.4. ABSENCE OF LIAISON. Liaison is not made in conversational style between any two lexical words:

(15) a. *un court / instant*
a short moment

b. *les hommes / étaient fatigués*
the men were fatigued

c. *elle donnait / un cours à l'université* [6]
she gave a course at the university

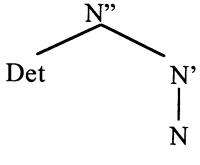
Complementizers with latent final consonants such as *quand* 'when' and *dont* 'therefore' do not receive an easy classification. Only when introducing subordinate clauses may they trigger liaison, not in direct questions, and in indirect questions the situation seems intermediate. Some sources cite them as making

obligatory liaison in subordinate clauses (De Jong 1990), but others cite them as making only optional liaison (cf. Tranel 1987:188). We thus consider it safe not to make assumptions based on complementizers, and will omit them from our discussion. But as the reader will be able to notice, they do not affect our argument.

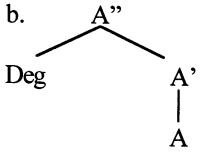
3. PREVIOUS ANALYSES. In this section we will review the proposals that have been made to account for the contexts of application of French liaison, within the different approaches to phrasal and prosodic phonology. As we will see, they all present serious inadequacies that call for an alternative solution to the problem.

3.1. DIRECT REFERENCE THEORY. Ellen Kaisse (1985) devised a theory in which c-command relationships and edge locations directly readable from syntactic structure play a role in delimiting the contexts where postlexical phonological processes may occur. Kaisse claims that liaison applies between two words *a* and *b* where *b* c-commands *a*. The term 'c-command' utilized by Kaisse is an abbreviation for 'domain c-command', which is equivalent to 'm-command' (that is, α m-commands β if the first maximal projection dominating α also dominates β). Thus, Kaisse's claim should be interpreted to mean that liaison applies between two words *a* and *b* where the first maximal projection dominating *b* also dominates *a*. This is illustrated by the following diagrams:

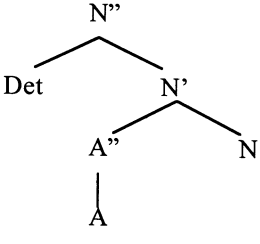
(16) a.



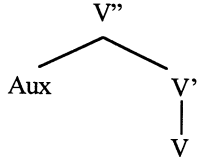
b.



c.



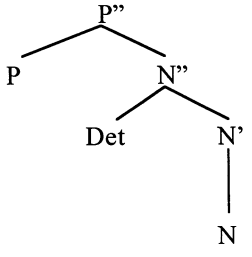
d.



Liaison occurs between a determiner and a noun, a degree adverb and an adjective, an adjective and a noun, or an auxiliary and a verb, because the words on the right in each context m-command the word on the left. Note that this analysis

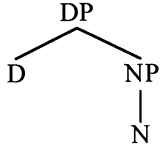
has to face the problem posed by prepositions, which head their own maximal projections (i.e. P"), and lie outside the maximal projection that determiners are contained in (i.e. N"). This wrongly predicts absence of liaison between a preposition and a determiner:

(17)

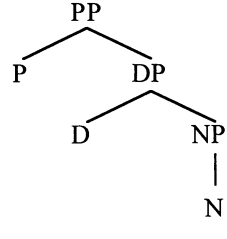


This problem would be solved if the syntactic configurations involving prepositions could be equated to those in (16). According to current standard assumptions in the Government and Binding approach, function words of the kind illustrated in (16) are heads of their own maximal projections, rather than specifiers of the maximal projections headed by lexical categories. Thus, Kaisse's proposal would have to be revised to read: liaison applies between two words *a* and *b* where *a* is a functional head and word *b* is the leftmost word m-commanded by *a*. The tree diagrams in (18) illustrate the new picture:

(18) a.



b.



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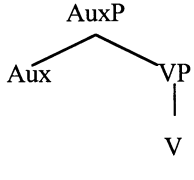


However, this revised analysis along the lines originally proposed by Kaisse still presents a major problem, and that is the categorical judgments it

imposes on the presence or absence of liaison. As we have shown in section 2, there are contexts in which liaison is obligatory, but there are other contexts in which it is frequent, and others in which it is rare. Determiners, demonstratives, numerals/quantifiers and possessive adjectives make obligatory liaison, whereas prepositions, degree adverbs, auxiliaries and copulas do not. The analysis suggested in (18) cannot predict these facts, since it is based entirely on the syntactic configuration in which two words appear, and those syntactic configurations are shared by determiners, prepositions, and auxiliaries/copulas alike, as shown in (18). This major problem is shared by other accounts proposed in the literature, which we will discuss in the remainder of this section. As a result, the conclusion we will reach is that an alternative approach is necessary, one which distinguishes among the functional categories that can make liaison in Style I.

3.2. END-BASED APPROACH. Selkirk (1986) argues that there is a postsyntactic level of phonological structure that she calls PROSODIC STRUCTURE. This structure is built from syntactic structure by parameterized settings that place boundaries to the right or left edges of words, heads, and maximal projections, giving rise to three levels of prosodic structure, respectively: the prosodic word, the small phonological phrase, and the phonological phrase. Languages choose the direction of prosodic boundary insertion for each level of prosodic structure. The settings can be represented as in (19):

(19) End parameter settings:

(i) a.	$]_{\text{Word}}$	b. $_{\text{Word}}[$	Prosodic Word
(ii) a.	$]_{\text{Xhead}}$	b. $_{\text{Xhead}}[$	Small Phonological Phrase
(iii) a.	$]_{\text{Xmax}}$	b. $_{\text{Xmax}}[$	Phonological Phrase

According to Selkirk (1986), the domain of French liaison is the small phonological phrase, which she claims is constructed by placing a right edge boundary at the end of every syntactic head. That is, the end parameter setting chosen is $]_{\text{Xhead}}$ in French. The crucial assumption here is that only lexical categories (i.e. N, A, V) are heads, and that prenominal adjectives and preverbal adverbs are neither maximal projections nor heads. In (20)-(22) we exemplify the workings of this particular algorithm (cf. (35)-(37) in Selkirk (1986), p. 396):

(20) a. $_{S}[[Sais\text{-}tu]_{V}\ [[quand]_{Comp}\ [ils\ [[inviteront]_{V}\ [un\ [autre]_{AP}\ [grand]_{AP}\ [artiste]_{N}]_{NP}]_{VP}]]]$

b. .....]$_{Xhead}$ .....]$_{Xhead}$ .....]$_{Xhead}$

c. (_____) (_____) (_____)

(21) a. $_{S}[[Ces\ [[très]_{Det}\ [aimables]_{A}]_{AP}\ [enfants]_{N}]_{NP}\ [[en]\ [ont]]_{Aux}\ [avalé]_{V}\ ]_{VP}]]]$

b. .....]$_{Xhead}$ .....]$_{Xhead}$

c. (_____) (_____)

(22) a. $_{S}[On_{\ VP}\ [[m'[a]]_{Aux}\ [souvent]_{AdvP}\ [amené]_{V}\ _{PP}[[dans]_{P}\ [un]\ [énorme]_{AP}\ [wagon]_{N}]_{NP}]]]]$

b. .....]$_{Xhead}$ .....]$_{Xhead}$

c. (_____) (_____)

This approach has to face the same problems we pointed out above for an analysis based on the Direct Reference Theory. Namely, it cannot account for the differences among function words in degree of frequency of occurrence of liaison. Treating all function words alike, as invisible to prosodic boundary insertion (cf. Selkirk's 1984 Principle of Categorial Invisibility of Function Words), leads to the impossibility of capturing the distribution of liaison stated in section 2 of this paper. Within the same framework, De Jong (1990) attempted to provide an analysis that could solve this problem. Providing empirical support from real speech data (the Orléans corpus, cf. Blanc and Biggs 1972), De Jong acknowledged the existence of different degrees of frequency in the realization of liaison, depending on the grammatical category of the word whose final consonant was involved. De Jong pointed out that liaison was less frequent after prepositions, copulas and auxiliaries, even in monosyllabic forms, than after determiners, possessive adjectives, demonstratives, quantifiers and numerals, or clitics. He suggested that the difference between obligatory and optional liaison lies in the difference between 'real' function words and closed-category phrasal heads. 'Real' function words such as determiners, possessive pronouns, demonstratives, numerals and clitics are not heads of any kind, but specifiers or modifiers, whereas prepositions, auxiliaries and, copulas are function words occupying the head position of a maximal projection (Prepositional Phrase and Verb Phrase, respectively). De Jong argues that the domain of obligatory liaison is more restrictive than Selkirk's (1986) small phonological phrase, namely the prosodic word (PWd), parsed from syntactic structure by picking out the right edge of every head. Since real function words are not heads, they will fall in the same prosodic word with an adjacent head. The domain of optional liaison would

be the small phonological phrase (SPP), which is built inserting prosodic boundaries at the right end of every lexical head. Then, a more inclusive domain where liaison is not found in conversationsl style would be the maximal phonological phrase (MPP), constructed picking out the right edge of lexical maximal projections. This is summarized in (23):

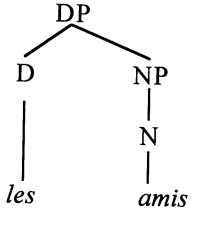
(23) PWd formation: $]X^{head}$
SPP formation: $]X^{head}$, where X^{head} is major-category.
MPP formation: $]X^{max}$

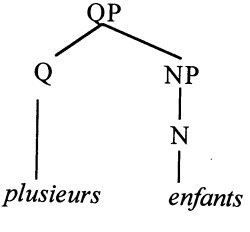
The example in (24), slightly adapted from De Jong (1990:82), illustrates the workings of this algorithm:

(24) MPP: ( )( )
SPP: ( ) ( ) ( )
Pwd: ( ) ( ) ( ) ( ) ( ) ( )
$_S[[Ils\ [[ont]_V\ [été]_V\ [aidés]_V]_{VP}]\ _{PP}[[par]_P\ [des\ [enseignants]_N]\ [[admirables]_A]_{AP}]_{NP}]_{PP}$
they have been helped by indef. teachers wonderful
'they have been helped by wonderful teachers'

This analysis is still not satisfactory, because it assumes that determiners, possessive pronouns, numerals and quantifiers are specifiers or modifiers of some sort, not heads. However, as pointed out above, for the past decade or so it has been standardly assumed in the syntactic theory of Principles and Parameters (or even the most recent minimalist framework, cf. Chomsky 1995) that these elements are heads, much like prepositions, copulas and auxiliaries. In a simplified manner, these would be the syntactic representations for determiners and quantifiers:[7]

(25)





If this is the case, how can we maintain the distinctions among functional heads regarding their different degrees of participation in liaison? It seems clear that an alternative approach is necessary in order to solve this issue. We will present such an alternative in the remainder of this paper.

4. ALTERNATIVE ANALYSIS. Our claim will be that the differences in frequency of liaison are attributable to differences in morphosyntactic relationships between the elements between which liaison occurs. Looking at the distribution of liaison presented in section 2, the crucial generalization that arises is that liaison is obligatory in two contexts: a) between a function word and a lexical element agreeing in number and/or gender, or b) between a function word and a lexical element forming a complex head in syntactic structure. The first type of context is instantiated by the sequences formed by determiners, possessive adjectives, quantifiers, numerals and the noun or adjectives that follow, as well as a subject clitic and a following verb. These elements enter into agreement relationships of gender and number. The second type of context is instantiated by the sequences formed by verbs and enclitic or proclitic pronominal forms (i.e. *sont ⁀-ils*, *allons ⁀-y*, *les ⁀écoute*, *en ⁀achète*). These are cohesive sequences which cannot be ruptured by the insertion of any other phonological material, such as adverbs (e.g. *je les aide beaucoup* 'I help them a lot', **je les beaucoup aide*).

Prepositions, degree adverbs, auxiliaries, and copulas (and complementizers) do not enter into agreement relationships with the elements they precede. A copula and its predicate usually agree in number and gender, but there are examples where no agreement is displayed (cf. (26)). In contrast, it is impossible to find examples with lack of agreement between determiners, possessives, quantifiers and numerals and nouns or adjectives:

(26) a. *Jean et Paul sont venu et parti, respectivement* (**venues, *parties*)
John and Paul have come(sing.) and left(sing.), respectively
b. *Jean et Paul sont bon et beau, respectivement* (**bons, *beaux*)
John and Paul are good(sing.) and handsome(sing.), respectively

Prepositions, degree adverbs, auxiliaries and copulas do not form unbreakable sequences with adjacent elements, either. Auxiliary verbs and copulas may be separated from past partiples and predicates by adverbs:

(27) a. *Il a bien avancé*
he has well advanced
b. *J'en veux bien*
I of-them want very much ('I want some very much')
c. **J'en bien veux*

The relatively high frequency of liaison observed with monosyllabic forms of prepositions, degree adverbs, auxiliaries and copulas contrasts with the rare occurrence of liaison with polysyllabic forms of the same categories. This asymmetry can be explained if we assume that these function words display clitic-like properties when they are monosyllabic. This is a well attested pattern of monosyllabic function words crosslinguistically. Interestingly enough, the number of syllables is not a condition on obligatory liaison. Polysyllabic numerals or quantifiers trigger obligatory liaison, whereas monosyllabic prepositions, degree adverbs, auxiliaries, and copulas only trigger optional liaison (cf. (5) vs (10)-(13)). The contrasting examples in (28) show that it is agreement in morphosyntactic features that is responsible for defining the domains of application of French liaison (Bernard Tranel, p.c.):

(28) a. *vingt-trois ⁀étudiants*
twenty-three students
b. *vingt-trois / octobre*
twenty-three October
'the twenty-third of October'

In (28a) the numeral *ving-trois* shares the plural number feature with the noun *étudiants*, and liaison occurs. In (28b), on the other hand, *ving-trois* does not express plurality, but the semantic value of ordinal numbers (see Tranel 1981:215-216 for more examples), and no liaison occurs.

Thus, to summarize, two words α and β enter in a liaison environment when word α is a functional head that agrees in one or more phi-features with word β, or when α and β are in the same syntactic X^0. Our claim is that, as a property of language, phonological domains may be defined by morphosyntactic relationships holding among linguistic expressions in an utterance. One instantiation of this relationship would be that to a closer degree of morphosyntactic cohesion corresponds a closer degree of phonological cohesion, as suggested in Elordieta (1994). We suggest that there is a postsyntactic level of grammatical representation where morphosyntactic relationships are expressed, possibly in terms of morphosyntactic domains, and that these domains may be

mapped into the phonological component as phonological domains. For the particular phenomenon of French liaison, we formulate the domain of obligatory application as in (29):

(29) *Domain of obligatory liaison:*

$$_{m}[\alpha_{[+\phi]}\beta_{[+\phi]}] \rightarrow [\ ]_{p}$$

$$_{m}[\alpha\ \beta] \rightarrow [\ ]_{p}$$

This means that a sequence formed by two words α and β sharing the same ϕ-features (sequence represented with the subscript label *m*) is mapped onto the phonological component as one domain (indicated as *p*), where the phonological process of French liaison is specified to apply.[8] The following examples from Quebec French illustrate cases of liaison applying with right-dislocated noun phrases across an intonational boundary, which shows that the nature of the relationship between α and β must be morphosyntactic, not syntactic or prosodic (liaison is indicated by writing the consonant before the noun):[9]

(30) a. *J'en ai un,* n-*elephant*
I-clitic have one, elephant
b. *Je vous ai vu en donner deux,* z-*oies*
I saw you clitic give two, geese

The two parts composing these dislocated constructions are separated by an intonational break, indicated by the comma, and belong to two different intonational phrases, i.e. two different prosodic constituents. The main part of the construction is able to stand alone as a grammatical sentence, that is, it constitutes a separate syntactic constituent from the dislocated part.

A schematic illustration of our analysis is provided by the following examples:

(31) $[\text{les}_{[+\phi]}\ \text{amis}_{[+\phi]}]_{m} \rightarrow [\text{les amis}]_{p}$ *les amis*

(32) $[\text{son}_{[+\phi]}\ \text{opinion}_{[+\phi]}]_{m} \rightarrow [\text{son opinion}]_{p}$ *son opinion*

(33) $[\text{trois}_{[+\phi]}\ \text{ingénieurs}_{[+\phi]}]_{m} \rightarrow [\text{trois ingénieurs}]_{p}$ *trois ingénieurs*

(34) $[\text{les écoute}]_{m} \rightarrow [\text{les écoute}\ ]_{p}$ *les écoute*

The question that remains unanswered is why one of the agreeing elements must be a functional category. If agreement were the only factor at play, the final consonant of a noun should always be pronounced when followed by an adjective with which it agrees in gender and number. But that is not the case in conversational style (cf. (15a)). Within the End-Based approach, the line of the analysis would be that among function words, only those which agree in phi-features with a following element are invisible to prosodic boundary insertion, but again, why do we find this asymmetry between function words which realize inflectional features and those which do not? This asymmetry in postlexical phonological behavior is not an isolated property of French, but is observed in other languages as well. As shown in Elordieta (1997), Basque and Ìgbo also present similar cases of phonological differences between two clearly defined sets of function words: those which express inflectional features and those that do not. From this observation of the 'weak' morphological and prosodic properties of inflectional features across languages, we propose the hypothesis that inflectional features are not elements that can stand morphologically or prosodically on their own, and that they need to be realized on linguistic expressions which are morphologically or prosodically 'strong' enough to support them. The function words realizing those features (e.g. determiners, agreement, tense and aspect morphemes) may or may not be strong or independent in this sense. If they are 'weak', they need to incorporate or be incorporated into another head which provides them with sufficient morphological support. The morphological (or perhaps *morphosyntactic*) domain thus formed in a postsyntactic morphophonological module of grammar could then be visible as a phonological domain, which phonological processes may select for. In French, functional heads realizing inflectional features are not sufficiently strong in a morphophonological sense, and need to associate with adjacent heads. These morphological or morphosyntactic combinations are then potential phonological domains. Liaison applies obligatorily in these sequences, with the additional condition that the elements must share the same inflectional features. Since lexical heads form independent words in this sense, they will not need to merge with other heads, and thus no liaison is expected to apply. This explains the absence of liaison between a noun and an adjective. Prepositions, degree adverbs, complementizers, auxiliary verbs, and copulas are function words which do not realize morphosyntactic features shared by other heads, and therefore do not participate in obligatory liaison. Monosyllabic forms of these words make frequent liaison, a fact that we analyzed as an effect of a process of cliticization of these forms to adjacent heads. Monosyllabic function words often display clitic-like properties across languages, showing a close degree of phonological cohesion with adjacent heads. In the case of French, we suggest that cliticization forms a domain of

optional application of liaison, possibly the clitic group (cf. Nespor and Vogel 1986, Hayes 1989).

Notes

* I am most grateful to Jean-Roger Vergnaud for an inspiring discussion of the topic of this paper, as well as to François Dell, Cécile Fougeron, Bruce Hayes, Dominique Sportiche, Bernard Tranel and the audience at BLS 23 for helpful comments and suggestions. This research was funded by a fellowship from the Department of Education, Universities and Research of the Basque Government.

[1] See Tranel (1995) and references therein for discussion on the representation of final consonants in French

[2] The numbers *cinq* 'five', *six* 'six', *sept* 'seven', *huit* 'eight', *dix* 'ten', and perhaps also the quantifiers *plus* 'more' and *tous* 'all' display mixed properties; their final consonants are pronounced before vowels and not before consonants, but they are also pronounced before a pause. Tranel (1996) proposes a double underlying representation for these words, one with a latent final consonant and one with a fixed final consonant.

[3] Not all adjectives may appear in prenominal position, and of those which can, only a small set triggers liaison in the presence of a following noun: *petit* 'small, little', *gros* 'big', *grand* 'tall', *bon* 'good', *vieil* 'old', and a few other adjectives with suppletive forms (i.e. with fixed final consonants), such as *bel* 'beautiful', *nouvel* 'new', *fol* 'crazy', *mol* 'half-hearted'. Less frequent adjectives such as *eminent, intelligent,* or *mauvais* do not trigger obligatory liaison (*mauvais /? avocat* 'bad lawyer', *l'eminent/?avocat* 'the eminent lawyer', *les intelligents /? amis* 'the intelligent friends'. We must conclude then that liaison is lexicalized for some adjectives.

[4] The preposition *chez* makes obligatory liaison when followed by the pronouns *eux* 'their (masc.)' and *elle(s)* 'her/their (fem.)', and optional when followed by a full noun phrase. All other prepositions make optional liaison no matter what follows. Tranel (1981:246) suggests that the word combinations *chez eux* and *chez elle(s)* have been lexicalized with liaison, much like *accent aigu* 'acute accent' and *Etats-Unis* 'United States'. Also, it appears that liaison is more frequent with the preposition *en* than with any other preposition, especially when *en* is followed by a bare noun (e.g. *en avion* 'by plane', *en argent* 'made of silver'). Tranel (1981:247) provides an explanation based on the phonological nature of the linking consonant ([n]), and he also suggests (personal communication) that the segmental lightness of *en* compared to the other prepositions could be another factor responsible for this difference, the assumption being that lighter words tend to cliticize.

[5] It must be pointed out that not all consonants make liaison with the same frequency. It is much easier to pronounce word-final /t/ than to pronounce /s/, a fact which is well documented in the traditional literature on French liaison.

[6] For some speakers it is not as bad to make liaison between a verb and its direct object as it is to make liaison between a noun and an adjective or between a subject and a verb. Still, these speakers judge liaison in the context V-Obj rare or awkward in natural conversational style.

[7] For the purposes of our discussion, we treat possessive pronouns and numerals as determiners and quantifiers, respectively, although there have been proposals that analyze them as heads of their own maximal projections. Since in any case these categories are taken to be heads, this issue does not affect the validity of our criticism.

[8] The mapping theory between morphological or morphosyntactic domains and phonological domains I am proposing is very similar to Inkelas' (1990) theory of the mapping between morphological and prosodic constituency in the lexicon. Thus, my proposal could be taken as an extension of this theory into the postsyntactic level.

[9] (31a) is taken from Tranel (1992:279), and (31b) from Morin and Kaye (1982:305). These type of sentences are not accepted by all speakers, but Tranel (1992:274) cites them as possible in Parisian French as well. On the main syntactic differences between these constructions and other dislocated structures with the preposition *de*, see Tranel (1992:276-8).

References

Blanc, Michel, and Patricia Biggs. 1972. L'enquête socio-linguistique sur le français parlé à Orléans. Le français dans le monde 85. 16-25.

Chomsky, Noam.1995. The minimalist program. Cambridge, MA: MIT Press.

De Jong, Daan. 1990. The syntax-phonology interface and French liaison. Linguistics 28.57-88.

Elordieta, Gorka. 1994. On prosodic government. MIT Working Papers in Linguistics 23, 115-133. Cambridge, MA: MIT.

Elordieta, Gorka. 1997. USC dissertation, forthcoming.

Hayes, Bruce. 1989. The prosodic hierarchy in meter. Rhythm and meter, ed. by Paul Kiparsky and Gilbert Youmans, 201-260. Orlando: Academic Press.

Inkelas, Sharon. 1990. Prosodic constituency in the lexicon. Garland: New York.

Kaisse, Ellen. 1985. Connected speech: The interaction of syntax and phonology. Orlando: Academic Press.

Morin, Yves-Charles, and Jonathan Kaye. 1982. The syntactic bases for liaison. Journal of Linguistics 18.291-330.

Nespor, Marina, and Irene Vogel. 1986. Prosodic phonology. Dordrecht: Foris.

Selkirk, Elisabeth. 1972. The phrase phonology of English and French. Cambridge, MA: MIT dissertation.

Selkirk, Elisabeth. 1984. Phonology and syntax: The relation between sound and structure. Cambridge, MA: MIT Press.

Selkirk, Elisabeth. 1986. On derived domains in sentence phonology. Phonology Yearbook 3.371-405.

Tranel, Bernard. 1981. Concreteness in generative phonology. Berkeley, CA: University of California Press.

Tranel, Bernard. 1987. The sounds of French. Cambridge: Cambridge University Press.

Tranel, Bernard. 1992. On suppletion and French liaison. Romance languages and modern linguistic theory, ed. by Paul Hirschbühler and Konrad Koerner, 269-308. Amsterdam and Philadelphia: John Benjamins.

Tranel, Bernard. 1995. Current issues in French phonology: Liaison and position theories. The handbook of phonological theory, ed. by John Goldsmith, 798-816. Oxford: Blackwell.

Tranel, Bernard. 1996. Exceptionality in Optimality Theory and final consonants in French. Grammatical Theory and Romance Languages, ed. by Karen Zagona, 275-291. Amsterdam and Philadelphia: John Benjamins.

SYLLABLE WEIGHT AND THE PHONETICS/PHONOLOGY INTERFACE

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This paper examines the hypothesis that syllable weight is determined on the basis of two phonetic properties: duration and total energy. It is argued that syllables which are inherently prominent in terms of either duration or energy are treated as heavy syllables for purposes of weight (quantity) sensitive stress. It is argued on the basis of experimental data from ten languages that duration and energy for different rimes are similar across languages regardless of the phonological weight system employed by a particular language. These phonetic hierarchies correspond closely to the phonological weight hierarchies observed by languages of the world. Syllables which are heavy cross-linguistically are also phonetically longer and/or possess more energy. Phonological differences in weight result principally from a difference in the phonetic property upon which weight distinctions are based: duration or energy. This parametrization creates weight reversals, cases in which the same syllable is heavy in one language but light in another. Within a single phonetic dimension, however, languages choose the weight distinction(s) which rely on the largest phonetic and perceptual differences.*

1. INTRODUCTION. This paper explores the relationship between syllable weight and two phonetic properties which are independently known to lend prominence to a syllable: duration and energy. As such, it may be viewed as part of a general research program (albeit with slightly different results and conclusions) on the relationship between syllable weight and phonetics (see, for example, Hubbard 1994, 1995, Broselow, Huffman and Chen 1996).

Before proceeding further, a couple of caveats are in order regarding the limitations of this paper. First, I deal primarily with syllable weight as diagnosed by stress assignment, which is both the best documented weight-sensitive process and the one which displays the broadest range of weight distinctions cross-linguistically. Other processes which are commonly taken as indicators of syllable weight, such as minimal word requirements, reduplication, compensatory lengthening, etc. are not treated in this paper for reasons of space. For more data on these processes and their relationship to syllable weight and stress, the reader is referred to Gordon (1997a). I also do not offer an explicit formal account of the mapping between phonetic properties and phonological weight patterns which behave more symmetrically than consideration of phonetic patterns alone might suggest. The reader is referrred to Hayes 1996 for an algorithm linking phonetic properties to phonological patterns and Gordon 1997b for discussion of this algorithm as it relates to syllable weight.

The structure of the paper is as follows. Section 2 provides a typological overview of the types of weight criteria displayed by stress systems. In section 3, an inventory of *unattested* weight hierarchies of weight certain rimes is presented. In section 4, I discuss the phonetic basis for weight, arguing on the basis of phonetic data from ten languages with diverse weight patterns that syllables which are either inherently long or possess inherently great energy are selected as heavy. It is shown that cross-linguistic differences in syllable weight arise from two sources. First, languages may differ in the phonetic property on which they base weight distinctions, duration or energy. Second, languages differ as to where they draw weight distinctions. This difference has a phonetic basis: languages choose weight distinction based on the most robust phonetic and perceptual differences.

2. SYLLABLE WEIGHT: AN OVERVIEW. It has long been known that stress placement in many languages is a function of syllable weight (e.g. Allen 1973, Hyman 1977, McCarthy 1979, Prince 1990, etc.). In these weight-sensitive languages, "heavier" syllables attract stress. For example, in Latin (Allen 1973), stress falls on the penultimate syllable if it contains either a long vowel or diphthong or ends in a consonant. In words with more than two syllables, if the vowel in the penultimate syllable is short and not followed by a tautosyllabic consonant, stress falls on the antepenultimate syllable. Examples of Latin stress appear in (1).

(1) Latin stress
amī́kus 'friend', *karpéntum* 'carriage', *símulo:* 'I pretend'

Research has also revealed that languages may differ as to which syllables count as heavy and which as light. For example, in Khalkha (Bosson 1964, Poppe 1970, Walker 1995), CVV but not CVC is heavy for purposes of stress.

Numerous other weight patterns are attested in languages of the world. Some of these distinctions are presented in section 2.1. Interestingly, one nearly universal fact about weight distinctions is that syllable onsets do not affect the weight of a syllable[1]. For example, in Latin, the penultimate syllable in *pú.bli.kus* 'public' is light, even though it contains three segments under one possible syllabification. Crucially, the penultimate rime contains only a short vowel, and thus is considered light. Henceforth, onset consonants will not be considered in the discussion of weight. Following convention, however, a syllable initial consonant, though weightless, will be used in this paper in transcribing syllable types, e.g. CVC, CVV. Furthermore, note that CVV refers to both long vowels and diphthongs unless otherwise noted.

2.1. A TYPOLOGY OF WEIGHT DISTINCTIONS. In this section, a typology of weight distinctions is presented focusing on simpler binary weight distinctions and beginning with the two cross-linguistically most common weight distinctions, the Latin type one in which both CVV and CVC is heavy and the Khalka one in which CVV but not CVC is heavy. The reader is referred to Gordon (1997b) for discussion of the typology of weight distinctions including more complex weight hierarchy.

2.1.1. CVV, CVC HEAVY VS. CV LIGHT. Languages like Latin which treat long vowels and diphthongs as well as syllables closed by a consonant as heavy are cross-linguistically quite common, attested, for example, in diverse languages such as Estonian (Hint 1973), Arabic (McCarthy 1979), Cebuano (Shryock 1993), among many others.

2.1.2. CVV HEAVY VS. CVC, CV LIGHT. The Khalkha weight system in which CVV but not CVC is heavy is also quite common in languages of the world, attested in languages like Malayalam (Mohanan 1986), Menomini (Bloomfield 1962), and Yukulta (Keen 1983).

2.1.3. CVV, CV + SONORANT HEAVY VS. CV + OBSTRUENT, CV LIGHT. In addition to the Latin and Khalkha types of weight distinctions, there are a few languages which make a weight distinction between syllables closed by an obstruent and those closed by a sonorant, e.g. Kwakw'ala (Boas 1947). In these languages, only syllables containing a long vowel or syllables containing a short vowel and a sonorant coda are heavy. Syllables containing a short vowel and an obstruent coda or no coda at all are light.

2.1.4. WEIGHT DISTINCTIONS BASED ON VOWEL QUALITY. Certain languages draw weight distinctions based on vowel quality. The most common subgroup of this type are languages which treat full (i.e. non-reduced vowels) as heavier than reduced (i.e. schwa-like or centralized vowels). Crucially, in languages which make a weight distinction between full and reduced vowels, the reduced vowels are phonetically very short relative to the non-reduced vowels. This can be seen in measurements from Mari (Gruzov 1960) and Javanese (see below in section 4) and also in descriptions found in grammars. In Chuvash, the reduced vowels are "fleetingly pronounced, and sometimes so reduced as to sound almost coalesced with the following consonant..." (Krueger 1961: 71). Among languages which distinguish between full and reduced vowels, there exist two subgroups. One group ignores coda consonants, e.g. Javanese (Herrfurth 1964) and Chuvash (Krueger 1961), while the other group treats *all* closed syllables as heavy whether they contain a reduced vowel or not, e.g. Malay (Winstedt 1927).

Some other languages make weight distinctions between vowels of different qualities which do not involve a full vs. reduced vowel distinction. In languages which draw weight distinctions based on vowel height, it is the lower vowels which are universally heavier than the higher vowels. For example, in the Jaz'va dialect of Komi (Lytkin 1961), non-high vowels are heavy, whereas high vowels are light.

3. IMPLICATIONAL WEIGHT HIERARCHIES. If one considers the type of weight distinctions discussed in section 2, certain universal patterns emerge. Most notably, there are certain syllable types which are never heavier than certain other syllable types. For example, there appear to be no languages in which VC is heavier than VV^2. Furthermore, there are no languages, to the best of my knowledge, in which syllables closed by an obstruent coda are heavier than syllables closed by a sonorant coda. There are other unattested weight patterns. High and mid vowels are never heavier than low vowels, mid vowels are never heavier than low vowels, and reduced vowels are never heavier than full vowels (where reduced entails a schwa or centralized quality and short duration). It is possible, however, for the same syllable type to be heavy in one language but light in another language. For example, in many languages, including Latin, closed syllables and syllables containing a long vowel are heavier than open syllables containing a short vowel, regardless of vowel quality. In other languages, including Komi Jaz'va and Javanese, syllables containing a heavy (=full or relatively low) vowel are heavier than all syllables containing a light vowel, even those closed by a coda consonant. To take an illustrative example compare the syllables /tip/ and /ta/ in Latin and Komi Jaz'va (11). In Latin, /tip/ is heavy, whereas /ta/ is light. In Komi Jaz'va, the opposite pattern obtains: /tip/ is light, whereas /ta/ is heavy. In section 5, the difference between languages like Latin and languages like Komi Jaz'va will be argued to arise from a difference in sensitivity to the two phonetic properties of duration and energy.

4. A PHONETIC BASIS FOR WEIGHT. This section presents phonetic data from ten languages which demonstrate that phonologically heavy syllables intrinsically possess either greater energy or duration than light syllables, or are *both* longer and louder than light syllables. It is a well-known observation that both energy (and its perceptual correlate, loudness) and duration are common phonetic correlates of stress. In many languages, stressed syllables are either longer or louder than unstressed syllables or are *both* longer *and* louder than unstressed syllables. The correlation between stress and an increase in duration and/or loudness has been experimentally shown for many languages including English (Fry 1955; Beckman 1986), Italian (Bertinetto 1980), Mari (Baitschura 1976),

Tagalog (Gonzalez 1970), etc. and impressionistically noted for many other languages. It thus is not surprising that quantity-sensitive languages would use these same phonetic properties not only to signal stress, but also to determine the position of stress in a word[3].

4.1. EXPERIMENTAL EVIDENCE. An experiment was designed to test the general hypothesis that languages treat syllables which are either longer or possess more energy as heavy. Ten languages with diverse weight patterns and different prominence systems were examined. Two languages in which CVV but not CVC or CV are heavy were considered: Telugu and Khalkha. Three languages in which both CVV and CVC are heavy were included: Italian, Finnish and Japanese. The Japanese evidence for this weight distinction comes from primarily from poetry (Vance 1987). Note that Italian does not possess phonemic long vowels. It does, however, have diphthongs which pattern as heavy. One language with a weight distinction between full and reduced vowels was also analyzed: Javanese. In addition to the languages displaying quantity sensitive stress, three languages with quantity insensitive stress (French, Farsi, and Russian) as well as a tone language (Bole) served as experimental controls. The languages investigated for the phonetic study appear in table 1.

Language	Weight distinction	Reference(s)
Telugu	CVV > CVC, CV	Brown 1981
Khalkha	CVV > CVC, CV	Poppe 1970, Bosson 1964
Italian	CVV, CVC > CV	Bertinetto 1981
Finnish	CVV, CVC > CV	Sadeniemi 1949
Japanese	CVV, CVC > CV	Vance 1987
Javanese	Full V > Reduced V	Herrfurth 1964
French	quantity insensitive (phrase)	Delattre 1966
Farsi	quantity insensitive (final)	Windfuhr 1990
Russian	quantity insensitive (phonemic/morphological)	Comrie 1990
Bole	tone	Lukas 1969

TABLE 1. Languages examined

Languages without quantity-sensitive stress serve as experimental controls, in the sense that, if they display similar duration and energy patterns to those found in quantity-sensitive languages, we avoid a potential circular relationship between phonetics and syllable weight whereby phonetic patterns could be argued to be purely the result of phonological criteria.

4.2. METHODOLOGY. A corpus of two syllable words of the form (C)VC(C)V(C) was constructed for each language, varying the rime of the first syllable and keeping the vowel in the second syllable constant. The first syllable was chosen as a target in order to avoid potential final lengthening effects (Wightman et al. 1992). The rimes appearing in the first syllable were varied according to the vowel quality and length (if long vowels occurred in the language) of the syllable nucleus. Three vowel qualities were examined /i, u, a/. Short vowels were examined in both open syllables and syllables closed by a member of a set of coda consonants; for example, by different sonorant codas, usually /m, n, r, l/, and coda obstruents (if tolerated in non-final position by the language). The set of coda consonants and the vowels examined for each language is listed in Table 2. Attempts were made whenever possible to control for keep surrounding consonants uniform. The first syllable had the same stress level for all words in the corpus, as did the second syllable. The first syllable was stressed in all

languages except for Farsi, French, Chickasaw, and also Javanese in cases where the first syllable was a reduced vowel. In Javanese, the reduced vowel was measured in the second (=stressed) syllable of a word containing a reduced vowel in the first syllable[4]. By keeping stress uniform for all target syllables, a difference in stress level between different syllable types is eliminated as a potential confounding factor. Due to the lack of a consensus regarding syllable affiliations in Russian, only open syllables were examined. Rimes containing /u/ were not measured in Chickasaw due to an absence of this vowel in the inventory. Rimes containing /i/ were not measured in Khalkha due to confounds created by the vowel harmony system.

Language	Vowels and codas examined
Telugu	a, i, u, aː, iː, uː, m, l, r, s, k, g
Khalkha	a, u, aː, uː, m, n, l, r, s, ʃ, x, k, g
Italian	a, i, u, m, n, l, r, s
Finnish	a, i, u, aː, iː, uː, m, n, l, r, s, t
Javanese	a, i, u, ə, m
French	a, i, u, l, ʀ, s
Farsi	a, i, u, m, n, l, r, f, s, z, ʃ, ʒ, x, k, g
Russian	a, i, u
Japanese	a, i, u, aː, iː, uː, m, n
Bole	a, i, u, aː, iː, uː, m, n, l, r

TABLE 2. Vowels and codas measured

Six to eight tokens of each word were recorded from one speaker in each language. Words appeared in a carrier phrase. Two measurements were made for each rime using Kay CSL: duration and total perceptual energy, the integration of energy and duration in the perceptual domain. Total energy was measured rather than another measure of energy such as average energy, because psychoacoustic experiments suggest that the ear integrates energy and time up to durations under which most syllable durations fall (see Moore 1989 and Scharf (1978) for a review of the literature).

The procedure for measuring total perceptual energy was as follows. First, in order to control for token to token variation in speaking level, average amplitude (RMS) in decibels for each target vowel and the following coda consonant (if any) was calculated relative to a reference vowel in the 2nd syllable which, as mentioned earlier, was kept constant. Second, the average amplitude of each segment in the target rime was converted to a value representing perceived loudness relative to the vowel in the second syllable. Perceived loudness was computed from a graph in Warren (1970) based on experiments designed to measure relative perceived loudness of tones. While Warren's results are based on a different type of stimulus than real speech, it may serve as a reasonable and also tractable estimate of the relationship between acoustic energy and perceived loudness. Third, the relative loudness value for each segment was multiplied by the duration of the segment to yield a total energy value for the segment. Finally, if the rime contained a coda, total energy values for the vowel nucleus and the coda were added together yielding a total energy value for the rime (see endnote for an example of the procedure)[5].

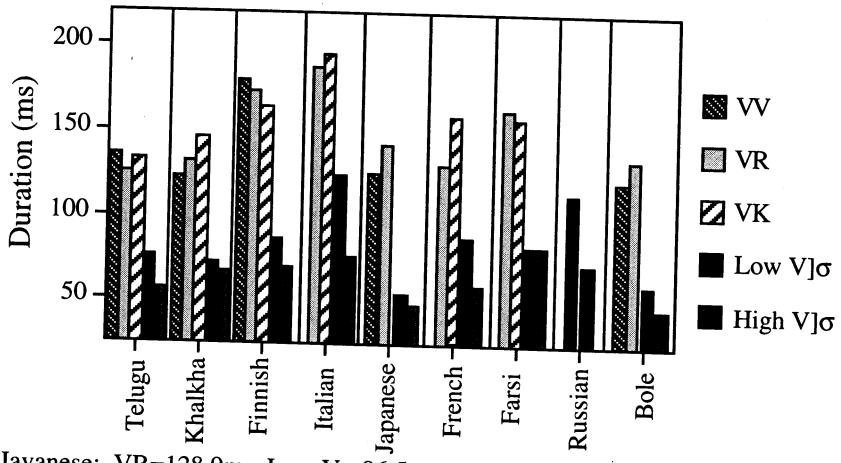
4.3. RESULTS. Average duration and energy values for the various rime types examined in each language are presented in sections 4.3.1. and 4.3.2. Values are grouped by each rime type which plays a role in weight distinctions in languages of the world: i.e. long vowels, sonorant closed syllables containing a short vowel, obstruent closed syllables containing a short vowel, and low and high vowels in

open syllables. The values for each class of rimes were calculated by grouping rimes by natural classes into progressively larger groupings. For example, the average values for obstruent closed syllables were determined by first averaging values for rimes closed by fricatives and combining this average value with the average of rimes closed by a stop. Similarly, averages for long vowels were computed by first averaging values for *high* long vowels and averaging this number together with the average for *low* long vowels. Likewise, if only one type of syllable closed by a nasal was examined but two liquids were measured (e.g. Telugu), the two liquids were averaged together and then this average was averaged with the value for the nasal closed syllables. By adopting this method of averaging, imbalances in the number of segments belonging to each class were controlled for.

4.3.1. DURATION. Duration values for the five rime types VV, VR, VO, and phonemically short low and high vowels in open syllables appear in figure 1. Values for the reduced vowel in Javanese were also calculated. Due to graphical limitations related to the introduction of a category of reduced vowels, which would have made the figure less readable, values for Javanese appear immediately below figure 1.

The general pattern which emerges from figure 1 is for long vowels and closed syllables (both obstruent and sonorant closed) to be substantially longer than open syllables containing a short vowel, either a low or a high vowel. This is reflected in the large values for VV, VR, and VK relative to the high vowel and also relative to the low vowel. By comparison, the difference in duration between high vowels and low vowels is relatively small. Also, the difference between any two members of the set of rimes including VV, VR and VK is typically fairly small compared to the difference between any of these rimes and both low and high vowels in open syllables. These general patterns emerge in all languages regardless of language specific weight patterns, though there are differences between languages in the magnitude of the difference between these three longest rime types and the two shortest ones, as well as different rankings of VV, VR and VK relative to each other.

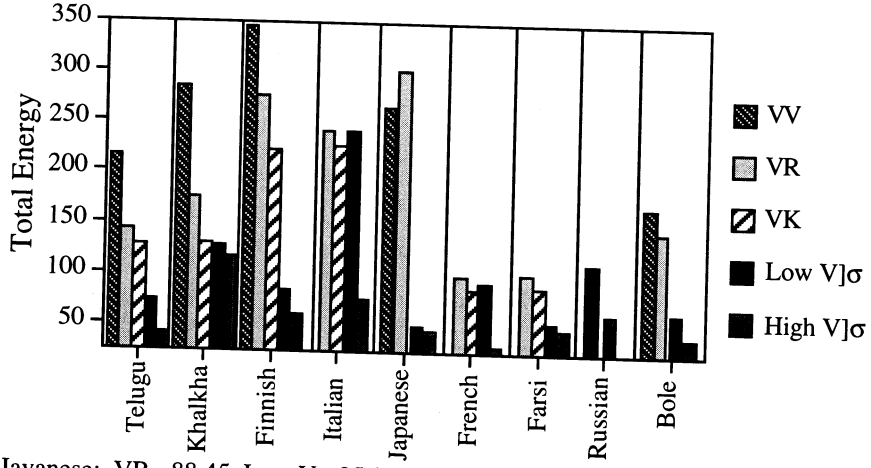
It appears on the basis of figure 1, that the Latin type weight pattern in which CVV and CVC (including CVK and CVR) accords well with the phonetic data where VV and VC are also phonetically long. However, it is also important to note that in Khalkha nor Telugu, VV is not significantly longer than VC even though CVV is phonologically heavier than CVC in both of these languages. In Khalkha, VV is actually shorter than both VR and VK. Nor is the weight distinction between full and reduced vowels in Javanese reflected in duration patterns not shown in figure 1. A full vowel in an open syllable is insignificantly longer than a reduced vowel in a closed syllable: reduced V in a closed syllable = 73.7ms vs. full V in an open syllable = 72.3. On the basis of these facts, it appears that duration does not offer an explanation either for weight distinctions of the Khalkha or Telugu type or for full vs. reduced vowel distinctions of the Javanese type.



Javanese: VR=128.9ms, Low V= 86.5ms, High V=60.8ms, Reduced V=26.1ms

FIGURE 1. Duration of five rime types in ten languages

4.3.2. ENERGY. Results of the energy measurements appear in figure 2. Values for low and high vowels are for phonemically short low and high vowels in open syllables.



Javanese: VR= 88.45, Low V= 85.05, High V= 56.00, Reduced V= 26.10

FIGURE 2. Energy values for five different rimes in eleven languages

As is apparent from figure 2, long vowels typically are characterized by the greatest amount of total energy in all languages containing long vowels. Lowest in energy are the high vowels. The ordering of VR and VK rimes relative to one another is also fixed across languages, with VR always having greater energy than VK. The ordering of VR and VK relative to low vowels displays the greatest

variability from language to language. In Italian and French, low vowels have approximatley the same amount of energy as VR and VK, whereas in Telugu, Khalkha, Chickasaw, Finnish, Farsi, Japanese and Bole, low vowels have less energy than VR and VK (where VK occurs).

Energy offers an explanation for weight distinctions which cannot be accounted for by consideration of duration alone. Long vowels in Telugu and Khalka have much more energy than all other rimes, patterning with the heavy behavior of long vowels in Telugu and Khalkha. The difference in energy between long vowels and the next highest ranked rime in terms of energy is greater than the difference in energy between any of the four lowest ranked rimes. In Telugu, the energy value for VV is 73.24 higher than for VR, whereas the largest difference between any of the four lowest ranked rimes is only 53.88 (between VK and LowV). In Khalkha, the energy value for VV is 109.77 greater than that of VR, while the next largest difference (between VR and VK) is only 35.15. Thus, just as languages like Italian, Japanese, and Finnish employ weight distinctions between rimes which are maximally different in terms of *duration*, Telugu and Khalkha exploit the weight distinction between rimes which are maximally differentiated in terms of *energy*. Similarly, in Javanese, reduced vowels have much less energy than other rimes patterning with their light behavior phonologically. The difference between reduced vowels and other rimes is greater than the difference between any other rimes. This difference between reduced vowels and high vowels, the next lowest ranked rime in terms of energy, is not much greater than the difference between high vowels and the next highest rime, low vowels (29.9 vs. 29.05). However, bear in mind that the proximity of reduced vowels and high vowels to one another in terms of energy is probably an artifact of the experimental corpus. Recall from section 4.2. that the reduced vowel was measured relative to another reduced vowel, which has less energy than full vowels to which other targeted vowels were compared.

It is also interesting to note, that VR has greater energy than VK in all languages considered, though none of the languages examined makes a phonological weight distinction between obstruent and sonorant closed syllables. Also, in all languages, low vowels have greater energy than high vowels, even though none of the languages examined makes this weight distinction. These low level phonetic patterns in the examined languages correspond to phonological weight distinctions found in other languages. A reasonable and empirically testable hypothesis is that low vowels have much more energy than high vowels in languages which make this weight distinction, and that syllables closed by a sonorant have much more energy than syllables closed by an obstruent in languages which phonologically distinguish between the two for weight. Thus, one might hypothesize that in Kwakw'ala, there is a marked distinction in energy between long vowels and sonorant closed syllables on the one hand, and all other rimes on the other hand.

There is another interesting phonetic pattern seen in figure 2. Languages in which low and high vowels differ most markedly in terms of energy (Italian, French, Javanese, Russian) tend to be the languages without phonemic long vowels. In contrast, differences in energy between low and high vowels tend to be much smaller in languages without phonemic length distinctions (Telugu, Khalkha, Finnish, Japanese, Bole). Farsi is somewhat anomalous in this respect, since its energy difference between low and high vowels is relatively small compared to the other languages without phonemic vowel length contrasts. However, it is unclear whether distinctions in the Farsi vowel system are based entirely on qualitative rather than durational differences. Length contrasts are preserved in certain dialects of Farsi as well as in certain poetic traditions (Windfuhr 1990).

The different energy patterns between languages with and languages without phonemic long vowels is largely due to different duration patterns found in the two sets of languages (see figure 1). Duration differences between low and high vowels are greater in languages in which there are no phonemic length contrasts for the vowels. This difference presumably has a functional explanation. In languages without phonemic length contrasts, vowel qualities which are inherently long, the low vowels, may be made even longer relative to inherently shorter vowel qualities without potentially jeopardizing a phonemic vowel length contrast. This phonetic asymmetry between languages with and languages without phonemic vowel length contrasts corresponds to a phonological asymmetry in syllable weight. Languages with weight distinctions based on vowel quality including full vs. reduced vowel distinctions occur almost exclusively (21 of 23 cases) in languages without phonemic vowel length. In the exceptional cases in which they do occur, there is also a weight distinction between phonemically long and short vowels. On the basis of the data seen in this paper, we may hypothesize that the presence of a weight distinction based on smaller phonetic differences (e.g. weight distinctions based on vowel quality) necessarily implies that there will also be a weight distinction based on larger phonetic differences (e.g. weight distinctions between phonemically long and short vowels).

5. SUMMARY: DURATION AND ENERGY-- PUTTING THE TWO TOGETHER. The data examined in this paper strongly suggests that weight distinctions have a phonetic basis. Certain weight distinctions are grounded in energy, while others are grounded in duration. Examples of energy based weight distinctions are the Khalkha type distinction where CVV but not CVC is heavy, and the Javanese type of distinction, according to which full vowels are heavier than reduced vowels. Presumably other vowel quality based weight distinctions are also energy based, though data from the relevant languages were not examined here. Duration based weight distinctions include the Latin type pattern, according to which CVV and CVC are heavy, as well as possibly the pattern seen in languages like Malay according to which both full voweled syllables and closed syllables are heavy, though the data at this stage is inclusive as to whether this is an energy or duration based weight distinction.

The parametrization of weight along the two phonetic dimensions of duration and energy results in weight reversals, cases in which the same rime may be heavy in one language but light in another language: e.g. Latin vs. Komi Jaz'va. In Latin /tip/ is heavy and /ta/ is light, whereas in Komi Jaz'va, /tip/ is light and /ta/ is heavy. On the basis of the data examined in this paper, it is presumably the case that in Latin, duration is the relevant property for weight, whereas in Komi Jaz'va, energy is the crucial property. It does not at this stage seem possible to determine the phonetic dimension upon which a language will base its weight distinctions merely by looking at phonetic properties. For example, there are quite large energy differences between high vowels and other rimes in Italian. This difference, however, is not exploited phonologically: Italian weight distinctions are based on duration. Crucially, however, within either of the two phonetic dimensions of duration and energy, languages exploit the weight distinction which relies on the most robust phonetic differences.

The unattested phonological weight distinctions are correctly predicted to be unlikely to occur on the basis of phonetics. For example, although in Italian, French, Khalkha, VK is the longest rime, in none of these languages is the duration difference between VK and the shorter rimes larger than the difference between any of the rimes other than VK. Thus, the difference between VK and other rimes is unlikely to be exploited into a weight contrast, at least without first making another more salient weight distinction. Similar small phonetic reversals

like that seen between VR and VV in Japanese are likewise unlikely to exploited into a weight distinction, since other weight cutoffs are phonetically and perceptually more desirable.

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[1]The familiar counterexample to the claim that onsets are universally weightless is provided by Pirahã (Everett and Everett 1984). Davis (1988) discusses a few additional cases of languages which apparently are sensitive to onsets in determining stress.

[2]Two exceptions to this generalization have been argued for in the literature. Biblical Hebrew (McCarthy 1979) and Salcha (Tuttle 1991). In both of these languages stress falls on a heavy final syllable where heavy is equivalent to closed syllables but not open syllables containing a long vowel, otherwise on the penult. While I am unable to comment on the Hebrew facts, Tuttle states that long vowels are shortened in word-final position, a phonetic fact which could explain their failure to attract stress.

[3]It is conceivable that other factors play a role in the assignment of stress, notably the ability of certain syllables to carry certain intonation contours which could enhance the prominence of a syllable. For example, pitch, which is linked to stress in many languages, is better realized on vowels than many consonants due to the sonorant nature of vowels. Thus, if a language wanted stressed syllables to possess a particular pitch contour more suited to vowels than consonants, it might be more likely to stress long vowels than VC syllables. However, energy seems more closely related to "stress" as typically conceived than pitch, since most languages have distinct (though often intersecting) intonational (including pitch accent) and stress systems.

[4]Because energy for the reduced vowels in Javanese was measured relative to another reduced vowel rather than to a full vowel, energy values for the target reduced vowel could potentially be inflated. This does not influence the conclusion reached in section 5.

[5]The procedure may be illustrated by means of a concrete example. Let us take the first syllable of the word /pant**a**/. First, the average energy of /**a**/ was subtracted from the average energy of /**a**/ and the average energy of /**n**/. Let us suppose the average energy of /**a**/ is 6dB greater than the average energy of /**a**/, and the average energy of /**n**/ is 3dB greater than the average energy of /**a**/. 6dB correpsonds to a twofold increase in perceived loudness, while 3dB corresponds to a 1.55 increase in perceived loudness. The duration of /**a**/ in /p**an**t**a**/ is thus multiplied by 2, and the duration of /**n**/ in /p**an**t**a**/ is multiplied by 1.55 yielding total energy values for /**a**/ and /**n**/. Finally, the product of these operations are summed together providing a total energy value for the rime as a whole.

REFERENCES

ALLEN, S. 1973. Accent and rhythm. Cambridge: Cambridge University Press.

BAITSCHURA, U. 1976. Instrumental phonetische Beiträge zur Untersuchung der Sprachmelodie und des Wortakzentes im Tscheremissischen. Études Finno-Ougriennes **XIII**. 109-22.

BERTINETTO, P. M. 1980. The perception of stress by Italian speakers. JPh **8:4**. 385-95.

BERTINETTO, P.M. 1981. Le Strutture Prosodiche dell'Italiano. Firenze: Accademia della Crusera.

BLOOMFIELD, L. 1962. The Menomini language. New Haven: Yale University Press.

BOAS, F. 1947. Kwakiutl grammar with a glossary of the suffixes. edited by Helene Boas Yampolsky and Zelig Harris. Transactions of the American Philosophical Society **37:3**. 201-377.

BOSSON, J. E. 1964. Modern Mongolian. Uralic and Altaic Series **38**. Bloomington: Indiana University.
BROSELOW, E.; S. CHEN; and MARIE HUFFMAN. Syllable weight: convergence of phonology and phonetics. ms. SUNY Stony Brook.
BROWN, C.P. 1981. A Grammar of the Telugu Language. New Delhi: Asian Educational Services.
COHN, A.; and K. LOCKWOOD. 1994. A phonetic description of Madurese and its phonological implications. Working Papers of the Cornell Phonetics Laboratory **9**. 67-92.
COMRIE, B. 1990. Russian. In Comrie, B. ed. The World's Major Languages. New York: Oxford University Press. 329-47.
DAVIS, S. 1988. Syllable onsets as factors in stress rules. Phonology **5**. 1-19.
DELATTRE, P. 1966. Les dix intonations de base du français. French Review **40**. 1-14.
EVERETT, D.; and K. EVERETT. 1984. Syllable onsets and stress placement in Pirahã. WCCFL **3**. 105-16.
FRY, D. B. 1955. Duration and intensity as physical correlates of linguistic stress. JASA **27**. 765-68.
GOLDSMITH, J. 1990. Autosegmental and metrical phonology. Oxford: Blackwell.
GONZALES, A. 1970. Acoustic correlates of accent, rhythm, and intonation in Tagalog. Phonetica **22**. 11-44.
GORDON, M. 1997a. A phonetically-driven account of syllable weight. UCLA Working Papers in Phonology **2**.
GORDON, M. 1997b. Conflicted weight criteria and the theory of syllable weight. UCLA Working Papers in Phonology **2**.
GRUZOV, L. P. 1960. Sovremenyi mariiskii yazyk: Fonetika. Joshkar-ola: Mariiskoe Knizhnoe Izdatel'stvo.
HAYES, B. 1995. Metrical stress theory: principles and case studies. Chicago: University of Chicago Press.
HAYES, B. 1997. Phonetically-driven phonology: the role of optimality theory and inductive grounding. Proceedings of the 1996 Milwaukee Conference on Formalism and Functionalism in Linguistics.
HERRFURTH, H. 1964. Lehrbuch des Modernen Djawanisch. Leipzig: VEB Verlag.
HINT, M. 1978. Eesti keele sõnafonoloogia I. Tallinn: Eesti NSV Teaduste akadeemia.
HUBBARD, K. 1994. Duration in moraic theory. PhD dissertation. University of California, Berkeley.
HUBBARD, K. 1995. 'Prenasalised consonants' and syllable timing: evidence from Runyambo and Luganda. Phonology **12**. 235-56.
HYMAN, L. 1977. On the nature of linguistic stress. In Hyman, L. ed.. Studies in stress and accent. Southern California Occasional Papers in Linguistics **4**. Dept. of Linguistics, USC. 37-82.
JASSEM, W., Morton, J., and Steffen-Batóg, M. 1968. The perception of stress in synthetic speech-like stimuli by Polish listeners. Speech Analysis and Synthesis **I**. 289-308.
KEEN, S 1983. Yukulta. In Dixon, R.M.W. and Blake, B. eds.. Handbook of Australian Languages **3**. Canberra: Australian National University. 191-306.
KENSTOWICZ, M. 1994. Sonority-driven stress. ms. MIT. Available on Rutgers Optimality Network.
KRUEGER, J. R. 1961. Chuvash manual. Uralic and Altaic series **7**. Bloomington: Indiana University Press.
LUKAS, J. 1969. Tonpermeable und Tonimpermeasble Konsonanten im Bolanci Nordnigerien. Ethonological and Linguistic Studies **52**. 133-138.

LYTKIN, B. I. 1961. Komi-Yaz'vinckii Dialekt. Moscow: Akademii Nauk.
MCCARTHY, J. 1979. Formal problems in Semitic phonology and morphology. Ph.D. dissertation, MIT.
MOHANAN, K.P. 1986. The theory of lexical phonology. Dordrecht: Reidel.
MOORE, B. 1989. An Introduction to the psychology of hearing. San Diego: Academic Press.
POPPE, N. 1970. Mongolian language handbook. Washington, D.C.: Center for Applied Linguistics.
PRINCE, A. 1990. Quantitative consequences of rhythmic organization. Parasession on the syllable in phonetics and Phonology. CLS **26**. 355-98.
SCHARF, B. 1978. Loudness. In Carterette, E.; and M. Friedman. eds. Handbook of perception **IV**: Hearing. New York: Academic Press. 187-242.
SADENIEMI, M. 1949. Metriikkamme perusteet. Helsinki: SKST.
SELKIRK, E. 1984. Phonology and syntax: The relation between sound and structure. Cambridge, MA: MIT Press.
SHRYOCK, A. 1993. A Metrical analysis of stress in Cebuano. Lingua **91**. 103-48.
TUTTLE, S. 1991. Metrical structures in Salcha Athapaskan. Occasional Papers on Linguistics **16**. Papers from American Indian Languages Conferences. UCSC. July and August, 1991. 203-17.
VANCE, T. 1987. An Introduction to Japanese phonology. Albany: State University of New York Press.
WALKER, R. 1995. Mongolian Stress: Typological implications for nonfinality in unbounded systems. Phonology at Santa Cruz **4**. 85-102.
WARREN, R. M. 1970. Elimination of biases in loudness judgements for pure tones. JASA **48**. 1397-1413.
WIGHTMAN, C.W.; SHATTUCK-HUFNAGEL S.; OSTENDORF, M.; and Price, P.J. 1992. Segmental durations in the vicinity of prosodic phrase boundaries. JASA **92**.1707-17.
WINDFUHR, G. 1990. Persian. In Comrie, B. ed. The World's Major Languages. New York: Oxford University Press. 523-46.
WINSTEDT, R. 1927. Malay grammar. Oxford: Oxford University Press.

Converging evidence for the notions of *subscene* and *primary scene*

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1. Introduction

The general question that forms the background to this paper is one that has interested many scholars over the years, including linguists, psychologists, philosophers, and others. This question concerns the role of our experiences in motivating features of language. A number of influential studies have proposed that certain categories of experiences—or their cognitive representations—are particularly significant in accounting for facts of language use and structure. Examples of these proposed ways of parsing experience into significant divisions include *experiential domains*, which play a central role in the conceptual metaphor theory of Lakoff and associates (Lakoff & Johnson 1980; Sweetser 1990; Johnson 1987; Lakoff 1987, 1993; Turner 1991; etc.); *prototypical events*, discussed in Slobin's (1985) study of the acquisition of grammatical categories; and Fillmore's (1968, 1982) *case frames* and *semantic frames*, which are important elements in several current theories of semantic representation. Each of these proposed constructs parses experience in ways which are relevant to language.

In this paper we consider two types of linguistic evidence for a pair of additional constructs of this general sort. By looking at facts about metaphorical language and about children's acquisition of grammatical constructions, we hope to show that our two proposed units of experience, which we call *subscene* and *primary scene*, respectively, play a significant role in explaining aspects of linguistic and conceptual structure.

We begin by considering some aspects of metaphorical data.

2. Metaphorical evidence for primary scenes and subscenes

2.1 'Gaps' and primary metaphors

Recent research into the cognitive structures referred to as 'mappings' in conceptual metaphor theory has shown that these mappings—systematic sets of metaphoric correspondences between concepts from different experiential domains—are best analyzed as low-level, local conceptualizations. To see the significance of this principle, consider the following example, taken from Grady et al. (1996). Sentences like those in (1) have been cited as evidence for a mapping between buildings (the 'source' domain of the metaphor, which provides the lexical material and inferential structure) and theories (the 'target' domain).

(1) a. You have failed to *buttress* your arguments with sufficient facts.
b. Recent discoveries have shaken the theory to its *foundations*.
c. Their theory *collapsed/caved in* under the weight of scrutiny.

However, there are crucial elements of buildings which are not conventionally mapped onto theories, even though these elements are integral to our experiences with buildings—a crucial point given the emphasis on experiential motivation within conceptual metaphor theory. Sentences like those in (2) are much less readily interpretable than those in (1), suggesting that whatever conceptual mapping underlies the expressions in (1) is not based on our typical experiences with buildings.

(2) a. ? This theory has no *windows*.
b. ? The *tenants* of her theory are behind in their *rent*.
c. ? I examined the *walls* of his theory.

An alternative analysis of the metaphoric conceptualizations underlying the sentences in (1) involves mappings at a much lower level of conceptual elaboration and images that are much less rich and specific:

(3) a. PERSISTING IS REMAINING ERECT
b. ORGANIZATION IS PHYSICAL STRUCTURE

These two metaphors motivate figurative language about target concepts other than theories, and are not restricted to source terms from the semantic area of buildings. For instance, the examples in (4) are licensed by (3a) and (3b), respectively:

(4) a. This situation will not *stand.*
b. Society seems to be *unraveling*.

The interaction of (3a) and (3b) allows references to the *collapse* of a theory, and so forth, since theories (like political regimes, grammatical systems, and other non-physical organizations of linked elements) can be understood as erect physical structures. Data sets licensed by metaphors at this level do not show 'gaps' of the sort illustrated in (2).

2.2 Experiential motivation for metaphors

Another advantage of the 'primary metaphor' analysis is that it comes closer to addressing the issue of experiential motivation, both for expressions such as those in (1), and by extension for conceptual metaphor in general. One of the aims of the account offered here is to provide further detail and substance to our understanding of the basis for metaphorical conceptualizations.

While there is no plausible basis for forming a strong cognitive association between theories and buildings per se, we can construct a reasonable account of how the mappings in (3) might arise. They can plausibly be traced to recurring experience types (or 'primary scenes'[1]) which bring together the source and target concepts in tightly coherent and predictable ways. Figure 1 sketches the experiential basis for conceptualizing the organization of an abstract entity—i.e. the relevant complex of internal causal relationships—as physical structure:

	Participant 1	**Participant 2**	**Nonparticipant**
Subscene 1: Physical manipulation of complex object	Person who manipulates object	Complex, structured physical object	
Subscene 2: Formation of cognitive representation of object's organization	Person who forms cognitive representation of object	Cognitive representation of object's (logical) organization	
(Perception of object's color)	Perceiver of color		Color of object

Figure 1 — Primary scene: manipulation of a complex object

The figure reflects the fact that Participant 1 in each 'subscene'—or distinguishable aspect of the scene as a whole—is the same person, in the roles of physical manipulator and conceptualizer, respectively. Participant 2 is the structured object itself in one case, and in the other the cognitive representation of the relationships holding within the object. These dimensions of the total experience unfold simultaneously. From the point of view of the person in the scene (i.e. Participant 1) the relevant association is between manipulating the object and forming an understanding of its structure. An additional aspect of the overall scene—the potential for the person to be aware of the object's color—is included as a reminder of the fact that any actual experience involves innumerable details to which we could potentially attend; only certain dimensions of these experiences are linked in ways which give rise to entrenched metaphoric associations.

We can construct similar figures to illustrate the scenes which motivate the following primary metaphors:

(5) a. ACHIEVING A PURPOSE IS ACQUIRING A DESIRED OBJECT
b. BECOMING ACCESSIBLE TO AWARENESS IS EMERGING FROM A CONTAINER

These basic mappings underlie data such as the following, which has previously been analyzed as evidence for a complex 'Conduit Metaphor' for communication (Reddy 1979)[2]:

(6) a. I didn't *get much out of* this article.
b. There's very little *content in* this paper.

The Conduit Metaphor—which on Reddy and others' analyses involves a mapping between sending objects in packages (source) and linguistic communication (target)—shows 'gaps' like those illustrated in (2) for the theories-as-buildings metaphor: we cannot typically speak of *envelopes*, *boxes* or *couriers*, or of acts of *sealing*, when referring to communicative processes.

Figure 2 indicates the type of recurring scene which could give rise to the association in (5b). This diagram refers to the temporal coincidence of processes in the domains of perception and knowledge. Here X represents the object of perception and X' represents knowledge associated with X as a perceptual stimulus.

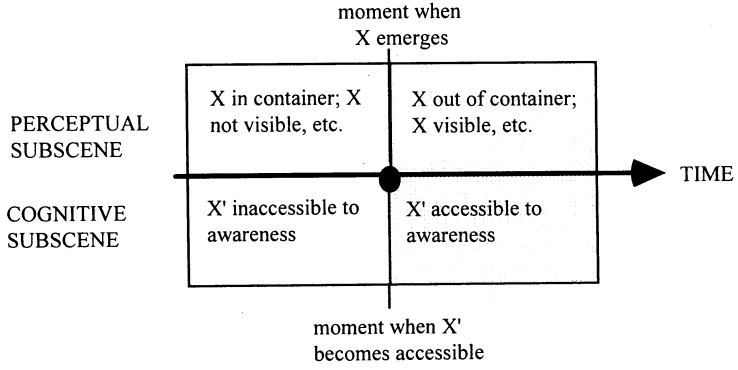

Figure 2 — Primary scene: emergence of object from container

We experience scenes like the one schematized in Figure 2 many times each day—whenever we perceive something in our environment as it emerges from a containing space—and the association between the perceptual and inferential aspects of such scenes is likely to be very well established in our cognitive structure.

It would be possible to give many more examples like the ones already discussed in this section. For instance, a primary metaphor along the lines of ACCEPTING IS SWALLOWING—where 'accepting' means offering no resistance to a proposed claim, or to some event or situation—is motivated by a recurring event type involving an emotional/intentional subscene as well as a physical one. We

experience this correlation every time we consciously swallow something (and this is certainly one of children's first experiences with accepting vs. rejecting what the world offers them).

To summarize the proposal of this section, primary metaphors are motivated by tight correlations between distinguishable dimensions of recurring, locally defined experience types. We refer to these dimensions, which unfold dynamically (over very brief time spans), as *subscenes*.

3. Acquisitional evidence for subscenes and primary scenes

In this section we consider the apparent role played by subscenes in semantic acquisition. It is argued that young children tend to map linguistic forms onto aspects of learning contexts which are describable in terms of subscenes. In particular, they tend to associate forms either with primary scenes—the tight correlations of subscenes which serve as the basis for primary metaphor—or with individual subscenes. We first take a brief look at data pertaining to each of these two situations.

3.1 Mapping forms onto primary scenes

There is evidence that some linguistic expressions with conventional metaphorical uses are initially associated by children with scenes which conflate their literal and metaphorical meanings (this idea is termed the *Conflation Hypothesis* in Johnson 1997a). For example, consider the following sentence from Clark's Shem corpus, from the CHILDES archive (see MacWhinney 1995 and Clark 1982). This sentence was uttered by an adult to a child in response to the child's request for a toy:

(7) Oh, I see what you wanted.

This sentence can be interpreted in a literal, visual way as making a statement about the speaker's visual experience (seeing the object that the child sought). It can also be interpreted metaphorically as making a statement about the speaker's new state of awareness. Under the latter interpretation it is an example of the UNDERSTANDING IS SEEING metaphor (Lakoff & Johnson 1980, Sweetser 1990).

These are mutually compatible interpretations of the kind discussed in Norvig (1988). That is, it is not necessary for a hearer to choose between the two interpretations in order to make sense of the sentence. Interpretational overlap of this kind is made possible by the fact that there is a primary scene associating the two interpretations. This primary scene involves two subscenes: a physical act of perception and a change of awareness. It is in fact quite similar to the primary scene described in Figure 2:

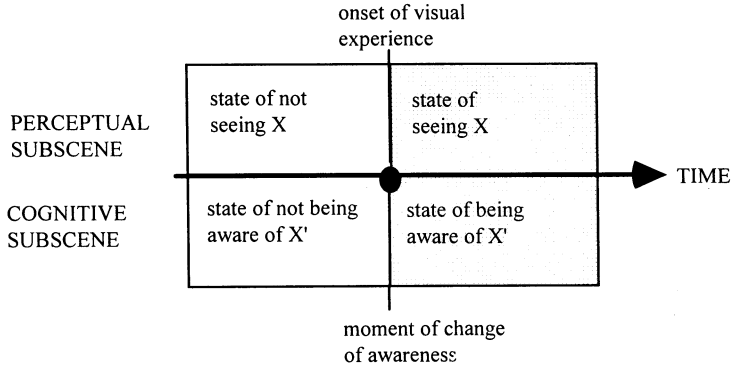

Figure 3 — Primary Scene: Becoming aware by seeing

In addition to the primary scene shown here, there is a specifically linguistic property of (7) which makes it amenable to interpretational overlap. Not only does it include a polysemous verb, but it also includes a complement which can be analyzed in two different ways: either as a free relative clause which denotes an object, or as an embedded interrogative clause which denotes a proposition or piece of knowledge. These analyses correspond to participants in the perceptual and cognitive subscenes, respectively (i.e. X and X').

Due to this combination of semantic and formal properties, the interpretational overlap shown by example (7) can be a property of a variety of expressions of the form *see* + wh-clause provided they occur in contexts characterized by primary scenes like the one in Figure 3. In Johnson (1997a) it is shown that such contexts are very frequent in adult speech to children, and that children produce evidence of mapping this expression type, as a lexical construction, onto the primary scene. If this is the case, then the child's process of learning to use such expressions metaphorically is a matter of differentiating the cognitive from the perceptual subscene in the semantic representation, rather than extending the expression on the basis of a complex mapping. This allows for simple learning of metaphorical senses on the basis of positive evidence (Johnson 1997c).

3.2 Mapping forms onto subscenes which are parts of complex scenes

Subscenes can be seen to play a somewhat different role in the acquisition of a semi-idiomatic construction called the 'What's X doing Y?' construction, or 'WXDY' (see Kay & Fillmore 1994, Sag 1996). This construction superficially resembles wh-questions about activities. However, it does not denote anything about activities. Consider the following example:

(8) What is this scratch doing on the table? (Kay & Fillmore 1994)

This sentence seeks an explanation for the fact that there is a scratch on the table. The word *doing* does not denote an activity. Rather, what is important is the predication holding between the phrase right after *doing* (the Y phrase—in this case *on the table*) and the subject of *doing* (the X phrase—in this case *this scratch*). The construction conventionally expresses that this described state of affairs requires an explanation.

In Johnson (1997b) it is argued that children initially treat instances of this construction as normal wh-questions. These interpretations are motivated by a class of expressions which allow interpretational overlap, and expressions of this type are common in adult speech to children. Consider the following:

(9) What are you doing with that knife?

This sentence can be interpreted either as a literal question about an activity, or as an instance of the WXDY construction, indicating the incongruity of the addressee's holding a knife. The difference between the two interpretations depends on whether the phrase *with that knife* is interpreted as an Instrumental associated with an activity, or as a possessive *with*, as in

(10) She stood in the doorway with a knife.

Both interpretations can be entertained simultaneously because, in order for a person to be performing an activity with a knife, they must typically be holding a knife. That is, the relatively complex scene of a person using an object in order to perform an action typically includes the simple subscene of a person holding the object.

In order to allow interpretational overlap like this, WXDY expressions must have Y constituents which can be construed as predicates on events or as predicates on individual participants in events. This is a property of *with*-phrases, as we have seen, and also a property of Locative expressions:

(11) What are you doing in my room?

Like the *with*-PP discussed above, this Locative PP has two possible interpretations: it can be construed as denoting the location of an activity, or simply the location of the addressee. With both the Locative and the *with*-PPs, one available interpretation is relatively complex (location of an event, using an object to perform an action) and one is simple (location of a person or thing, possession of an object). The simple interpretations correspond to what we call subscenes.

There is evidence that young children have a preference for attributing subscene interpretations to PPs. Johnson (1997b) discusses data from the Shem corpus on the child's utterances having the same form as the WXDY construction. Despite the fact that the child hears examples of such sentences with many different kinds of Y phrase, the child produces examples only with Y phrases that

are Locatives or *with*-PPs—that is, only with Y phrases for which subscene interpretations are available.

4. Further discussion of subscenes and primary scenes

4.1 A more detailed characterization

We view primary scenes and subscenes as the products of humans' innate tendency to 'chunk' experiences in certain ways. Because they are the result of built-in ways of chunking experience, they reveal themselves in our conceptualizations and linguistic encodings of experience. Below are more detailed discussions of the properties which we attribute to primary scenes and subscenes.

Temporal locality

Implicit in the idea of chunking experience is one of the most important properties of both primary scenes and subscenes: *temporal locality*. By this we mean that, as experience-types and conceptualizations, they can unfold in their entirety over a very short time span—speaking intuitively, these experiences can be registered in an instant. Scenes which take longer to unfold necessarily involve the experience of multiple, differentiated states or events.

On the other hand, we do not mean that primary scenes and subscenes must be inherently delimited—i.e. they need not have natural endpoints or culminations, and they need not be instantaneous (or 'punctual') events. In fact, they need not involve change over time. For instance, the primary metaphor UNINTERESTING IS FLAT may be partly motivated by a subscene in which we merely observe a flat surface and find no remarkable textures or depth variations to attend to. Aside from the process of *scanning* (see Langacker 1987) there is no dynamic activity or change inherent in such a scene. A subscene like 'Observing Flatness' would be *imperfective*, in Langacker's (1987) sense, meaning that it would be conceived as involving no change. It also would not be delimited by an inherent beginning or endpoint. Although the flatness relation is temporally unbound, the instantiation of the subscene (of observing flatness) could take place in an instant, precisely because there is no change to register, no complex sequence of states or events involved. In short, a moment within an undifferentiated succession of such moments can be the basis for a subscene or primary scene; in any given instant there is correlation between flatness and the lack of stimulus of a certain kind.

Causal simplicity

The property of temporal locality is closely related to another important property of subscenes: *causal simplicity*. The notion of causal simplicity or directness has played a role in various discussions of lexical vs. phrasal causatives (Fodor 1970, Lakoff 1977, Dowty 1979, etc.). Croft (1991) defines an *atomic event* as one involving only a single type of causation and a single aspectual type. It seems that all subscenes, if they involve change, count as atomic events in Croft's sense.

However, primary scenes do not count as atomic events, because the causal properties of primary scenes are more complex.

In fact, Croft's typology of causation can shed some light on what makes primary scenes special. He recognizes four types of causation: physical (typified by 'billiard ball' causation between two inanimate objects), volitional (or mental-to-physical causation, e.g. moving one's arm intentionally), affective (or physical-to-mental causation, e.g. being frightened by a loud noise), and inducive (or mental-to-mental causation, e.g. persuading someone of the truth of a proposition). One interesting feature of the division of a primary scene into subscenes is that it crosscuts the causal structure of the primary scene. For example, consider the primary scene hypothesized to characterize children's early understanding of the *see* + wh-complement construction, illustrated in Figure 3. In each subscene there is a moment (represented as a dot on the temporal line) when one state changes to another. These moments are simultaneous because they correspond to what can be viewed as a single causal event: light carrying the information of a visual scene hits the retina and the scene enters the seer's consciousness. This event can be construed as an instance of physical causation or of affective causation, because the person who sees can be construed as either a physical or a sentient being. A cause in the physical subscene has an effect in both the physical and the cognitive subscenes. Therefore the cognitive subscene has the same temporal structure as a simple physical event by virtue of being causally connected to a simple physical event.

Subscenes and primary scenes as constraints on lexicalization in acquisition

The discussion of the causal structure of primary scenes suggests a way in which they help children encode abstract concepts linguistically. Various researchers have made proposals about what types of events and relations children might tend to encode first. For example, Clark (1993) suggests that children use a 'whole-action' assumption in mapping meanings onto verbs, similar to the 'whole-object' constraint proposed for children's early noun meanings (Markman 1989). Suppose, as was suggested in the discussion of *with*-phrases and the WXDY construction, children have an innate tendency to encode what we have called subscenes. This would not be surprising, given the properties we have attributed to subscenes. The causal simplicity and temporal locality of subscenes would tend to make them maximally individuable as eventualities in the child's experience. Furthermore, the temporal locality of subscenes would tend to make them relatively available for ostension. That is, assuming children in the early stages of acquisition tend to map forms onto aspects of the immediate contexts in which they hear the forms, it is natural that they would map words for states and events onto those that are temporally local in the utterance contexts.

Primary scenes can then be regarded as providing the child with special opportunities to linguistically encode relatively abstract meanings, since in primary scenes, abstract subscenes share the simple temporal and causal properties of physical subscenes.

4.2 *Theoretical context: Other hypothesized units of meaning and experience*

In order to provide a fuller understanding of how we conceive subscenes and primary scenes, in this section we briefly compare them with several other theoretical proposals regarding ways of parsing experiences into units relevant to language and conceptualization.

Metaphor domains. It should be clear from the foregoing discussion that subscenes are quite different from the *domains* of conceptual metaphor. One clear difference is that there are many different types of events and scenes which make up our experience with any particular domain, whether it is a richly elaborated domain such as travel or a relatively schematic, unidimensional domain such as vertical elevation. In the latter case, for instance, we have experiences with lifting objects, lowering objects, ascending or descending staircases, observing that certain actions are easier or harder depending on our relative elevation (e.g. being able to better observe a scene from a raised position), and so forth. Subscenes cross-cut rich domains—since entities emerge from containers whether we are traveling, cooking, or fighting, for instance—and combine to inform our understandings of even narrowly defined domains.

Semantic primitives/atoms. Subscenes have something in common with semantic primitives or atoms—as discussed for instance by Katz & Fodor (1963), Wierzbicka (1972), Norman et al. (1975), and Schank (1975)—in that subscenes are conceived as irreducible units. They are units of experience, however, rather than semantic representation per se. Furthermore, a semantic atom like CAUSATION (Norman et al.) is not equatable with a subscene, even if we are permitted to understand it as a component of experiences, as opposed to stored representations. This is because causation is a phenomenon which inheres in all sorts of scenes which we participate in. Lifting a book, heating a cup of coffee, and informing people of news (i.e. causing them to know it) are all instances of causation, yet there is no self-contained component shared by all these experiences; when we observe causation we are necessarily observing some additional detail(s) of a scene, for instance that lifting, heating, or changes in knowledge states are involved. Causation, therefore, is more schematic as a concept than any particular subscene. The schematicity of subscenes is constrained not by our ability to perform logical decompositions of concepts—e.g. into causation plus other elements—but by our ability to consciously attend to aspects of experience.

Schematic concepts. Like certain accounts of semantic atoms, Langacker's discussions of *schematic* concepts such as 'extensionality' and 'abstract motion' (e.g., 1987: 169-170) present a picture which differs from our characterization of subscenes in that the schematic concepts include less detail. For instance, abstract motion includes 'reciting the alphabet' as well as the process of milk going sour

(170). This category of events (as construed by a human conceptualizer) is broader than any category defining a subscene could be. Events which Langacker would categorize as instances of abstract motion would constitute distinct subscenes, in a way parallel to those involving CAUSATION, as discussed above.

Prototypical events. Slobin's (1985) *prototypical events*—including 'object manipulation' and 'transfer'—are also slightly more schematic than subscenes, since object manipulation, for instance, could include grasping, pushing, squeezing, pulling apart, etc., each of which would be a distinct subscene; we cannot, in real-time, attend to a process of object manipulation without being aware of additional details of the process. (Note that we can attend to an act of squeezing without attending to various other details of the overall scene, such as whether we are standing or sitting, the color of the object, what the purpose of the squeezing is, and so forth.)

Semantic frames and mental spaces. Subscenes are distinguishable from various other theoretical constructs on the basis that subscenes are more narrowly constrained, and by definition may include less detail. For instance, *semantic frames* (Fillmore 1982) may include richly elaborated scenarios and bodies of cultural background knowledge, such as are involved in the restaurant dining frame. *Mental spaces* (Fauconnier 1985) too can be quite rich in detail—e.g. the space evoked by a phrase like *in the Impressionist painting hanging above my uncle's love seat.* Another important property which distinguishes subscenes from mental spaces is the grounding role played by subscenes in conceptual structure. While mental spaces may include counterfactuals, unreal entities, and impossible scenarios, subscenes are by definition components of actual experiences, and primary scenes involve tight, literal correlations between these dimensions of experience.

Image-schemas and basic-level categories. These are two other types of theoretical entities which bear comparison with subscenes, since they are conceived as fundamental units in terms of which we understand experience. In the limited space we have here it is impossible to do anything more than point out some possible distinctions between subscenes and these cognitive structures. Based on published accounts, image-schemas can be distinguished from subscenes on the basis that they can include such static representations as 'a flat bounded planar space' (Turner 1991: 57) and because there can be many subscenes which make up our experience of a given image-schema. (See, for instance, Johnson's discussion [1987: 21-23] of the extremely varied scenes which involve types of containment.) Basic-level categories (Brown 1958, Rosch 1975, etc.) have only received substantial treatment as categories of objects, rather than experiences; DOG is an instance of a basic-level category for most speakers of American English, but clearly not an instance of a subscene. It might be interesting, however, to consider whether a basic level of activities could be

described in terms of subscenes. (For a brief reference to the possibility of defining basic-level activities, see Lakoff 1987: 271.)

5. Conclusion and Prospect

Based on evidence from children's acquisition of semantic structure and from metaphorical language—both the particulars of data and the possibilities for accounting plausibly for the data—we conclude that experiences at the level of the subscene are very relevant to conceptualization and the linguistic forms that follow from particular conceptualizations. Representations with a minimal level of complexity, and constrained to very local temporal and causal frames, are apparently at work behind metaphoric mappings and at least some semantic structures formed by children as they acquire English. Key to the characterization of subscenes is that they appear to be at the lowest level of cognitive processing to which we can consciously attend—that is, they are self-contained dimensions of subjective experience.

We speculate that subscenes may prove useful as analytic units in many areas of language study. For instance, they may help account for cross-linguistic differences in the organization of important semantic domains, such as spatial relations. Choi & Bowerman's (1991) study of Korean acquisitional data and Talmy's (1983) study of Atsugewi spatial suffixes illustrate the fact that spatial concepts which seem basic to English-speakers (e.g. containment) do not play a distinct part in all grammatical systems for representing space. It may be the case that subscenes define the most basic units for organizing the spatial domain, and that more general concepts such as containment are well-motivated but non-universal generalizations over more particular relations. These relations inhere directly in particular experience types (i.e. subscenes). Different languages might then sort these more specific concepts in various ways.

In language acquisition, we can speculate that the tendency for young children to map forms onto subscenes and primary scenes is a universal. If this is the case, then the phenomenon observed in the child's interpretations of the WXDY construction should reflect a more general phenomenon concerning children's interpretations of Instrumentals[3] in other contexts. This means that, in other languages in which the Instrumental has the same form as a 'possessive' marker, we would predict that the possessive meaning would be learned first, since it corresponds to a subscene. In languages in which the Instrumental does not share a form with a possessive marker, we would expect the Instrumental to be learned relatively late, because it is characterized by a complex scene involving the relation between an object, a person, and an activity (see Jackendoff 1990).

Subscenes and primary scenes may also contribute to explanations of historical semantic change. Primary scenes, we claim, are the kinds of correlations in experience which are the most likely to result in compatible but distinguishable construals of situations and events. They may therefore be significant factors in semantic/pragmatic reanalysis (see, e.g., Traugott 1988).

In conclusion, we feel that the notions of *subscene* and *primary scene* have an important foundational role to play in cognitive approaches to semantic structure, and they may serve as the basis for analysis and predictions in a number of subfields of linguistics.

Notes

[1]We refer to these experiences as primary scenes because they are basic structures from which more complex conceptualizations arise.

[2]For further details of the recent, decompositional analysis, see Grady (1998).

[3]There are several statements in the literature (e.g. Clark & Carpenter 1989) to the effect that the Instrumental relation is learned early by children. We speculate that on careful review the data will prove compatible with our analysis.

References

Brown, Roger. 1958. How shall a thing be called? Psychological Review 65:14-21.

Choi, Soonja, and Melissa Bowerman. 1991. Learning to express motion events in English and Korean: The influence of language-specific lexicalization patterns. Cognition 41:83-121.

Clark, Eve V. 1982. The young word maker: A case study of innovation in the child's lexicon. In: E. Wanner and L. R. Gleitman (eds.), Language acquisition: The state of the art. Cambridge: Cambridge University Press.

Clark, Eve V. 1993. The lexicon in acquisition. Cambridge Studies in Linguistics 65. Cambridge: Cambridge University Press.

Clark, Eve V., and Kathie L. Carpenter. 1989. On children's uses of *from*, *by*, and *with* in oblique noun phrases. Child Language 16:349-364.

Croft, William. 1991. Syntactic categories and grammatical relations. Chicago: University of Chicago Press.

Dowty, David. 1979. Word meaning and Montague Grammar. Dordrecht: Reidel.

Fauconnier, Gilles. 1994 [1985]. Mental spaces: Aspects of meaning construction in natural language. Cambridge: Cambridge University Press.

Fillmore, Charles. 1968. The case for case. In E. Bach and R. Harms (eds.), Universals in linguistic theory, 1-90. New York: Holt, Rinehart & Winston.

Fillmore, Charles. 1982. Frame semantics. In Linguistic Society of Korea (ed.), Linguistics in the morning calm, 111-138. Seoul: Hanshin.

Fodor, Jerrold A. 1970. Three reasons for not deriving *kill* from *cause to die*. Linguistic Inquiry 1:429-438.

Grady, Joseph. 1998. The Conduit Metaphor revisited: a reassessment of metaphors for communication. In J.P. Koenig (ed.), Conceptual structure, discourse and language 2. Stanford: CSLI.

Grady, Joseph, Sarah Taub, and Pamela Morgan. 1996. Primitive and compound metaphors. In Adele Goldberg (ed.), Conceptual structure, discourse, and language. Stanford: CSLI.

Johnson, Christopher. 1997a. Metaphor vs. conflation in the acquisition of polysemy: The case of *see*. In Masako K. Hiraga, Chris Sinha, and Sherman Wilcox (eds.), Cultural, typological and psychological perspectives in cognitive linguistics. John Benjamins.

Johnson, Christopher. 1997b. The acquisition of the 'What's X Doing Y?' construction. Proceedings of the 21st Boston University Conference on Language Development, 343-353.

Johnson, Christopher. 1997c. Learnability in the acquisition of multiple senses: SOURCE reconsidered. Proceedings of the 22nd Annual meeting of the Berkeley Linguistics Society.

Johnson, Mark. 1987. The body in the mind: the bodily basis of meaning, imagination, and reason. Chicago: University of Chicago Press.

Katz, Jerry, and Jerry Fodor. 1963. The structure of a semantic theory. Language 39:170-210.

Kay, Paul, and Charles Fillmore. 1994. The 'What's X Doing Y?' Construction. Unpublished ms., UC Berkeley.
Lakoff, George, and Mark Johnson. 1980. Metaphors we live by. University of Chicago Press.
Lakoff, George. 1987. Women, fire, and dangerous things: What categories reveal about the mind. Chicago: University of Chicago Press.
Lakoff, George. 1993. The contemporary theory of metaphor, in: A. Ortony (ed.), Metaphor and thought. Cambridge: Cambridge University Press. Second edition, 202-251.
Lakoff, George. 1977. Linguistic gestalts. Proceedings of the 13th Annual Meeting of the Chicago Linguistics Society, 225-235.
Langacker, Ronald W. 1987. Foundations of cognitive grammar, Vol. I: Theoretical prerequisites. Stanford: Stanford University Press.
MacWhinney, Brian. 1995. The CHILDES project: Tools for analyzing talk. Hillsdale, NJ: Erlbaum.
Markman, Ellen. 1989. Categorization and naming in children: Problems of induction. Cambridge: MIT Press.
Norman, Donald, and David Rumelhart, LNR Research Group. 1975. Explorations in cognition. San Francisco: Freeman.
Norvig, Peter. 1988. Interpretation under ambiguity. In Axmaker, Shelly, Annie Jaisser, and Helen Singmaster (eds.), Proceedings of the 14th Annual Meeting of the Berkeley Linguistics Society.
Reddy, Michael. 1979. The conduit metaphor: A case of frame conflict in our language about language. In A. Ortony (ed..), Metaphor and thought. Cambridge: Cambridge University Press.
Rosch, Eleanor. 1975. Cognitive representations of semantic categories. Journal of Experimental Psychology 104:192-233.
Schank, Roger. 1975. Conceptual information processing. Amsterdam: North Holland.
Slobin, Dan. 1985. Crosslinguistic evidence for the language-making capacity. In D. Slobin (ed.), A crosslinguistic study of language acquisition. Vol. 2: Theoretical issues. Hillsdale, NJ: Lawrence Erlbaum.
Sweetser, Eve. 1990. From etymology to pragmatics: Metaphorical and cultural aspects of semantic structure. Cambridge: Cambridge University Press.
Talmy, Leonard. 1983. How language structures space. In Herbert Pick & Linda Acredolo (eds.), Spatial orientation: Theory, research, and application. New York: Plenum Press.
Traugott, Elizabeth Closs. 1988. Pragmatic strengthening and grammaticalization. In Axmaker, Shelly, Annie Jaisser, and Helen Singmaster (eds.), Proceedings of the 14th Annual Meeting of the Berkeley Linguistics Society, 406-416.
Turner, Mark. 1991. Reading minds. Princeton University Press.
Wierzbicka, Anna. 1972. Semantic primitives. Frankfurt: Athenäum.

Evaluating the Empirical Basis for Output-Output Correspondence*

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1. Overview of paper

Output-output correspondence (OOC) constraints, constraints which demand correspondence between independently occurring surface forms, have recently been added to the set of constraint types invoked in much OT work. In this paper we examine some of the better-known arguments originally adduced in support of OOC constraints, and argue that adoption of such a powerful mechanism is not justified, at least in the cases discussed. This paper deals specifically with the following: the incomplete/complete phase distinction of Rotuman, as analyzed by McCarthy (1995); English truncated hypercoristics, as discussed by Benua (1995); and the treatement of Base Identity and Uniform Exponence in Kenstowicz (1994).

Three criticisms are leveled at the OOC-based analyses cited above. First, we find cases of 'opportunism.' For example, there is an unprincipled culling of the data and an unprincipled choice of bases in correspondence relations. Second, there is misanalysis, in that clearly significant generalizations are overlooked, technical aspects of the theory are improperly treated and implausible generalizations are accepted. Third, we believe that the analyses based on OOC lead to problematic predictions, some of which are strongly contraindicated by existing data, and others of which we consider highly suspect.

We offer simple, principled solutions which we hope will contribute to a more constrained theory of phonology — one that perhaps has no place for OOC.

2. Rotuman Phase: McCarthy (1995)

In discussing the distribution of the Rotuman phase distinctions, McCarthy (1995:2) adopts the view of Churchward (1940), though no details are provided: "Rotuman has a contrast in major-category words between two phases, the complete and the incomplete, distributed according to syntactico-semantic principles." As we will see below, the phases are, instead, PHONOLOGICALLY, conditioned. To account for the phonological differences between the (syntactico-semantically conditioned) phases, McCarthy proposes the following constraint:

(1) Inc-Ph Constraint (McCarthy 1995:11)
Every incomplete-phase stem ends in monosyllabic foot (or heavy syllable).
Align($\text{Stem}_{\text{Inc.Ph.}}$, Right, $[\sigma]_{\text{Ft}}$, Right) (or Align($\text{Stem}_{\text{Inc.Ph.}}$, Right, $\sigma_{\mu\mu}$, Right))

The ranking of this constraint within the larger OT constraint hierarchy, including the familiar types of OT Faithfulness and Well-formedness constraints, accounts for the descriptive observation that "the incomplete phase is identical to the com-

plete phase, except for the fact that the *final foot* of the complete phase is realized as a *monosyllabic foot* in the incomplete phase" (McCarthy 1995:11). This accounts for alternations of the type *tokiri*$_{comp}$:*tokir*$_{inc}$ (deletion), *seseva*$_{comp}$:*seseav*$_{inc}$ (metathesis), etc.[3] McCarthy claims that the underlying representations of complete and incomplete phase forms in (2) differ in that the latter contains an additional morpheme which is sensitive to the constraint given in (1).

(2) | Complete Phase Input | Incomplete Phase Input |
|---|---|
| | *tokiri* | *tokiri* +INCPH |

First, we believe that the assumption that there is a 'syntactico-semantic' basis for the phase distinctions must be rejected. According to Churchward (1940), the incomplete phase is associated with an 'indefinite' interpretation when applied to nouns; in the case of verbs, Churchward proposes an imperfective or non-completive reading for the incomplete phase. In contrast, the complete phase, is to be correlated with 'definite' interpretation, 'positiveness, finality, or emphasis', or a perfective or completive interpretation for verbs. We are dubious of Churchward's equation of noun definiteness and verbal aspect, since it is apparently without parallel, but there are more basic reasons to discard the analysis.

A sentence like (3)[4] shows that even a personal pronoun like *gou* 'I', which corresponds to complete phase *goua*, can show phase distinctions. It seems highly unlikely that the first person pronoun could ever be interpreted as indefinite.[5]

(3) *gou la tük iris*
I$_{inc}$ / FUT / stop$_{inc}$ / them$_{inc}$ 'I will stop them'

Sentences (4) and (5) further demonstrate the problem of attributing phase alternations to syntactico-semantic principles. The verb *noh(o)* 'live' shows precisely the same aspectual form and interpretation in the two sentences, yet it is in the incomplete phase in (4) and in the complete phase in (5). In fact, *all verbs* are in the complete phase before the anaphoric clitic *e*, regardless of the aspectual interpretation of the verb. Note also that an 'indefinite' interpretation of personal names such as *Titof* and *Raho* is semantically excluded — in spite of their being in the incomplete phase. The corresponding complete phase forms are *Titofo* and *Raho*.

(4) *ma Titof noh ma tupue' te'is 'e Faufano* (II.9)
and / Titofo$_{inc}$ / lived$_{inc}$ / with / tupu'a$_{inc}$ / this$_{inc}$ / at / Faufano
'and Titofo lived with this *tupu'a* at Faufano'

(5) *ia tä puer se hanue=t ne Rah noho e* (I.3)
he / TNS / rule$_{inc}$ / over / land=the$_{inc}$ / where / Raho$_{inc}$ / lived$_{cmp}$ / there(in)
'he ruled over the land in which Raho lived'

In (6) and (7) we provide a partial list[6] of suffixes and clitics which invariably trigger the complete phase and the incomplete phase, respectively.

(6) Suffixes and clitics which invariably trigger the complete phase
-ga 'nominalizer': *pu'a* 'to be greedy' > *pu'aga* 'greed'
-me 'hither': *ho'a* 'to take' > *ho'ame* 'to bring'
-a 'trans. suffix': *hili* 'to choose (intr.)' > *hilia* 'to choose s.t. (tr.)'
e 'locative anaphor': *noho* 'to dwell, live' > *noho e* 'to dwell therein'

(7) Suffixes and clitics which invariably trigger the incomplete phase
-'ia 'ingressive': *sunu* 'to be hot' > *sun'ia* 'to become hot'
-'åki 'causative': *tole* 'to carry' > *tol'åki* 'to cause to be carried'
-kia 'transitive': *ho'a* 'to take (intr.)' > *hoa'kia* 'to take (tr.)'
ta'a 'that': *vaka* 'canoe' > *vak ta'a* 'that canoe'

Note that there is no sense in which the *ho'a* of *ho'ame* 'to bring' is a 'definite' version of *ho'a* 'to take,' or in which the *sun* of *sun'ia* 'to become hot' is an 'indefinite' version of *sunu* 'to be hot.' Equally clearly, the incomplete phase *vak* (from *vaka* 'canoe') in *vak ta'a* 'that canoe' is definite.

A coherent pattern does emerge, however, in that the suffixes and clitics in (6) are all *monosyllabic*, whereas those in (7) are *disyllabic*. It is not our goal to provide here a full OT analysis of the complete/incomplete alternations (deletion, metathesis, etc.). The details of our analysis can be found in Hale & Kissock (1996, 1997) and Hale, Kissock, & Reiss (1997). Many aspects of McCarthy's analysis can be preserved in the purely phonologically-based account which we propose. We restrict ourselves here to stating the algorithm which describes where incomplete phase formation occurs within the prosodic domain of the clitic group:

(8) Phonological Conditions for Clitic Group Incomplete phase
Build R>L binary feet within each clitic group. If a vowel is both at the right edge of a foot and a morpheme, that vowel will undergo the effects of Incomplete phase formation.

McCarthy's description of the correspondence relations among underlying (lexical) form, complete phase surface form and incomplete phase surface form is described in (9) and sketched in (10):

(9) "With respect to its vocalism and its foot structure, the incomplete phase is faithful to the complete phase, rather than the lexical form, strongly supporting the correspondence-based model in (54)". [McCarthy 1995:47]

(10) McCarthy's (54) specifies the following correspondence relations:

Lexical Specification

⇓

Complete Phase Surface ⇒ Incomplete Phase Surface

There exists, however, another set of phonologically conditioned alternations affecting Rotuman stems. This so-called broad/narrow alternation involves shifting the vowel *a* > *e* in well-defined phonological environments (see Hale and Kissock 1996, 1997 for details). In (11) we see that a morpheme like *i'a* actually has four surface variants, depending on phase context and broad/narrow context. The morpheme *puga*, however, has only three variants, due to the phonological makeup of the stem.

(11) The broad/narrow alternation

	Complete phase contexts	Incomplete phase Contexts
Broad version contexts	*i'a* *puga*	*ia'* *puag*
Narrow version contexts	*i'e-* *puge-*	*ie'-* *puag-*

The relevance of the broad/narrow alternation becomes apparent when we try to decide which complete phase form should serve as the basis of comparison in correspondence relations for narrow version incomplete phase forms. If we choose the narrow version complete phase form, we get the correct result in the case of *i'e-* and *ie'*—since "[w]ith respect to its vocalism and its foot structure, the incomplete phase is faithful to the complete phase"; but we get the wrong result in the case of *puge-* and *puag*, since the latter has an *e* but the former has an *a*. If we, instead, choose the broad version complete phase form as the basis of correspondence, then we get the correct result for *puga/puag*, but not for *i'a/ie'*. This is sketched in (12):

(12) Which 'Output' is base for Narrow Incomplete forms?

Broad Complete		Narrow Incomplete
***i'a*	>	*ie'-*
puga	>	*puag-*

Narrow Complete		Narrow Incomplete
i'e	>	*ie'-*
***puge-*	>	*puag-*

We can summarize the discussion so far as follows. The syntactico-semantic basis for the phase distinctions which McCarthy adopts from Churchward is implausible, since no known language expresses the range of meanings which Churchward associates with the incomplete phase through a single morpheme. Furthermore, the existence of a definiteness distinction on personal pronouns is semantically incoherent. Since we have demonstrated the phonological conditioning of the phases, it is clear that there is no incomplete phase morpheme, contra McCarthy's analysis presented in (2) above; therefore there can be no OOC between the phases since the two phases are underlyingly identical. Finally, even if we wanted to invoke OOC to capture the phase relations, we have no principled method of selecting a base that will also account for the productive broad/narrow alternation.

3. English Hypocoristics (Benua 1995)

Benua's discussion of OOC in the generation of truncated names in certain New York and Philadelphia dialects of English also appears to suffer from opportunism, misanalysis and implausible predictions. Benua posits a constraint against word-final sequences of *æ* followed by *r* in these dialects, based on an apparent distributional gap. The sequence in question does occur, but only in hypercoristic forms such as those listed in (13) which are related to forms containing medial *-ær-*.

(13) Posited constraint: *ær#

Larry	Lar	[ær#]
Harry	Har	[ær#]
Sarah	Sar	[ær#]
		[kar] / *[kær]

This well-formedness constraint is violated in such forms, according to Benua, since it is outranked by constraints demanding correspondence between truncated and non-truncated forms. Note, first of all, that the analysis rests on the assumption that the absence of [ær#] in these dialects of English is the result of a phonological constraint rather than being an accidental gap. The oft-touted property of OT that such grammars "repair" *any* input to conform to the surface phonology of the language in question gives rise to a prediction. If there really is a *ær# constraint and it is "active" in these dialects, then speakers of these dialects should be unable to pronounce -ær# sequences when learning languages which *do* allow them. We strongly suspect that this is a false prediction.

The truncated names in (14) preserve the vowel quality of their corresponding full. The full form, which must be lexically listed, serves, in Benua's analysis, as the basis of correspondence for the monosyllabic truncated forms. However, (15) shows that monosyllabic forms are not consistently faithful to the vowel of the full names, nor is the disyllabic hypercoristic consistently faithful to the full

form. The absence of *Sarry, however, demonstrates that the truncated form need not be related to a disyllabic hypercoristic.

(14)	Sarah	Sar	*Sarry
	Harold	Har	

(15)	Lawrence [lɔrəns]	Larry [læri]	*Lawry [lɔri]
	Lawrence [lɔrəns]	Lar [lær]	*Lawr [lɔr]

Therefore, there can be no general principle of vowel quality faithfulness in the formation of truncated hypercoristics. Only by opportunistically restricting the data considered does the analysis succeed in capturing attested forms.

Benua's model of OOC in these forms essentially parallels that which McCarthy sketches for Rotuman. The following quotation can be compared to the model described in (9) and (10) above:

(16) Discussing Larry:Lar, Benua says (1995:6):

> ...there is no correspondence relation between the input and truncated output form. This predicts that truncated words will never be more faithful to the underlying stem than the base is. That is, there should be no case in which the base shows epenthesis, deletion, coalescence or other lack of faithfulness to the input that is not also observed in the corresponding truncated words.

This prediction is falsified by the forms in (17) which show that the underlying t/d contrast is maintained in truncated forms, but neutralized to flap [D] in the full forms.

(17) Truncation forms show more faithful consonants

Pe[D]er	Pe[D]ey	Pe[t]e
Ju[D]ith	Ju[D]y	Ju[d]e

In (18) we see that truncated forms may maintain vowel contrasts that are neutralized in full forms:

(18) Truncation forms show more faithful vowels

P[ə]tricia	P[æ]t
G[ə]rard	G[ɛ]r
L[ə]rraine	L[o]ri

To conclude this section, we propose that a far more plausible analysis is that truncated hypercoristics are lexicalized. Note that in a great number of common cases this is, in fact, the only possible analysis.

(19)	Nathaniel	Nate	[note *Nathe, *Nathy]
	Robert	Bob	
	Margaret	Peg	
	Edward	Ted	

In the case of English hypercoristics our command of the data, as native speakers, is clearly much better than in most other cases cited in the literature. Flaws discovered in an OOC analysis of this data, then, should serve as caution signals for cases where the data are much less understood and accessible.

4. Uniform Exponence (Kenstowicz 1994)

Kenstowicz (1994) discusses several types of OOC, including Uniform Exponence and Base-Identity. The Uniform Exponence constraint which Kenstowicz adopts is defined in (20):

(20) Uniform Exponence: minimize the differences in the realization of a lexical item (morpheme, stem, affix, word).

Uniform Exponence, therefore, appears to be a functionally motivated constraint, the effect of which is to avoid allomorphy.

The only case we have space to consider in this context concerns Kenstowicz's analysis of the *honor, hono:ris, hono:rem...* paradigm of Latin (see Hale, Kissock, and Reiss 1997 for a treatment of additional cases). Kenstowicz cites the adjective *honestus* 'honest' as providing evidence that this morpheme has in fact an underlying */s/*. Crucial to the analysis is the claim that *honestus* is 'close enough' to *honor* to provide an acquirer with the critical evidence that, in spite of the invariant realization of the final segment of the nominal stem as [r], it should be taken as the realization of underlying /s/. The form *honestus* must therefore be analyzed by an acquirer as *hones-tu-s*, with the first morpheme being the same as that in *honor, hono:ris, hono:rem...* Note that there is variation in vowel of the second syllable of this "morpheme" as well as the *r:s* difference. The constraint UE(N) is to be interpreted as 'uniform exponence within the nominal paradigm'. Critically, due to the interpretation of UE(N), *hones-tus* is left out of consideration in evaluating the 'uniform exponence' of this morpheme. This clearly represents opportunistic selection of the material considered for comparison. Kenstowicz's evaluation of UE(N) for this Latin paradigm is given in (21) below where *VsV is the constraint responsible for Latin rhotacism, whereby underlying /s/ surfaces as [r] between vowels.

(21) Tableau for *honor, hono:ris,* etc. (from Kenstowicz 1994:44)
/hono:s, hono:sis, hono:sem, .../

		UE(N)	*VsV	Faith-/s/
☞	honor hono:r-is hono:r-em	✓	✓	***...
	honos hono:r-is hono:r-em	*!	✓	**...
	honos hono:s-is hono:s-em	✓	*!*...	✓

The UE(N) satisfaction checkmarks for these three paradigms are clearly unjustified, given the *phonemic* differences in vowel length within the paradigm. We have used a crooked underline to highlight the offending marks. In order to remedy this inaccurate evaluation we provide a new tableau which corrects the evaluation of UE(N) and also expands the candidate set.

(22) Tableau with fuller candidate set and corrected evaluation marks
/hono:s, hono:sis, hono:sem, .../

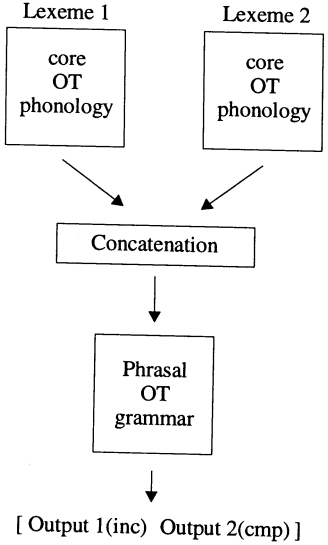
		UE(N)	*VsV	Faith-/s/
☞	hono:r hono:r-is hono:r-em	✓	✓	***...
	hono:s hono:s-is hono:s-em	✓	*!*...	✓
	honos hono:r-is hono:r-em	*!	✓	**...
	honor hono:r-is hono:r-em	*!	✓	***...
	honos hono:s-is hono:s-em	*!	**...	✓

The winning candidate, that which shows uniformity in all aspects (consonant and vowel quality) is not the attested paradigm in Latin. Note the corrected evaluations (with straight double underlining) of the sets from (21), as well as the fact that the actually attested paradigm (the winner in 21) comes in fourth in (22). The reader should confirm that a constraint banning the sequence *–o:r* word-finally will not remedy the situation. Uniform Exponence does not appear to be relevant to the extension of stem-final *-r* throughout these paradigms. We suggest that *honor* and *honestus* are no longer derivable from single underlying representation.

5. Discussion and conclusions

As stated above, we hope to make a positive contribution in this paper, besides merely pointing out flaws in attempts to analyse some very difficult data. Given the phonological conditioning of the Rotuman phase alternations, and given the fact that McCarthy acknowledges the *serial* nature of Rotuman derivations involving output-output correspondence, it may be justified to adopt a fairly conservative approach to Rotuman. By keeping a form of serialism, but doing away with output-output correspondence, we can capture pre-OT generalizations about the phonology of specific post-lexical prosodic domains (e.g., the clitic group in Rotuman). We sketch a model of such a grammar (or, to be more precise, pairing of optimality-theoretic phonological grammars) in (23).

(23) A Semi-Traditional Alternative



It is obvious that we cannot prove that OOC is never justified. It is also obvious that we cannot provide here alternative analyses for all the cases of OOC dis-

cussed in the literature. However, a device as powerful as OOC should only be adopted as a last resort.

In the conclusion to a later paper (Kenstowicz 1995:433), Kenstowicz raises some fundamental questions regarding the use of OOC. "Can [OOC] be restricted to situations in which one structure is a substring of the other? Or should we allow identity constraints to hold among a family of related words, e.g. to get the effects of paradigm levelling?" Kenstowicz goes on to note the vagueness of terms like 'family of related words' and 'isolation form'. Clearly, these terms need to be defined in order to select a base against which identity can be evaluated. As far as we can tell, these fundamental questions have yet to receive a satisfactory solution in the literature. The failings of the specific cases of OOC which we have discussed, those of McCarthy, Benua and Kenstowicz, are related to the absence of clear guiding principles concerning these fundamental questions. If phonological theory pretends to be constrained by standards of explicitness and rigor, OOC should be eschewed until these fundamental questions receive a more satisfactory treatment.

Notes

*We wish to thank audiences at BLS, WCCFL, AFLA, MOT for comments and discussion. Thanks also to Ida Toivonen for comments and discussion on drafts of this paper.

1. Hale and Reiss.
2. Kissock.
3. See Hale and Kissock (1996, 1997) for discussion of a fuller range of data. The limited number of examples in this paper are sufficient to illustrate our points.
4. All examples are taken from Churchward (1940).
5. The form *iris* is also an incomplete phase pronoun, corresponding (irregularly) to *irisa*.
6. The lists in (6) and (7) represent only a selection of the relevant clitics and suffixes; for a more complete survey see Hale & Kissock (1996, 1997).

References

Benua, Laura. 1995. Identity Effects in Morphological Truncation. To appear in J. Beckman, S. Urbanczyk & L. Walsh (eds), *University of Massachusetts Occasional Papers in Linguistics* 18: *Papers in Optimality Theory*, Graduate Linguistic Student Association, Amherst, MA (also ROA).

Churchward, C. M.. 1940. *Rotuman Grammar and Dictionary.* Sydney: Methodist Church of Australasia.

Hale, Mark and Madelyn Kissock. 1996. *The Phonology-Syntax Interface in Rotuman.* Austronesian Formal Linguistics Association meeting, UCLA (to appear in proceedings of same).

-------. 1997. *The Incomplete Phase in Rotuman: a synchronic analysis*, ms., Concordia University and Harvard University.

Hale, Mark, Madelyn Kissock and Charles Reiss. 1997. What is Output? Output-output Correspondence in OT. *Proceedings of the West Coast Conference on Formal Linguistics XVI*, Seattle.

Kenstowicz, Michael. 1995. Cyclic vs. non-cyclic constraint evaluation. *Phonology* 12, 397-436.

Kenstowicz, Michael. 1994. *Base-Identity and Uniform Exponence: Alternatives to Cyclicity.* ROA.

McCarthy, John. 1995. *Faithfulness in Prosodic Morphology & Phonology: Rotuman Revisited.* ROA.

Titifanua, Mesulama and C. M. Churchward. 1938. *Tales of a lonely island.* Oceania Monographs, no. 4. Sydney [reprint Institute of Pacific Studies, University of the South Pacific, 1996].

What Sound Symbolism, Functionalism, and Cognitive Linguistics Can Offer One Another

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1 Introduction

Sound symbolism—non-arbitrary relations of either a natural or conventional sort between sound and meaning—has been the subject of speculation for many centuries and of research throughout this century. Yet sound symbolic phenomena have yet to be integrated fully into linguistic theories. Saussure (1959), in formulating his principle of the arbitrariness of the sign, explicitly rejected any significant role for such phenomena in language. Similarly, sound symbolism has never found a place within the generative perspective, in which the form and content of language are seen as distinct and independent.

In contrast, the primary theme of the functionalist and cognitive linguistic theories has been finding relations among linguistic form, content, and function. Moreover, in these related perspectives, language is seen as being meaningfully connected to non-linguistic entities such as cognition, the body, and the social and cultural context. Furthermore, these theories can comfortably handle phenomena that are probabilistic rather than deterministic or categorical in nature. These three characteristics are attributes of sound symbolic phenomena. Therefore, functionalism and cognitive linguistics should be able to incorporate sound symbolism. It is surprising that there has not been more attention to sound symbolic phenomena, which provide clear examples of form-meaning relations.

In this paper, I will first argue that research in sound symbolism can benefit from the functionalist and cognitive linguistics perspectives, providing examples from the literature as well as some original work. Second, I will outline one way in which research on sound symbolism can serve as a test and extension of these related linguistic theories.

1.1 What functionalism and cognitive linguistics can offer the study of sound symbolism

The recent volume *Sound Symbolism* (Hinton, Nichols and Ohala 1994) which originated from a previous BLS meeting, documents the extent to which sound symbolism permeates language. Most work on sound symbolism has focused on documenting the existence of such phenomena and searching for possible causes or bases. Less emphasis has been placed on investigating what functions these phenomena may serve.

1.2 A function of sound symbolism: Facilitator of learning and memory?

1.2.1 Berlin and O'Neill's proposal

Berlin and O'Neill 1981 and Berlin 1992, have put forth ideas which serve as an excellent starting point in asking what function(s) sound symbolism might play. In their research into folk taxonomies, they observed that 'semantic

transparency' (including both sound symbolism and metaphor) is distributed unevenly across the lexicon. Names for wild, rare, or uncultivated flora and fauna are more semantically transparent than are names for common, cultivated or domesticated flora and fauna. In Tzeltal, transparent terms such as *ch'ix te*, literally 'spine tree' contrast with opaque terms such as *ich* 'chili pepper' (Berlin 1992:255-60). This phenomenon is found in English as well; *bachelor buttons* and *Queen Anne's lace* are compound metaphorical labels for wildflowers, while *rose* and *tulip* are simple labels for common garden flowers. Likewise, *sloth* is a linguistically simple but sound symbolic label for a rarely encountered wild animal (*sl-* is a phonestheme [see sections 1.3, 1.4, and 2.3.3] that is associated with slowness or laziness, e.g. slow, sluggard, slacker, slouch) that contrasts with *dog*, a linguistically simple and arbitrary label for that common pet.

Berlin and O'Neill have suggested that this difference in semantic transparency/opacity is due to the different cognitive demands inherent in learning and remembering the two types of names. They argue that while repeated exposure to common names ensures enough opportunities for them to be learned and retained by rote memory, rare names are less easily learned and retained. They propose that semantic transparency, which ties the name to other information or imagery, serves as an aid to learning and memory.

1.2.2 The plausibility of Berlin and O'Neill's functionalist proposal

This proposal is largely consistent with literature on human memory (e.g. Craik and Lockhart 1972; Inoue 1991; Murakami 1982; Quenk 1964). In addition, studies of language acquisition support the idea that regular sound-meaning patterns are easier to acquire than irregular systems. In natural language learning, there is some cross-linguistic evidence that more regular morphological systems are learned earlier than less regular ones (e.g. Slobin and Bever 1982). Experiments on the acquisition of miniature artificial languages (Braine, Brody, Brooks, Sudhalter, Ross, Catalano, and Fisch 1990; Brooks, Braine, Catalano, Brody, and Sudhalter 1993) confirm that regularity aids acquisition.

1.2.3 Tests of the proposal

With Nameera Akhtar, I have begun to test whether sound symbolism can facilitate the word learning of young children, specifically, whether young English-speaking children can use sound symbolic information to narrow the referent of unknown words (Hutchins and Akhtar 1996). To date we have concentrated on phonetic symbolism of size and shape, two well-known types of sound symbolism. To test whether children are sensitive to this type of sound symbolism, we used a modified fast-mapping procedure. In tests of fast-mapping, the experimenter shows the child two or more objects and uses a nonsense label to ask the child for one of them.

For our version of this task, we created 16 pairs of toy-like objects. Eight of the pairs were identical except for the dimension of size, while the other eight pairs of objects only differed in shape. In addition, we created 16 pairs of labels composed of sounds found by previous researchers to be associated with one end

of the size or shape continuum. The labels were assigned to the objects according to sound symbolic criteria.

We presented each pair of toys simultaneously and then asked the child to give the experimenter one of them, using the appropriate label. The child's selection was scored as being sound symbolically congruent or incongruent with the label used. For the trials differing on the dimension of shape, all age groups selected the target object at levels significantly above that expected by chance. The four and five-year olds exhibited sensitivity to sound symbolism for size as well. Thus, there is preliminary evidence that by the age of three years, English-speaking children can make use of some types of sound symbolism to narrow the possible referent of new labels (see also Davis 1961; Irwin and Newland 1940; Newman, 1933). Further examination of the functions that sound symbolism may play in language acquisition and use should prove fruitful.

Much more work is necessary to determine to what extent social and cultural practices affect the degree to which sound symbolic devices are exploited in different languages and in one language throughout its history. Berlin (1992) has proposed, for example, that the use of sound symbolism might be negatively correlated with literacy, because written sources serve as external memory aids and lessen the burden on the individual's own memory. Such a proposal suggests that sound symbolism should be exploited to different degrees across languages and in one language as its speakers undergo cultural change. Some cross-cultural data support this contention. Research in non-European languages suggests that the frequency of onomatopoeic words may be higher in non-written languages than in written European languages. For example, approximately 49% of Tzeltal Mayan bird names are onomatopoeic (Hunn 1977), while the corresponding percentage is 39% in Kaluli (Feld 1982), 38% in Aguaruna (Berlin and O'Neill 1981) 37% in Canadian Delaware (Speck 1946 as cited in Berlin and O'Neill 1981), and 34% in Huambisa (Berlin and O'Neill, 1981), in contrast to 4% in French (Callebaut 1985), 7% in Dutch and 13% in Flemish (Verheyen 1943-1950 as cited in Callebaut 1985).

Some diachronic evidence also supports the idea that exploitation of sound symbolism is inversely correlated with literacy. While admittedly suffering from a lack of standardization of sampling methods, dictionaries of bird names in Latin and of French in two historical periods indicate that the percentage of onomatopoeic terms has decreased over time while literacy has increased (Callebaut 1985; Andre 1966). More research is necessary to determine to what degree use of sound symbolism is related to cultural and cognitive factors.

1.3 A functionalist classification of sound symbolism?

The functionalist perspective can be applied productively to sound symbolic phenomena in another way. While such phenomena differ considerably on a number of factors, they are usually classified by their degree of iconicity or the degree to which they conform to the morphophonological characteristics of the language (see Hinton, Nichols, and Ohala 1994). However, other factors may be

used to classify them, including their length and scope of reference. I propose a general iconic principle for sound symbolic phenomena:

More phonological material indicates more semantic specificity.

At the lesser end of the sound continuum, we find elemental phonetic symbolism. In this case, phonemes or phonetic features such as a vowel's place of articulation (high-low, front-back) or its F_2 frequency (Ohala 1983, 1994) have repeatedly been found to be associated with broad dimensions of meaning. For example, /i/, a high, front vowel with high F_2 frequency, is often associated with smallness, nearness, speed, brevity, lightness (in weight and luminosity), sharpness, and happiness, among other factors (e.g. Alspach 1917; Chastaing 1958, 1965; Newman 1933; Sapir 1929; Tarte 1974; Tarte and Barritt 1971; Trigo 1991; Ultan 1978).

Some languages, including English and the Austronesian family (see Blust 1988), exhibit a type of sound symbolism with more phonological content and semantic specificity than phonetic symbolism: phonesthemes. English phonesthemes are typically phoneme clusters occurring in word-initial or word-final position, which are conventionally associated with attributes of actions or objects. For example, *-ump* is found in many words referring to dense, compact, or heavy objects (e.g. *clump, lump, hump, bump, stump, plump*; see also Sections 1.4 and 2.3.3).

Malkiel (1990: 99-100) has proposed another type of sound symbolism that is spread across the entire word and has more phonological content than phonesthemes or morphosymbolism. For example, the pattern, $C_1VC_2C_2o/a$, is characteristic of Italian adjectives referring to foibles or negative attributes, such as *buffo* 'ridiculous', *fello* 'sinister, evil...', *giucco* 'foolish', *gobbo* 'hunch-back, crooked', *goffo* 'awkward', *matto* and *pazzo* 'mad, insane, deranged'.

Onomatopoeia lies at the largest end of the sound continuum. In this case, a whole word refers to a highly specific referent[1]. For example, *whippoorwill* and *bobwhite* refer to the birds that make those sounds, and *buzz* and *hum* to particular types of sounds. This is the highest degree of specificity or reference found in sound symbolic phenomena.

This proposed typology should be investigated further, as it is largely based on the IndoEuropean family. In addition, the phenomena at the ends of the continuum—phonetic symbolism and onomatopoeia—are best studied. Experimental work on the psychological reality of phonesthemes and morphosymbolism is especially lacking.

1.4 English Phonesthemes

In a series of studies, my colleagues and I (Hutchins 1995, 1997; Hutchins, Mervis, Robinson and Bertrand 1997) have been investigating the psychological reality of phonesthemes by testing whether native speakers will interpret nonsense words containing a phonestheme in a manner consistent with the probabilistic semantic association of that phonestheme. For example, in a study we are currently conducting, native English-speaking subjects hear unknown words each

containing a phonestheme and have to select one of four possible definitions for that word (see Table 1). Each definition offered to the subject is the semantic gloss of a phonestheme, only one of which appears in the unknown word. By chance, subjects should pick the corresponding definition only 1 in 4 times, yet the mean number correct, to date, is closer to 1/2 than 1/4. Likewise, when given a definition and asked to select which of four unknown words they think best expresses the definition, another group of subjects is also choosing the sound symbolically correct words at rates just above 1/2, twice as high as expected. These preliminary results, along with those from other studies in the series, suggest that phonesthemes are psychologically real to native English speakers.

Table 1: Testing the psychological reality of English phonesthemes

Subjects receive:	Subjects select:
A. /twɪʃ /	a. To turn, distort, entangle, or oscillate; or the effect of such an action
	b. To radiate out from a point or to be elongated.
	c. A line having breadth.
	d. Something careless, slovenly, or low.
(/tw/ is a phonestheme. The target answer is a.)	
B. Collision creating noise or action with abrupt end.	a. splan
	b. wrudge
	c. dack
	d. skwoof
(/ æk/ is a phonestheme. The target answer is c.)	

1.5 Summary

It is clear that work on sound symbolism can benefit from the theoretical perspectives of functionalism and cognitive linguistics and from the experimental methodology of psychology. I will now argue that research in sound symbolism can help to test and extend these theories.

2 What sound symbolism can offer cognitive linguistics and functionalism

Langacker (1991), like Saussure (1959), has noted that linguistic symbols are composed of two poles—phonological and semantic—and a symbolic relation between them. Such a characterization is fairly straightforward for words and morphemes. However, Langacker's more controversial claim is that every linguistic unit, from the smallest morpheme to the most complex grammatical phrase, is a symbol, and therefore is composed of these two poles. Thus, the task is to show that more complex units are composed of a phonological pole, a semantic pole, and the symbolic relation between the two.

In his work, Langacker elaborates the semantic commonalties of word classes such as NOUN and VERB, as have other researchers (e.g., Hopper and Thompson 1984). The phonological pole seems more difficult and less extensively treated.

For instance, Langacker (1991:293) says, 'we can posit a schema for the class of nouns, which we can abbreviate as follows: [THING/...]. This symbolic unit is maximally schematic at each pole; semantically its only specification is that it profiles a thing, while phonologically it has no specific content.'

However, if one puts aside the assumption of the arbitrariness of the sign, and is willing to accept probabilistic rather than necessary and sufficient features, the phonological poles of abstract categories can be schematized. Sound symbolic research has revealed certain phonological characteristics of word classes. Below I will give selected examples (see also the review by Kelly, 1992).

2.1 Phonological criteria distinguishing the classes VERB and NOUN in English

2.1.1 English verbs tend to have fewer syllables than do English nouns

Cassidy and Kelly (1991) provided evidence for this general statement from several different sources. First, they examined the Brown corpus, a large corpus of written English prose and found that nouns had more syllables than verbs, controlling for frequency and date of entry into the language. Cassidy and Kelly also examined a corpus of adult speech directed to children, finding again that nouns had more syllables, on average, than did verbs, using both type and token counts, and across the group of mothers whose speech was sampled. Cassidy and Kelly further found that native English-speaking adults and children (from 3 to 5 years) were sensitive to the syllabic differences between nouns and verbs and generalized this knowledge to new exemplars.

2.1.2 English nouns and verbs have different typical stress patterns

Kelly's (1988) analysis of written corpora showed that disyllabic English nouns typically are stressed on the first syllable, while verbs are stressed on the second syllable—for example, record / record, permit / permit. In addition, Kelly found that native English speakers are sensitive to the stress differences tied to word class. Moreover, he discovered that the syllabic stress pattern affected the likelihood that a word of one class would be extended to the other class. In other words, nouns that had the characteristic first-syllabic stress were less likely to be used as verbs than were those with the second syllable stress common to verbs.

2.1.3 Frequent English nouns and verbs have different typical vowel distributions

Sereno and Jongman's (1990; Sereno, 1995) examination of the Brown corpus indicated that highly frequent nouns and verbs differ in vowel distribution such that nouns have a tendency to have back vowels and verbs to have front vowels. Low frequency items, however, do not differ in vowel distribution by word class. Sereno and Jongman also showed that adult native English speakers are sensitive to and can make use of these probabilistic differences.

These three studies indicate that the grammatical classes NOUN and VERB have characteristic phonological shapes in English (see also the review by Kelly, 1992). In addition, these phonological patterns provide examples of what Malkiel (1990) called morphosymbolism.

2.2 Phonological content of other word classes

Phonological correlates of other word classes can also be identified. For example, Malkiel (1990) studied the transition from Latin to Spanish adjectives, noting that with time, adjectival forms became increasingly standardized toward a canonical phonological form. Despite descending from Latin adjectives of varying length, Spanish adjectives are primarily (though not exclusively) disyllabic. Likewise, most Spanish adjectives begin with a consonant. Many Latin adjectives that began with a vowel were lost or came to acquire an initial consonant (e.g., /j/ or /g/). In addition, Spanish adjectives canonically end in the gender-marking o/a (and are also marked for number). There seems to be a relation of degree between the probabilistic sound symbolic correlates of word class and the more regular morphological correlates (which of course have a sound component as well).

2.3 Phonological content of grammatical subclasses

Slobin (in press) has recently described the open lexical class as a collection of small closed classes. Similarly, Levin (1993) and others divide the category VERB into subclasses, by semantic and/or syntactic factors. The lexicon seems naturally to break down into small sets of words united by meaning and/or syntactic behavior. Below I will review evidence that sets of words sharing semantic or syntactic features may also share phonological properties.

2.3.1 Subclasses of adjectives

Malkiel's studies of morphosymbolism in the Romance languages provide examples of adjectival subclasses with shared phonological and semantic features. For example, the subclass of Classical Latin adjectives that refer to a physical defect, oddity, or undesired state is united phonologically by being disyllabic, having as first vowel either /æ/, /e/, /aj/, or /aɔ/, and ending in -us or -er. The Italian adjectives for foibles or negative attributes (described in Section 1.3) provide another example of an adjectival subclass united by sound and meaning.

2.3.2 Subclasses of nouns

A number of studies have identified probabilistic phonological characteristics of seemingly arbitrary gender classes (see the review by Kelly, 1992). In French, for instance, some word-initial and word-final segments serve to distinguish masculine from feminine nouns. Tucker, Lambert, Rigault, and Segalowitz (1968) showed that school-aged French children were sensitive to these phonological correlates of gender, and were able to use them to classify unknown words.

Trade and scientific names in English have also been found to have semantic and phonological organization. Rubin, Stoltzfus and Wall (1991) showed that categories such as brands of laundry detergents, non-prescription pain killers, and names of radioactive elements have characteristic phonological forms (See Table 2). These features can be used by native speakers to create and classify novel exemplars.

Table 2[a]: Phonological forms of noun subclasses

Category	Prototypical Examples	Modal Value of Property		
		# Syllables	Ending	Root Value
Laundry detergents	Tide, Cheer	1	(none)	English word
Pain killers	aspirin, Anacin	3	-/In/	no English meaning
Radioactive elements	uranium, plutonium	4	-/ium/	proper noun

[a] Table modified from Rubin, Stoltzfus, and Wall (1991)

2.3.3 Subclasses of verbs

Gropen and others (e.g. Gropen et al 1989) have suggested that some verb subcategorization frames may be correlated with phonological structure. For example, the English dative has two forms, a prepositional form (1a) and a double-object form (1b).

1a. John got a ticket for Mary.
1b. John got Mary a ticket.

Some verbs are restricted to the prepositional form (1c), partly for semantic reasons (they must be compatible with the idea of transfer of possession), and partly for phonological reasons. Polysyllabic and Latinate-sounding words are less acceptable in the double-object form (*1d).

1c. John obtained a ticket for Mary
1d. *John obtained Mary a ticket.

Gropen and colleagues additionally showed that adults and children (between 5 and 8 years) are sensitive to the phonological biases associated with these alternations.

Another possible instance of English verb subclasses being united phonologically involves phonesthemes. English phonesthemes commonly depict types of motion (see Rhodes 1994 and Rhodes and Lawler 1981 for other functions). In English, information specifying the manner of motion is often incorporated in the verb while path information is often specified in the satellite (e.g. Slobin 1996; Talmy 1991). Verbs that code for manner often contain phonesthemes (see examples below). I think many phonesthemes function to unite subclasses of motion verbs semantically and phonologically. This possibility needs more investigation.

2a. The bottle *fl*oated into the cave.
2b. The bird *fl*ew across the sky.
2c. The river *fl*owed into the ocean.

(/fl/ = to move smoothly, continuously or rhythmically; e.g. flap, flicker, flutter, flounder)

3a. The man *str*ode out of the room.
3b. The couple *str*olled across the lawn.
3c. The woman *str*etched across the table to get the book.

/str/ = to use muscles; or forceful action in a linear path; e.g. strain, straighten, strive)

4a. The infantry *tr*udged across the plain.
4b. The mare *tr*otted out of the barn.
4c. The child *tr*aipsed along the path.

(/tr/ = to locomote by foot; e.g. tramp, trample, tread, trek, trip, troop)

5a. The pendulum *sw*ung back and forth.
5b. The driver *sw*erved around the stalled car.
5c. The leaves *sw*ayed in the wind.

(/sw/ = to oscillate, undulate, or move rhythmically to and fro; e.g. swagger, swish)

6a. The car cr*ash*ed into the wall.
6b. The ball sm*ash*ed through the window.
6c. The knife sl*ash*ed into the fabric.

(/æʃ/ = to make flamboyant, violent, or destructive contact; e.g. clash, gnash, mash)

7a. The couple tw*irl*ed around the dance floor.
7b. The tornado wh*irl*ed across the flat plain.
7c. The caterpillar c*url*ed into a ball.

(/əl/ = to twist, double-back, knot, or intertwine; e.g. swirl, unfurl)

8a. The baby cr*awl*ed across the kitchen floor.
8b. The drunken man spr*awl*ed across the couch.
8c. The fishermen tr*awl*ed along the coast.

(/aɔl/ = to drag, stretch out, or lengthen; e.g. drawl)

9a. The car z*ipp*ed along the highway at 90 miles an hour.
9b. The children sk*ipp*ed down the path.
9c. On the way to the party, the woman n*ipp*ed into the store to buy a card.

(/ɪp/ = a brisk movement, action, or event; e.g. blip, flip, sip, skip, whip, zip)

2.4 Summary

The data reviewed in this section provide evidence that word classes and subclasses have canonical phonological shapes that are probabilistically associated with those categories. In other words, the phonological pole of these rather abstract categories is not empty of shared content or maximally schematic (containing only some unspecified phonological content) as suggested by Langacker (1991). Indeed, a phonological schema can be constructed for these categories that depicts the canonical sound pattern. Ideally, the generality of each canonical pattern should be quantified to provide an indication of the degree to which it is instantiated by various members of the category.

3 Conclusions

The research reviewed in this paper suggests that further work in sound symbolism can be guided productively by the theoretical perspectives of functionalism and cognitive linguistics. For example, a functionalist perspective has generated the hypothesis that sound symbolism serves as an aid to learning and memory (Berlin and O'Neill, 1981; Berlin 1992). This hypothesis deserves further empirical attention.

Likewise, research into sound symbolism can help test and extend cognitive linguistic and functionalist theories. For example, sound symbolic research has demonstrated that the phonological pole of more abstract linguistic categories is not empty. Such work confirms Langacker's (1991) basic description of the bipolar character of all linguistic symbols and augments his description of the phonological pole of word classes. New work on sound symbolism may help answer old questions about the nature, structure, and function of language.

NOTES

1. Leanne Hinton (personal communication) disagrees with this characterization, arguing that the whole word may not be involved in onomatopoeia. The disagreement may stem from slightly different ways of classifying sound symbolic phenomena. For example, I would classify the word *crash* (following Wescott 1987) as involving two phonesthemes, *cr-* associated with discordant noise, e.g. cry, creak, croak) and *-ash* (associated with flamboyant, violent, or destructive contact, e.g. mash, gnash, clash). The whole word *crash* refers to the entire idea, a more specific degree of reference. While sounds smaller than whole words may be mimetic or imitative (e.g. some examples of phonesthemes and phonetic symbolism), I reserve the label onomatopoeia for whole words.

REFERENCES

Alspach, E. M. 1917. On the psychological response to unknown proper names. *The American Journal of Psychology* 28, 436-43.

André, J. 1966. Onomatopées et noms d'oiseaux en latin. *Bulletin de la Société de Linguistique de Paris*. 61.146-56.

Berlin, Brent. 1992. *Ethnobiological classification.* Princeton: Princeton University Press.

Berlin, Brent and John O'Neill. 1981. The pervasiveness of onomatopoeia in Aguaruna and Huambisa bird names. *Journal of Ethnobiology* 1, 238-61.

Blust, Robert. A. 1988. *Austronesian root theory: An essay on the limits of morphology.* Philadelphia: John Benjamins.

Braine, Martin D. S.; Brody, Ruth E.; Brooks, Patricia J.; Sudhalter, Vicki; Ross, Julie A.; Catalano, Lisa; and Shalom M. Fisch. 1990. Exploring language acquisition in children with a miniature artificial language: Effects of item and pattern frequency, arbitrary subclasses, and correction. *Journal of Memory and Language* 29, 591-610.

Brooks, Patricia; Braine, Martin D. S.; Catalano, Lisa; Brody, Ruth E. and Vicki Sudhalter. 1993. Acquisition of gender-like noun subclasses in an artificial language: The contribution of phonological markers to learning. *Journal of Memory and Language* 32, 76-95.

Callebaut, B. 1985. Onomatopées et noms d'oiseaux en français. *Le Français Moderne: Revue Linguistique Française* 55, 49-77.

Cassidy, Kimberly Wright and Michael H. Kelly. 1991. Phonological information for grammatical category assignments. *Journal of Memory and Language* 30, 348-69.

Chastaing, Maxime. 1958. Le symbolisme des voyelles: Significations des 'i'. I. Symboles de cris et de mouvements. II. Symboles d'acuité et de petitesse. *Journal de Psychologie* 55, 403-23; 461-81.

Chastaing, Maxime. 1965. Dernières recherches sur le symbolisme vocalique de la petitesse. *Révue Philosophique de la France et de L'Etranger* 155, 41-56.

Craik, Fergus I. M. and Robert S. Lockhart. 1972. Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior* 11, 671-84.

Davis, R. 1961. The fitness of names to drawings: A cross-cultural study in Tanganyika. *British Journal of Psychology* 52, 259-68.

Feld, Stephen. 1982. *Sound and sentiment: Birds, weeping, poetics, and song in Kaluli expression.* Philadephia, PA: University of Pennsylvania Press.

Gropen, Jess; Pinker, Steven; Hollander, Michelle; Goldberg, Richard; and Ronald Wilson. 1989. The learnability and acquisition of the dative alternation in English. *Language* 65, 203-57.

Hinton, Leanne, Nichols, Johanna, and John J. Ohala. 1994. Introduction: Sound symbolic processes. *Sound symbolism*, ed. by Leanne Hinton, Johanna Nichols, and John J. Ohala, 1-12. Cambridge University Press.

Hopper, Paul J. and Sandra A. Thompson. 1984. The discourse basis for lexical categories in universal grammar. *Language* 60, 703-52.

Hunn, Eugene S. 1977. *Tzeltal folk zoology: The classification of discontinuities in nature.* New York: Academic Press.

Hutchins, Sharon S. March 1995. Development of the ability to use phonesthemes as guides to the meaning of novel words. Poster presented at the biennial meeting of the Society for Research in Child Development, Indianapolis, IN.

Hutchins, Sharon S. 1997. English phonesthemes: Their variability, psychological reality, and compositionality. Emory University dissertation in preparation.

Hutchins, Sharon S., and Nameera. N. Akhtar. July 1996. Early sensitivity to sound symbolism in English-speaking children. Paper presented at the VIIth International Congress for the Study of Child Language, Istanbul, Turkey.

Hutchins, Sharon S.; Mervis, Carolyn B.; Robinson, Byron F.; and Jacquelyn Bertrand. 1997. Weeds in the garden of language: The psychological reality of English phonesthemes. Manuscript under revision.

Inoue, Tomoyoshi. 1991. Encoding activities by preschool children under orienting versus learning instructions: Are onomatopoeias associated with more concrete images? *Japanese Psychological Research* 33, 11-17.

Irwin, Francis W. and Elizabeth Newland. 1940. A genetic study of the naming of visual figures. *Journal of Psychology* 9, 3-16.

Kelly, Michael H. 1988. Phonological biases in grammatical category shifts. *Journal of Memory and Language* 27, 343-58.

Kelly, Michael H. 1992. Using sound to solve syntactic problems: The role of phonology in grammatical category assignments. *Psychological Review* 99, 349-64.

Langacker, Ronald W. 1991. *Concept, image, and symbol: The cognitive basis of grammar*. Mouton de Gruyter.

Levin, Beth. 1993. *English verb classes and alternations*. Chicago: University of Chicago Press.

Malkiel, Yakov. 1990. *Diachronic problems in phonosymbolism*. Philadelphia: John Benjamins.

Murakami, Yoshihoro. 1982. The facilitation effects of phonetic symbolism on paired associate learning. *Japanese Journal of Psychological Research* 24, 62-67.

Newman, Stanley S. 1933. Further experiments in phonetic symbolism. *American Journal of Psychology* 45, 53-75.

Ohala, John J. 1983. Cross-language use of pitch: An ethological view. *Phonetica* 40, 1-18.

Ohala, John J. 1994. The frequency code underlies the sound-symbolic use of voice pitch. *Sound symbolism*, ed. by Leanne Hinton, Johanna Nichols and John J. Ohala, 325-47. Cambridge: Cambridge University Press.

Quenk, Alexander T. 1964. Phonic shift as a function of inappropriate stimulus conditions. Dissertation Abstracts International, University Microfilms No. 65-3065.

Rhodes, Richard A. 1994. Aural images. *Sound symbolism*, ed. by Leanne Hinton, Joanna Nichols and John J. Ohala, 276-92. Cambridge: Cambridge University Press.

Rhodes, Richard A. and John M. Lawler. 1981. Athematic metaphors. *Chicago Linguistic Society* 17, 318-42.

Rubin, David C.; Stoltzfus, Ellen R. and Kirsten L. Wall. 1991. The abstraction of form in semantic categories. *Memory and Cognition* 19, 1-7.

Sapir, Edward. 1929. A study in phonetic symbolism. *Journal of Experimental Psychology* 2, 225-39.

Saussure, Ferdinand de. 1959. *Course in general linguistics*. W. Baskin, Trans. New York: Philosophical Library (Original work published in 1915).

Sereno, Joan A. 1994. Phonosyntactics. *Sound symbolism*, ed. by Leanne Hinton, Johanna Nichols and John J. Ohala, pp. 263-75. Cambridge: Cambridge University Press.

Sereno, Joan A. and Allard Jongman. 1990. Phonological and form class relations in the lexicon. *Journal of Psycholinguistic Research*. 19.387-404.

Slobin, Dan I. 1996. Two ways to travel: Verbs of motion in English and Spanish. *Grammatical constructions*, ed. by Shibatani, Masayoshi and Sandra A. Thompson. 195-219.

Slobin, Dan I. in press. The origins of grammaticizable notions: Beyond the individual mind. *The cross-linguistic study of language acquisition* Vol. 5, ed. by Dan I. Slobin. Cambridge: Cambridge University Press.

Slobin, Dan I., and Thomas G. Bever. 1982. Children can use canonical sentence schemas: A cross-linguistic study of word order and inflection. *Cognition* 12, 229-65.

Talmy, Leonard. 1993. Path to realization: A typology of event conflation. *BLS* 17, 480-519.

Tarte, Robert D. 1974. Phonetic symbolism in adult native speakers of Czech. *Language and Speech* 17, 87-94.

Tarte, Robert D. and Loren S. Barritt. 1971. Phonetic symbolism in adult native speakers of English: Three studies. *Language and Speech* 14, 158-68.

Trigo, Loren. 1991. Scales and diminutivization. *Linguistic Inquiry* 22(3), 578-83.

Tucker, G. R.; Lambert, Wallace E.; Rigault, A. and N. Segalowitz. 1968. *Journal of Verbal Learning and Verbal Behavior* 7, 312-16.

Ultan, Russell. 1978. Size-sound symbolism. *Universals of human language, vol. 2: Phonology*, ed. by Joseph H. Greenberg, 525-68. Stanford, CA: Stanford University Press.

Wescott, Roger W. 1987. Holesthemes or phonesthemes twice over. *General Linguistics* 27, 67-72.

Clausal Case, Verbal Nouns and the Copula *NO* in Japanese*

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1. Introduction. Verbal nouns have been the focus of much research since Grimshaw and Mester (1988) because of their special properties bearing on theta theory and Case theory. This paper will discuss the syntactic structure of a verbal noun construction in example 1, shedding more light upon those properties.[1]

(1) Yamada-san ga tyuukosya o HANBAI no ori (ni)
Yamada-Mr. NOM used cars ACC sale ? occasion (on)
'(on) the occasion when Mr.Yamada sells used cars'

I refer to nominative and accusative Cases as clausal Case, and *ga* and *o* as clausal Case markers. HANBAI in 1 is a verbal noun or VN, and I highlight VNs in capital letters. As the name implies, VNs possess both verbal and nominal characteristics, and I will illustrate their dual character shortly. Theta-theoretically, HANBAI is the main predicate, taking two arguments *Yamada-san* and *tyuukosya*. I put a question mark in the gloss for *no*, because its categorial status is controversial. Example 1 is an NP, witness the fact that it can take the postposition *ni*. The example, therefore, raises this question: What licenses clausal Case markers *ga* and *o* in 1, although it is an NP in terms of its distribution?

To answer this question, one needs to account for the dual character of VNs, which is illustrated in 2.

(2) a. Yamada-san no tyuukosya no HANBAI
Yamada-Mr. GEN used cars GEN sale
'Mr. Yamada's sale of used cars'
b. Yamada-san ga tyuukosya o HANBAI-suru
Yamada-Mr. NOM used cars ACC sale-do
'Mr.Yamada sells used cars.'

In 2a, HANBAI is the head of an NP, taking two genitive-marked NP modifiers. It, then, behaves just like a regular noun. In 2b, HANBAI-*suru* is a complex predicate, and takes two NP arguments marked by clausal Case. HANBAI behaves like a verb in that it cooccurs with, and theta-marks, nominative and accusative NPs. VNs, thus, have both nominal and verbal characteristics.

I will argue in this paper that the dual character of VNs follows from the hypothesis that they do not always project as an NP. HANBAI projects in 2a, but does not in 2b. When they project as an NP, VNs behave just like a regular noun, exhibiting nominal characteristics. When they do not, they form a complex predicate and exhibit verbal characteristics. Specifically, I will argue that HANBAI in 1 does not project but forms a complex predicate with the copula *no*. Thus, example 1 has the structure shown in 3.

(3) [$_{NP}$ [$_{IP}$ Yamada-san ga tyuukosya o [HANBAI no]] [$_{NP}$ ori]]

Example 1 is analyzed as an NP whose head noun *ori* is modified by a relative clause with a complex predicate HANBAI *no*. This analysis explains the external

distribution of 1. As for clausal Case, the complex predicate assigns accusative Case to *tyuukosya*; and Infl of the relative clause, nominative Case to *Yamada-san*.

This paper is organized as follows. Section 2 reviews previous analyses of 1. Section 3 shows that some occurrences of *no* are the nonfinite copula. In section 4, I will argue that *no* in 1 is also the nonfinite copula, and present my analysis of 1. Section 5 summarizes the main arguments of this paper.

2. Review of previous analyses. Faced with the dual character of VNs, previous attempts have either treated them as an N, attributing their verbal characteristics to their interaction with some verbal or functional element in their vicinity, or treated them as an underspecified category compatible with behaving as an N or a V. This section critically reviews Miyagawa (1991), Sato (1993), and Manning (1993).

2.1. Miyagawa (1991). Miyagawa (1991:6-19) claims that *ori* in 1 has an aspectual meaning, and that it is an Aspectual functional category ASP. ASP licenses clausal Case, and takes as its complement an NP whose head is a VN. The derivation of 1 under Miyagawa's account is given in 4.

(4) $[_{ASP'}$ Yamada-san$_i$ ga $[_{ASP'}$ $[_{NP}$ t_i tyuukosya o $t_j]$ $[_{ASP}$ HANBAI$_j$ no ori]]]

In 4, HANBAI projects as an NP, and incorporates into ASP in order to assign accusative Case to *tyuukosya*. *Yamada-san* moves to the Spec of ASP phrase, where it is marked nominative. The verbal noun construction in 1, then, is an ASP phrase or a clause.

Miyagawa's analysis has two problems. First, contrary to his claim, aspectual nouns are irrelevant to the licensing of clausal Case, as shown in 5.

(5) Yamada-san ga tyuukosya o HANBAI no mise
Yamada-Mr. NOM used cars ACC sale ? shop
'the shop where Mr.Yamada sells used cars'

5 differs minimally from 1 in having *mise* instead of an aspectual noun *ori*. Nevertheless, clausal Case is licensed in this example as well. The presence of *ori* in 1, therefore, is irrelevant to the licensing of clausal Case. The second problem concerns the external distribution of 1. As Manning (1993) points out, Miyagawa's analysis wrongly predicts that 1 has the same distribution as a clause, but in fact its external syntax is exactly that of an NP.

2.2. Sato (1993). Sato (1993:124-189) bases his analysis of 1 on the parallelism between 1 and 2b. He takes VNs as an N and argues that in 2b the light verb *suru* is responsible for the verbal characteristics of HANBAI. Analogously, he posits a zero light verb in 1 and argues that it is responsible for the verbal characteristics of HANBAI. 6 shows his analysis of 1.

(6) $[_{NP}$ $[_{CP}$ $[_{IP}$ Yamada-san ga $[_{I'}$ $[_{VP}$ tyuukosya o $[_{V'}$ HANBAI $[_{V}$ zero light verb]]]]] no] $[_{N}$ ori]]

In 6, the temporal word *ori* takes a CP complement and licenses the occurrence of the zero light verb inside the CP. HANBAI and the zero light verb form a complex

predicate. Nominative Case is assigned by Infl associated with the zero light verb, and accusative Case is assigned by the complex predicate.

Sato's analysis has two problems. First, as I have shown in 5, nouns with no temporal meaning can occur in place of *ori*. This raises the questions of what licenses the zero light verb in 5 and 6, and whether or not its occurrence can be sufficiently constrained at all. Second, Sato analyzes HANBAI in 1 as projecting as an NP. His analysis, then, predicts that noun modifiers which normally occur in an NP headed by HANBAI can also occur in 1. This prediction, however, turns out to be false, as shown in 7.

(7) a. [$_{NP}$ seiryokutekina HANBAI]
aggressive sale
'aggressive sale'
b. *Yamada-san ga tyuukosya o seiryokutekina HANBAI no ori
aggressive

7 shows that the noun modifier *seiryokutekina*, which normally occurs in an NP headed by HANBAI, cannot occur in 1. Sato (1993:77) explains the unacceptability of 7b by proposing a generalization that a modified VN such as *seiryokutekina* HANBAI in 7b cannot project an argument structure. However, a question still remains as to why that is the case.

2.3. Manning (1993). Manning (1993) proposes the concept of categorial underspecification, and argues that VNs are an underspecified category which is compatible with behaving as either a verb or a noun. His analysis of VNs as an underspecified category can best be illustrated with examples like 8.

(8) Yamada-san ga tyuukosya no HANBAI no ori
Yamada-Mr. NOM used cars GEN sale GEN occasion
'the occasion when Mr.Yamada was engaged in the sale of used cars'

Manning takes the *no* following HANBAI in 8 as the genitive Case marker. He argues that the nominative-marked argument *Yamada-san ga* specifies that its sister is a verbal projection, while the genitive-marked argument *tyuukosya no* selects for a nominal sister. He concludes from this that HANBAI is an underspecified category so that it may meet these two contradictory requirements.

However, resorting to the concept of an underspecified category is conceptually undesirable because it makes the theory of grammar less restrictive. Moreover, examples like 9 pose an empirical problem to Manning's analysis of 8.

(9) Yamada-san ga Berkeley no gakusei no toki
Yamada-Mr. NOM Berkeley GEN student ? time
'the time when Mr.Yamada was a student at Berkeley'

9 is similar to 8 in having a nominative-marked NP *Yamada-san ga* and a genitive-marked NP *Berkeley no*. But it differs from 8 in that it does not contain a VN but a regular noun *gakusei*. If we follow Manning's reasoning, we are forced to treat regular nouns like *gakusei* as an underspecified category. However, regular nouns differ crucially from VNs in always projecting as an NP and in failing to occur in the sentence pattern 2b. Therefore, regular nouns cannot be treated as an

underspecified category. From this it follows that nominative Case in 9 is licensed independently of *gakusei*. This, in turn, raises a question about Manning's analysis of 8. What licenses nominative Case in 8? Whatever it may be, the licenser of nominative Case in 9 may well be the licenser in 8 as well, and consequently the VN in 8 may not be underspecified.

3. Nominative *ga* and the copula *no* in Japanese. The category of *no* in examples like 1 has been controversial. In this section, I will demonstrate that some occurrences of *no* are the nonfinite attributive form of the copula, and in the next section I will argue that *no* in 1 is also the nonfinite copula.

There is no agreement about how many types of *no* should be recognized, but for the purpose of the present discussion I confine myself to only two types of *no*, which are illustrated in 10.

(10) isya no musume (Sells 1996b)
doctor COP/GEN daughter
(i) 'my daughter who is a doctor' (copular use)
(ii) 'the doctor's daughter' (genitive use)

10 is ambiguous with two readings. In the first reading (i), *no* functions like the copula, while in the second reading (ii) it functions like a genitive marker. Sells (1996b) refers to *no* here as the default linker, claiming that *no* is a single morpheme with various uses, including the copular use and the genitive use. However, I will claim, following Okutsu (1981:113-197), that the copula *no* and the genitive Case marker *no* are distinct morphemes.

I will present three arguments for recognizing the copula *no* as a morpheme distinct from the genitive Case marker. The first argument concerns the distribution and interpretation of *no*. Its distribution and interpretation correspond exactly to those of the present- and past-tense attributive forms of the copula. First, consider 11.

(11) a. Taro ga imamonao dokusin da/de aru/*no
Taro NOM still bachelor COP-PRE /COP-PRE/?
'Taro is still a bachelor.'
b. Taro ga imamonao dokusin *da/de aru/no riyuu wa
Taro NOM still bachelor COP-PRE/COP-PRE/? reason TOP
teisyoku ga nai kara desu
steady job NOM not have because COP-PRE
'The reason Taro is still a bachelor is that he does not have a steady job.'

In 11, *da* is the copula, and I take *de aru* as a periphrastic form of the copula. In 11a, *da* and *de aru* are called a conclusive form (i.e. a form used in matrix clauses). 11b contains 11a as a relative clause. *De aru* here is called an attributive form (i.e. a form used in relative clauses and noun complement constructions). In 11b, *no* can replace the attributive form *de aru* without any change in meaning. Note that *da* can occur only in 11a, while *no* can occur only in 11b. 11 seems to suggest that *no* is the attributive form of *da*, because *da* and *no* are complementary in distribution. However, this is not the case, as 12 shows.

(12) a. Taro ga sakunen made dokusin datta/de atta/*no
Taro NOM last year till bachelor COP-PAST/COP-PAST/?
'Taro had been a bachelor till last year.'
b. Taro ga sakunen made dokusin datta/de atta/no riyuu wa
Taro NOM last year till bachelor COP-PAST /COP-PAST/? reason TOP
teisyoku ga nakatta kara desu
steady job NOM not had because COP-PRE
'The reason Taro had been a bachelor till last year is that he did not have a steady job.'

In 12a, both *datta* and *de atta* can be used, while *no* cannot. 12b contains 12a as a relative clause. The copulas *datta* and *de atta* are a conclusive form in 12a and an attributive form in 12b. In 12b, *no* can replace the past-tense attributive forms of the copula *datta* and *de atta*. 11 and 12, then, show that *no* shares its distribution and interpretation with the present- and past-tense attributive form of the copula.

The second argument for the copula *no* is based on the cooccurrence of *no* with the nominative Case marker. Consider 11b and 12b again. *Dokusin* is a regular noun, and *Taro* is marked nominative. What assigns or licenses nominative Case here? Assuming the GB theory, we can take its assigner to be the Infl associated with the finite copula. However, nominative Case is still assigned when *no* replaces the copula. This fact is explained if *no* is a verbal element and is associated with Infl. But the fact is unexplained, if *no* is the genitive Case marker or the default linker. This argument, coupled with the first argument, leads us to conclude that *no* in 11b and 12b is the nonfinite attributive form of the copula.

The third and final argument for the copula *no* comes from the fact that the copula *na* shares the two properties of *no* discussed above. First, consider 13.

(13) a. ryoosin ga imamo kenzai da/de aru/*na
parents NOM still good health COP-PRE/COP-PRE/COP
'My parents are still alive and well.'
b. ryoosin ga imamo kenzai *da/de aru/na gakusei
parents NOM still good health COP-PRE/COP-PRE/COP student
'students whose parents are still alive and well'

In 13, *kenzai* is an adjectival noun (AN) or a noun with an adjectival meaning. In 13a, *da* and *de aru*, which are conclusive forms, can occur, but *na* cannot. 13a is embedded in 13b as a relative clause. In 13b, *de aru* and *na*, which are attributive forms, can occur, but *da* cannot. The copula *na* is an attributive form and takes ANs. This explains why *na* is unacceptable in 13a, but acceptable in 13b. 13b shows that the copula *na* shares its distribution and interpretation with the present-tense attributive form of the copula. However, this does not mean that *na* is the attributive form of *da*. Consider 14.

(14) a. ryoosin ga sono toozi mada kenzai datta/de atta/*na
parents NOM that time still good health COP-PAST/COP-PAST/COP
'My parents were still alive and well at that time.'

b. ryoosin ga sono toozi mada kenzai datta/de atta/na
parents NOM that time still good health COP-PAST/COP-PAST/COP
gakusei
student
'students whose parents were still alive and well at that time'

In 14a, conclusive forms *datta* and *de atta* can occur, but *na* cannot. 14b contains 14a as a relative clause. In 14b, *na* can replace the past-tense copula *datta* and *de atta*. 13 and 14, then, show that just like *no*, the copula *na* shares its distribution and interpretation with the present- and past-tense attributive forms of the copula.

Moreover, nominative Case in 13b and 14b is licensed, even when *na* replaces the finite copula. This fact is explained by assuming that the Infl associated with *na* licenses nominative Case. *Na* and *no*, therefore, share another property, namely being associated with Infl.

I conclude from these three arguments that *no* and *na* are allomorphs, and that they are the nonfinite attributive forms of the copula.[2] *No* subcategorizes for regular nouns or nominal nouns (NNs), while *na* subcategorizes for ANs. 15 summarizes the finite and nonfinite forms of the copula.

(15) Finite and Nonfinite Forms of the Copula in Japanese

	Finite Form	Nonfinite Form
Conclusive Form	PRE : da (de aru) PAST: datta (de atta)	NN: *no AN: *na
Attributive Form	PRE : *da (de aru) PAST: datta (de atta)	NN: no AN: na

In 15, *da* is exceptional among the finite forms in that it lacks an attributive form. The nonfinite form cannot be used as a conclusive form, because a conclusive form is by definition finite. In Japanese, no verb except the copula has nonfinite attributive forms corresponding to *no* or *na*. In this section, I have demonstrated that some occurrences of *no* are the nonfinite attributive forms of the copula.

4. Analysis of the verbal noun construction. In this section, I will first argue, following Yoshida (1986:102-106) and Matsumoto (1992:118), that *no* in example 1 is also the copula and then discuss how clausal Case is licensed in 1. Finally, I will propose my analysis of 1 and present some arguments for it.

4.1. Nominative *ga* and the copula *no* in the verbal noun construction. Two facts indicate that *no* in example 1 is the copula. First, example 1, repeated below, is actually ambiguous with two readings given in 16.

(1) Yamada-san ga tyuukosya o HANBAI no ori (ni)
Yamada-Mr. NOM used cars ACC sale ? occasion (on)
'(on) the occasion when Mr.Yamada sells used cars'
(16) a. (on) the occasion when Mr. Yamada sells used cars
b. (on) the occasion when Mr. Yamada sold used cars

The two readings in 16 differ only in the tense interpretation of HANBAI *no*. This suggests that *no* in 1 is independent of tense distinction, just as the copula *no*. Second, in 1 *no* cooccurs with a nominative-marked NP, just as in the case of the copula *no*. On the basis of these two facts, I claim that *no* in 1 is also the nonfinite copula, and that the Infl associated with *no* licenses nominative Case in 1, just as in 11b and 12b.

One potential problem with this analysis of *no* is that *no* in 1 cannot be replaced by the finite copula but by *suru* 'do' or *sita* 'did', as shown in 17.

(17) a. Yamada-san ga tyuukosya o HANBAI no/*de aru/*datta ori
COP/COP-PRE/COP-PAST
b. Yamada-san ga tyuukosya o HANBAI no/suru/sita ori
COP/do/did

In 17a, neither the present-tense nor the past-tense copula can replace *no*. Instead, as 17b shows, *suru* and *sita* can replace *no*. In fact, the finite copula cannot take VNs, with the exception of a few examples like 18.

(18) Sells (1996b)
bokutati wa asita Tokyo e SYUPPATU da!
we TOP tomorrow Tokyo to departure COP
'Tomorrow we leave for Tokyo.'

In 18, the finite copula *da* takes the VN SYUPPATU. Now, I propose to solve the potential problem by arguing that finite and nonfinite copulas differ in their subcategorization properties. The finite copula takes NNs and ANs, while *suru* takes VNs. However, this pattern does not apply in the case of the nonfinite attributive forms, because *suru* lacks such a form. Therefore, the nonfinite attributive form of the copula takes all three types of nouns, as shown in 19.

(19) Subcategorization Properties of the Copula in Japanese[3]

Finite Form (Conclusive & Attributive Forms)	Nonfinite Form (Attributive Form)
copula [NN ____] copula [AN ____] (*suru* [VN ____])	copula (*no*) [NN ____] copula (*na*) [AN ____] copula (*no*) [VN ____]

19 shows that the finite form of the copula subcategorizes for NNs and ANs, while *suru* subcategorizes for VNs. The situation is different when the nonfinite form is involved. Since *suru* lacks a nonfinite attributive form, the copula subcategorizes for all. *No* takes both NNs and VNs, and *na* takes ANs. In this subsection, I have argued that *no* in 1 is the nonfinite copula and that the Infl associated with *no* licenses nominative Case in 1, just as in 11b and 12b.

4.2. Accusative *o* and verbal nouns in Japanese. I have argued that nominative Case in 1 is licensed independently of the VN, but I argue that accusative Case in 1 depends crucially on the VN for its licensing. This kind of asymmetry between nominative and accusative Cases in the way they are licensed is justified. Under

the GB theory, nominative Case is assigned irrespective of the property of the verb, while accusative Case is closely tied to the property of the verb. This section discusses the relation between accusative Case and the property of the VN in 1.

We have seen in section 2 that HANBAI in 1 cannot take noun modifiers which usually occur in an NP headed by HANBAI, as shown in 7 below.

(1) Yamada-san ga tyuukosya o HANBAI no ori (ni)
Yamada-Mr. NOM used cars ACC sale ? occasion (on)
'(on) the occasion when Mr.Yamada sells used cars'

(7) a. [$_{NP}$ seiryokutekina HANBAI]
aggressive sale
'aggressive sale'

b. *Yamada-san ga tyuukosya o seiryokutekina HANBAI no ori
aggressive

Seiryokutekina in 7a is a noun modifier, occurring in an NP headed by HANBAI, but it cannot occur in 1, as shown in 7b. I argue that unlike HANBAI in 7a, HANBAI in 1 does not project as an NP, and that due to the absence of a nominal projection, *seiryokutekina* cannot occur in 1.[4] This explains the unacceptability of 7b. Sato (1993:14-15) refers to VNs like HANBAI in 1 as a bare VN as opposed to a modified VN. However, drawing on the research on ANs, such as Murasugi (1990), I refer to HANBAI in 1 as an unprojected VN. 7b, however, will be acceptable if *tyuukosya* is marked genitive, as shown in 7b'.

(7) b'. Yamada-san ga [tyuukosya no seiryokutekina HANBAI] no ori

In 7b', HANBAI projects as an NP, and the two modifiers *tyuukosya no* and *seiryokutekina* occur inside the NP. 1 and 7b', then, show that accusative Case is assigned only when HANBAI does not project. Now, I propose to explain the correlation between the unprojected VN and accusative Case assignment by arguing that the unprojected VN and the copula *no* form a complex predicate which assigns accusative Case.

My assumptions about accusative Case assignment in 1 are as follows. First, I accept Sato's (1993:98) claim that all VNs have lexico-semantic representations, but that only bare (or unprojected) VNs project argument structures from them. I argue that VNs in Japanese differ from complex event nominals (Grimshaw 1990:45-150) in English in three respects. First, complex event nominals always project as an NP, while VNs do not always do so. Second, complex event nominals always project argument structures, while VNs do so only when they do not project as an NP. Third, complex event nominals have a suppressed argument position, while VNs do not. HANBAI, for example, has a lexico-semantic representation and an argument structure given in 20.

(20) HANBAI 'sale'
a. Lexico-semantic representation: there is an event such that x sells y.
b. Argument structure: <Agent, Theme> [5]

Note here that HANBAI assigns a theta-role to its external argument. Second, I assume following Hoekstra (forthcoming) that lexical verbs are composite elements consisting of a lexical basis and functional material. The lexical basis is either a

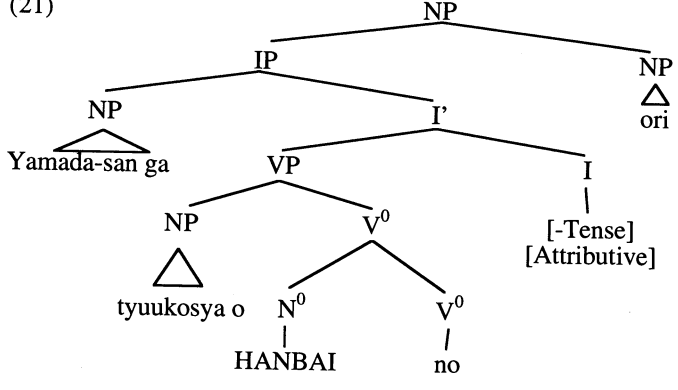
noun or an adjective. Functional material licenses a lexical basis, just as functional categories in general license lexical categories. I claim that the complex predicate HANBAI *no* in 1 is equivalent to a lexical verb, with HANBAI providing a lexical basis and *no* providing functional material. *No*, then, licenses the projection of 20b. Following Burzio (1986:178-186), I assume that HANBAI *no* assigns accusative Case because it assigns a theta-role to its external argument.

In this subsection, I have argued that the VN in 1 does not project as an NP but forms a complex predicate with the copula *no* and that the complex predicate theta-marks the two arguments and licenses accusative Case. Sato's generalization that a modified VN cannot project an argument structure follows from the assumption that when licensed by *no*, only a zero-level VN projects an argument structure.

4.3. Analysis of the verbal noun construction. I now propose 21 as the structure of the verbal noun construction in 1.

(1) Yamada-san ga tyuukosya o HANBAI no ori (ni)
Yamada-Mr. NOM used cars ACC sale ? occasion (on)
'(on) the occasion when Mr. Yamada sells used cars'

(21)



21 shows that 1 is an NP whose head noun is modified by a relative clause. This explains why its external syntax is exactly that of an NP. I follow Murasugi (1991:140-164) in taking relative clauses as IPs.[6] HANBAI does not project as an NP, but forms a complex predicate with *no*. N^0 and V^0 are minimal projections, and the complex predicate is again a V^0. I have borrowed this notation from Sells (1996a, b), where this kind of syntactic combination is proposed for the light verb construction.[7] This combination is not morphological, partly because elements such as a focus particle can intervene between the VN and *no*, as shown in 22.

(22) Sato (1993:164)
doo-koogi o TYOOKOO nomi no sai ni wa
the course ACC auditing only GEN situation in TOP
'when just auditing this course'

In 22, *nomi* 'only' intervenes between the VN TYOOKOO and *no*. As for clausal Case assignment in 1, HANBAI *no* assigns accusative Case to *tyuukosya*; and Infl,

nominative Case to *Yamada-san*. This explains why clausal Case is licensed, even when nouns with no aspectual or temporal meaning occur in place of *ori*. Furthermore, we need not introduce an underspecified category into the theory of grammar because nominative Case is assigned by Infl. Since *no* is the nonfinite attributive form, Infl in 21 has features to license that particular inflectional form.

One argument for the proposed analysis comes from Hoshi's (1994:150-151) observation that *GA/NO* Conversion is possible in the verbal noun construction. Since *GA/NO* Conversion takes place in relative clauses, the proposed analysis predicts Hoshi's observation. This prediction is borne out, as shown in 23.

(23) sengetu Taro ga/no Tokyo e SYUTTYOO no ori ni
last month Taro NOM/GEN Tokyo to business trip COP occasion on
hahaoya ga tazunete kita
mother NOM visiting came
'On the occasion when Taro made a business trip to Tokyo last month, his mother came to visit him.'

In 23, *Taro* can be marked genitive, and this fact is explained if we assume 21.

A second argument for 21 is that we can now treat unprojected VNs and ANs in the same way. I classify nouns in Japanese into three subcategories in 24.

(24) Three Subcategories of Nouns in Japanese
a. Nominal Noun (NN): NNs always project as an NP.
b. Verbal Noun (VN): VNs lead a double life; they sometimes project as an NP and sometimes do not.
c. Adjectival Noun (AN): Most ANs never project as an NP. Some ANs (e.g. *binboo* 'poverty', *kenkoo* 'health') sometimes project as an NP and sometimes do not.

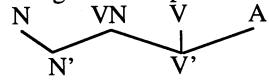
NN, VN and AN are subcategories of nouns because they are free forms morphologically (Sells 1996a). They contrast with verbs and adjectives, which are bound forms taking tense suffixes. ANs form a complex predicate with the copula when they do not project, as shown in 25.

(25) John ga okane ga hituyoo na ori
John NOM money NOM need COP occasion
'the occasion when John needs money'

In 25, *hituyoo* is an AN and does not project as an NP. Theta-theoretically, it is the main predicate but needs the copula to project its argument structure.[8] The proposed analysis, then, can treat unprojected VNs and ANs in the same way.

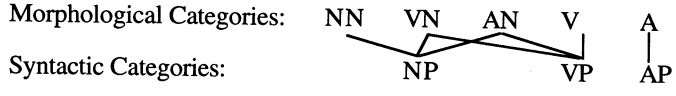
The proposed analysis can also explain the dual character of VNs in terms of the distinction between morphological and syntactic categories in Japanese. Sells (1996a) proposes 26 to explain the dual character of VNs.

(26) Morphological and Syntactic Categories in Japanese (Sells 1996a)



In 26, VN is associated with both N' and V', because it is underspecified or dually categorized as V and N. AN is left unassociated, because it always combines with the copula, having no phrasal projection of its own. A is taken to project as a V' as a result of tense inflection. Now, the proposed analysis in 21 leads us to 27.

(27) Morphological and Syntactic Categories in Japanese



In 27, VN and AN are associated with both the NP and the VP. When they project, they are NPs. When they do not, they form a complex predicate which projects as a VP. I take the traditional position that A projects as an AP in Japanese. Note here that the three-way classification of Ns parallels that of syntactic categories. This parallelism is explained by taking VNs and ANs as a lexical basis on which to build complex predicates which function semantically as a VP and an AP. The proposed analysis in 21, thus, explains the dual character of VNs in terms of the discrepancy between morphological and syntactic categories in Japanese.

5. Conclusion. In this paper, I have first shown that some occurrences of *no* are the nonfinite attributive form of the copula, and that *no* in 1 is also the nonfinite copula. Then, I have argued that HANBAI in 1 does not project as an NP but forms a complex predicate with *no*. Finally, I have proposed an analysis of 1, where *ori* is modified by a relative clause and where the Infl of the relative clause licenses nominative Case and the complex predicate accusative Case.

Before closing the paper, I would like to point out that VNs and ANs are mostly borrowings (Kageyama 1982, Murasugi 1990, Kubo 1992:119-121) and that this partly explains why they do not always project as an NP. In Japanese, Vs and As are bound morphemes, taking their own tense suffixes, while Ns are free morphemes. Because we cannot attach verbal or adjectival tense suffixes directly to Vs and As borrowed from other languages, we first change the syntactic category of borrowings into Ns (i.e. VNs and ANs). Since the recategorized borrowings are Ns in Japanese, it is only natural that VNs and ANs should project as NPs. However, once they do, they miss the original purpose of making up the shortage of Vs and As in the vocabulary of Japanese. In order to fulfill the purpose, they do not project as an NP but form complex predicates with the copula. This turns VNs back into their original syntactic category, namely verbs, and ANs into something similar to their original category, namely adjectival verbs. Two stages of recategorization, then, are involved in making use of the borrowed Vs and As in Japanese.

NOTES

* I would like to thank the BLS 23 audience for their comments on my paper.

[1] The following abbreviations are used in this paper: NOM = nominative Case, ACC = accusative Case, GEN = genitive Case, COP = copula, PRE = present tense, PAST = past tense, TOP = topic marker.

[2] Sells (1996b) also claims that *da* is 'both inflected and tensed', while *na* is 'inflected but not tensed'.

The opposition between the allomorphs *no* and *na* is neutralized immediately before the nominalizer *no*. See Miyagawa (1987) for relevant discussions.

[3] The copula either subcategorizes for an NP (i.e. a maximal projection of NNs, ANs, and VNs) or, as I argue below, forms a complex predicate with a zero-level projection of ANs and VNs. On this score, it is similar to *suru* 'do'.

[4] Yoon (1991) and Han (1996) give the same argument concerning VNs in Korean light verb constructions.

[5] Contra Sato, I assume that the external theta role Agent is not suppressed.

[6] In 21, I ignore the relative operator and its trace.

[7] Sells (1996a, b) proposes this syntactic combination for the light verb construction with *suru* 'do' in Japanese and *hata* 'do' in Korean.

[8] Urushibara (1994:114-116) points out similarities between the VN in 2b and the AN in 25 and refers to both types of construction as a light verb construction.

REFERENCES

BURZIO, LUIGI. 1986. Italian syntax: a government-binding approach. Dordrecht: D.Reidel.

GRIMSHAW, JANE. 1990. Argument structure. Cambridge, MA: MIT Press.

_____, and ARMIN MESTER. 1988. Light verbs and θ-marking. Linguistic Inquiry 19.205-32.

HAN, HAK-SUNG. 1996. Syntactic affixation and the structure of Korean. Proceedings of 1996 Seoul International Conference on Generative Grammar, 23-37.

HOEKSTRA, TEUN. forthcoming. The nature of verbs and Burzio's generalization. In Arguments and Case: explaining Burzio's generalization, ed. by Eric Reuland.

HOSHI, HIROTO. 1994. Passive, causative, and light verbs: a study on theta role assignment. Storrs, CT: The University of Connecticut dissertation.

KAGEYAMA, TARO. 1982. Word formation in Japanese. Lingua 57.215-58.

KUBO, MIORI. 1992. Japanese syntactic structures and their constructional meanings. Cambridge, MA: MIT dissertation.

MANNING, CHRISTOPHER. 1993. Analyzing the verbal noun: internal and external constraints. Japanese/Korean Linguistics 3.236-53.

MATSUMOTO, YO. 1992. On the wordhood of complex predicates in Japanese. Stanford, CA:Stanford University dissertation.

MIYAGAWA, SHIGERU. 1987. Lexical categories in Japanese. Lingua 73.29-51.

_____.1991. Case realization and scrambling. Columbus:Ohio State University, ms.

MURASUGI, KEIKO. 1990. Adjectives, nominal adjectives and adjectival verbs in Japanese: their lexical and syntactic status. UCONN Working Papers in Linguistics 3.55-86.

_____. 1991. Noun phrases in Japanese and English: a study in syntax, learnability and acquisition. Storrs, CT: The University of Connecticut dissertation.

OKUTSU, KEIICHIRO. 1981. 'Boku wa unagi da' no bunpoo. [Grammar of 'I am an eel.'] 3rd edition Tokyo: Kurosio Shuppan.
SATO, YUTAKA. 1993. Complex predicate formation with verbal nouns in Japanese and Korean: argument transfer at LF. University of Hawaii dissertation.
SELLS, PETER. 1995. The category and Case marking properties of verbal nouns in Korean. Harvard Studies in Korean Linguistics 6.370-86.
_____. 1996a. Case, categories and projection in Korean and Japanese. Proceedings of the 1996 Seoul International Conference on Generative Grammar, 47-62.
_____. 1996b. Morphological expression and ordering in Korean and Japanese. Stanford:Stanford University ms.
URUSHIBARA, SAEKO. 1994. Syntactic categories and extended projections in Japanese. Waltham, MA: Brandeis University dissertation.
YOON, JAMES HYE SUK. 1991. Theta operations and the syntax of multiple complement constructions in Korean. Harvard Studies in Korean Linguistics IV.433-45.
YOSHIDA, TOMOYUKI. 1986. Morphology and Case assignment in Japanese. Columbus, OH:Ohio State University MA thesis.

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The Current Status of *ɨi* in Seoul Korean: monophthongization in progress*

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1. Introduction

Late Middle Korean had six falling diphthongs: *ɨ y*, *ɘy*, *ay*, *uy*, *oy*, and *ʌy*. Of these, five have monophthongized. The diphthong *ɨ y*, or to be more exact, the current form of the Late Middle Korean diphthong *ɨ y*, is the only remaining one in contemporary Seoul Korean. The current form of the Late Middle Korean diphthong *ɨy* can have two different diphthongal realizations. In word-initial position, it tends to be realized as [ɨi], but [ɨ̯i] is the form when the diphthong occurs in non-word-initial position (cf. Y.C. Chung 1991). I, thus, represent this diphthong as *ɨi*.

Researchers have suggested that *ɨi* is also going through a change following the other falling diphthongs. One extreme claim is made by Kim (1976), who argued that this diphthong has completely monophthongized and is not present in Korean any more. Chung (1991) and Kim-Renaud (1986) also observe that *ɨi* is very often produced as a monophthong and suggest that in some phonological contexts, the underlying form may not be *ɨi* any longer.

In consideration of these suggestions the present paper examines the current status of *ɨi* in Seoul Korean. This paper shows based on quantitative evidence that the diphthong is undergoing a monophthongization change in one phonological environment, and that it has already gone through monophthongization changes in the other phonological (or morphological) contexts. An attempt is also made to provide phonetic and structural explanations of these changes.

The organization of this paper is as follows: in sections 2 and 3 some relevant information on the monophthongization of *ɨi* is provided; in section 4 the methodology of this study is introduced; in sections 5 and 6 the results of the statistical (Varbrul) analyses of the data are provided and discussed; in section 7 phonetic and phonological accounts of the monophthongization of *ɨi* are provided. This section is followed by concluding remarks in section 8.

2. Background

Seoul Korean had the falling diphthongs shown in (1) in the 15th century. Though some scholars suggest that Seoul Korean also had the diphthong *i y* in this period, it is a minority opinion.

(1) Falling diphthongs of Late Middle Korean (15C)

[-bk]	[+bk]	
(iy)	ɨy	uy
	ɘy	oy
	ay	ʌy

Following Hong (1988) and Park (1992), this study assumes that present-day Seoul Korean has the monophthongal system shown in (2). That is, it is assumed that vowel *ɛ* has merged with *e* and that *ü* and *ø* have monophthongized to *wi* and *we*, respectively.

(2) Monophthongs of Seoul Korean

[-bk]	[+bk]	
i	ɨ	u
e	ə	o
	a	

Present-day Seoul Korean has the diphthongs shown in (3); they are all rising diphthongs except *ɨi* . The starred sequences indicate those that are not allowed in contemporary Seoul Korean.

(3) Diphthongs of Seoul Korean

a) *w* diphthongs

wi	*wɨ	*wu
we	wə	*wo
	wa	

b) *y* diphthongs

*yi	*yɨ	yu
ye	yə	yo
	ya	

c) isolated diphthong: ɨi

3. The change of Middle Korean diphthong *ɨ y* in different dialects of Korean

Though Seoul Korean still retains it, middle Korean diphthong *ɨ y* has already monophthongized in some dialects of Korean. In the Chunla dialect the diphthong changed to *ɨ* in all phonological and morphological contexts. In the Kyongsang dialect it changed to *i*, with the exception of the possessive marker *ɨ y*, which changed to *e*. In the Phyongan dialect, *ɨ y* changed to *i* or *u* in post-consonantal position and to *i* or *ɨ* non-post-consonantally, and the possessive marker *ɨ y* changed to *e*. However, it is reported that Kangwon and Chungchung dialects still retain this diphthong, as is the case with the Seoul dialect.

In the Seoul dialect *ɨi* shows extreme variation. This diphthong is very often produced as a monophthong. Also different monophthongs alternate with *ɨi* . Different patterns of variation are observed in three distinct phonological environments. There are two important constraining linguistic factors: 1) presence of the preceding consonant, 2) syllable position within the word, 3) morphological status of *ɨi* , i.e., whether *ɨi* is a possessive marker or not. When *ɨi* is preceded by a consonant, there is variation between [i] and [ɨi], [i] dominating the variation. When there is no preceding consonant, syllable position is an important constraint: in word-initial syllable variation between [ɨi] and [ɨ] are visible; in a non-word-initial syllable [i] and [ɨi] alternate, [i] again dominating the variation. One exception to this generalization is the possessive marker *ɨi* , which shows variation between [e] and [ɨi], the former being the dominant variant.

4. Methods

4.1. data

The data were collected during my fieldwork in Seoul, Korea in the summer of 1994 and the winter to early Spring of 1995. Recordings were made from some 60 Seoul Korean speakers stratified by age, social status and sex. There were 3 age groups, 3 social status groups and 2 gender groups, making 18 cell groups. Four different styles of speech were elicited — two styles of spontaneous speech: in-group speech and interview speech; and two styles of read speech: sentence reading and word-list reading.

4.2. Preliminary analysis

As introduced earlier, variation involving the diphthong *ɨi* in Seoul Korean is subject to the following constraints: whether there is a consonant preceding the diphthong, whether the diphthong appears in a word-initial or non-word-initial syllable, and whether *ɨi* is a possessive marker or not.

Considering previous suggestions (e.g., Chung 1991 and Kim-Renaud 1987), the first issue to settle is whether *ɨi* is still the underlying form in all these phonological and morphological contexts. As the first step towards settling this issue, a preliminary statistical analysis was conducted. The data was examined to check which vowel is now produced by Seoul Korean speakers in the environments where the diphthong *ɨi* would have appeared before the beginning of monophthongization (i.e., in the environments where the orthographic form *ɨi* is used in the written language of present-day Korean). The results of this preliminary analysis are given in (4).

(4) ♦post-consonantally (e.g., *hɨi mang* 'hope')

	ɨi	*i*	*N*	Assumed U.R.
ingroup	1(2%)	42(98%)	43	
interview	1(1%)	100(99%)	101	/i/
sentence reading	40(18%)	183(82%)	223	
word reading	126(72%)	49(28%)	175	

♦non-post-consonantally

•word-initial syllable (e.g., *ɨi ca* 'chair')

	ɨi	*i*	*N*	U.R.
ingroup	7(44%)	9(56%)	16	
interview	57(54%)	49(46%)	106	/ɨi/
sentence reading	212(58%)	153(42%)	365	
word reading	253(72%)	96(28%)	349	

•non-word-initial syllable (e.g., *cuɨi* 'caution')

	ɨi	*i*	*N*	U.R.
ingroup	0(0%)	29(100%)	29	
interview	9(3%)	252(97%)	261	/i/
sentence reading	27(11%)	208(89%)	235	
word reading	159(64%)	88(36%)	247	

♦as a possessive marker (e.g., *na-ɨi* 'my (*I*+Pos)')

	i	*e*	*N*	U.R.
ingroup	1(6%)	17(94%)	18	
interview	4(3%)	140(97%)	144	/e/
sentence reading	224(27%)	610(73%)	834	
phrase reading	99(29%)	237(71%)	336	

One important factor that needs to be considered is the characteristics of the orthographic system of Korean called *hankul*. *Hankul* was invented in the 15th century modeling the actual pronunciations of the then Seoul Koreans (cf. C.S. Lee 1994:261). This writing system was faithful to the speakers' (presumed) actual productions especially in its representation of vowels. There is, accordingly, general agreement among researchers that the present discrepancies between the spellings and the actual pronunciations of Korean vowels are due to linguistic change.

One of the upshots of the property of the Korean spelling system being faithful to actual pronunciations is that 'spelling pronunciation' can easily occur unlike in other languages. The results given in (4) first reveal that there is a radical difference between spontaneous (conversational) and read speech in the speakers' production. Since we are examining the phonemic status of *ɨi* in different environments, it should naturally be the case that our assessment of the underlying form be based on spontaneous speech, not read speech, because the latter is not a true reflection of the phonological system native to the speakers. Thus here read speech, where spelling pronunciation is dominant, is not considered in the assessment of the underlying form in each environment.

Let us then take a look at the results of the preliminary analysis more closely and consider what these results suggest. First, the results can be taken to suggest that *ɨi* has (nearly) monophthongized to *i* in the post-consonantal environment. [i] was the dominating variant in this context: 99 percent (142/144) of the tokens found in spontaneous (ingroup + interview) speech were realized as [i]. Only two tokens were produced as a diphthongal variant. The results also suggest that non-post-consonantal *ɨi* has also (nearly) monophthongized to *i* when it appears in a non-word-initial syllable. *i* occurs in this environment 97 percent (281/290) of the tokens found in spontaneous speech. Actually *ɨi* may have gone through one and the same change (not two separate changes) in these environments, where non-word-initial *ɨi* has changed to *i*. (Note that post-consonantal *ɨi* is always non-word-initial *ɨi* .) The possessive marker *ɨi* , which always appears in a non-word-initial position, seems to have taken a different path of change. The results indicate that Seoul Korean speakers now almost categorically (97% (157/162)) use the form [e] instead of the diphthongal variant as the possessive marker.

However, there is one phonological environment where there is a strong competition between the diphthongal variant and [ɨ]. It is word-initial position (or non-post-consonantal position in a word-initial syllable). In this context [ɨi] occurs in 52% (64/122) of the tokens found in spontaneous speech. From a diachronic point of view, this result indicates that Seoul Korean still retains the diphthong *ɨi* in this environment.

In sum, the results given in (4) can be interpreted as follows: *ɨi* has changed to *i* when it is neither a word-initial vowel nor a possessive marker, to *e* when it is used as a possessive marker, but still remains an underlying diphthong in word-initial position. The above quantitative results support C.S. Lee's (1994) suggestion

that ii remains a diphthong only in word-initial position. Based on the results shown in (4), I assume in this study that underlying ii is present in Seoul Korean only in word-initial position and that ii has already monophthongized in the other phonological or morphological contexts. The focus of this paper will be the variation between [i] and [i͡i] in word-initial position.

(5)

Variable	Variants
(ii$_i$)	[i] ~ [i͡i]

(NB. Subscript 'i' refers to 'word-initial'.)

4.3. Variable rule analysis of (ii$_i$)

The judgement of the variants of the variable (ii$_i$) was made twice: at the time of the transcriptions and before the statistical analysis. Each token was judged as one of the two variants of the variable. Another Seoul Korean speaker independently judged one hundred tokens of this variable. Her judgements and mine showed a high degree of agreement. There was 91 percent of agreement between her judgements and mine. Unread and misread potential tokens were excluded from the analysis. This study is based on 836 tokens of the variable (ii$_i$).

The tokens of (ii$_i$) were subject to Varbrul analysis (Ivarb version 2.3. Pintzuk 1988). The factor groups listed in (6) were considered in the analysis of the variable (ii$_i$). Only external constraints (see Kang 1997 for a detailed discussion of the division of external factor groups into their factors) were considered in this analysis, since no linguistic constraints were predicted to play a significant role in the alternation of the two variants of (ii$_i$).

(6) Factor groups considered in the variable rule analysis of (ii$_i$)

Factor groups	Factors
1. speech style	ingroup, interview, sentence reading, word-list reading
2. gender	male, female
3. social status	upper, middle, lower
4. age	16-25, 26-45, 46 or older

5. Results

The results of the Varbrul analysis of the tokens of (ii$_i$) are given in (7). In the table the percentage of application indicates the percentage of the monophthongal variant, i.e., [i], among the tokens. Three factor groups, 'speech style', 'social status', and 'age' were selected as significant in the variation being discussed. The speakers produced the monophthongal variant clearly more often in more casual speech than more formal speech. Also the frequency of monophthongal production showed a linear relationship with both the social status and age scales. The rate of monophthongal production showed an increase towards the lower end of both these scales. However, 'gender' was not chosen as a significant constraint, suggesting that the two gender groups did not show a significant difference in their behavior toward this variable.

(7) Goldvarb probabilities for factors for (i͡i)

Factor groups	Factors	Weight	% Applications	Total N
*Speech Style	ingroup	0.70	56	16
	interview	0.63	46	106
	sentence R	0.56	42	365
	word list R	0.39	28	349
Gender	male	0.52	39	427
	female	0.48	34	409
*Social Status	upper	0.43	30	293
	middle	0.51	38	306
	lower	0.57	44	237
*Age	16-25	0.58	43	263
	26-45	0.52	39	268
	46+	0.41	29	305

Input = 0.36, loglikelihood = -523.473
Total chi-square = 77.392, Chi-square/cell = 1.248

* The starred factor groups indicate those selected as significant in the stepwise regression analysis.

6. Discussion

The results given in (7) can be taken as suggesting that i͡i is currently going through monophthongization in word-initial position. Both age group and social class distribution of the two variants of the variable (i͡i) exhibit the patterns that can be typically observed in phonological changes in progress. The fact that the diphthongal, not monophthongal, variant (i.e., i͡i) is orthographically represented by the spelling can be taken as additional evidence supporting the claim that the diphthong is now monophthongizing. (The Korean orthographic system was invented, as mentioned earlier, modeling the actual pronunciations of the 15C Seoul Korean speakers.) The two variants seem to be in close competition with each other. In spontaneous speech, the diphthongal and the monophthongal variants occur about 52% and 48% of the time, respectively. This result suggests that the diphthong i͡i is still present in Seoul Korean as an underlying vowel (despite its limited phonological distribution), refuting some researchers (e.g., Kim 1976) claim that the diphthong has completely monophthongized.

7. Possible explanations

In this section an attempt is made to provide explanations of the monophthongization change of the diphthong i͡i . First, I claim that acoustic/ perceptual factors have played a significant role in this change. Second, I adduce structural pressure as another factor that motivates the monophthongization of i͡i , the only remnant of the six Late Middle Korean falling diphthongs.

7.1. A phonetic explanation

Phonetically diphthongs are defined as vowel-like sequences that cannot be characterized by a single vocal tract shape or by a single formant pattern (Kent and Read 1992, Laver 1994). The diphthongal sequence is normally considered as consisting of two components: 'glide + vowel' or 'vowel + glide'. (Phoneticians also use the term 'onglide' or 'onset' to refer to the first part of the diphthong and the term 'offglide' or 'offset' to refer to the second part ' (Peters 1991).)

Previous studies (e.g., Fox 1983) showed that the perception of diphthongs are crucially dependent on the first two formants of the vocoid sequences like in the perception of monophthongs. What is noteworthy is that languages prefer a certain type of diphthongal sequences than others. According to Lindau, Norlin and Svantesson (1990), diphthongs occur in about one third of the world's languages. Diphthongs of the *ay*-type occur in 75 percent of these languages and the *aw*-type occur in about 65 percent. Similar findings are reported by Kawasaki (1982) and Eström (1971). What these findings suggest is that languages prefer those diphthongs whose onset and offset are maximally (or sufficiently) different perceptually and in sonority, as Lindblom (1986) suggests.

The diphthongs of Seoul Korean do not seem to be an exception to this tendency of the world's languages. As shown in (3b), the sequence *yi*, whose onset and offset are least perceptually and acoustically distinct, is not allowed in Seoul Korean. (9) has been made based on the average F1 and F2 values of the monophthongs of Seoul Korean produced by ten male speakers reported in Yang (1993). On the basis of these values, the differences between each vowel and *i* in both F1 and F2 formant frequency values were calculated. Then using the formula (8) the distance between each vowel and the vowel *i* in acoustic vowel space was calculated. The formula used in this calculation is given below:

(8) Distance in vowel space from *i* = $\sqrt{(\text{F1 difference})^2 + (\text{F2 difference})^2}$

(9) Average F1 and F2 values of Seoul Korean monophthongs produced by 10 male speakers and the acoustic distance in vowel space between the vowel *i* and each of the other vowels (source of F1 and F2 values: Yang 1993)

Vowel	F1 (Hz)	F1-difference from *i*	F2 (Hz)	F2-difference from *i*	Acoustic distance from *i*
i	341	0	2219	0	0
e	490	149	1968	251	291
ɨ	405	64	1488	731	734
a	738	397	1372	847	935
ə	608	267	1121	1098	1130
u	369	28	981	1238	1238
o	453	112	945	1274	1279

The values of acoustic distance from each vowel to *i* are given in the last column of (9). Since the formant frequency values of *y* are presumed to be very similar to those of *i* (the shape of the vocal tract when *y* is produced is highly

similar to that for the production of *i*: see Kent and Read 1992:136), the latter's values are also used for *y*.

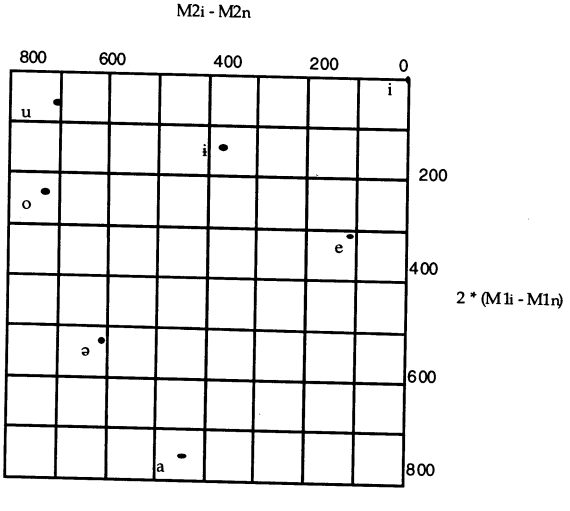
Though the onset and offset of diphthongs do not necessarily correspond exactly to the monophthong produced independently (Ladefoged 1982), (9) shows that the vowel *ɨ* is the second closest in acoustic vowel space to the vowel *i*, next to *e*. This finding suggests that the onset and the offset of the diphthong *ye* and *i͡i* may not be as perceptually distinguishable as those of the other diphthongs. When the languages' preference of those diphthongs whose onsets and offsets are maximally (or sufficiently) perceptually different is considered, the result may also suggest that the diphthongs *ye* and *i͡i* are least perceptually stable among all the diphthongs of Seoul Korean that involves *y* or *i*. The calculation of the perceptual distance using the formula (10) confirms this claim as shown in (11). The fact that the diphthong *ye* in Seoul Korean is also going through monophthongization (Nam 1984, Kang 1996) provides additional support behind the claim.

(10) $P = (1000/\log_{10} 2)(\log_{10}(1 + f/1000)$ Fant (1973)

(11) Perceptual distance from *i* (calculated based on f1 and f2 values of (9))

Vowel	F1 (Mel)	F1-difference from *i*	F2 (Mel)	F2-difference from *i*	Perceptual distance from *i*
i	425	0	1692	0	0
e	577	152	1575	117	192
ɨ	492	67	1319	373	379
a	800	375	1250	442	580
ə	688	263	1088	604	659
u	455	30	990	702	703
o	541	116	963	729	738

(12) Seoul Korean vowels on the plane of perceptual distance from vowel *i*



The formant charts shown in (12) graphically shows the clearly shorter perceptual distances of *e* and *i* from *i* (see sections 5.8 and 6.6.2 of Kang 1997 for details).

As a complement to the phonetic explanation given so far, a structural explanation is given in the following section formalized in a phonological (OT) framework. The two are both needed for the accurate description of the dual causation of *ii* monophthongization.

7.2. A phonological explanation

A phonological explanation is given in the framework of the correspondence model of OT (McCarthy and Prince 1995). To account for the variable nature of the variation involving (ii), the notion of 'variable dominance' (Reynolds 1994) is also adopted here. The constraints used in my phonological account of the monophthongization of *ii* are listed in (13).

(13) Constraints
1.*F-Diph: Falling diphthongs are prohibited.
2 *i: *i* is prohibited.
3. MAX(i): Every *i* in underlying representation has a correspondent in surface representation.
4. L-Anchor: The leftmost element of underlying representation has a correspondent at the leftmost position of surface representation.
5. *Coda: Coda is not allowed.

As discussed earlier, the falling diphthongs of Late Middle Korean have all monophthongized except *ii* . This indicates that the structural pressure to monophthongize *ii* has been present for a rather long time in Seoul Korean (cf. Y.C. Chung 1991) and can be considered a strong motivating factor for the monophthongization of *ii* . The constraint *F-Diph (cf. Rosenthall 1994) is used in this study to represent this internal pressure toward the monophthongization of *ii* in Seoul Korean. The diphthongal realization of *ii* has a duration considerably longer than the monophthongs of Seoul Korean, supporting the standard assumption held by phonologists that falling diphthongs are associated with two moras (cf. Schane 1995, McCarthy 1995, Rosenthall 1994).[1] Accordingly, it is assumed in this study (also following Y.S. Lee 1993 and Kim-Renaud 1986) that the onset and the offset of *ii* are linked to two separate moras.

The high central unrounded glide *i* is rarely found in the world's languages. Few languages (cf. Maddieson 1984) have this glide. The markedness constraint, *i is motivated by this observation. Different vowels show different deletability. MAX(i) penalizes deletion of underlying *i*. L-Anchor penalizes the deletion of a word-initial segment, which is rarely observed cross-linguistically. Languages, as well documented, prefer an open syllable to a closed syllable. This general cross-linguistic tendency is represented by the constraint, *Coda, which penalizes candidate forms with a coda consonant.

Another crucial assumption is made in this paper. Korean is one of those languages which distinguish glides and vowels underlyingly (e.g., *ui* 'the ear of a cow' vs. *wi* 'top' and *kiun* 'power' vs. *kyun* 'germ'), so it is assumed following Hayes (1989) that in Korean the moraic structure of vocoids is given in UR. Tables (14) and (15) show that variable ranking between *F-Diph and Max(i) are the main

cause of variation between the diphthongal variant and *i* ; the constraint ranking in (16) shows that the strengthening of the constraint *F-Diph is another cause of the monophthongization of *ii* . (The ranking in (16) indicates that *F-Diph and Max(i) are unranked (or variably ranked); the arrow indicates that *F-Diph is gaining strength relative to Max(i); see Kang (1997) for details.)

(14) L-Anchor, *i̯ , *Coda >> *F-Diph >> Max(i)

μμ || iisa	L-Anchor	*i̯	*Coda	*F-Diph	Max(i)
ii.sa				*!	
☞i.sa					*
i.sa	*!				
i̯i.sa		*!			
ii̯.sa			*!		
i̯sa		*!			*
i̯sa	*!				

*V̯ : moraless vocoid, V:vocoid associated to a mora.

(15) L-Anchor, *i̯ , *Coda>> Max(i) >> *F-Diph

μμ || iisa	L-Anchor	*i̯	*Coda	Max(i)	*F-Diph
☞ii.sa					*
i.sa				*!	
i.sa	*!				
i̯i.sa		*!			
ii̯.sa			*!		
i̯sa		*!		*	
i̯.sa	*!				

(16) Constraint ranking

*L-Anchor, *i̯ , *Coda >> {*Falling Diph, MAX(i)}

8. Conclusion

This paper has examined the current status of the diphthong *ii* , the only remnant of the six Late Middle Korean falling diphthongs. In this paper, I first showed based on quantitative evidence that *ii* still remains in Seoul Korean as an underlying vowel contrary to some researchers' claim. It was also shown that the distribution of *ii* is limited only to word-initial position though the diphthong

retains its traces in orthographical representations in other phonological environments as well. I also suggested (on the basis of quantitative evidence) that non-word-initial *ɨi* has changed to *i* through phonological change, and that the possessive marker *ɨi* has monophthongized to *e* through morphologically conditioned change, while the diphthongal variant and [ɨ] are in close competition with each other in word-initial position.

Then an attempt was made to provide phonological and phonetic explanations of the monophthongization of *ɨi*. It was suggested that two factors have played an important role in this change. One was the internal structural pressure to monophthongize *ɨi*, which is the only remaining falling diphthong in Seoul Korean. This factor was formalized as the phonological constraint, *Fall-Diph, in my phonological account. It was shown that the pressure toward the monophthongization of *ɨi*, i.e., the strength of the constraint *Fall-Diph, is growing increasingly stronger.

I suggested that lack of perceptual salience was another important motivator in the monophthongization of *ɨi*. Languages are more likely to retain perceptually stable diphthongal sequences, i.e., those diphthongs whose onset and offset have sufficient auditory/perceptual distinction, than perceptually unstable (diphthongal) sequences. *ɨi* was shown to have the second smallest internal perceptual distinction of all the existing diphthongal sequences of Seoul Korean involving a high front vocoid next to *ye*, which is also going through monophthongization.

Notes

1. I assume here following Kenstowicz (1994:45) that a mora is, at least for vowels, a unit of metrical time.

* I thank Donald Winford, Beth Hume, Keith Johnson, and Mary Beckman for their helpful comments and suggestions on this paper.

References

Chung, Y.C. 1991. A re-examination of the diphthongal system of contemporary Korean. In *A festschrift for Dr. Lee Seungwuk*. vol. I. 379-403.
Eström, B. 1971. Diphthong systems. Stockholm University. Ms.
Fant, G. 1973. Speech sounds and features. Cambridge: MIT Press.
Fox, R. A. 1983. Perceptual structure of monophthongs and diphthongs in English. Language and Speech 26. 21-60.
Gay, Th. 1968. Effect of speaking rate on diphthong formant movements. Journal of the Acoustical Society of America 44. 1570-1573.
Hayes, B. 1989 . Compensatory lengthening in moraic phonology. Linguistic Inquiry 20. 253-305.
Hong, Y.S. 1988. A sociolinguistic study of Seoul Korean. Seoul: Hanshin Publishing Co.
Kang, H.S. 1996. Variability in the deletion of the palatal glide *y* in Seoul Korean: the variable process and its implications. BLS 22.
Kang, H.S. 1997. Phonological variation in glides and diphthongs of Seoul Korean: its synchrony and diachrony. Ph. D. Dissertation. The Ohio State University. Columbus, Ohio.
Kawasaki, H. 1982. An acoustical basis for universal constraints on sound sequences. Ph. D. Dissertation. University of California at Berkeley.

Kenstowicz, M. 1994. Phonology in generative grammar. Cambridge, MA: Blackwell.
Kent, R. D. and C. Read. 1992. The acoustic analysis of speech . San Diego, CA: Singular Publishing Group, Inc.
Kim, S.K. 1976. Palatalization in Korean. Ph. D. Dissertation. University of Texas. Austin, Texas.
Kim-Renaud, Y. 1986. *ii*-monophthongization in Korean. Studies in Korean linguistics. Seoul: Hanshin Publishing Co. 119-132.
Labov, W. 1982. Building on empirical foundations. In W. Lehmann and Y. Malkiel (eds.), Perspectives on historical linguistics. 17-92.
Ladefoged, P. 1982. A course in phonetics. New York: Harcourt Brace Jovanovich, Inc.
Laver, J. 1994. Principles of phonetics. Cambridge: Cambridge University Press.
Lee, C.S. 1994. Korean phonology. Inchon: Inha University Press.
Lee, Y. S. 1993. Topics in the vowel phonology of Korean. Seoul: Hanshin Publishing Co.
Lindau, M., K. Norlin and J. Svantesson. 1990. Some cross-linguistic differences in diphthongs. Journal of the International Phonetic Association 20. 10-14.
Lindblom, B. 1986. Phonetic universals in vowel systems. In J. Ohala and J. Jaeger (eds.), Experimental Phonology. 13-44.
Maddieson, I. 1984. Patterns of sounds. Cambridge: Cambridge University Press.
McCarthy, J. 1995. Extensions of faithfulness: Rotuman revisited. Ms. University of Massachusetts, Amherst.
McCarthy, J. and A.S. Prince. 1995. Faithfulness and reduplicative identity. University of Massachusetts Occasional Papers 18. 249-394.
Nam, K.W. 1984. A study of Korean pronunciation. Seoul: *Ilcokak*.
Park, K.R. 1992. Perception study 2 of Modern Korean vowels 'we' and 'wi'. *Kaysineomunyeonkuhoi* vol. 9.
Peeters, W. J. M. 1991. Diphthong dynamics: A cross-linguistic perceptual analysis of temporal patterns in Dutch, English and German. Ph. D. Dissertation. University of Utrecht. Netherlands.
Reynolds, W. 1994. Variation and phonological theory. Ph. D. Dissertation. University of Pennsylvania. Philadelphia, Pennsylvania.
Rosenthall, S. 1994. Vowel/glide alternation in a theory of constraint interaction. Ph. D. dissertation. University of Massachusetts, Amherst.
Schane, S. 1995. Diphthongization in particle phonology. The handbook of phonological theory. Cambridge, MA: Blackwell.
Yang, B. G. 1993. An acoustical study of Korean vowels. In S. Kuno et al. (eds.), Harvard studies in Korean linguistics V. Seoul: Hanshin Publishing Co. 230-238.

Lexical tone and stress in Latvian

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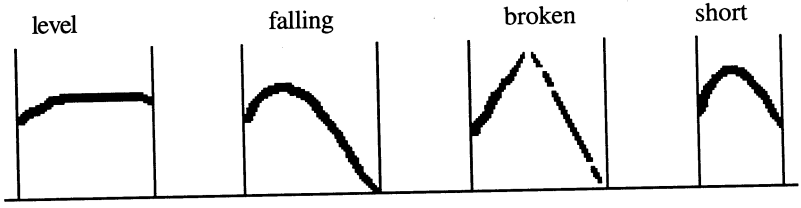
1. Introduction[1]

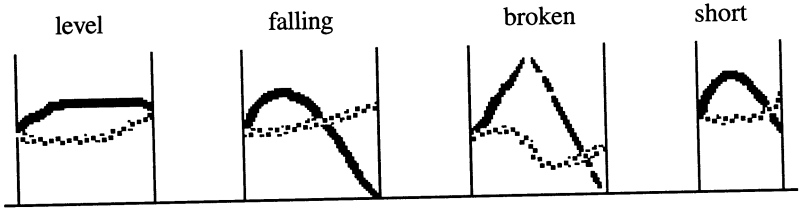
Among the world's languages there are various suprasegmental systems of stress and tone. Latvian, an Indo-European language, exhibits an interesting system where both lexical tone and lexical stress are found, but where they do not have to be linked to the same syllable as they do in pitch-accent systems such as Lithuanian. Main word stress in Latvian occurs on the first syllable of a word (see *Endzelīns*, 1922).

The restricted middle-dialect region of Latvian that I am investigating exhibits a three-way tonal contrast (regardless of main word stress) on all "heavy" syllables, or syllables containing a long vowel, diphthong, or vowel+sonorant (see Ekblom, 1933; *Kariņš*, 1996; *Rudzīte*, 1964, 1993). Prior to this investigation, the most extensive research on these syllable intonations was conducted by Ekblom (1933). Ekblom describes the tonal, intensity, and durational characteristics of these intonations as illustrated in (1) - (3). His data comes from one informant, the eminent Latvian philologist *Jānis Endzelīns*.

(1) Tonal characterizations of Latvian syllable intonations following Ekblom (1933:34)



(2) Tonal (solid line) and intensity (dotted line) patterns of the syllable intonations, following Ekblom (1933:48).



(3) duration of /uo/ before voiced C

level		falling		broken	
l_d	29.8	r_b	26.4	l_g	23.9
		d_b	32.3	l_b	25.3
				d_b	30.8
x	29.8		29.4		26.7

duration of /uo/ before voiceless C

level		falling		broken	
l_k	22.5	l_k	22.1	d_t	23.4
k_p	26.5	t_p	25.2		
	24.5		23.7		23.4

source: Ekblom (1933:10)

(4) duration of /au/ before voiced C

level		falling		broken	
r_g	34.2	b_d	33.3	r_g	25.0
		b_d	33.0	n_d	31.4
x	34.2		33.2		28.2

duration of /au/ before voiceless C

level		falling		broken	
l_k	30.6	t_t	26.7	r_t	25.5
		l_k	30.2		
	30.6		28.5		25.5

source: Ekblom (1933:11)

Of these physical characteristics of the syllable intonations, both tone and duration appear to have direct correlates. Each intonation has a distinct tonal curve, and the durations of the intoned syllables are described as having the pattern level > falling > broken. In this paper, I re-examine the phonetic characteristics of these intonations, and provide a phonological analysis of the phonetic facts.

2. Experiment

During the summer of 1995 I traveled to the town of Smiltene in central Vidzeme in Latvia in order to acquire experimental data. This study is based upon elicited utterances from three speakers. JP is the father of DJ. SO is unrelated to them, but grew up on the neighboring farm.

(5) Informants:

JP	male	67 years old	6th grade edu.
SO	female	31 years old	college edu.
DJ	female	51 years old	7th grade edu.

In this paper I report on acoustic measurements of the six words shown in (6). All of these words have primary word stress on the first syllable.

(6) Words investigated:

level		falling		broken	
liela	'large'	dièna	'day'	miêru	'peace'
neliela	'not large'	nedièna	'misfortune'	nemiêri	'unrest'

Each of these words was placed in the neutral carrier phrase shown in (7) below. The informants were asked to read each sentence emphasizing the underlined word. Each word appeared six times.

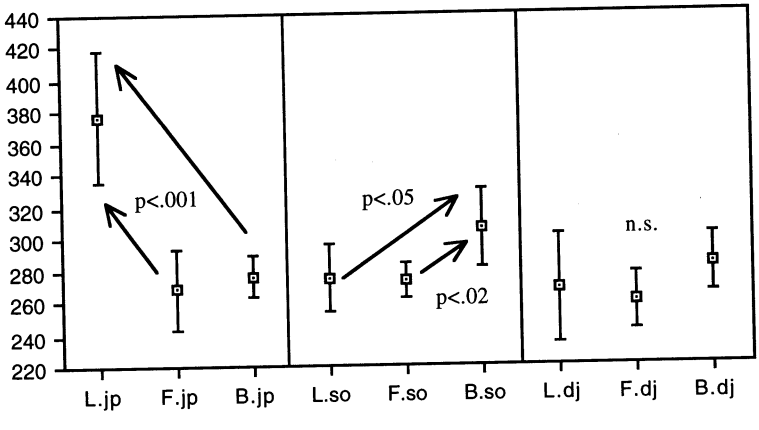
(7) Carrier phrase:

Nu _____ *labi lien.* 'Well _____ crawls (sounds) good/well'

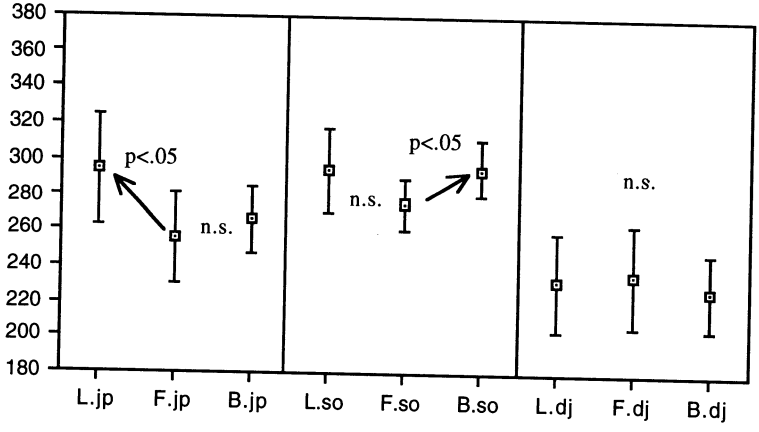
3. Results

Unlike Ekblom (1933), I find no correlation between syllable intonation and syllable duration which holds across speakers. This is shown in (8) and (9).

(8) Mean duration in milliseconds of /ie/ in *liela* (level), *diena* (falling), and *mieru* (broken) for three speakers. Significant differences are indicated by an arrow.

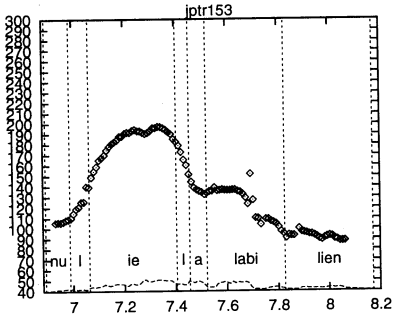


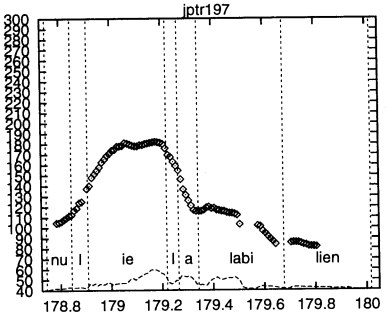
(9) Mean duration in milliseconds of /i:/ in *mi:ļi* (level), *gri:da* (falling), and *dzi:ve* (broken) for three speakers. Significant differences are indicated by an arrow.

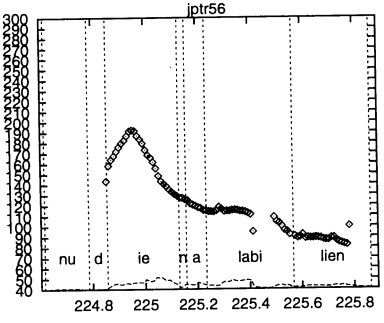


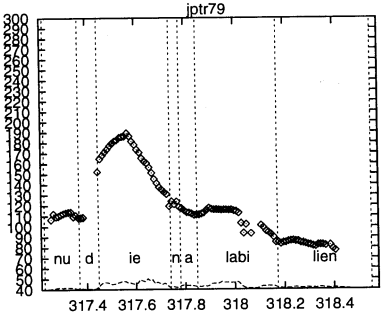
However, I do find that each of the three syllable intonations has a distinct tonal contour. These contours are similar to those described by Ekblom (1933), although they are not identical. Since all three informants showed very similar patterns, I present data only from speaker JP. The tonal contours are shown in figures (10) and (11). The figure in (12) illustrates that a rise in pitch occurs over the primarily stressed syllable even if this syllable is non-initial. The data for this figure is taken from speaker IL, a 48 year old male native speaker from Riga. For more information on this speaker, see *Kariņš* (1996).

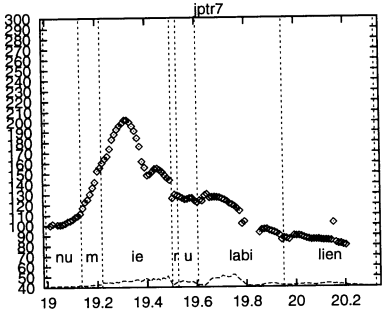
(10) Diphthong /ie/, level, falling, and broken intonations in primary stressed syllables; JP

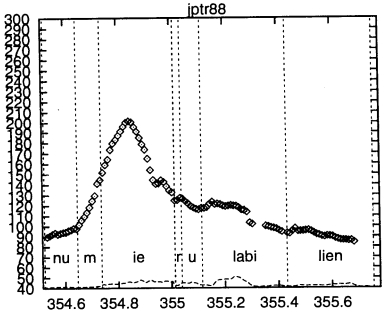




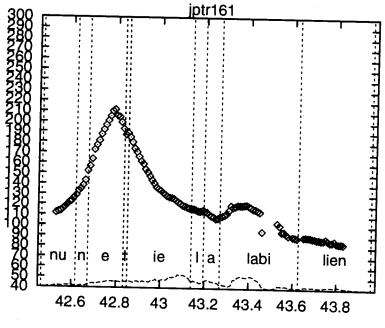


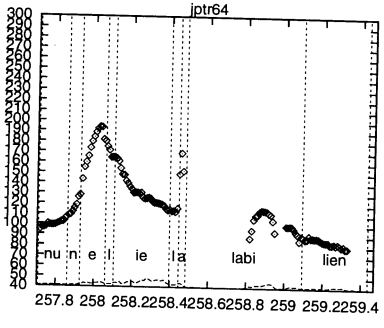


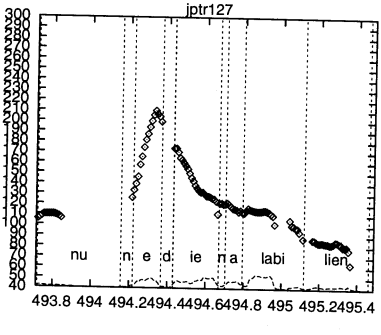


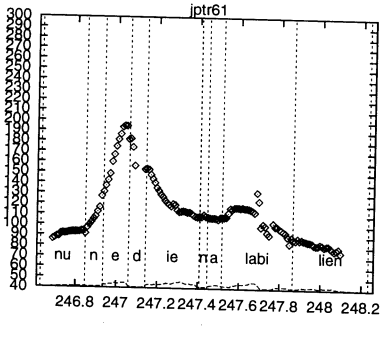


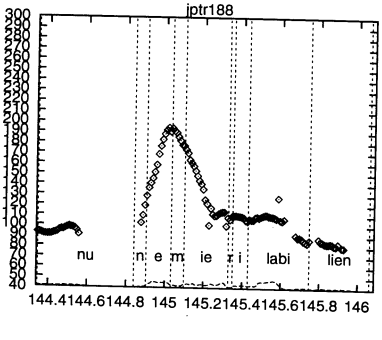
(11) Diphthong /ie/, level, falling, and broken intonations in non-primary stressed syllables; JP

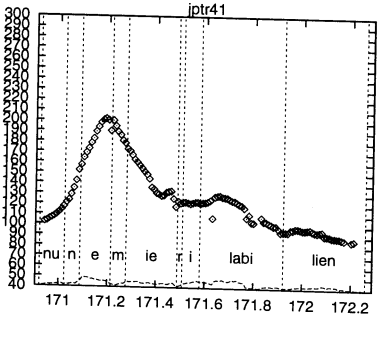




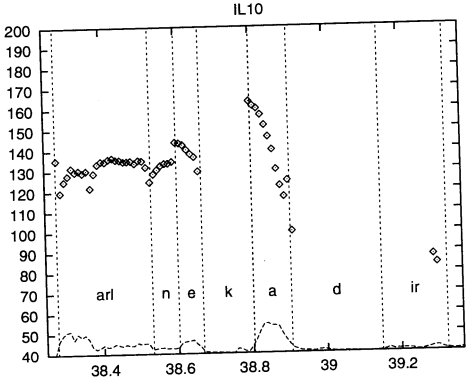






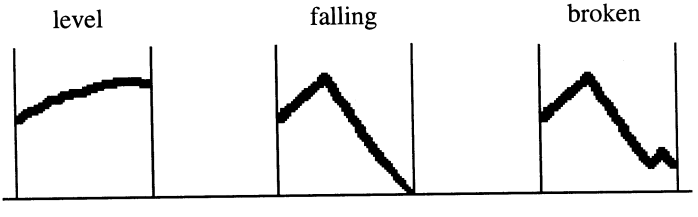


(12) The short stressed vowel /a/ in *nekád* 'never'; speaker IL (48 year old male from Riga)

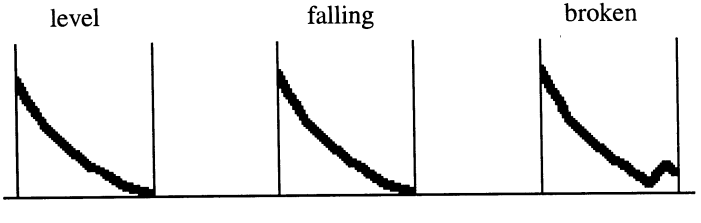


The general patterns found in the pitch contours of the words in figures (10) - (12) are illustrated in figures (13) - (15) below. Note that they differ somewhat from what Ekblom (1933) describes.

(13) Tonal characterizations of the three syllable intonations under main word stress



(14) Tonal characterizations of the three syllable intonations in non-primary stressed position



(15) Characterization of the tonal contour over a light syllable with primary word stress



4. Phonological analysis

The phonological analysis of the syllable intonations that I present is a tonal one. Blevins (1993) analyses Lithuanian pitch-accents as being H tones lexically associated with moras in the relevant syllables. Turning to the Latvian data, the pitch contours in (11) and (12) support the analysis of primary stress in Latvian being phonologically associated with a H tone, as shown in (16).

(16) Phonological representations of the words *vaga* 'furrow' (primary stress on the first syllable) and *nekad* 'never' (primary stress on the second syllable)

a.

```
( x  . )
 σ   σ
 |   |
 μ   μ
 /|  /|
v a g a
 |
 H
```

b.

```
( .  x )
 σ   σ
 |   |
 μ   μ
 /|  /|\
n e k a d
     |
     H
```

In addition, the fundamental frequency curves suggest that there is either a word edge or phrase edge L tone that brings the pitch down from the H stress tone. This is illustrated in (17). I leave it for further investigation to determine whether this is indeed a word-based or phrase-based phenomenon.

(17) Boundary L tone association

a.

```
( x  . )
 σ   σ
 |   |
 μ   μ
 /|  /|\
k a ķ i s   'cat'
 |    ⋱
 H     L
```

b.

```
( .  x )
 σ   σ
 |   |
 μ   μ
 /|  /|\
n e k a d   'never'
     |  ⋱
     H   L
```

4.1 The level intonation

Given that primary stress in Latvian is associated with a H tone, the lexical representation of a word with a level intonation on the primary syllable could have one of two possible representations, either with or without a H tone specified. This is illustrated in (18).

(18) Possible lexical representations of the level intonation

a.


b.


In order for the "free" metrical tones (both H and L) to properly attatch to the word, there must be a constraint of the form of (19) active in the language which has them attatch to the rightmost free tone bearing unit (which is the mora in Latvian).

(19) RIGHTMOST Free tones (non-lexical) attach to the rightmost free tone bearing unit

As illustrated in (20), this constraint is not enough to generate the proper tonal output for the analysis of (18a).

(20) Lexical (H) and phrasal/metrical ([**H**]) tones and the level intonation

a.

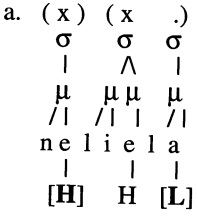

b.

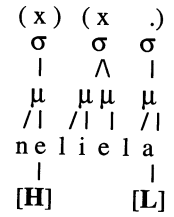

In order for (20a) to surface properly, the OCP must be an active constraint, as shown in (21).

(21) OCP No adjacent identical tones

Turning to words with heavy syllables that are not in primary stress position shown in (11) above, the analysis in (22a) shows that if the level intonation is to have a lexically specified H tone on the first syllable, then the OCP must be active in order to delete the second H tone.

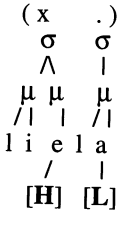
(22) Predictions of tonal association on the word *neliela* 'not large, small', after the inclusion of lexical (H) and phrasal ([L]) tones

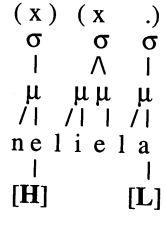
a.


b.


However, note that in (20a) the OCP deletes the H tone on the left (since the tone continues to rise throughout the syllable), while in (22a) it deletes the H tone on the right (since the tonal peak is clearly on the stressed first syllable). Considering that the analyses in (20b) and (22b) are not problematic with regard to considerations of the OCP, I adopt the unspecified analysis of the level intonation, as shown in (23).

(23) Final analysis of the representation of the level tone in the words *liela* 'large' and *neliela* 'not large, small'

a.


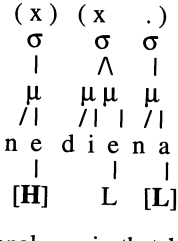
b.


4.2 The falling intonation

The falling intonation in Latvian shows a gradual fall in pitch over the duration of the intoned syllable. This indicates a L tone target on the second mora of the target syllable, as shown in (24).

(24) Apparent representation of *diena* 'day' and *nediena* 'bad luck' with the falling intonation

a.


b.


An immediate problem with each of these analyses is that both (19a) and (19b) violate the OCP by having two successive L tones. However, we know that

the falling intonation must have a lexically specified L tone on the second mora of the syllable, otherwise the H metrical stress tone would be predicted to dock on the rightmost free mora in the word *diena*. It is clear that this does not occur, since we have a clear tonal contrast between the level and falling intonations under primary word stress. This fact points to the existence of another constraint, shown in (25) below.

(25) MAX-T Every tonal element of the input has a correspondent in the output (see McCarthy & Prince, 1995)

Given the incompatibility of the OCP and MAX-T, it must be the case that the relative ranking of these constraints is that shown in (26).

(26) MAX-T >> OCP

4.3 The broken intonation

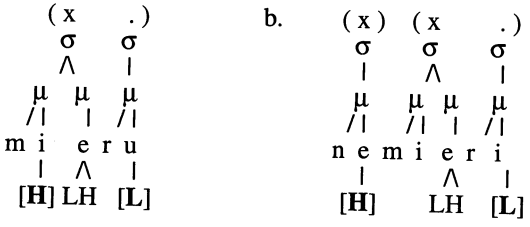
As seen in the tonal contours in (10) and (11) above, the broken intonation differs from the falling intonation by having a slight rise in pitch towards the very end of the syllable, followed by a fall. This corresponds to what one perceives as a laryngealization or "creaky voice" on the latter part of the syllable. One way to account for this phonologically would be that the broken intonation is the same as the falling with the addition of some feature such as [laryngeal] present on the latter part of the syllable. Such an analysis is presented in (27).

(27) Possible combined tonal and feature representation of *mieru* 'peace ACC' with the broken intonation on the first syllable



However, this analysis ignores the tonal aspect of this phenomenon. While it may be true that the second mora becomes laryngealized, this may indeed be a phonetic repercussion of tonal interaction on the second mora. An alternate (tonal) analysis of the broken intonation is provided in (28).

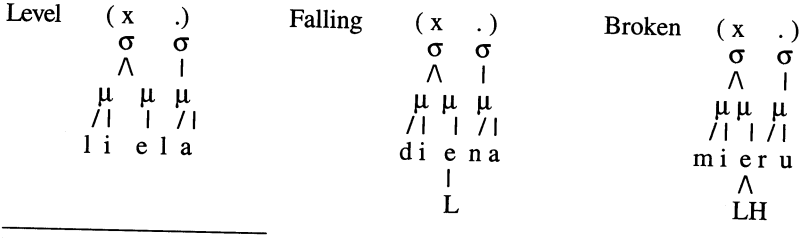
(28) Reanalysis of *mieru* 'peace ACC' and *nemieri* 'unrest' with the broken intonation as a purely tonal phenomenon



The phonetic interpretation of a LH contour over a single mora is that the pitch drops rapidly to hit a valley before the immediately following H, resulting in a laryngealization of the latter part of the vowel.

A summary of the lexical representations of the Latvian syllable intonations is provided in (29).

(29) The lexical tonal specifications for the three Latvian syllable intonations



Notes

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REFERENCES

Blevins, Juliette. 1993. A tonal analysis of Lithuanian nominal accent. Language. 69.2:237-273.

Ekblom, Richard. 1933. Die Lettischen Akzentarten. Uppsala: Almqvist & Wiksells Boktryckerei A. B.

Endzelīns, Jānis. 1922. Lettische Grammatik. Rīga: Lettischen Bildungsministerium.

Kariņš, A. Krišjānis. 1996. The prosodic structure of Latvian. Ph.D. dissertation, University of Pennsylvania. [Institute for Research in Cognitive Science Report 96-15, University of Pennsylvania].

McCarthy, John J. and, Alan S. Prince. 1995. Faithfulness and reduplicative identity. Manuscript. University of Massachusetts and Rutgers University.

Rudzīte, Marta. 1964. Latviešu dialektoloģija. Rīga: Latvijas valsts izdevniecība.

_____. 1993. Latviešu valodas vēsturiskā fonētika. Rīga: Zvaigzne.

FEAR OF FALLING: VERTICAL SPACE AS A SET OF NEGOTIATED COORDINATES *

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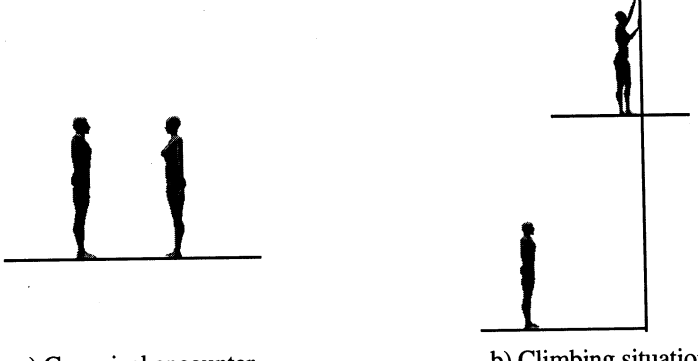
1. INTRODUCTION. In this paper I reconsider two hypotheses: that the vertical dimension is essentially subject to the same conceptualization as the horizontal frames of reference, as suggested by Levinson (1996a), or conversely that the vertical dimension is the source domain for the lexical assignment of the horizontal dimension, as proposed in Shepard & Hurwitz (1984). In contrast to these views, I argue that, with respect to linguistic encoding, the vertical dimension may not be a 90-degree rotation of, nor the source for, the horizontal plane, but can rather be a set of negotiated coordinates of both dimensions.

Carlson-Radvansky & Irwin (C-R & I) (1993, 1994) found that the deictic (or ego-centric) frame of reference did not contribute at all to the assignment of the English term 'above.' Although perspective-taking has been found to be flexible (Levelt 1984, Bryant et al. 1992, Logan 1995, Logan & Sadler 1996), it is generally agreed that environment-centered representation based on gravity is the determining factor for assigning vertical relation terms such as *above* and *below* (Garnham 1989, Friederici & Levelt 1990, C-R & I 1993). However, I claim that the dominance of verticality based on gravity can be overridden by speaker intention in a language like Japanese.[1]

This paper addresses these questions using new contexts and new types of informants. I draw on data from rock climbers, who routinely and intensively manipulate spatial concepts in immediate contexts. I collected data at rock climbing areas in Japan and the US, and focus on Japanese data for this analysis. I discuss here what I call 'climbing instructions'. These are usually given from expert climbers to novice climbers to teach climbing skills and give route descriptions, and they provide a prominent research site for studying body-movement descriptions, topological features, and the human-tool-environment interface on the vertical plane.



a) Canonical encounter b) Climbing situation

FIGURE 1. Canonical encounter vs. climbing situation

First, I delineate how an actual climbing setting is different from what is called the 'canonical encounter (Clark 1973)' or 'canonical setting for speech' (Levelt

1989). According to Levelt (1989: 49), it is where 'the interlocutors are relatively close together and mutually visible. They share the pull of gravity as well as important aspects of the visual frame. As a consequence, they all have about the same sense of verticality.' Shown in Figure 1 are simplified schemata for (a) the 'canonical encounter' and (b) 'a climbing situation'. In our case, the speaker is an experienced male climber, and the hearer, an inexperienced male belayer (a person who secures a climber by the use of a rope). The climbing situation is different from the canonical encounter in the following ways:

1) *Orientation*: The canonical encounter is based on the face-to-face orientation, but the climbing situation is fundamentally based on the face-to-back orientation.

2) *Stability*: The belayer, being on the gravitationally canonical plane, has the same sensitivity to gravity as in the canonical encounter. The climber on the other hand has to behave in a more precarious, gravity-laden environment, where just being on the plane requires of him/her some effort.

3) *Body Axis*: In this study the body axis of a climber is roughly parallel to the vertical plane of rock surface. The belayer's body axis is perpendicular to the horizontal plane (as in the canonical encounter).

4) *Relativized (or merged) Perspective*: In the climbing situation, due to the communicative purpose of giving instructions and directions, the speaker is expected to take a more hearer-oriented, empathic perspective where possible. The speaker's perspective is often overlaid upon the hearer's perspective, represented as psychological and physical projection with degrees of deictic shift.

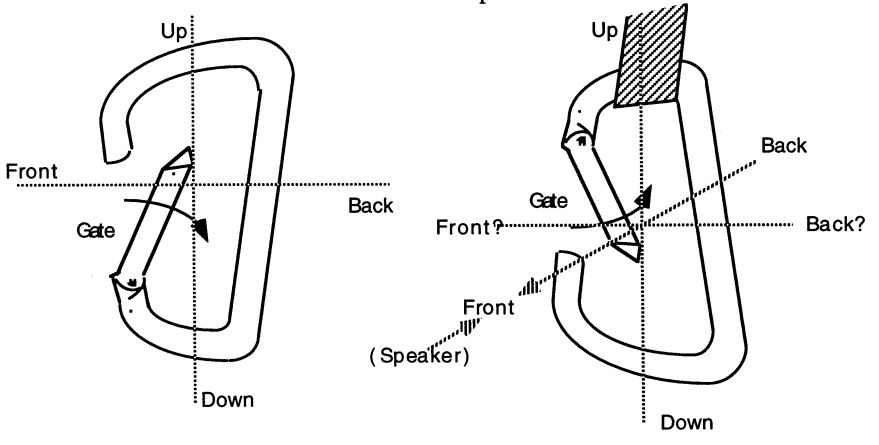
5) *Visual Field*: The climber is on a higher plane, the belayer on the ground level. The climber's visual fields are limited on the vertical plane, but (s)he can have bird's eye views of the horizontal plane occupied by the belayer. In contrast, the belayer's perspective is somewhat the opposite.

6) *Viewing Angle*: The angle of visual trajectory is not necessarily horizontal as seen in the canonical encounter, but often tilted. This tilting of visual trajectory may contribute to enabling both horizontal and vertical dimensions to come to merge to some extent, as will be mentioned later.

Superficially, linguistic encoding of vertical space in English and Japanese does not seem to differ at all in canonical encounters—both languages dominantly utilize 'facing' (C. Hill 1982, Levinson 1996a) orientation. However, they manifest quite discordant features on the gravity-sensitized locus of spatial experience, like rock climbing. In this critical region, I believe, spatial cognition comes to exhibit its maximal adaptability and resistance to linguistic encoding of space.

Before the data analyses, I comment on the use of carabiners. (Other climbing terms related to this analysis are glossed in the Notes.[2]) Although carabiners can be thought to have canonical and intrinsic directions as a physical object, the lower carabiner on a quick-draw is usually turned upside down in actual use for the ease of clipping a rope in (Fig. 2b). This manipulation makes it harder to define which part is oriented to which direction. Climbers, however, would generally agree that spatial term assignment for the lower carabiner is based not on the intrinsic orientation of a carabiner but on the ego-centric frame of reference of the user. So, ordinarily, the 'front' of a carabiner is the part defined ego-centrically from the user's perspective (as in Fig 2b), not the part intrinsically defined when it is upright (as in Fig. 2a). It is the case both in English and Japanese.

2. DATA ANALYSIS 1. Here I introduce a case in which a vertical frame of reference is overridden by an interactional intention of an information-giver, here the climber. The case involves the use of vertical spatial terms such as *ue* and *shita*



a) Intrinsic position (orientation to clip in to a bolt hanger)

b) In-use position on quickdraw (orientation to clip a rope in)

FIGURE 2. Intrinsic and in-use positions of carabiner

in Japanese, the counterparts of *above/up* and *below/down* in English. The usages were, I claim, the quite natural result of contextual negotiation among the vertical context, speaker's and hearer's empathic perspective, and the language-specific property of the vertical lexicon. Let's examine how the climber managed such an emergent context in terms of his communicative intention to the belayer.

Before the main point, we consider a phrase addressed to the climber by a spectator, who happened to stand close to the belayer (Text 1). Spectator O cautioned the climber, 'Don't fall off in front of the first bolt because we can't catch/stop you.' This expression, describing the climber below a bolt hanger, would sound awkward to English speakers because a more appropriate English expression would be 'Don't fall off below/under the first bolt.' (Although *before* is acceptable because of its association with the temporal use.)

(1) (Y = climber; O = spectator)	
Y: *warii*	Hard.
O: *ipponme yori* **mae** *de ochinai de ne.*	Don't fall off **before/ in front of** the first bolt,
Y: *Aah.*	Aghh!
O: *tomere nai kara.*	'cause (we/he) can't catch/ stop you.

The use of *mae* 'front' obviously was a replacement for *shita* 'below,' because comparative *yori* 'than' is not usually used with *mae* (and *ushiro* 'back'), but with *ue* 'above' and *shita* 'below'. (The phrase *yori mae* means '(to) the front past something' as in *kono hakusen yori mae ni denaide kudasai* 'Don't cross this white line.') In our context, the ordinary front of an object on the rock is defined by the speaker's relation to the gravitational vertical, thus should be the empty

space on the hither side of the bolt from the spectator's point of view, as seen in Figure 3(a).

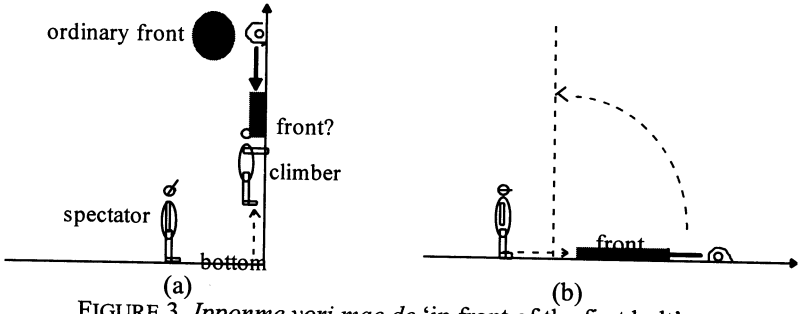


FIGURE 3. *Ipponme yori mae de* 'in front of the first bolt'

However, the 'below' interpretation for the phrase *mae de* 'in front' in Text (1) is still tenable if we see this scene as a 90-degree rotation of the horizontal plane to match the vertical face, as seen in Figure 3b. It is most plausible when the commentator is close to, or at the bottom of the rock, and is typically conceptualized as being on the same (vertical) plane. In any case, the space described as 'in front of' a bolt hanger is not assigned by the intrinsic orientation of a bolt hanger, nor by the ordinary front region in space, but in terms of the relationship to the climber who is approaching the object on the same plane. In other words, although it is hard to assign the intrinsic 'front' part of a bolt hanger, the projective front region defined by the 'canonical encounter' is envisaged via the relation between the climber and the bolt hanger. This case, however, falls in a gray area because *mae* may represent a temporal sense (like English *before*), and the phrase *ippon-me yori mae* 'before the first bolt' can be construed as equivalent to *ippon-me ni todoku mae* 'before you get to the first bolt'. We still need to investigate an unambiguously spatial, not temporally mediated, instance.

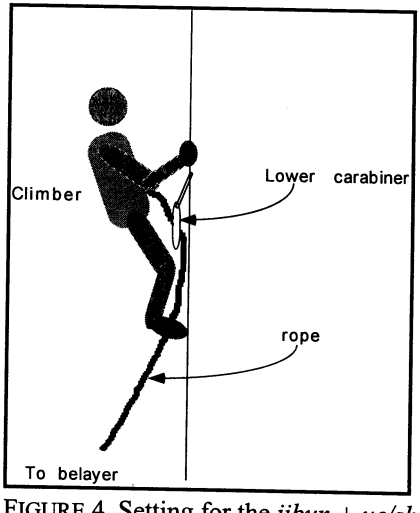


FIGURE 4. Setting for the *jibun* + *ue/shita* expressions

3. DATA ANALYSIS 2. The above spatial projection, which arguably includes an anomalous shift of coordinates, takes on still further coordinate transformation in the climber's following utterances, used in order to show what *gyaku kurippu* 'back clipping' is about. Back clipping is a bad way of clipping a rope into a carabiner such that the rope may easily clip out of the carabiner if a climber falls. Text (2) shows the sequence at issue, which may be subdivided into the pre- and main sequences. Figure 4 exhibits the physical context in which the series of utterances was made.

Let's look at the main sequence first, and come back to the pre-sequence, which I believe contributes to foreshadowing a

gradual progress into the climber's *subjectified* (Langacker 1991, 1993) vertical space. Here the climber went up to the first bolt and started to explain to the belayer what 'back clipping' is. The question concerns how the rope and the lower carabiner were related by the use of spatial expressions. Specifically, the *jibun* + *ue/shita* pattern in main sequence was persistently observed five consecutive times in fifteen sentences. For example, Text (2.2.a)) includes a *jibun-ue* pair, and in Text (2.2.b)) we find a *jibun-shita* pair (bolded).

(2.1) Pre-sequence:

a) *dakara* ***ma-shita*** *de yatteru no ga ii desu ne, furare nai kara. ...De san-pin-me gurai ikuto, moo, ochitemo gurando shinainde, mizuraideshoo,* ***ue*** *o, kubi ga itaku natte kite.*
'so, it's better to do that (belay) **right down** there, 'cause you are not pulled around. ...and when you get to the third bolt, you don't have a ground fall, and it's hard to look **up** (at me) now, 'cause your neck starts to hurt, right?'

b) *ni-sanpo* ***sagatte*** *mo iin desu yo.* ***ushiro*** *no hoo de (birei shite).*
'So you can **step backward**. (Belay me) **at the back** of there.'

(1 turn)

(2.2) Main sequence:

a) ***jibun*** *ga noboruhoo ga, koo, iwa yori* **ue**, *kotchi-gawa ni muku yoo ni surun desu.*
'Make sure that the end tied to '**self**' must come **above** the rock, or to *this side* (= to me/you).'

b) ***jibun*** *no noboru hoo ga* ***shita*** *desu yone.*
'The (prospective) direction in which '**self**' goes is **below**, you see?'

c) *de ochita baaini, ko, koo hazurerukoto ga arun desu yone,* ***jibun*** *no zairu ga* ***shita*** *dattara.*
'In case of fall, the rope may clip out of the biner if **self**'s rope is **below** (the carabiner).'

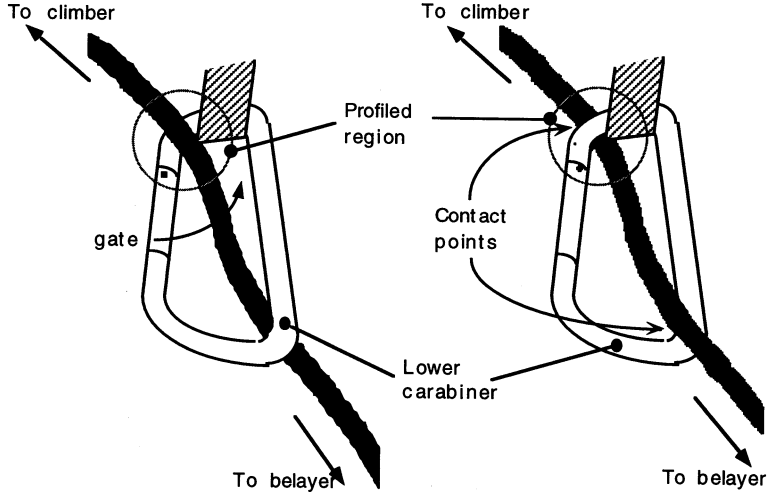
d) ***jibun*** *no zairu ga, kanarazu* ***ue-muki*** *ne.*
'Make sure that **self**'s rope goes **upward** (or toward **above** it).'

e) *koo,* ***jibun*** *ga noboru hoo ga* ***shita-muki*** *dattara, ochita toki ni hazureru to.*
'Like this, if **self**'s direction of climb is **downward** (or toward **under** the biner), the rope may possibly clip out.'

The simplified schema for the series of his explanations is:

a) *jibun ga noboru hoo* 'self's direction of climbing'	*ue*	:OK, the correct way
b) *jibun no noboru hoo* 'self's direction of climbing'	*shita*	:NO, *gyaku kurippu* 'back clipping'
c) *jibun no zairu* 'self's rope'	*shita*	:NO, *gyaku kurippu* 'back clipping'
d) *jibun no zairu* 'self's rope'	*ue-muki*	:OK, the correct way
e) *jibun ga noboru hoo* 'self's direction of climbing'	*shita-muki*	:NO, *gyaku kurippu* 'back clipping'

Only the cases of *ue* are regarded as the correct way of clipping. Let's take a closer look at how he tried to distinguish between *ue* and *shita* for the rope and the lower carabiner.



a) *Ue* 'above' (Correct) b) *Shita* 'below' (Wrong: *back clipping*)

FIGURE 5. The *ue* vs. *shita* relationships for lower carabiner

First, we see from Figure 5 that his use of *ue* 'above' and *shita* 'below' does not refer to the ordinary up/down relation of the rope: in both cases the rope tied to the climber goes upward, and the other end downward to the belayer. So, if based on the gravitational up/down orientation, both a) and b) should be described by the term *ue* 'up/above.' A series of *ue* vs. *shita* expressions must refer to some other relation(s) between the objects depicted here. Besides, the focus of attention is neither on the empty space 'above' the carabiner, nor on the contact points 'on' the carabiner—there are two contact points, thus it's ambiguous. Also in the profiled region, the use of 'on,' which is an alternative translation of *ue*, does not distinguish Figure 5(a) from 5(b).

We could also postulate that the Japanese word *ue* is an all-inclusive term for English *up, above, over*, and *on*, but represents more of a topological notion (such as the English term 'on'), in contrast to the other terms, which represent more of an absolute coordinate notion. [3] However, even if we conjecture that *ue* represents a topological notion such as *on*, it still doesn't explain why Figure 5(a) must be described with *ue*, but not with *shita*. Thus this fact endorses a coordinate, not topological, notion of *ue*.

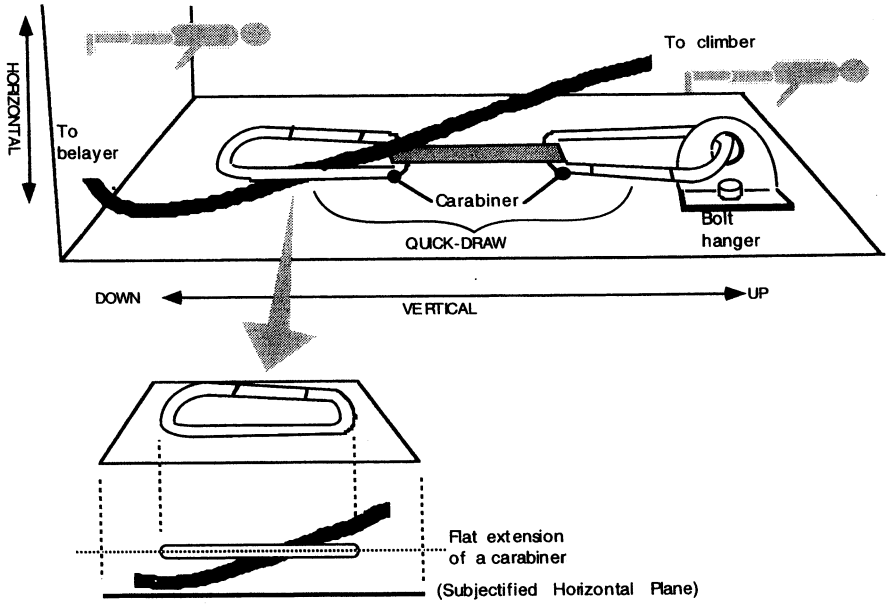


FIGURE 6. Flat extension of carabiner

The only consistent interpretation of this *ue/shita* relationship is as follows: 1) the flat extension of a carabiner is seen as parallel to the vertical ground; 2) although the carabiner is dangling vertically from a bolt hanger, the relation of the rope and the carabiner is schematically transferred together with the vertical ground onto the subjectified horizontal plane, as seen in Figures 6 and 7. Only in this virtual space can we make sense of why the rope should go *above* the carabiner to be clipped in correctly. Now the question is, 'which was rotated, the rope and the carabiner, or the body axis of the climber?' I assume it's the body axis here.[4] One may regard this interpretation as post hoc, but I argue that there are enough contextual cues to uphold this reasoning.

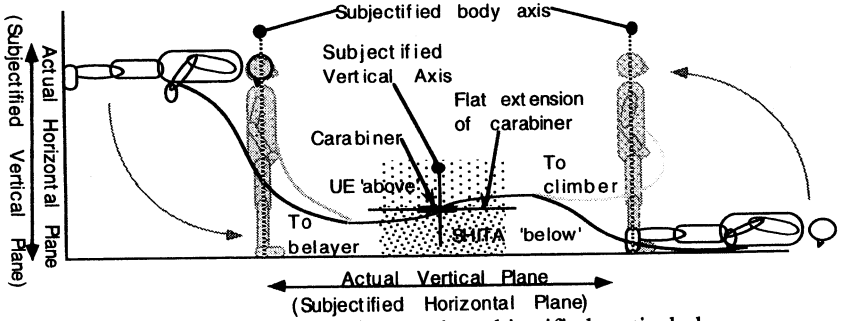


FIGURE 7. *Ue* and *shita* on the subjectified vertical plane

4. SUBJECTIFICATION PROCESSES. At least three causes contribute to realizing this anomalous virtual space. Firstly, the subjectified body axis of the climber and the belayer may have contributed to the projection of a new frame of reference. As shown in Figure 8, the climber leaned backward, turned his body around, and looked down at the belayer when he explained what 'back clipping' is, whereas the belayer looked up at the climber, watching how it should be avoided. In this situation, the canonical direction of view, which is ordinarily perpendicular to the body axis and parallel to the horizontal dimension, is vertically rotated, supposedly together with the imaginary body axis. Through this process both climber's and belayer's bodily axes approach the completely subjectified body axis in the subjectified coordinate system.

Secondly, in Text (2) the uses of *ue/shita* were always accompanied by the word *jibun* 'self.' The word *jibun* 'self' is underspecified in terms of the referent, as is evident from the English gloss: it can variably mean 'I,' 'you,' 'generic YOU,' or any person contextually referable. The climber could have used other self-referring terms like *watashi*, *ore*, *boku*, etc. 'I/me', but in Japanese all come with connotative social values: formal and polite, if not distancing, for *watashi*; rough and male for *ore*; and young or childish for *boku*. Thus, the word *jibun* may have been the safest, most neutral option. This vague referentiality may facilitate an empathic perspective, since *jibun* can refer to both the climber and the belayer. This underspecified neutrality can thus be substantialized as the imaginary third person who has the completely subjectified body axis shown in Figure 8. At least, the use of *jibun* could not have disrupted such potential co-referentiality and projection of reference frames.

Finally, some lexical items in the pre- and main sequences would have facilitated the mapping of the body-ground relation, from the horizontal plane (schematically, _i_) onto the vertical plane (•—|, where 'i' and '•—' represent the body axis). The latter body axis is anomalous because, on the vertical plane, the body axis normally parallels the surface (i.e., il). I claim that this anomalous projection was not

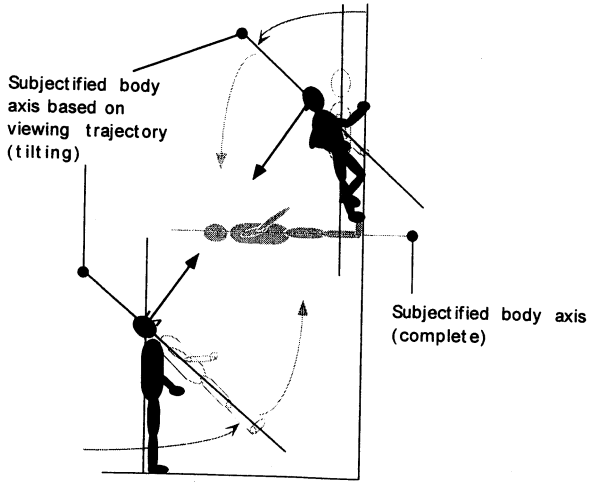


FIGURE 8. Subjectification based on visual trajectory

achieved solely by the use of *ue/shita* oppositions, but by the climber's lexical selection and manipulation of frames, back and forth into his own subjectified verticality. Let's look at the simplified sequences again. (The equation sign '=' means 'occurred together or close to each other' as a pair.)

Pre-sequence (see also Text 2.1.):		**Processes**
a) *ma-shita=ue*	(right below=above)	default for climber, ordinary vertical plane
b) *sagaru=ushiro*	(step back=back)	default for belayer ==>schematization/projection of the horizontal onto the vertical plane by climber
Main sequence (see also Text 2.2.):		
a) *jibun=ue*	(self=above)	subjectified vertical dimension introduced
[*kotchi-gawa*] (this side)		[shift back to the horizontal frame of reference]
b) *jibun=shita*	(self=below)	subjectified vertical dimension re-introduced
c) *jibun=shita*	(self=below)	subjectified vertical dimension presumed to be shared
d) *jibun=ue-muki*	(self=upward)	subjectified vertical dimension maintained
e) *jibun=shita-muki*	(self=downward)	subjectified vertical dimension maintained

TABLE 1. Subjectification by gradual reinforcement

First, the verb *saga(ru)* 'step back' was used in the Pre-sequence right before the series of *ue/shita* expressions (see 2.1.b)). The frame of reference activated by the phrase *sagaru = ushiro* 'step back(ward)' is the belayer's, which is '_i_'. After the activation of the frame, the climber utilized the same schema at Main-sequence 2.2.a), as attested by the use of *ue*, except that it is rotated 90-degrees (i.e., '•—I'). He obviously disregarded the actual environment in which his body axis aligned with the vertical plane ('il'). The climber could have used, instead of *ue,* other expressions with the same sense and more naturalness, such as *kotchi-gawa* 'this side,' *temae* 'in front,' *karabina no mae* 'in front of the carabiner,' *jibun no hoo* 'to the direction of self,' all of which represent the actual schematic relation ('il'), but he didn't. Thus the schematic equivalence between '_i_' and '•—I' might have been the result of neutralizing the gravitational constraint imposed upon the vertical frame of reference on earth. Put another way, this very schema was mapped from the horizontal onto the vertical plane, evoking the subjectified vertical axis. *Saga(ru)* probably 'primed' this mapping, but this assumption does not go beyond a hypothesis.

Other lexical items seem to have covertly contributed to the reinforcement of the schematization. At the first *jibun-ue* pair (Main-sequence 2.2.a)), the climber seemed to have noticed that he lacked attention to the hearer's reference frame, which is inevitably restricted by gravity for coordination of objects. Apparently he tried to remedy the excessive subjectivity by referring back to the belayer's horizontal frame of reference. His word *kotchi gawa* 'this side' (2.2.b)), a paraphrase of *ue* at 2.2.a), supports this idea, because both the climber and the belayer are on the *same* side from the carabiner. 'This side' was not the climber's exclusive, ego-centric domain because, when he uttered the phrase *kotchi-gawa,* he directly looked at and talked to the belayer, trying to get the belayer to share his perspective. The radical shift induced by the *jibun-ue* pair was perhaps temporarily mitigated at *kotchi-gawa* 'this side,' a less radical transformation than *ue* and similar to the previous one at *sagaru* in 2.1.b). After this second attempt, the climber seems to have presumed that the belayer was convincingly introduced into the new frame of reference, and kept using the same subjectified frame until

the end of the series. (He repeatedly received positive responses from the belayer during his explanation.) Table 1 shows how they contextually moved into the subjectified frame of reference based on rotated visual fields and subsequent mental rotation. This process was achieved by the climber's lexical selection and manipulation of frames.

I emphasize that the anomalous *ue/shita* expressions so far considered are only acceptable in the immediate environment where the experiencing subject is located close to the reference object, here the lower carabiner. It would be totally unacceptable for a belayer standing at the bottom of a route to refer to the rope and the carabiner in terms of vertical coordinate terms like *ue* and *shita*. Such negotiation as just seen was made possible and tacitly understood only by the subjects who actively experienced and shared the environment.

5. DISCUSSION AND CONCLUSION. These data suggest or recognize at least two types of verticality, one defined by actual gravitational force, and the other free of, or less sensitive to, gravitational constraint. Seen this way, the value placed on the vertical dimension and its dominance based on gravity may have been overestimated in the notional frameworks of space. It is shown here that the subjectified vertical dimension can *linguistically* override the actual gravitational pull in a particular context.

Lyons (1977: 690) points out that verticality is assumed to be 'physically and psychologically the most salient of the spatial dimensions: linguistically, ... it is the primary dimension,' and the most salient aspect of spatial expressions is the orientation of entities described by Up/Down, followed by Front/Back, and then by Left/Right (Bryant et al. 1992, Logan 1995). These claims are generally consistent with the contentions made by other cognitive linguists, psychologists, and anthropologists.[5] Talmy (1983, 1985) and Langacker (1987, 1991, 1993) do not pay much attention to gravitational force and concomitant linguistic expressions, but their emphasis on the importance and primacy of perspective-taking is crucial here. Talmy's (1983, 1996) distinction between 'a steady-state long-range perspective' and 'a moving close-up perspective' and similarly Langacker's (1991, Ch 12) global and local scope of attention are most relevant for future study. Zeroing in on the local scope of *subjectified* verticality, whether it is gravity-sensitive or not, should be more emphasized in spatial term assignment.

Generally agreeing with Friederici & Levelt (1990), Carlson-Radvansky & Irwin (1993: 242) mention, 'on earth, the powerful influence of an environment-centered frame based on gravity most likely dominates, unless the reference object is made salient in some way.'[6] Augmentation of salience may require special features of reference objects, as seen in C-R & I's studies (1993, 1994) in which they used an object that particularly has front/back, left/right, and up/down relations (chair) and human coordinates. However, ways of augmenting salience in actual discourse may not be so restricted, because most Japanese-speaking climbers agree on the acceptability of *ue* 'above/up' in describing certain objects in the gravitationally incongruent frame of reference. Although those objects (bolt and carabiner) have only vaguely defined intrinsic relations, the relations between them make sense in the speaker's intention-governed, subjectified, gravity-insensitive space.

However, some languages may be more gravity-sensitive in their perspective-taking and lexical assignment of spatial terms, whereas other languages might

allow more amenable shifts of perspective, and are not so strongly constrained by perceived gravity in the assignment of the vertical lexicon. For instance, English-speaking climbers are more consistent than Japanese in assigning spatial terms based dominantly on their gravity-sensitive perception.

Levinson and his colleagues (e.g. Brown & Levinson 1993, Haviland 1993, Levinson 1996a, 1996b, Pederson 1995) pointed out that some languages, contrary to the dominant Western notion of space, rely on indigenous (and often absolute) frames of reference for spatial term assignment. Our hypothesis may thus be comparable to their findings about horizontal space that Hausa (C. Hill 1982), Tamil (Pederson 1993, 1995), and English/Japanese (Levinson 1996a, 1996b) can manifest different degrees of coordinate rotation and transformation in the canonical encounter, depending on the local norms of spatial alignment. Likewise, vertical perspective-taking may not be so rigid as claimed by Garnham (1989), but will be more or less freely recruited within the speaker's cognitive elbowroom defined by each language. Perhaps gravity is the dominant factor in establishing the absolute (vertical) frame of reference, but the potential ease/difficulty to stay in or move out of the frame may vary according to languages, as will the sensitivity and 'boundness' to gravity in spatial lexical assignment.

In any case, with few exceptions vertical space has been very rarely investigated from this experiential perspective, let alone through actual interaction and conversation. We now see that vertical space, unlike what has always been assumed, is compatible with expressions which override (presumably) an ultimate vertical perception such as gravity, and will only be fully understood not by *imagining* ourselves on the plane but by actually *being* on it.

NOTES

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[1] However, it does not exclude the possibility that other frames of reference as well as the environmental one are also computed. In fact they were shown to compete with the environmental reference frame for lexical assignment, but failed to be prototypically selected, as attested by the response times to spatial cues (Carlson-Radvansky & Irwin 1994).

[2] There seems to be great individual variability for the vertical term assignment in both English and Japanese, but this point is beyond the scope of this paper.

[3] (Long 1993: 185-6 for more glossary) **belay**: procedure of securing a climber by use of a rope. **bolt**: artificial anchor placed in a hole drilled for that purpose. **lead**: to be first on a climb; to lead a route, placing protection. **quickdraws**: a (sewn) sling with carabiners; used for drag-free rope management for the leader

[4] However, there seems to be a continuum for vertical spatial terms on this point. The relative acceptability of such expressions as 'under (here meaning 'behind') the screen' and 'climb over the roof (which sticks out horizontally)' indicate that 'under/over' may be contextually compatible with rotated vertical planes, in contrast to more strictly gravity-defined prepositions like 'up/down' and 'above/below,' both of which defy the applicability to rotated verticality: '* above/ * up the screen' in describing the situation represented by 'under (= behind) the screen.'

[5] The mental imagery literature attests both possibilities (see Kosslyn 1990). In our case, the orientation of a rope and carabiners are determined by gravity and physically 'extensive' in an

ordinary climbing setting, thus are not easily manipulable unlike objects such as the 'Shepard figure' used in traditional imagery and mental rotation studies (Shepard & Cooper 1982). It thus seems inevitable for the more movable, i.e. the body axis, to move.

[6] As is evident from Brugman's (1988) and Lindner's (1982) studies, prepositions and adverbs such as 'over' and 'up' are extremely polysemous, and their uses, highly contextual. However, they are tacitly assumed to relate entities which behave in the space where gravity is the defining force of those expressions. Levelt (1984) and Logan (1995) maintain that frames of reference are quite freely selected if certain frames of reference are made salient. Logan (1995), for example, used explicit instructions to take such-and-such part of a object as the 'top' and to compute spatial relations (Experiments 9-11), demonstrating that the origin of the reference frame could be moved around space. However it is still unlikely that subjects can randomly change the perspective among frames of reference. There must be some constraints on the manipulability of the reference frames (Levinson 1996b).

[7] Our hypothesis is partially compatible with Friederici & Levelt's (1990) findings that their subjects (astronomers) were heavily skewed toward (confounded) ego-centric and environment-entered frame of reference on the earth for spatial term assignment, but they tended to rely on an ego-centric (or viewer-centered) representation when gravity was *absent*.

REFERENCES

Bloom, Paul, Mary A. Peterson, Lynn Nadel, and Merrill F. Garrett. (ed.) 1996. Language and Space. Cambridge, MA: MIT Press.

Brown, Penelope and Stephen C. Levinson. 1993. "Uphill" and "downhill" in Tzeltal. Journal of Linguistic Anthropology 3 (1). 46-74.

Brugman, Claudia M. 1988. The Story of *Over*: Polysemy, Semantics, and the Structure of the Lexicon. New York: Garland Publishing Inc.

Bryant, David J., Barbara Tversky, and Nancy Franklin. 1992. Internal and external spatial frameworks for representing described scenes. Journal of Memory and Language 31. 74-98.

Carlson-Radvansky, Laura A. and David E. Irwin. 1993. Frames of reference in vision and language: Where is above? Cognition 46. 223-244.

_____. 1994. Reference frame activation during spatial term assignment. Journal of Memory and Language 33. 646-671.

Clark, Herbert H. 1973. Space, time, semantics, and the child. In Cognitive Development and the Acquisition of Language, ed. by T. E. Moore, 27-63. New York: Academic Press.

Garnham, Alan. 1989. A unified theory of the meaning of some spatial relational terms. Cognition 31 (1). 45-60.

Haviland, John B. 1993. Anchoring, iconicity and orientation in Guugu Yimidhirr pointing gestures. Journal of Linguistic Anthropology 3 (1). 3-45.

Hill, Clifford. 1982. Up/down, front/back, left/right: A contrastive study of Hausa and English. In Here and There: Cross-linguistic Studies on Deixis and Demonstration, ed. by Jürgen Weissenborn and Wolfgang Klein, 13-42. Amsterdam: John Benjamins.

Kosslyn, Stephen M. 1990. Mental imagery. In An Invitation to Cognitive Science Vol . 2: Visual Cognition and Action, ed. by D. N. Osherson, S. M. Kosslyn, and J. M. Hollerbach, 73-97. Cambridge, MA: MIT Press.

Friederici, A. D. and Willem J. M. Levelt. 1990. Spatial reference in weightlessness: Perceptual factors and mental representations. Perception & Psychophysics 47 (3). 253-266.

Langacker, Ronald W. 1987. Foundations of Cognitive Grammar, Vol.1: Theoretical Prerequisites. Stanford, CA: Stanford University Press.

_____. 1991. Concept, Image, and Symbol: The Cognitive Basis of Grammar. Berlin: Mouton.
_____. 1993. Universals of construal. Berkeley Linguistics Society 19: 447-463.
Levelt, Willem J. M. 1984. Some perceptual limitations on talking about space. In Limits in Perception ed. by A. J. Van Doorn, W. A. van der Grind, & J. J. Koenderink, 323-358. Utrecht: VNU Science Press.
_____. 1989. Speaking: From Intention to Articulation. Cambridge, MA: MIT Press.
Levinson, Stephen C. 1996a. Anthropology of space. Annual Review of Anthropology 25. 353-382.
_____. 1996b. Frames of reference and Molyneux's question: Crosslinguistic evidence. In Bloom et al, 109-169.
Lindner, Susan. 1982. What goes up doesn't necessarily come down: The ins and outs of opposites. Chicago Linguistic Society 18. 305-323.
Logan, Gordon D. 1995. Linguistic and conceptual control of visual spatial attention. Cognitive Psychology 28: 103-174.
_____ and Daniel D. Sadler. 1996. A computational analysis of the apprehension of spatial relations. In Bloom et al, 493-529.
Long, John. 1993. How to Rock Climb. 2nd ed. Evergreen, CO: Chockstone Press.
Lyons, John. 1977. Semantics. Cambridge, UK: Cambridge University Press.
Pederson, Eric. Geographic and manipulable space in two Tamil linguistic systems. In Spatial Information Theory, ed. by A. U. Frank and I. Campari, 294-311. Berlin: Springer.
_____. 1995. Language as context, language as means: Spatial cognition and habitual language use. Cognitive Linguistics 6 (1). 33-62.
Shepard, Roger N. and Shelley Hurwitz. 1984. Upward direction, mental rotation, and discrimination of left and right turns in maps. Cognition 18. 161-193.
_____ and Lynn A. Cooper. 1982. Mental Images and Their Transformations. Cambridge, MA: MIT Press
Talmy, Leonard. 1983. How language structures space. In Spatial Orientation: Theory, Research, and Application, ed. by H. L. Pick Jr. & L. P. Acredolo, 225-282. New York: Plenum Press.
_____. 1985. Lexicalization patterns: Semantic structure in lexical forms. In Language Typology and Syntactic Description, ed. by Tim Shopen, Vol. 3, 57-149. Cambridge, UK: Cambridge University Press.
_____. 1996. Fictive motion in language and "ception". In Bloom et al, 211-276.

Reference Specificity, Comprehension of Pronouns and Levels of Representation

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1. Introduction

In studies of the mechanisms of mental representation involved in discourse comprehension, anaphora has become crucial because of its effectiveness in showing the way listeners or readers coordinate superficial linguistic representation and content-based representation[1] of the previous parts of a discourse in comprehending an ongoing portion of the discourse.

Many experimental studies have been dedicated to the issue of how and in what order these two types of discourse representation are accessed for assigning pronominal reference. But two sharply differing psychological accounts of the cognitive processes have emerged: (1) some psychological theories (e.g. Garnham & Oakhill, 1985; Carreiras, Garnham & Oakhill, 1993; Garnham, Oakhill, Ehrilch & Carreiras, 1995; others) have provided the experimental evidence that the resolution of definite pronominal anaphors always implies a kind of sequential search, from superficial representation to discourse model; while (2) in contrast, according to other empirical research, those anaphors are claimed to be interpreted by direct access to elements contained in a discourse model, without being filtered first by grammatical constraints of the surface representation (e.g. Sag & Hankamer, 1984; Tanenhaus, Carlson & Seidenberg, 1985; Lucas, Tanenhaus & Carlson, 1990; others). This binary division, inspired by syntactic tradition on the one hand and pragmatic distinction tradition on the other, does not make correct predictions of some processing relation status between morphosyntactic and pragmatic-based anaphora in Spanish.

This paper aims to show that anaphor resolution requires a more flexible and integrative processing model than that postulated in the above two models of mental representation mechanisms. To this end, we adopt tactics to compare gender cueing effects in comprehending singular and plural pronouns of so-called hybrid nouns[2] in three different discourse contexts. First, we review in brief the main theorems of the two theoretical explanations of anaphor resolution processing in relation to Spanish anaphora, followed by a discussion of some peculiar properties of gender use in hybrid noun pronouns concerning the controversial time-course of pragmatic inference in resolving pronominal anaphors. Finally, we discuss the implications of our experimental data for anaphor resolution processing.

2. Backward Sequential Search

It is generally held that pronouns must match their nominal antecedents at least in respect to number and gender, particularly in languages with a non-semantic gender system. According to this view, pronominal anaphors are generally conceived as substitutes for linguistic expressions, that is, rather than having their own semantic interpretations, they are just words that make reference to linguistic antecedents for their interpretation. The accusative pronoun 'las'[3] in sentence (1) is an example of a prototypical agreement between antecedent and its anaphor[4]:

(1) Juan prestó *unas plumas* a su amiga hace un mes.
Juan (nom.) lent some pens (acc. fem. pl.) to his friend (dat. fem. sg.) ago one month
'Juan lent some pens to his (girl) friend a month ago'

Pero nunca se **los/las* devolvió.
but ∅ (she) never to him (dat.) them (acc. pro. pl. masc./ fem. pl.) returned
'But she never gave them back to him'

In this semantically-empty view of pronouns, the interpretation of anaphor thus has to be linked first of all with grammatical information of the superficial representation in the active memory of listener or reader (Kintsch & van Dijk 1978; van Dijk & Kintsch 1983). However, if the reference search results in a failure at this stage, or if there is more than one likely candidate agreeing with the antecedent in lexical markings, the search naturally expands to include additional processes which might single out an adequate correference by semantic constraints in a discourse model (Frederiksen, 1981). For example:

(2) *La gente* de esta zona nos quiere mucho.
people (nom. sg. fem.) of this area us (acc.) to like much
'The people of this area like us very much'

Por eso *los* respetamos mucho *a ellos* también.
for that them (acc. pl. masc.) to respect (1P. pl.) much to they (acc. dupl.) too
'So, we respect them very much too'

In the second sentence of (2), the accusative 'los' is not in accordance with its antecedent 'gente' in number and gender. The listener or reader having made a greater cognitive effort, therefore, could assign a reference with a semantically consistent concept among elements configured in the discourse model of the first sentence. This process can be guided more effectively by the availability of discourse factors such as topic, foregrounding, thematic saliency, and agent status (e.g. Frederiksen, *ibid.*). Further, in cases where the resolution still has not been performed successfully on semantic grounds, inference will be drawn, as a final step, on the basis of pragmatic world knowledge permitted in the discourse model (Garnham & Oakhill, *ibid.*). This view is based on the assumption that pragmatic inference is not the core of the comprehension process and comes into play later than

other processes. We may observe this very case in the example (3):

(3) A: Creo que estoy embarazada.
to believe (1P. sg.) that am pregnant
'I believe that I am pregnant.'

B: ¿Qué? ¿De quién es ?
what? of whom is ∅ (pro-drop)?
'What? Whose is it?'

The pro-drop subject in '¿de quién es ∅?' clearly lacks a lexical antecedent in the previous sentence. Besides, in the strict sense there is no element which is semantically consistent with the omitted subject. To comprehend the omitted subject, some necessary information has to be supplied via world knowledge inferred in relation to the predicate 'to be pregnant', state of affairs that supposes the target baby in the woman as a result of the woman's relations with a man (who is usually regarded as responsible for that situation in many cultures). In this backward sequential search approach, the issue of anaphor resolution is addressed in terms of multiple cognitive processes where a rigidly bottom-up search is performed; the discourse model is relegated to a secondary role and takes part in the comprehension only after a preceding surface representation search has failed.

On this premise, three conclusions are logically drawn concerning time effects in comprehension: processing time will increase with each additional step required to resolve an anaphor; the comprehension of grammatically disagreeing or ambiguous anaphors will be more time-consuming than that of grammatical ones because of one or two additional processes; finally, the increase in processing time will show up at or immediately after the anaphor, which will affect in turn the reading time of the whole sentence that contains it.

3. Direct Access to Discourse Model

Contrary to the sequential search in which information in two discourse representations is applied in order, Sag & Hankamer (1984) argued that the reference of a pronominal anaphor is assigned directly from elements of a discourse model. Their claims appear to challenge the traditional view of pronominal anaphors as copying forms for lexical markings of the antecedent: the interpretation of a pronominal anaphor is not mediated by its relation with any representation of an antecedent expression, but by direct reference to elements of a discourse model. Semantic and pragmatic-based inference accompanies comprehension from the start through elements evoked in the discourse model which is a model of the situation in the world that the discourse is about. Similar claims have long been made in the psychological literature (e.g. Bransford, Barclay & Franks, 1972; Lucas, Tanenhaus & Carlson, *ibid.*; Marslen-Wilson, Tyler & Koster, 1993). Following this approach, it is reasonably assumed that grammatical mismatch

between pronoun and antecedent does not cause any delay in processing if a plausible inference is made by semantic consistency or the state of affairs described in the discourse. In this way, the omitted pronoun in example (3) may be resolved with ease, even though an explicit antecedent does not appear in the preceding sentence.

Other clear evidence vis-à-vis discourse understanding through direct access to a discourse model is found in the following example of Spanish neuter:

(4) *La renuncia del gerente* sorprendió al dueño.
the resignation of the manager (nom. sg. fem.) surprised the owner (acc. masc. sg.)
'The resignation of the manager surprised the owner'

Pero él tomó *?ésa/eso* con calma porque estaba provist*a/o*.[5]
but he accepted it (acc. sg. fem./neut.) with calm because ∅ was foreseen (fem./masc.)
'But he accepted it with calm because it was foreseen'

Surprisingly, 'ésa' being the grammatical demonstrative sounds somewhat unnatural, whereas the neuter 'eso' sounds more natural in this context. The theoretical interest of the neuter anaphors in Spanish[6] resides in the fact that their occurrence is obviously influenced by the character of the referent itself, rather than by aspects of its lexical designation, specifically, its gender (Klein, 1979, P. 173). The reference of the neuter anaphor 'eso' in (4) is not identified by the lexical markings of its antecedent contained in superficial representation. Insofar as the nominal neuter of the above example does not match its antecedent in morphosyntactic categories, the best clue to recover its reference must be found in a direct manner via a discourse model token allotted to the event referred to by the noun phrase 'resignation of the manager'. This phenomenon may originate from an intrinsical function of the neuter to make direct reference to events (or action), situations, abstract concepts, without passing through the morphosyntactic route, although there is a nominal antecedent in the discourse.

However, if anaphors, in fact, do not serve a pointer function for instructing the hearer to identify the reference on the morphosyntactic basis, it seems most likely that the information semantically or pragmatically evoked in a discourse model will always be taken, from the outset of resolution processing, as a crucial key to the references' identity. Thus, this direct approach makes two strong predictions. On the one hand, the resolution of mismatching anaphors (e.g. examples (2) to (4)) will not be more time-consuming than that of grammatically agreeing ones, if those anaphors can make a semantic or pragmatic-based reference. On the other hand, it claims that in the interpretation of pronominal anaphors the reader or listener makes use of only the discourse model, whatever discourse or situational context those anaphors may occur in, and that, as a result, the representation of superficial features of the discourse plays no role in the interpretation of such expressions.

4. Inference and Gender Agreement Patterns of Hybrid Nouns

In some of the previous examples of conceptual and neuter anaphors, we have observed that not all anaphors satisfy the simple agreement pattern as a copy of lexical markings. To pursue the issue in detail, some peculiar anaphoric properties of so-called hybrid nouns will be discussed. Hybrid nouns in Spanish are those nouns which neither simply take the agreements of one consistent agreement pattern nor belong to two natural sexes at the same time. Person-related generic nouns meet this definition (see Note 2 for the examples). Since these nouns do not make reference to a specific sex-determined person, problems of pronominal agreement patterns arise in two situations: first, when a speaker, consciously or unconsciously, needs to reveal the real sex of the referent as the conversation unfolds; and second, when a speaker is willing to use indicators of sex supposing that the hearer can easily infer the sex of the referred person by discourse context. The following assumption can be made: the pronominal agreement form to be used for hybrid nouns depends in part on the morphosyntactic basis and in part on the type of target involved. More specifically, four situations can be considered for the possible agreement patterns:

(i) where a hybrid noun refers to a singular person without any information that is relevant for the real sex of the referent;
(ii) where a hybrid noun refers to plural persons without any information relevant for their sex;
(iii) where a hybrid noun refers to a singular person with information by which the sex of the referent can be inferred;
(iv) where a hybrid noun refers to plural persons with information by which the sex of the referents can be inferred.

First, if information relevant for the sex of the referent in question is not available, the scope of possible agreement would be reduced to the morphosyntactic gender category, as shown in the following example:

(6) *La visita que llegó* es del país vecino.
the visitor who arrived (nom. sg. fem.) is from the country neighboring
'The visitor who arrived is from the neighboring country'

El personal del municipio *la/* (?)*lo* recibió con una ceremonia
the personnel of the City Hall her/him (acc. sg. fem./ masc.) received with a ceremony
'The personnel of the City Hall received her/him with a ceremony'

The second sentence in (6) shows that the agreement form (e.g. pronoun 'la') is subject to the gender cue imposed by its antecedent. The listener (or reader) may have trouble in comprehending the masculine pronoun 'lo', whereas the speaker may intend to reveal the real male sex of the referred person beyond grammatical restrictions. Nevertheless, in the situation where those nouns refer to persons in

plural, such scope is shown to be extended to plural pronoun with masculine gender, besides grammatical pronoun 'las':

(7) *Las visitas que llegaron* son del país vecino.
the visitors who arrived (nom. pl. fem.) are from the country neighboring
'The visitors who arrived are from the neighboring country'

El personal del municipio *las/ los* recibió con una ceremonia.
the personnel of the City Hall them (acc. pl. fem./ masc.) received with a ceremony
'The personnel of the City Hall received them with a ceremony'

The reason for this double pattern might arise from the compounding relation between the antecedent's generic sense reinforced by its plural number and the fact that the plural masculine gender can also refer to a mixed set of people of female and male sex, as observed in 'padres' (literally, 'fathers', but it also means parents). Obviously, this implies that the speaker can either anaphorize a plural hybrid noun by its morphosyntactic features, or by a masculine gender plural pronoun with recourse to the generic-sense reading.

In some cases where the sex of the person referred by the antecedent can be inferred in linguistic context, the speaker is expected to pronominalize it according to gender marking of the antecedent expression and the pragmatic source as well:

(8) *Esa persona con bigote grande* se quedó calvo hace 10 años.
that person with mustache big (nom. sg. fem.) went bald ago ten years
'That person with a big mustache went bald ten years ago'

Las señoras de su barrio siempre *lo/ ?la* saludan con cariño.
the ladies of his neighborhood always him/ her (acc. sg. masc./ fem.) greet with affection
'In his neighborhood, ladies always greet him/ her with affection'

(9) Dos bellos personajes del cine han superado el cancer mamario.
two beautiful personalities (nom. pl. masc.) of the film have overcome the cancer mammary
'Two beautiful film personalities have overcome breast cancer'

Una revista quiere entrevistar *?los/las* para sus lectores.
a magazine want to interview them(acc. pl. masc./ fem.) for its readers
'A magazine wants to interview them for its readers'

Contrary to expectation, the morphosyntactic-based singular anaphor 'la' in (8) sounds somewhat unacceptable. Equally in (9) where a masculine hybrid noun is arranged to refer to the female sex, the grammatically disagreeing anaphor 'las' appears to be preferred. Among the four possible situations supposed, grammatical anaphors are judged more acceptable only in the first case, while pragmatic inference-based anaphors are more acceptable forms in the rest of the situations, including the second case. All of these accounts can be resumed in three patterns of agreement:

(i) a hybrid noun tends to be pronominalized on the basis of lexical markings when there is no information relevant for real sex of the referential target;
(ii) nevertheless, in the same context, a plural hybrid noun shows two different patterns of agreement on the basis of either feminine (grammatical) or masculine marking for the generic sense;
(iii) a hybrid noun shows a strong tendency to be pronominalized by semantic features on the basis of pragmatic information of the real sex of the referential target, if this information is explicitly available.

Number and availability of pragmatic information about real sex can be introduced as main factors which have influence in the patterns of agreement. In many other languages, number has been considered (Corbett, 1991, p.189) to be of more importance for gender match, because it is the category most often realized together with gender.

5. Experiments

The core question we are addressing is whether the use of superficial representation is routinely used from the beginning of definite pronominal anaphor resolution for hybrid nouns (with feminine gender), or whether such resolution comes about directly via a discourse model without passing through the superficial representation.

Three experiments were conducted to compare our previous linguistic analysis-based observations with number and gender cueing effects in on-line processing. In the discourse without sex-relevant pragmatic information (Experiment 1), gender effect would be maximized in resolving singular pronouns, while the plural pronouns were expected to be resolved with no statistically significant time-consuming difference, because gender cueing effect and generic sense reading would both be commonly involved. It was predicted (Experiments 2 and 3) that reading times of sentences containing pragmatic-based pronouns would be slower than those of sentences with grammatical ones, if they are resolved on the basis of a gender cue; however, if inference can be made from the outset of the resolution, pragmatic pronouns would be interpreted faster than grammatical ones.

The sentence-by-sentence self-paced reading technique was employed. 10 hybrid nouns with feminine gender (shown in Note 2) were used for the experimental texts. Each experimental text consisted of two separate sentences: the first sentence contained a feminine hybrid noun in grammatical subject position, and in the second sentence an accusative pronoun was used for such a hybrid noun. The structure of the second sentence of each text is symmetrical except for pronouns through the three experiments. In each experiment, there were four versions of each text: a 2 x 2 factorial design with the following factors:

1. Sentences with singular antecedent vs. sentences with plural antecedent.
2. Sentences with agreeing pronoun vs. sentences with disagreeing pronoun.

5.1. *Experiment 1*

Subjects and Materials:

The subjects were 59 volunteers from the undergraduate Psychology Department of the Universidad Nacional Autónoma de México. 10 sets of 4 texts were constructed with combinations of the 4 factors. In the first sentences of each text, pragmatic information of sex of the referred target was not supplied.

TABLE 1: Example without Pragmatic Information about Natural Sex of Antecedent

Una autoridad en educación pública vino a la Universidad ayer.
'An authority on public education came to the university yesterday'

La Universidad *la/lo* invitó a dar conferencias de su tema.
'The university invited her/him to give lectures on her/his subject'

Unas autoridades en educacion pública vinieron a la Universidad ayer.
'Some authorities on public education came to the university yesterday'

La Universidad *las/los* invitó a dar conferencias de su tema.
'The university invited them to give lectures on their subject'

Result and Discussion[7]:

Table 2 shows the results of Experiment 1 which differ in gender cueing effects, depending on the number category. In the case of singular number, the gender matching pronoun ('la') was processed faster than the mismatching one ('lo'). But this effect was not repeated with plural pronouns. Unexpectedly, the masculine form 'los' was preferred for generic-sense reading triggered by plural number, rather than the pronoun 'las' containing feminine gender marking. The fact that the generic-sense reading was imposed in plural pronouns suggests that they can be resolved on the basis of pragmatic plausibility without commitment to morphosyntactic computation, even in the discourse without pragmatic information of the referred target. In this regard, the data also implies that predictions based on linguistic judgment can turn out not to coincide with the result of on-line processing.

TABLE 2: Mean Reading Times (msec.) for Second Sentences as a Function of Type of Pronoun and Gender Cue

	Sentences with singular antecedent	:	Sentences with plural antecedent
Pronoun with gender cue (la : las)	2536	:	2561
Pronoun with no gender cue (lo : los)	2593	:	2541

5.2. *Experiment 2*

Subjects and Materials:

58 subjects from the same Psychology Department as in Experiment 1 volunteered for the test. Altogether, 10 sets of 4 texts were constructed, each of which contained information relevant for female sex in the first sentence. The information excluded, however, female sex-marked professions or proper names to avoid matching ambiguities between pronominal anaphors and these nouns that generally have feminine gender marking in Spanish.

TABLE 3 : Example with Information about Female Sex of Antecedent

Una autoridad en educación de la mujer vino vestida de minifalda.
'An authority on the education of women came wearing a miniskirt'

La Universidad *la/lo* invitó a dar conferencias de su tema.
'The university invited her/him to give lectures on her/his subject'

Unas autoridades en educación de la mujer vinieron vestidas de minifalda.
'Some authorities on the education of women came wearing miniskirts'

La Universidad *las/los* invitó a dar conferencias de su tema.
'The university invited them to give lectures on their subject'

Result and Discussion:

The data of this experiment can prove neither the gender cueing effect nor inference making because pronouns with grammatical gender marking have the same form (i.e. 'la' and 'las') as pronouns with semantic gender. Therefore, mean reading times of these pronouns do not guarantee which of the two factors (i.e. gender cueing and pragmatic inference) is engaged in the resolution. On the contrary, it may be suggested that the uniformity of the result comes from crossing effects of both factors. The clue to the correct interpretation has to be found in the results of Experiments 1 and 3 where we clearly can observe effects of gender cueing and pragmatic inference.

TABLE 4 (Experiment 2): Mean Reading Times (msec.) for Second Sentences as a Function of Type of Sentence, Type of Pronoun and Gender Cue

	Sentences about fem. sex : Sentences about fem. sex with singular antecedent with plural antecedent
Pronoun with gender cue (la : las)	2468 : 2533 → 2509 (mean time)
Pronoun with no gender cue (lo : los)	2617 : 2648 → 2632 (mean time)

5.3. *Experiment 3*

Subjects and Materials:

The subjects were undergraduate Psychology 75 volunteers of the Universidad Nacional Autónoma de México. The design was the same as in Experiment 2, except that male sex relevant information was used in the first sentence.

TABLE 5 : Example with Information about Male Sex of Antecedent

Una autoridad en seguridad nacional llegó ayer fumando el puro.
'An authority on national security came smoking cigar yesterday'

La Universidad *la/lo* invitó a dar conferencias de su tema.
'The university invited her/ him to give lectures on her/his subject'

Unas autoridades en seguridad nacional llegaron ayer fumando el puro.
'Some authorities on national security came smoking cigar yesterday'

La Universidad *las/los* invitó a dar conferencias de su tema.
'The university invited them to give lectures on their subject'

Result and Discussion:

The result of Experiment 3 shows the same pattern of resolution between 4 types of anaphor: that is, pronouns have a regular tendency to be resolved faster on the basis of real sex, rather than grammatical gender marking, evidence that the resolution was plausibly performed by pragmatic inference.

TABLE 6 (Experiment 3): Mean Reading Times (msec.) for Second Sentences as a Function of Type of Sentence, Type of Pronoun and Gender Cue

	Sentences about male sex : Sentences about male sex with singular antecedent with plural antecedent
Pronoun with gender cue (la : las)	2592 : 2655 → 2623 (mean time)
Pronoun with no gender cue (lo : los)	2464 : 2568 → 2516 (mean time)

6. General Discussion and Concluding Remarks

Concerning anaphor resolution processing, experimental research has proceeded along two opposing theoretical lines. On the one hand, it is commonly assumed that pronominal anaphors must originally be interpreted from the superficial representation of discourse. On the other hand, some empirical studies have argued that such resolution is performed using a discourse model only.

These opposing explanations were also replicated in Spanish anaphors. It has

been claimed (Garnham, Oakhill, Ehrlich & Carreiras, 1995) that processing of all pronouns in Spanish is heavily based on gender marking, apart from number. However, according to another experimental study based on grammatical judgment and on-line processing (Carreiras & Gernsbacher, 1992), a discourse model is plausibly accessed to resolve Spanish conceptual anaphors that have grammatically mismatching markings. The discrepancy of the results has to be explained by the types of anaphor employed. Garnham *et al.* used anaphors for nouns with semantic-based gender, while Carreiras *et al.* employed texts containing anaphors for collective, generic and multiple item nouns in the singular form.

The anaphors observed in our examples and experiments show that their matching scope with antecedents is not confined simply to linguistic representation, but expands to the pragmatic domain. The comprehension of pronouns of hybrid nouns in Spanish is affected by the availability of specific information concerning the referred persons' sex, and also by number category as one possible determinant factor in processing. Contrary to the claims that inference is drawn as a last resort in anaphor processing, anaphors that require pragmatic inference for their comprehension did not cause difficulties when the discourse context provided the information relevant for a specific natural sex of the referred target. Further, the fact that the resolution of the masculine plural pronouns in the discourse which lacked pragmatic information was not affected by gender marking suggests that number effect for generic sense was made only in plural number. Plural hybrid nouns seem to be contextually free to generate generic sense, even if relevant information is not supplied.

The data presented here suggest that a theory of anaphor interpretation must allow both superficial representation and a discourse model to take part in the interpretation of anaphors from the beginning. As a consequence, it is necessary to postulate an integral model of processing where the anaphor resolution process could be equally controlled by syntactic, semantic and pragmatic factors under the right conditions, without necessarily being used in a strict preestablished order. Our finding is consistent with a system, postulated in some empirical studies (i.e. Carreiras *et al.*, 1992; Marslen-wilson *et al.*, 1993), that is highly flexible and opportunistic in its use of superficial and pragmatic information. In such a model open to multiple information sources, both the plural number associated with the generic sense and the grade of pragmatic information specificity can play guiding roles in the interpretation processing of anaphors, at least for hybrid nouns in Spanish. Again, the complexity involved in using different sources of information suggests that discourse comprehension does not always depend on unilateral order from the computation of morphosyntactic information to pragmatic-based information or vice versa.

Notes

Abbreviations:
Acc.- accusative, Dat.- dative, Dupl.- duplicative, Fem.- feminine, Masc- masculine, Neut.- neuter, Nom.- nominative, 1P.- first person, 3P.- third person, Pl.- plural, Sg.- singular.

[1] It has been commonly accepted (Kintch & van Dijk, 1978; Webber, 1979; van Dijk & Kintch, 1983; Johnson-Laird, 1983) that there are at least two levels of discourse representation: that is, superficial representation as morphosyntactic information of discourse; and its associated content-based abstract representation (called 'discourse model' or 'mental model of discourse') as a model of the state of affairs described in the discourse, i.e. a conceptual representation of the real or imaginary world portrayed in discourse.
[2] The term 'hybrid noun' comes from Corbett (1991, pp. 225-259), a term which refers to generic-person nouns without any relation to the real sex of referent. In languages with non-semantic gender system such as Spanish, these nouns show interesting phenomena of pronominalization, particularly when there is a mismatch between the grammatical gender of the noun and the real sex of the referred person. This is because nouns with reference to human beings tend to have semantic genders and, therefore, be anaphorized on semantic basis in place of morphosyntactic markings. Hybrid nouns in Spanish can be grouped into two grammatical genders, feminine and masculine: 1) examples of nouns with feminine gender - amistad, autoridad, celebridad, criatura, estrella, figura, persona, personalidad, víctima, visita, etc. (friend, authority, celebrity, little child, star, figure, person, personality, victim, visitor, respectively); and 2) examples of nouns with masculine gender - ídolo, individuo, personaje, etc. (idol, individual, personality, respectively).
[3] The accusative pronoun system in Spanish is organized in number and gender as follows:

	feminine	masculine	neuter
	personal : demonstrative	personal : demonstrative	personal : demonstrative
sg.	la ésta, ésa, aquélla	lo éste, ése, aquél	lo esto, eso, aquello
pl.	las éstas, ésas, áquellas	los éstos, ésos, aquéllos	

All Spanish nouns are assigned one of two arbitrary syntactic genders, masculine or feminine. Large numbers of nouns fall outside the semantic criteria except for some nouns referring to human beings and to a limited range of domestic animals. Agreement forms such as pronouns are also marked for gender and number. But curiously, pronouns have a three gender system which includes neuter. All these pronouns are used indifferently for nouns with reference to animate or inanimate things.
[4] Henceforth, both antecedents and their anaphors are italicized.
[5] Spanish adjectives have to agree in number and gender with nouns and pronouns that they qualify. For neuter pronouns, adjective markings are subject to the masculine agreeing form.
[6] Traditionally normative grammarians of Spanish (e.g. Real Academia Española, 1973, p.228; Whitley, 1986, pp. 160-162) have not accepted the nominality of neuter pronouns, but treat them as referring units for unnamed concepts, ideas, events or propositions expressed in preceding sentences. However, in some dialects (Klein, 1979; Ojeda, 1992) including in the standard use of the language (Fernández Ramírez, pp. 71-72), the neuters are shown to anaphorize feminine or masculine nouns in order to trigger abstract concept, event and generic sense.
[7] The difference of the results in each experiment is statistically significant. However, analyses of variance by subject and texts (stimulus) of each data are not included by the reason of space.

References:

Bransford, J., Barclay, J., & Frank, J. (1972), Sentence memory: A constructive versus

interpretive approach. *Cognitive Psychology*, 3, 193-203.

Carreiras, M., Garnham, A., & Oakhill, J. (1993), The use of superficial and meaning-based representations in interpreting pronouns: Evidence from Spanish, *European Journal of Cognitive Psychology* 5, 93-116.

Carreiras, M., & Gernsbacher, A. (1992), Comprehending conceptual anaphors in Spanish. *Journal of Cognitive Processes* 4, 323-347.

Corbett, G. (1991), *Gender*, Cambridge/ Cambridge University Press.

Fernández Ramírez, S. (1987), *Gramática Española: El pronombre* vol. 3. Madrid/ Arco.

Frederiksen, J. (1981), Understanding anaphora: Rules used by readers in assigning pronominal referents, *Discourse Processes* 4, 323-347.

Garnham, A., & Oakhill, J. (1985), On-line resolution of anaphoric pronouns: Effects of inference making and verb semantics. *British Journal of Psychology*, 76, 385-393.

Garnham, A., Oakhill, J., Ehrilch, M-F., & Carreiras, M. (1995), Representations and processes in the interpretation of pronouns: New evidence from Spanish and French, *Journal of Memory and Language* 34, 41-62.

Johnson-Laird, P. (1983), *Mental Models: Towards a cognitive science of language, inference and consciousness*. Cambridge: Harvard University.

Kintch, W., & van Dijk, T. (1978), Towards a model of text comprehension and reproduction. *Psychological Review*, 85, 363-394.

Klein, F. (1979), Neuterality, or the semantics of gender in a dialect of castilla, in W. Cressey & D. Napoli (Eds.) *Linguistic Symposium on Romance Languages* vol. 9, 164-176.

Lucas, M., Tanenhaus, M., & Carlson, G. (1990), Levels of representation in the interpretation of anaphoric reference and instrument inference, *Memory & Cognition* 18, 611-631.

Marslen-Wilson, W., Tyler, L. & Koster, C. (1993), Integrative processes in utterance resolution. *Journal of Memory and Language*, 32, 647-666.

Ojeda, A. (1992), The mass neuter in Hispano-Romance dialects, *Hispanic Linguistics* 5, 245-277.

Sag, I, & Hankamer, J. (1984), Toward a theory of anaphoric processing, *Linguistics and Philosophy* 7, 325-345.

Real Academia Española (1973), *Esbozo de la Gramática Española*, Madrid/ Espasa-Calpe.

Tanenhaus, M., Carlson, G., & Seidenberg, M. (1985), Do listeners compute linguistic representations? In D. Dowty, L. Karttunen & A. Zwicky (Eds.) *Natural Language Parsing*, Cambridge/ Cambridge University Press, 359-408.

van Dijk, T., & Kintch, W. (1983), *Strategies of Discourse Comprehension*. Orlando/ Academic Press.

Webber, b: (1979), *A Formal Approach to Discourse Anaphora*, New York/ Garland.

Whitley, S. (1986), *Spanish/English Contrasts* Washington/ Georgetown University Press.

Modality in Causatives*

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1 A Mirror Principle Problem

The Mirror Principle, as proposed by Baker (1985), asserts that the order in which morphemes appear on a morphologically complex element must conform to the hierarchical order in which the corresponding heads appear in the syntax.

(1) *The Mirror Principle*: Morphological derivations must directly reflect syntactic derivations (and vice versa).

Crucially, this principle regulates the distribution of a given morpheme relative to the other morphemes. It mandates that when a root is followed by three affixes, as in *root-aff1-aff2-aff3*, the corresponding heads H_R, H_1, H_2, and H_3 will appear in the syntax in the same hierarchical order such that H_3 appears closer to H_2 than H_1 or H_R, and H_2 is closer to H_1 and H_3 instead of H_R, and H_1 is closer to H_R and H_2 rather than H_3, and so on. This guarantees that the morphological order in (2) correlates with either syntactic hierarchy in (3), depending on whether the language is head-initial, as in (3a), or head-final, as in (3b).

(2) *root-aff1-aff2-aff3*

(3) a. ... H_3 [... H_2 [... H_1 [... H_R ...
b. ... H_R] H_1] H_2] H_3 ...

The Mirror Principle is an important feature of the syntactic theory because it establishes transparency between the morphological component and the syntax. Clearly, a theory that is capable of maintaining transparency between components is simpler than a theory in which each component acts independently from one another. Therefore, there is much at stake in preserving a principle along the lines of what is stated in (1) unless there is convincing evidence to the contrary.

An apparent counterexample to the Mirror Principle is observed in the causative structures in the context of negation in Turkish. The negation morpheme appears outside the causative morpheme, as seen in (4), which, according to the Mirror Principle, should indicate that the negation head NEG is located at a position that is higher than the causative head CAUSE in the structure. As a result, one would expect that negation would take scope over causation in this construction, which is certainly a reading that is available, but not the only

one. Crucially, sentences such as (4) display scopal ambiguity between negation and causation. The relevant morphemes are bold-faced below.

(4) *pro* Emine'yi bugün çalış-**tır-ma**-dı-m
1.SG E.-ACC today work-**CAUSE-NEG**-PAST-1SG
a. 'I didn't make Emine work today' (NEG > CAUSE)
b. 'I made Emine not work today' (CAUSE > NEG)

The first interpretation where negation takes scope over causation, i.e., NEG > CAUSE is what the Mirror Principle predicts. However, as correctly pointed out by Göksel (1993), the second interpretation where causation takes scope over negation, i.e., CAUSE > NEG, presents a Mirror Principle violation since the causative morpheme is not outside the negation morpheme, nor can it ever be.

It will be argued in this paper that there is a plausible explanation for the ambiguity in (4), especially the reading in (4b), which avoids violating the Mirror Principle. The account will capitalize on the fact that coercive and permissive causatives are not morphologically differentiated in Turkish, where the causative morphemes *-DIr-* and *-t-* are ambiguous between the *make* and *let* readings.[1] An example of this can be seen in the following.

(5) *pro* çocukları sıçra-t-tı-m
1.SG children-ACC jump-CAUSE-PAST-1SG
a. 'I made the children jump'
b. 'I let the children jump'

In (5a), the causative morpheme has the coercive, *make* reading, while in (5b), it has the permissive *let* reading. The main thesis of this paper is that the instances where causation appears to take scope over negation are derived by letting negation take scope over the permissive *let* reading of the causative, instead of the coercive *make* reading. Therefore, it will be argued that NEG takes scope over CAUSE in both instances, and that in (4a), it takes scope over the coercive, *make*-type CAUSE, but in (4c), it takes scope over the permissive *let*-type CAUSE. It will also be shown in section 3 that NEG > *let* is truth-functionally equivalent to *make* > NEG.

2 Coercive and Permissive Causatives (and other readings)

Coercive and permissive causatives are semantically differentiated from one another in terms of the extent to which the causer is involved in the causation and how much responsibility it bears in bringing about the caused event.

(6) The guard **made** the prisoners escape (coercive causative)

(7) The guard **let** the prisoners escape (permissive causative)

2.1 Coercive causatives

Coercive causatives are expressed with the verb *make* in English and with the verb *faire* in French. They are defined by the active involvement of the causer in the realization of the caused event. For example, what qualifies (6) as an instance of coercive causation is that the sentence entails that the guard plays an active role in the causation of the escape event.

One must bear in mind here that whether the causer directly interacts with the causee or merely manipulates the circumstances is not relevant to whether the causation is coercive or not. It is possible that the guard orders the prisoners to escape in (6). It is also possible that the guard contributes to the escape not by directly ordering them, but by making the living circumstances in the jail so intolerable that the prisoners feel compelled to escape. In both cases, the causation is coercive since the guard is the inducing factor in the escape, although the causation is executed in different ways. The way in which interactive (the former reading) and circumstantial (the latter reading) causation interpretations are obtained in the syntax is discussed in Kural (1996).

The discussion in this paper also abstracts away from the cases where there are understood (covert) intermediaries in the causation event, i.e., whether the causation is direct or indirect. For example, a sentence like *The mayor made the prisoners escape* may be used to describe a situation where the mayor of the city orders the director of the penitentiary, who in turn orders the guard, who then orders the prisoners to escape. Unfortunately, the issues regarding how such readings can be generated and what types of structures would produce this type of interpretation cannot be addressed in this particular forum. For a discussion, see Kural (1996).

2.2 Permissive causatives

Permissive causatives are formed with *let* in English, and *laisser* in French. What is characteristic for this type of causation is that the causer is more or less incidental in bringing about the caused event. This can be seen in (7), where it is understood that the guard does not play an active role in the prisoner's escape, but rather, contributes to the escape event simply by facilitating it in some way.

Despite their limited involvement, the causers in the permissive causative construction still have the interactive and circumstantial options, as is the case with coercive causation. In the interactive reading, the guard is likely to have aided the prisoners by handing them the key or helping them plan the escape. In the circumstantial reading, on the other hand, the guard may have cut off the

power at some crucial stage to help the prisoners, or turned a blind eye so as not to interfere with the escape that is taking place at the moment. Note that the last reading requires some explanation. In the common understanding of what causative clauses entail, it is customary to think that the causer must perform some act to actually be causing an event. By contrast, the noninterference reading presupposes complete inaction on the part of the guard/causer. It will become clear in section 5 how and why not interfering with the progress of an event counts as causation.

3 The Duality of Coercion and Permission

Duality is a particular type of relation between two quantificational elements where the inner negation of one quantifier is truth-functionally equivalent to the outer negation of the other. Formally, this relation can be stated as follows.

(8) $\neg Q_1(x)\ P(x) = Q_2(x)\ \neg P(x)$

In natural languages, duality obtains when there is universal and existential quantification. The best-known cases of dual expressions are shown in (9) through (14) below.

When negation takes scope over the universal quantifier *every x*, as in (9a), it is truth-functionally equivalent to the existential quantifier *some x* taking scope over negation, as in (9b). Conversely, when negation takes scope over the existential *some x*, it is equivalent to the universal *every x* taking scope over negation.[2]

(9) a. It seems not to be true that everyone in this room is asleep
b. Someone in this room seems not to be asleep

(10) a. It seems not to be true that someone in this room is asleep
b. Everyone in this room seems not to be asleep

The adverbials *always* and *sometimes* provide universal and existential quantification over event times, and they also display duality effects. Negation taking scope over the adverbial *always* in (11a) is equivalent to the adverbial *sometimes* taking scope over negation in (11b), and negation taking scope over *sometimes* in (12a) is equivalent to *always* taking scope over negation in (12b).

(11) a. It is not the case that Bill always understands the question
b. It is sometimes the case that Bill does not understand the question

(12) a. It is not the case that Bill sometimes understands the question
b. It is always the case that Bill does not understand the question

Adjectival predicates *certain* and *possible* provide universal and existential quantification over epistemically accessible possible worlds, and they display the same type of duality effects observed with *every/some* and *always/sometimes*. In the following examples, where negation takes scope over *certain* in (13a), it is equivalent to *possible* taking scope over negation in (13b), and when negation takes scope over *possible* in (14a), it is equivalent to *certain* taking scope over negation in (14b).

(13) a. It is not certain that Mary will be the new director
b. It is possible that Mary will not be the new director

(14) a. It is not possible that Mary will be the new director
b. It is certain that Mary will not be the new director

This specific interaction between the dual elements and negation is also observed between the verbs *make* and *let*. Negation takes scope over *make* in (15a), which is truth-functionally equivalent to (15b), where *let* takes scope over negation. Conversely, when negation takes scope over *let* in (16a), it is equivalent to *make* taking scope negation in (16b).

(15) a. He did not make the children sleep
b. He let the children not sleep

(16) a. He did not let the children sleep
b. He made the children not sleep

The generalization that emerges in this paradigm is that NEG > *make* is equal to *let* > NEG, and NEG > *let* is equal to *make* > NEG. Since this is the same type of relation observed between dual elements, it would be plausible to suggest that there is universal and existential quantification involved with these causative verbs in some way. Specifically, it can be argued on the basis of the paradigm in (15) and (16) that: (a) universal versus existential quantification is a component of coercive and permissive predicates *make* and *let*, and (b) universal versus existential quantification is what distinguishes *make* and *let*.

4 Quantification over Causally Possible Worlds

The adjectives *certain* and *possible* in (13) and (14) above can be defined as predicates that introduce universal and existential quantification over possible worlds that are epistemically accessible.

(17) a. *certain* P: $\forall$w, w an epistemically accessible world, P(w), or
certain P: $\Box$ P.
b. *possible* P: $\exists$w, w an epistemically accessible world, P(w), or
possible P: $\Diamond$ P.

In the case of *make* and *let*, the universal and existential quantification suggested by the duality facts presumably quantifies over possible worlds that are causally accessible. This would mean that the predicates themselves, i.e., *make* and *let*, are composed of two parts: (a) the base predicate CAUSE, which provides the causal nature of the relation between the causer and the caused event, and (b) universal (*make*) and existential (*let*) quantification over causally accessible possible worlds, which introduces the modality component.

(18) a. *make* P: CAUSE $\forall$w, w a causally accessible world, P(w).
b. *let* P: CAUSE $\exists$w, w a causally accessible world, P(w).

The formulation in (18) can be restated as in (19), using $\Box_C$ and $\Diamond_C$, which are the causal equivalents of the necessity and possibility operators $\Box$ and $\Diamond$.

(19) a. *make* P: CAUSE $\Box_C$ P
b. *let* P: CAUSE $\Diamond_C$ P

This formulation allows the dual behavior of *make* and *let* to be reduced to the duality of necessity ($\Box$) and possibility ($\Diamond$) operators, which is a result of the duality of the universal and existential quantifiers $\forall$ and $\exists$. The observation regarding the dual relation between *make* and *let* is given in (20).

(20) a. NEG > *make* = *let* > NEG
b. NEG > *let* = *make* > NEG

Based on the equivalence in (19), the observation in (20) can be reformulated as in (21) by replacing *make* P with CAUSE $\Box_C$ P and *let* P with CAUSE $\Diamond_C$ P.

(21) a. $\neg$CAUSE $\Box_C$ P = CAUSE $\Diamond_C$ $\neg$P
b. $\neg$CAUSE $\Diamond_C$ P = CAUSE $\Box_C$ $\neg$P

The causative component CAUSE does not contain any modal base, and it does not contribute to the duality between *make* and *let*, which is solely due to the universal and existential quantification, and how they interact with negation. It can, therefore, be safely removed from (21) without altering the equivalence.

(22) a. $\neg\Box$ P = $\Diamond$ $\neg$P
b. $\neg\Diamond$ P = $\Box$ $\neg$P

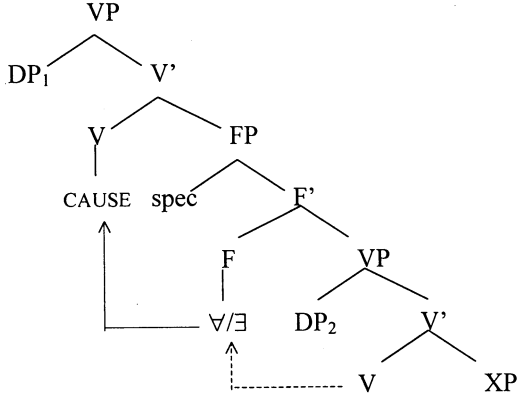
Finally, since the necessity and possibility operators are derived by letting *every* and *some* quantify over possible worlds, the equivalence of (22) can safely be treated as an extension of the duality of *every* and *some*.

(23) a. $\neg\forall(x)\ P(x) = \exists(x)\ \neg P(x)$
b. $\neg\exists(x)\ P(x) = \forall(x)\ \neg P(x)$

Once *make* and *let* are viewed as having two components, it becomes an issue how they are put together as a single lexical item in the syntax. There are a number of ways to achieve this. One is to assume that *make* and *let* are stored as full-formed lexical items in their own right, and that the equivalences given in (18) or (19) are simply meaning postulates in the sense of Dowty (1979). That is, when the meaning of *make* or *let* needs to be decided, the speakers retrieve this information from the lexicon.

There is, however, a more syntactic option that we will pursue here, which is to produce the modality-inducing element, i.e., the universal or existential quantification, as a functional head that combines with the predicate CAUSE in the syntax. The maximal projection of this functional head, FP, is generated as the complement of CAUSE.[3] The head F incorporates into CAUSE in the syntax to form the predicates *make* and *let*. In this view, *make* is inserted whenever the head that provides the universal quantification over causally possible worlds, say $\forall$, incorporates into CAUSE, and *let* is inserted whenever $\exists$ incorporates into CAUSE.

(24)



In languages like Turkish, where there is no overt morphological distinction between the coercive and permissive forms, the incorporation of $\forall$ or $\exists$ has no visible morphological effect.

5 Coda

5.1 The Noninterfering Causer Problem

Recall the inactive guard problem from the discussion in section 2 where the subject of permissive causation maintains its status as a causer even when it is not actively engaged in bringing about any event. In (7) for example, the guard may not be doing anything with respect to the escape that is taking place, but his failure to interfere with the escape would still be considered letting the prisoners escape, which essentially means he is causing the prisoners to escape.

(7) The guard let the prisoners escape

The reason that inaction counts as causation with permissives is that they contain existential quantification over causally accessible possible worlds. Once the prisoners' escape is under way, there is already a possible world in which *the prisoners escape* holds true. By not interfering in a manner that makes sure all causally possible worlds are such that *the prisoners escape* does not hold true, i.e., by not effectively stopping the escape, the guard ensures that there will continue to be a causally possible world in which *the prisoners escape* holds true. And it is in this respect that noninterference is compatible with (permissive) causation.

5.2 The Mirror Principle Problem

The main problem that was stated in the beginning is the apparent mismatch between the morphological position of the causation and negation morphemes and the ability of the inside element CAUSE to take wide scope over NEG, which is more to the outside. It is clear that the interpretation indicated in (4b) is correct, but one can argue that it is misleading in the way Göksel (1993) presupposes that Turkish causatives are always coercive, which is not true.

(4) *pro* Emine'yi bugün çalış-tır-ma-dı-m
1.SG E.-ACC today work-**CAUSE-NEG**-PAST-1SG
a. 'I didn't make Emine work today' (NEG > CAUSE)
b. 'I made Emine not work today' (CAUSE > NEG)

As mentioned in the introduction, causative morphemes in Turkish are ambiguous between the coercive reading in (5a) and the permissive reading in (5b).

(5) *pro* çocukları sıçra-t-tı-m
1.SG children-ACC jump-CAUSE-PAST-1SG
a. 'I made the children jump'
b. 'I let the children jump'

Although the coercive and permissive forms are not distinguished overtly in Turkish, they are kept semantically distinct. Therefore, one can plausibly assume that the coercive reading is the result of having CAUSE_C in the structure and permissive reading is due to CAUSE_P. The reading in (4a) is derived by having negation take scope over the coercive causation, i.e., NEG > CAUSE_C. In (4b), on the other hand, the scope reading is the result of negation taking scope over the permissive causation, i.e, NEG > CAUSE_P. By virtue of the dual nature of CAUSE_P and CAUSE_C, this latter reading is also equivalent to coercive causation taking scope over negation, i.e., CAUSE_C > NEG, which is what (4b) presents. However, a more accurate reading for (4), and especially (4b), that takes the modal nature of causatives into account would be as follows:

(25) *pro* Emine'yi bugün çalış-tır-ma-dı-m
1.SG E.-ACC today work-**CAUSE-NEG**-PAST-1SG
a. 'I didn't make Emine work today' (NEG > CAUSE_C)
b. 'I didn't let Emine work today' (NEG > CAUSE_P)

Negation takes wide scope over causation in both readings (25a) and (25b), which crucially satisfies the Mirror Principle.

Notes:

* I would like to thank Ed Stabler, Tim Stowell, Anna Szabolcsi, and the audiences at UCLA and UC Berkeley for their comments and suggestions.

[1]The distribution of the causative morphemes *-t- and -DIr-* is phonologically determined: *-t-* appears after vowels and /r/, and *-DIr-* appears elsewhere. There are also some lexicalized forms that need not concern us here.

[2]The truth-functional equivalence of the sentences with duals, such as (9a) and (9b), means that they are capable of describing the same type of situation. It does not mean that the two sentences are interchangeable. Quite often, there are some subtle differences between the sentences such that speakers would prefer one or the other based on discourse considerations.

[3]The causative component CAUSE must be taking the quantificational/modal component FP as its complement since it takes scope over the FP. Note that *let* P means 'cause some causally possible world to be such that P holds in that world', rather than 'in some causally possible world, cause P holds'. In order to 'cause some causally possible world to be such that P holds in that world', one must

actually be engaged in the causing event, just as one must be engaged in the letting event in order to 'let go P'. By contrast, when the modality takes scope over the causation, as in 'in some causally possible world, cause P', the act of causation itself is merely a possibility and may not have taken place.

References:

Baker, Mark. 1985. The Mirror Principle and Morphosyntactic Explanation. *Linguistic Inquiry* 16, 373-415.

Dowty, David. 1979. *Word Meaning and Montegue Grammar*. Reidel. Dordrecht.

Göksel, Aslı. 1993. *Levels of Representation and Argument Structure in Turkish*. Doctoral dissertation, School of Oriental and African Studies, University of London.

Kural, Murat. 1996. *Verb Incorporation and Elementary Predicates*. Doctoral dissertation. University of California, Los Angeles.

Focus and Judgment Type in San Lucas Quiaviní Zapotec*

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Overview

San Lucas Quiaviní Zapotec (SLQZ), an Otomanguean language spoken in Oaxaca, Mexico, allows a choice between two aspects to express future events: the IRREALIS and the DEFINITE. Use of the Definite aspect (2) implies stronger speaker belief that an event will take place than use of the Irrealis (1); the emphatic reading given to Definite-marked verbs (expressed in the gloss in (2)) accounts for why this has been called the Definite aspect: [1]

(1) **I**-to'oh Gyeihlly ca'rr
irr-sell Mike car
'Mike will sell the car

(2) **S**-to'oh Gyeihlly ca'rr
def-sell Mike car
'Mike will (definitely) sell the car'

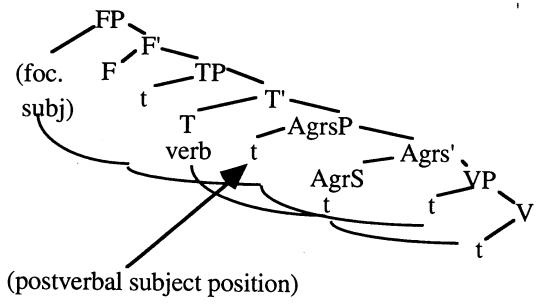
SLQZ is a VSO language that also allows SVO word order. Subject fronting results in a contrastive focus reading of the subject. SVO word order is freely allowed in sentences with Irrealis verbs (3) but disallowed in sentences with Definite verbs (4):

(3) Gyeihlly **i**-ta'z Lieeb
Mike **irr**-hit Felipe
'MIKE will hit Felipe'

(4) *Gyeihlly **s**-ta'z Lieeb
Mike **def**-hit Felipe
'Mike will definitely hit Felipe'

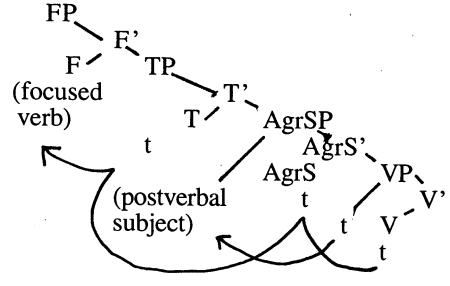
In this paper, I will propose that the differing word order constraints are due to a difference in speaker perception expressed by the two aspects. Sentences with preverbal, focused subjects are used to express a speaker's judgment that the subject is particularly salient in the discourse. Thus, such sentences represent CATEGORICAL judgments. In contrast, the emphatic future readings denoted by Definite verbs express a speaker's judgment that the existence of the event itself, rather than its participants, is especially salient. Thus, sentences with Definite aspect are used to express THETIC judgments. These notions will be explicitly defined below.

This different perceptual judgments expressed by sentences with focused subjects on one hand and Definite verbs on the other are reflected in the syntax of SLQZ in the following way: Irrealis verbs, which allow constituents to raise to the preverbal focus position, remain in the head of TP, as seen in the tree below:



Focused (preverbal) subjects. (Irrelevant projections omitted)

Definite verbs, which assert the existence of an eventuality (and thus represent focus of the predicate) raise to the head of the pre-IP/TP Focus projection. Since thetic judgments are predicated on eventualities rather than individuals, subjects of these constructions are blocked from raising to preverbal Focus or Topic positions:



Focused verb (=Definite aspect construction)

This paper will be structured as follows: First, I will provide an explicit definition of categorical and thetic judgments, as well as some background on how these notions have been previously applied to linguistic theory. Next, I will provide some background on the uses of syntactic focus in SLQZ. I will then draw a correlation between argument focus and categorical judgments on one hand, and verbal focus and thetic judgments on the other. Finally, I will show that these correlations are reinforced by the contrasting interpretation of indefinites in sentences whose verbs are marked with Irrealis and Definite aspect.

Thetic and Categorical Judgments in Syntactic Structure

In his 1972 paper, Kuroda, updating ideas first proposed by Franz Brentano in the nineteenth century, proposes the distinction between thetic and categorical judgments as a means of articulating differences in perception of events that cannot be described in terms of differences in logical interpretation. He gives as an example the difference in speaker perception expressed by active sentences such as *The Greeks defeated the Persians* versus that of their passive counterparts (e.g. *The*

Persians were defeated by the Greeks.) : While both sentences share the same argument structure, the former sentence (potentially) draws attention to the agent, the latter does not.

Kuroda divides such differences in perceptual judgment into two basic types: categorical judgments (in which speaker attention is drawn first to a particular entity in the sentence, then to whether or not the predicate holds true of this entity) and thetic judgments (in which speaker attention is focused on the event itself, rather than on its participants).

These different perceptual judgment types also differ in how they are constructed. Categorical judgments are constructed in two separate stages: first, the recognition of an entity that is to be the subject of predication, and second, affirmation or denial of what the predicate says about this subject. Thus, these have also been called DOUBLE JUDGMENTS.

In contrast, thetic judgments are constructed in a single stage: what Kuroda calls 'the recognition or rejection of material of a judgment'. Thus, thetic judgments have also been called SINGLE JUDGMENTS .

Kuroda further argues that this distinction in perceptual judgment type is reflected in the syntax of Japanese. He notes a contrast in meaning between simple sentences whose subjects are marked with the topic marker *wa* (5) versus those whose subjects are marked with *ga* (6):

(5) Inu **wa** hasitte iru
'The dog is running' (categorical) (Kuroda 1972)

(6) Inu **ga** hasitte iru
'A/the dog is running' (thetic) (Kuroda 1972)

By using the topic marker *wa*, the speaker expresses the idea that the dog (which must be a specific dog already entered into the discourse) is the most salient part of the sentence. Thus, Japanese sentences with *wa*-marked arguments represent categorical judgments. In contrast, (6) would be used if a speaker were to see a dog (not necessarily a dog previously known to her) and remark 'a dog is running' (or 'the dog/Fido is running') This thetic reading expresses the idea that the existence of an event that happens to involve a dog, not the dog itself, is particularly salient.

It should be made clear, however, that the notion of subject of a categorical judgment is distinct from that of a syntactic subject, even though subjects of categorical judgments are often syntactic subjects as well, as seen in (5). Kuroda notes that Japanese sentences may appear with *wa*-marked objects, in which case the syntactic object is the subject of a categorical judgment. In such sentences, the object is foregrounded in the discourse, much like raised objects in English passive constructions.

Also, I have deliberately described thetic and categorical judgments as perceptual judgments in order to disambiguate them from the notion of grammaticality judgments. Unless otherwise noted, I will use 'judgment' in this paper to refer to perceptual judgments of the kind described in this section.

Syntactic Focus in SLQZ

Before describing how thetic and categorical judgments are reflected in the syntax of SLQZ, I will briefly describe the operation and usage of syntactic focus in

SLQZ. Focused constituents in SLQZ appear in a preverbal focus position, and generally receive contrastive focus readings:

(7) Zhini' b-ta'z Gyeihlly Lieeb?
why perf-hit Mike Felipe
'Why did Mike hit Felipe?'

(8) Zhini' **Gyeihlly** b-ta'z Lieeb?
why **Mike** perf-hit Felipe
'Why did MIKE hit Felipe?'

I will assume (in the spirit of Rizzi 1995) that the focus features are checked when a focused constituent raises into FocusP, a functional projection above IP/TP.

The focus projection also serves as the landing spot for wh-words in SLQZ. (Wh-movement is obligatory in SLQZ.) This is supported by the fact that wh-questions, with the exception of those with *zhini'* 'why', disallow other focused constituents. This pattern has been noted in other languages in which focus is realized by overt syntactic movement (such as Hungarian (Horvath 1986)).

Answers to argument wh-questions also appear in the focus projection. The answers to both the subject and object argument wh-questions in (9) and (10), for example, are obligatorily preverbal:

(9)
Q. Tu b-dauhw comieed?
who perf-eat food?
'Who ate the food?'

A1. (La:a:a') **Gyeihlly** (b-dauhw comieed)
focus **Mike** (perf-eat food)
'Mike did'

A2. #B-dauhw **Gyeihlly** comieed
perf-eat **Mike** food
'Mike ate the food.'

(10)
Q. Xi i- to'oh Gyeihlly?
what irr-sell Mike
'What will Mike sell?'

A. **X:-ca'rr Gyeihlly** i-to'oh Gyeihlly
poss-car Mike irr-sell Mike
'Mike will sell his car'

While the second answer to (9), with a postverbal subject, is a grammatical sentence in SLQZ, it is not an appropriate answer to the question 'Who ate the food?' Felicitious answers must appear in the preverbal focus projection.

In contrast, subjects of event wh-questions cannot raise to focus:

(11)
Q. Xi b-e:e:i'ny Gyeihlly?
what perf-do Mike?
'What did Mike do?

A1. B-zhu:u:u'nny **Gyeihlly** loh Lieeb
perf-run **Mike** from Felipe
'Mike ditched Felipe'

A2. **#Gyeihlly** b-zhu:u:u'nny loh Lieeb
Mike perf-run from Lieeb
'Mike ditched Felipe'

In questions such as (11), in which a whole event, rather than a participant in the event, is being questioned, neither the subject nor object may be fronted; rather, the answer must assume canonical VSO form.

Correlations Between Syntactic Focus and Thetic/Categorical Judgments

The contrasting word orders of argument wh-question answers and event wh-question answers can now be correlated with the distinction between thetic and categorical judgments outlined earlier. First, consider the case of argument wh-questions. In these questions, the speaker makes two judgments: one, that an event occurred, and two, that he/she presupposes the existence of a specific participant in the event and wants more information about it. I will thus assume the following:

- Answers to argument wh-questions represent categorical judgments

Focused arguments in SLQZ (such as answers to argument wh-questions) can thus be construed as subjects of categorical judgments .

This raises the question, however, of reconciling the definitions of contrastively focused constituents and subjects of categorical judgments. While subjects of categorical judgments are by definition presupposed entities (thus 'old' information to the speaker), focused constituents are standardly assumed to be new elements in the discourse. How can a focused constituent be 'new' and 'old' information simultaneously?

The answer comes from some formal definitions of contrastive focus (Rooth 1992) and answers to wh-questions (Brennan 1995, Groenendijk and Stokhof 1984, Lee 1994): Contrastively focused arguments and answers to typical (non-rhetorical) argument wh-questions come from sets of presupposed entities. The 'new' information is the exact choice from among that set that makes a proposition true.

As previously noted, answers to event wh-questions such as (11) can only appear in standard VSO form; none of the arguments may be focused. In these cases, the speaker asking the question makes only one judgment: something happened, and he/she wants more information about it. I will thus propose the following:

- Answers to event wh-questions represent thetic judgments

Thus, this section has outlined further semantic correlations between focused arguments and categorical judgments. In the next section, I will show further evidence that focused arguments are subjects of categorical judgments.

Uses of *bu:unny*: Another Correlation Between Argument Focus and Categorical Judgments

Further evidence for a correlation between argument focus and categorical judgments (and postverbal subjects and potentially thetic judgments) comes from the interpretation of the SLQZ noun *bu:unny* 'person/one', as a preverbal and postverbal subject.

Bu:unny has a number of uses in SLQZ. It is often used as a generic term for 'people/person', in which case it appears preverbally:

(12) **Bu:unny** g-auw buhdy, burr g-auw gyiihzh
person irr-eat chicken donkey irr-eat grass
'People/a person will eat chicken, donkeys will eat grass'

It is also used as an impersonal subject, in which case it appears postverbally:

(13) R-u:ally **bu:unny** liebr ira'ta zhih tyenn g-ahcbe:e'-ru' bu:unny
hab-read **person** book every day because irr-learn-more person
'One reads books every day in order to learn more'

My consultant also uses sentences with *bu:unny* subjects to translate English passives, since SLQZ does not have an English-type passive construction. In these cases, *bu:unny* must appear postverbally as well:

(14) R-auhw **bu:unny** buhdy
hab-eat **person** chicken
'Chickens are eaten'

Sentences with preverbal *bu:unny* (such as (12)) can only be interpreted as generic statements about people. This is consistent with Kuroda's characterization of generic statements as categorical judgments. Conversely, the postverbal uses of *bu:unny* (impersonal subjects and dummy subjects of passive translations) consistently represent expressions of thetic judgments: in both cases, the eventuality itself (e.g., the reading of books or eating of chickens) is what is salient, rather than any particular participant in the event.

I will note in passing, however, that while preverbal subjects always represent categorical judgments, not all postverbal subjects represent thetic judgments. In SLQZ, as in English, identical (unmarked) forms can be used to express both judgment types. For instance, the English sentence *The dog is running* can be interpreted as expressing either a categorical judgment (as in (5)) or a thetic judgment (as in (6)).

Thus far, then, I have established the following points: First, categorical judgments emphasize a participant in an event and its relation to the predicate. Second, contrastive focus of arguments in SLQZ is realized by movement to a preverbal position. Third, since contrastively focused arguments are marked as particularly salient information, they represent subjects of categorical judgments.

The Definite Aspect and Thetic Readings

Now I return to the Definite aspect and the proposal that it obligatorily represents thetic judgments, and thus disallows preverbal subjects. While a correlation between thetic judgments and postverbal subjects has been noted cross-linguistically (German (Fintel 1993), Spanish (Mejías-Vicandi 1993, Moore 1996)), most of these accounts have posited syntactic subjects in sentences expressing thetic

judgments as occupying lower positions than subjects in sentences expressing categorical judgments. SLQZ differs from these languages in that theticity in sentences with Definite verbs is expressed by raising of the verb, rather than lowering of the subject.

Evidence for the obligatory raising of SLQZ verbs with Definite aspect comes from the fact that they disallow not only preverbal subjects, but other focused elements as well:

(15) Laa:a' izhih **i**-to'oh Gyeihlly ca'rr?
quest tomorrow **irr**-sell Mike car
'Will Mike sell the car TOMORROW?'

(16) *Laa:a' izhih **s**-to'oh Gyeihlly ca'rr?
quest tomorrow **def**-sell Mike car
'Will Mike sell the car TOMORROW?'

This suggests that Definite verbs themselves necessarily raise to higher positions than do verbs with other aspect markers. I thus claim that verbs with Definite aspect raise to Focus. This will account for both their incompatibility with other focused elements and their emphatic future readings.

The emphatic future readings of sentences with Definite-marked verbs are derived in the following way: Following Rooth 1992, I assume focus serves to contrast the focused element from a set of other candidates. Thus, the element checked in the focus projection makes a proposition true, while other elements from the set of possible candidates do not.

When a Definite verb (and its lexical and inflectional features) raises to the focus projection, ALL of its features are contrasted against those of other candidates. Thus, the proposition expressed by the sentence could only be true if all of the verb's features are true. For instance, the proposition expressed in (2) (repeated below) is only true if there is a selling event involving a car and Mike, and this event takes place in the future:

(2) S-to'oh Gyeihlly ca'rr
def-sell Mike car
'Mike will (definitely) sell the car'

Thus, of all the possible events that could happen in the world perceived by the speaker, the only one that MUST happen is the event of Mike selling the car sometime in the future.

In the case of verbal focus, it is not the participants in the event depicted by the verb that are perceived as particularly salient, but the event itself. Thus, sentences with Definite verbs express thetic judgments. The focus on the predicate draws attention to the predicate–and thus, the event it expresses–rather than to the subject or object of the sentence.

Further evidence for the raising of Definite-marked verbs to focus comes from the fact that contrastively focused verbs in other aspects disallow preverbal subjects as well:

(17) B-i:lldy **Gyeihlly** cïity n-gyi'a:a-dya' Gyeihlly
perf-sing **Mike** neg subj-dance-neg Mike
'Mike SANG, not danced'

(18) ***Gyeihlly** b-i:lldy cïity n-gyi'a:a-dya' Gyeihlly
Mike perf-sing neg subj-dance-neg Mike
'Mike SANG, not danced'

This confirms the hypothesis that verbal focus, like argument focus, involves movement to a higher (preverbal) projection. This also reinforces the correlation between verbal focus and the ungrammaticality of preverbal subjects.

This raises the question of why verbs in aspects other than the Definite receive contrastive focus, rather than emphatic, readings when raised to the focus projection. A possible hint at a solution comes from the following English examples:

(19) Mike will SING (not dance)
(20) Mike DOES sing

(19), with focal stress on the verb, gives a contrastive focus reading akin to that in (17). (20), with the auxiliary given focal stress, gives the emphatic reading. The crucial difference between these is that in (19), the verb itself is given contrastive focus, while in (20), only the tense and agreement features associated with the verb are given contrastive focus.

When the verb alone is focused, as in (19), the contrast expressed is between the activity denoted by the focused verb and other possible activities. Focusing of the tense and agreement features of the verb, however, forces the entire event to be focused, since the syntactic subject (via agreement) and temporal matrix of the verb are raised into the focus projection (at LF in English). Thus, it is not simply the activity denoted by the verb that is being focused, but the entire event denoted by the sentence.

While English allows tense and agreement features to appear separately from verbs (by means of auxiliaries), SLQZ does not have this option. Thus, while English contrastive focus can overtly distinguish the two types of verbal focus in (19) and (20), SLQZ focus movement cannot, since verbs obligatorily carry aspect marking (which also encodes tense features.)

A possibility I will consider is this: Focus features are generated on heads or XPs, and checked by movement into the Focus projection. When verbs are given contrastive focus interpretations, as in (19), focus features are generated on V. When an emphatic reading results (as in SLQZ sentences with Definite verbs), the focus feature is generated in the Tense/Aspect projections. Definite verbs, which incorporate with Tense and Aspect, are thus forced to raise to the Focus projection as well.

This section, then, can be summarized as follows: First, verbal focus in SLQZ expresses speaker emphasis on the event being described, rather than its participants. This is consistent with the definition of thetic judgments, which reflect a speaker's attention toward an eventuality, rather than a participant in an event. Thus, sentences with verbal focus in SLQZ reflects thetic judgments.

More Evidence: The Interpretation of Indefinites

Another feature of constructions expressing thetic judgments, frequently noted in recent literature (Ladusaw 1994, Fintel 1994, Kennelly 1996), is their association with indefinite and weakly quantified subjects. In this section, I will

show that the possible interpretations of indefinite noun subjects in SLQZ clauses with Definite verbs further supports the correlation established between Definite aspect and thetic judgments.

Sentences with Definite aspect disallow specific indefinite readings of bare nouns. This is consistent with Ladusaw's (1994) assertion that weak (non-presupposed) readings of indefinites result from 'existential closure due to the thetic mode of judgment':

(19) Ira'ta' bu:unny ri: jweer nah pehr baall gyaab nnihsgyihah
all people go out now but if falls rain
'Everyone is outside now but if it rains

ngaasy **n-u'uh *z-u'uh** bu:unny la:a'ny yu'uh
later **neut-exist/(*def-exist)** people in house
later there will be people in the house'

In (19), the people that will be in the house are necessarily coreferential with the people outside, and the sentence in ungrammatical with Definite aspect on the verb *ru' uh* 'exist'.

The Definite form of 'exist' *zu'uh* , however, is allowable in contexts in which the bare noun does not refer to some presupposed entity:

(20) Naahsy ciity tu n-u'uh la:a'ny yu'uh ngaisy **z-u'uh**
now neg who neut-exist in house later **def-exist**
'There's nobody in the house now, but later there will be

bu:unny la:a'ny yu'uh
people in house
people in the house'

Bare nouns can occur as subjects of future clauses with either Irrealis or Definite aspect in neutral contexts. In the following cases, for example, no set of people is assumed to exist or not exist:

(21) **Ch**-igueiny bu:unny bisitaar Sann Luu'c loh beraann
irr-go.to.do person visit San Lucas to summer
'People will visit San Lucas next summer'

(22) **Z**-igueiny bu:unny bisitaar Sann Luu'c loh beraann
def-go.to.do person visit San Lucas to summer
'People will visit San Lucas next summer'

In contexts in which the bare noun (*bu:unny*) can only be interpreted as an indefinite group of people, however, only Definite aspect may be used. This is seen in the contrast between grammatical (23) and ungrammatical (24):

(23) Teebag tu ny-a-dya' wduhbiihahz pehr loh beraann
neg who subj-come-neg last.year but to summer
Nobody came last year, but this summer,

re:e' **z**-igueiny bu:unny bisitaar Sann Luu'c
this **def**-go.to.do person visit San Lucas'
people will visit San Lucas'

(24) *Teebag tu ny-a-dya' uuduhbi:ahz pehr loh beraann re:e'
neg who subj-come-neg last.year but to summer this
'Nobody came last year, but this summer, people

ch-igueiny bu:unny bisitaar Sann Luu'c
irr-go.to.do person visit San Lucas
will visit San Lucas'

Conversely, coreferenced bare noun subjects may not appear with Definite verbs. (This is consistent with Kennelly's (1996) proposal that nonspecificity in Turkish is a reflection of thetic judgments):

(25) N-u'uh ra bu:unny Ba'c
neut-exist plural person Tlacolula
'There are people in Tlacolula now'

(26) Loh beraann re:e' **ch**iguiny ra bu:unny bisitaar Sann Luu'c
to summer this **irr**-go.to.do plural person visit San Lucas
'This summer, the people will visit San Lucas'

(27) # Loh beraann re:e' **z**iguiny ra bu:unny bisitaar Sann Luu'c
to summer this **def**-do plural person visit San Lucas
'This summer, people will visit San Lucas'

The fact that Definite-marked verbs disallow specific indefinite or corefenced readings of bare nouns is consistent with Ladusaw's and Kennelly's assertion that thetic judgments assign existential readings to their subjects, and thus are incompatible with specific indefinites. The incompatibility of Definite-marked verbs with specific indefinites, then, further supports the claim that Definite-marked verbs express thetic judgments.

Summary

In this paper, I have accounted for the incompatibility of preverbal subjects with Definite-marked verbs in SLQZ in the following way: First, I showed that preverbal subjects in SLQZ are focused, and represent subjects of categorical judgments. Second, I showed that verbs with Definite aspect raise to Focus themselves, which accounts for their emphatic readings and incompatibility with preverbal subjects. Finally, I showed that sentences with matrix verbs in Definite aspect necessarily express thetic judgments, and verbal focus provides another mechanism for deriving thetic judgments in grammar: by focusing the predicate, attention is drawn to the predicate, and the event it describes, rather than to the subject.

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[1] SLQZ aspect markers often have more than allomorph: Irrealis aspect can be marked by *i-*, *ch-*, *l-*,or *gu-* prefixes; Definite aspect appears as either *z-* or *s-*. SLQZ, like other Zapotecan languages, overtly reflects aspect, rather than tense, in its verbal morphology (although certain aspect markers also encode tense features).

References

Brennan, Virginia. 1995. Questions in Discourse. Proceedings of West Coast Conference on Formal Linguistics XIV. Stanford: CSLI.

Chomsky, Noam. 1992. A Minimalist Program for Syntactic Theory. Cambridge: MIT Occasional Papers in Linguistics, I.

Fintel, Kai. 1993. Theticity in Generative Grammar. Ms.,University of Massachusetts at Amherst.

Groenendijk, J., and Stokhof, M.1984. The Partitioning of Logical Space. Doctoral dissertation.

Kayne, Richard. 1994. The Antisymmetry of Syntax. Cambridge: MIT Press

Kennelly, Brenda. 1996. Nonspecificity = Theticity: An Instantiation of Presentational Focus To appear in Proceedings of Student Conference in Linguistics 8. Cambridge: MIT Working Papers in Linguistics.

Kuroda, S.Y. 1972. The Categorical and Thetic Judgment: Evidence from Japanese Syntax. Foundations of Language.

Ladusaw, William. 1994. Thetic and Categorical, Stage and Individual, Weak and Strong. In Mandy Harvey and Lynn Santelmann, eds., Proceedings from Semantics and Linguistic Theory 4. Ithaca NY: Cornell University, Department. of Modern Languages and Literatures.

Lee, Felicia. 1994. Negative Polarity Licensing in Wh-Questions: The Case for Two Licensers Paper presented at the 69th Annual Meeting of the LSA, New Orleans.

Mejías-Vicandi, Errapel. 1993. Syntax, Discourse, and Acts of Mind: A Study of the Indicative/Subjunctive Contrast in Spanish.. UC-San Diego: Doctoral dissertation.

Moore, John. 1996. Judgment Types and the Structure of Causatives. To appear in Proceedings of WECOL 96

Munro, Pamela, and Felipe Lopez (with Rodrigo Garcia and Olivia Méndez)> 1996. Dicsyonaary X:te:e'n Di:i'zh Sah Sann Luu'c. San Lucas Quiaviní Zapotec Dictionary. Diccionario Zapoteco de San Lucas Quiaviní. Ms., UCLA

Rizzi, Luigi. 1995. The Fine Structure of the Left Periphery. Ms., University of Geneva.

Rooth, Mats. 1992. A Theory of Focus Interpretation. Natural Language Semantics, Vol. 1, no.1.

Definiteness Effects and Perfect HAVE*

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Benveniste (1971) surveys a striking overlap in the distribution of HAVE and BE in the world's languages, and suggests that the former may be a derived form of the latter. In this spirit, Freeze (1992) gives a syntactic account which unifies existential BE and possessive HAVE, and Kayne (1993) extends (a modified version of) this account to auxiliary uses of HAVE and BE. However, Freeze's analysis of existential and possessive HAVE/BE link relies crucially on the presence of definiteness effects (DE; Milsark 1974 *inter alia*), or the invariant presence of an indefinite object NP, for both constructions, while Kayne's analysis of auxiliary HAVE/BE makes no mention of them. Since it has been argued (Vincent 1983) that the periphrastic Perfect results from a historical reanalysis of main verb HAVE + adjectival passive, one would expect that auxiliary HAVE would also show DE. Thus, while Kayne represents a valuable addition to a promising line of research, the account will be strengthened if it can be shown that DE are relevant to auxiliary uses of HAVE /BE. I will provide additional data from the English Perfect which suggests that DE do affect its use. Thus, by filling in a problematic gap in the distributional HAVE/BE paradigm, this paper lends additional support to the Benveniste-Freeze-Kayne view.

In section 1, I give a brief survey of cross-linguistic facts in support of a HAVE/BE connection, and a sketch of some accounts of these facts. Section 2 is a discussion of DE in general, and in particular their role in the existential/possessive paradigm. In section 3, I show that DE are also present in the Perfect, and therefore, that auxiliary HAVE is consistent with main verb HAVE and existential BE in this respect.

1.0 THE HAVE/BE PARADIGM: SYNCHRONIC EVIDENCE

As auxiliary verbs, HAVE and BE show several patterns of alternation: in Germanic languages, each combines with the past participle to form a unique meaning:

(1) a. HAVE+past participle = Perfect (-en...)
b. BE+past participle = passive (-en...)

In French, both HAVE and BE are used in forming the Perfect, which the selection depending upon the type of verb:

(2) a. j'**ai** mangé ... HAVE (unergative)
b. je **suis** venue... BE (unaccusative)

As main verbs, HAVE and BE are both associated with existential sentences: while standard English uses BE in existentials, main verb HAVE is used by languages such as French and the French-influenced creole spoken in Trinidad:

(3) a. There **is** more than one kind of tea in China.
b. It **have** more than one kind of tea in China. (Trinidadian)

Possessives are also formed with both verbs:

(4) a. I **had** a book.

b. *u menya **byla** kniga*
by me was a book
'I had a book' (Russian)

1.1 DIACHRONIC EVIDENCE

Vincent (1983) traces the origin of the Romance periphrastic Perfect from Latin synthetic Perfect to the reanalysis of main-verb HAVE in environments like (4), in which main verb HAVE occurs with a small clause including an adjectival passive:

(5) *in ea provincia pecunias magnas collocatas habent*
in that province capital great invested they-have
'They have great capital invested in that province'
(Latin; Cicero, in Vincent 1983)

Over time, sentences such as (5) came to allow a second interpretation, "They have invested great capital in that province," in which the previously secondary predicate *invested* is the main verb.

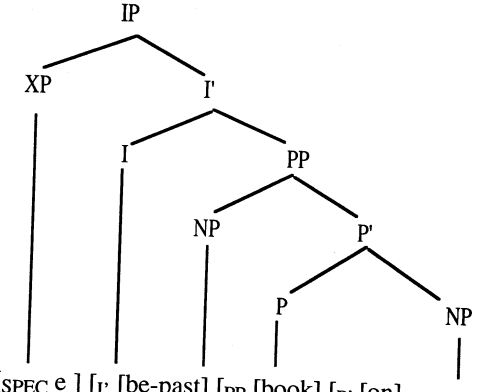
1.2 P-INCORPORATION: FREEZE AND KAYNE

Both Freeze (1992) and Kayne (1993) have proposed syntactic accounts which treat HAVE as a form of BE which is derived via the incorporation of a non-overt head. Freeze deals only with the non-auxiliary uses of HAVE/BE. His account unites existentials and possessives as instantiations of a more general locative construction. In a number of languages, here exemplified by Russian, existential sentences and locative predicates differ only in constituent order: when the theme *book* precedes the verb, the construction is locative (6a); when the theme follows the verb, the construction is existential (6b).

(6) a. *kniga byla na stole*
book NOM.FEM. was on table LOC.
'The book was on the table'

b. *na stole byla kniga*
on table LOC. was book NOM.FEM.
'There was a book on the table' (Russian)

Freeze assigns these sentences the following underlying structure:



(7) [IP [SPEC e] [I' [be-past] [PP [book] [P' [on] [table]]]]]

THEME (± definite)

LOCATION

The difference between (6a) and (6b) comes down to the movement alternatives available to the two arguments: if the NP in Spec, PP (the theme *book*) is definite, it moves to Spec, IP (as in 6a); if not, it stays in place and (optionally) the P' node moves to subject position (as in 6b), forming the existential. In other cases, such as English, the option of P' movement is more restricted— hence the constituent order: expletive BE NP PP.

Freeze analyzes both types of possessive constructions as locatives.[1] Therefore, they share with (6a) and (6b) the structure in (7). The derivation of BE-type possessives is obvious: a [+human] location moves to Spec, IP. The derivation of HAVE-type possessives requires some further elaboration. In many languages, PPs which are [+human] have a null preposition. Freeze argues that this is the case with languages (like English) which use HAVE-type possessives. He proposes that the HAVE form results from a movement which incorporates this abstract P with I (which, he suggests, takes place because the null P can't case-assign the NP in its Spec: Once the P moves, I may govern into the now-headless PP)[2]. The BE + P compound is spelled out as HAVE.

If Freeze is correct in characterizing existential and possessive constructions as underlyingly locative, we have an explanation for the alternation between HAVE and BE in possessives: HAVE is spellout of BE augmented by a null preposition.

The structure in (8) is Kayne's (1993) underlying possessive:

(8)

$[_{IP}\ e\ [I'_{D'}\ BE\ [_{DP}\ e\ [_{D'}\ [D/P^0][_{AgrP}\ [_{DPposs}\ LOCATION]\ [_{Agr'}\ Agr^0\ [_{NP}\ THEME]]]]]]]]$

Here, the DPposs moves to Spec, IP because neither Spec, AgrP (where it is base-generated) nor Spec, DP (through which it moves) is a Case position. However, without incorporation, the intermediate trace in Spec, D/P will be in an A' position. Once P is incorporated, it is an A position, and the movement will be licit. Having adopted essentially the same analysis as Freeze for possessives, Kayne goes deeper into the HAVE/BE paradigm: in keeping with Vincent's reanalysis proposal, Kayne

argues that auxiliary HAVE is essentially the same as (8), except that the complement of BE is a VP. In the case of the auxiliary, however, it is the (VP-internal) subject which must move though Spec, DP to Spec, IP, thereby motivating the incorporation of P with D/P.

Though Kayne builds on Freeze's locative paradigm in order to relate auxiliary and possessive HAVE, his analysis does not make crucial reference to the definiteness of the THEME argument[3]. So while he extends the coverage of the incorporation account in a way that is clearly attractive, he loses the definiteness effect which so clearly links existentials and possessives.

Clearly, a unified account of the distribution of HAVE and BE would be enhanced if DE could be shown to extend to auxiliary HAVE. Unfortunately, there appears to be no restriction against indefinite object NPs occurring with auxiliary HAVE:

(9) Mary has solved a/the problem.

2.0 DEFINITENESS EFFECTS IN EXISTENTIAL SENTENCES

In the existential BE environment, the seminal account of DE drives from Milsark (1974, 1977). Milsark defines a quantificational class of 'weak' determiners which can occur in the object of *there is* sentences (10a), and a nonquantificational or 'strong' class, including the indefinite article, which cannot (10b):

(10) a. There is a man in the other room
There are a few men in the other room
many men...
some men...
five men...

b. *There is the man in the other room
every man...
each man ...
many of the men...
some of the men...

Milsark offers the following account of the ungrammaticality of the predicates in (10b): in keeping with its presentational meaning, *there is* contains a covert existential quantifier which needs a set to quantify over. The quantificational class of NP is ruled out because it does not supply an unbound variable: the object NP cannot be quantified by both the covert EQ and a strong determiner.

Milsark further observes that there is a class of predicates which cannot occur as secondary predicates with existentials:

(11) a. There is a man sick in the other room.
naked
drunk
dying

b. *There is a man intelligent in the other room.
green
blond
Canadian

He observes that the predicates which are permitted in this construction are those which "seem to denote *states*, conditions in which an entity finds itself and which are subject to change without there being any essential alternation of the entity," while the class disallowed in these small clauses "denote what might be called *properties* of the entities of which they are predicated" (p.12). He then accounts for the restriction on existential small clause predicates with a general principle: weak NPs cannot be the subjects of predicates denoting properties. The restriction against properties as secondary predicates follows from the fact that *there is* requires a weak determiner in its object position. (Since Milsark, the standard terminology for this distinction has been that of Carlson 1977: *Stage-level* (stages) vs. *Individual-level* (properties). For reasons of clarity, these terms will be used below.) Note that, in terms of Freeze's locative paradigm, possessives and existentials are both underlyingly instances of BE + indefinite THEME + LOCATION. Therefore, a Freezian interpretation would pinpoint not *there is* but rather existential BE (and therefore possessive HAVE) as the source of DE.

2.1 PRAGMATIC DEFINITENESS

The definiteness of DE should not be confused with morphological definiteness. As has often been noted, it is quite possible to have a morphologically definite object of an existential:

(12) a. There were the same people at both conferences.
b. There was the usual crowd at the beach.
c. There was the stupidest article on the reading list. (Prince 1992)

Corpus-based studies of English existentials (Prince 1992, Ward and Birner 1995) have examined the DE phenomenon in existential sentences more closely. It turns out that the occurrences of strong determiners are quite restricted, for the most part falling into one of two types: *reminders* (13a) and *list-type* NPs which newly instantiate a variable in a proposition already in the discourse[4] (13b).

(13) a. A: I guess we've called everybody.
B: No, there's still Mary and John. (WB 1995)

b. A: Who was at the party last night?
B: There was John, Mary, Fred, Susan, Xavier, and Ethel. (WB 1995)

Therefore, rather than a morpho-syntactic constraint, DE should be thought of as a requirement that the object introduce a new discourse entity. If we think of discourse entities as potential variables, this view is entirely consistent with Milsark's analysis.

2.2 MAIN VERB HAVE

Szabolcsi (1986) and Iatridou (1996) discuss DE with main verb HAVE. In its strictly possessive sense, main verb HAVE requires an indefinite NP as its complement. Where the reference is definite, possession cannot be indicated with HAVE:

(14) a. That's a nice car. Do you own/*have it?
b. Do you see all the antiques in this room? I own/*have most of them.
(Iatridou 1996)

Iatridou also discusses cases of main verb HAVE with small clause complements. It turns out that, in such cases, the predicate must be Stage-level:

(15) a. *echo to pedhi mu arosto/ *kondo*
I have the child my sick / *short

b. *echo tin valitsa mu sto aftokinito / *prasini*
I have the suitcase my in the car / *green
(Modern Greek; Iatridou 1996)

Of course, it is also possible for a definite NP to follow main verb HAVE:

(16) I have the car.

This use of HAVE, however, forces what Iatridou calls a "custodial" interpretation; in either Greek or English, (15a-b) and (16) denote only temporary possession.

To account for this, Iatridou invokes Kratzer (1989). Kratzer argues that there is a spatio-temporal argument (e) available with Stage-level predicates, and that this argument can satisfy a requirement on quantification which is at other times satisfied by indefinites. Conditional *when* clauses are said to contain *always*, an adverb of quantification, and therefore also must contain some sort of variable. Kratzer offers the following evidence that S-L predicates can contribute the necessary variable:

(17) a. *When Mary knows French, she knows it well.
b. When Mary speaks French, she speaks it well.
c. When Mary knows a language, she knows it well. (Kratzer 1989)

(17a) contains neither a S-L predicate nor an indefinite NP. As (17b-c) demonstrate, either one or the other will repair the sentence. Again, this is consistent with an approach which treats DE as a discourse constraint: S-L predicates, not being inherent properties, evoke events, and events are potential discourse entities. So Modern Greek main verb HAVE + NP must have either a nonspecific NP or an event variable in its complement. Custodial HAVE, Iatridou argues, contains an unpronounced event argument which is temporal and/or locative in nature:

(18) *Chthes$_i$ o Kostas$_j$ iche to aftokinito* (e)$_{i/j}$.
yesterday$_i$ Kostas$_j$ had the car TEMP$_i$/LOC$_j$
(Modern Greek; Iatridou 1996)

As in English, only the use of main verb HAVE with an indefinite NP denotes true possession, while the others uses are custodial in nature. Iatridou represents custodial HAVE as in (18): a small clause with an implicit complement. Alternatively, this meaning distinction can be thought of as the difference between a Stage-level HAVE and an Individual-level HAVE; in either case, a variable is present.

3.0 DEFINITENESS EFFECTS AND AUXILIARY HAVE

As was shown in (9), repeated here as (19), the English Perfect does not require an indefinite object:

(19) Mary has solved a/the problem.

However, if those since Milsark who correlate DE with a requirement for a variable (or a new discourse entity) are correct, indefinite NPs are only one way in which the requirement can be satisfied. In fact, the Perfect HAVE does seem to show DE in the other sense posited by Kratzer: Perfect HAVE is incompatible with Individual-level predicates. The verb *run* in (20a) is ambiguous between a Stage-level and an Individual-level reading, (20b) (by itself) does not mean that John has been a runner; rather, it evokes at least one event of running. That is, the simple Present in (19a) can mean something like "John is a runner," but the Perfect in (20b) cannot (by itself) mean "John has been a runner."

(20) a. John runs.
b. John has run.

Likewise, an adjective in the Perfect must be Stage-level. This is most readily apparent with a predicate which by itself is ambiguous between Stage-level and Individual-level:

(21) a. John is blond.
b. John has been blond.

Hair-color can be thought of as a permanent attribute or a changeable, ultimately temporary attribute (in the sense that one may go to the hairdresser and select a new hair-color). In (21a), *blond* can have either meaning, though the first is more readily available. In (21b), however, the second, Stage-level reading is forced: it can only mean that John has dyed his hair.

3.1 SOME APPARENT COUNTEREXAMPLES:

An Individual-level interpretation of the predicate combined with the Perfect is apparently available with the addition of temporally modifying material:

(22) John has for run for 30 years.

can mean "John has been engaged in a single event of running for 30 years," or (more likely) "John has been a runner for thirty years." However, as we have seen, the second reading is not possible without some added material. This is a general fact: whenever Perfect HAVE is formed with an Individual-level predicate, some sort of additional material must be included:

(23) a. *Mary has been tall.
b. Mary has been tall since she was 12.

(24) a. *Angus has known French.
b. Angus has known French for 10 years.

(25) a. *Felix has disliked going to the dentist.
b. Felix has disliked going to the dentist his entire life.

In all cases, the Individual-level predicate is bad by itself and needs some way of indicating a temporal boundary for the situation depicted. In other words, it seems to be necessary to stipulate that the otherwise Individual-level predicate cannot be assumed to be a permanent state. This is clearly parallel to the situation with main-verb HAVE: additional material such as the *since clause* in (23b) or the temporal PPs in (24b) and (25b) reflect a fix-up process of predicate 'level-switching' akin to the forced custodial interpretation of main-verb HAVE + definite NP. The predicates *tall, know,* and *dislike,* which are ordinarily interpreted as properties, become Stage-level in the sense that there is an implicit change-of-state (or, as in the case of 25b, a potential change-of-state).

3.1 EXISTENTIAL CLOSURE

It remains to be shown why the Perfect must force this switch from Individual-level to Stage-level; that is, why can't an indefinite object NP provide the variable required in the presence of HAVE? One explanation which suggests itself is built on Diesing's (1992) treatment of indefinites. Building upon Milsark's weak/strong distinction, she points out a further contrast between *presupposed* and *cardinal* indefinites. Presuppositional indefinite objects are bound by some (possibly non-overt) adverb of quantification, such as *usually* or *seldom.* These indefinites undergo QR, thereby leaving the VP. When an indefinite fails to be thus quantified, it is "closed off" by existential closure (EC), a fix-up process proposed by Heim (1982), whereby an existential quantifier is inserted to bind the leftover variable. (In terms of the discourse model, this essentially amounts to the introduction of a new discourse entity.) In many cases, there is an ambiguity between a "quantificational" (QR) and an "existential" (EC) interpretation of object indefinites:

(26) a. I usually read a book by Robertson Davies.
b. Usually x (x is a book by Robertson Davies) $\wedge$ I read x
c. Usually t (t is lunch time) $\exists$x (x is a book by R. Davies) $\wedge$ I read x by t
(Diesing 1992 pp. 109-110)

(26a) can have a quantificational interpretation (26b), in which *a book by Robertson Davies* is bound by the adverb *usually,* or an existential reading (26c), in which the adverb quantifies over something other than the indefinite—i.e. an implicit context variable such as *by lunch time*—and the indefinite is closed off by EC. In either case, the variable contributed by the indefinite NP will be inaccessible to the covert existential quantifier of Perfect HAVE.

Diesing shows that EC is not allowed with experiencer verbs such as *detest, like, love,* and *appreciate* :

(27) a. I generally detest an opera by Wagner/*by lunch time.
b. John usually likes a film by Roger Corman/* by lunch time.

(27a-b) can only have the quantificational readings; something like "Whenever I hear an opera by Wagner, I detest it" and "If a film is by Roger Corman, chances are John will like it." Further, because experiencer verbs are Individual-level predicates, they are not associated with Kratzer's e variable. However, since EC is blocked, the indefinite in the complement should be available at some point in the derivation. In this case, HAVE + experiencer verb should show a grammaticality contrast between definite and indefinite complements. Indeed, this seems to be the case: though somewhat odd, (28b) is considerably better than (28c).

(27) a. Felix liked a/the film by Fellini.
b. ?Felix has liked a film by Fellini.
c. *Felix has liked the film by Fellini.

4.0 CONCLUSION

In showing that definiteness effects obtain when HAVE is used to form the Perfect, I have identified a formal property common to all parts of the HAVE/BE paradigm; in doing so, I have provided additional evidence in confirmation of the B-F-K approach. Further, I would like to argue that this is evidence of a particularly useful sort. If the Freeze and Kayne incorporation accounts are to be taken seriously as explanations of the inter- and intra-linguistic distribution of HAVE and BE, the discourse behavior of these verbs must be considered. The synchronic evidence of a link between HAVE and BE concerns questions of semantic function: both verbs are used in possessive and existential sentences. Further, the historical evidence of a connection between main verb HAVE and auxiliary HAVE relies on the notion that a class of sentences can contain a token of HAVE which is ambiguous between a possessive use and a Perfect marker. This means that the conditions for their use must overlap sufficiently to permit such ambiguity and eventual reanalysis. All of this suggests that the paradigm shares at least some properties in terms of their information status. Definiteness effects are an area of grammar where morphology and discourse interact, and so it is not surprising that they represent a common thread in the HAVE/BE paradigm.

Notes

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[1] In support of his claim that possessive sentences are locative, he points out that possessors must agree with a pronoun occurring in a locative adjunct:
i. I have a needle on me.
ii. *I have a needle on you.

[2] Technically speaking, the possessor need not be [+human]:
My car has mud flaps.

[3] For Kayne, it is the abstract D/P which is [+/-definite], not the theme subject; in any case, for the English possessive, his use of DE is involved only in derivationally linking i. John's sister
ii. A sister of John's (cf. *The sister of John's)

[4] The Prince and Ward-Birner approach to DE regards the crucial feature of these complements to be Hearer-newness. An alternative, and one more in keeping with Milsark's semantic account, is that the complement must be Discourse-new (Lipson 1997 *Definiteness effects with possessive HAVE,* unpublished manuscript).

References

BENVENISTE, E. 1971. Problems in general linguistics. Miami: University of Miami Press.

CARLSON, G. 1977. A unified analysis of the English bare plurals. *Linguistics and Philosophy 1* pp. 413-457.

DIESING, M. 1992. Indefinites. Cambridge, Mass.: MIT. Press.

FREEZE, R. 1992. Existentials and other locatives. *Language* 68 pp. 553-595

HEIM, I. 1982. The Semantics of Definite and Indefinite Noun Phrases. Ph.D. dissertation, University of Massachusetts, Amherst.

IATRIDOU, S. 1996. To have and have not: On the deconstruction approach to HAVE. *West Coast Conference on Formal Linguistics* 14.

KAYNE, R. 1993. Toward a modular theory of auxiliary selection. *Studia Linguistica* 47.

KRATZER, A. 1989. Stage-level and Individual-level Predicates. *Papers in Quantification.* pp. 7-62

MILSARK, G. 1974. Existential Sentences in English. Ph.D. dissertation, MIT.

_____. 1977. Toward an Explanation of Certain Peculiarities of the Existential Construction in English. *Linguistic Inquiry* 3 pp. 1-29

PRINCE, E. 1992. The ZPG letter: Subjects, definiteness, and information status. In S. Thompson and W. Mann, eds. Discourse Description: Diverse Analyses of a Fundraising Text. John Benjamins: Amsterdam.

SZABOLSCI, A. 1986. Definiteness Effects and lexical integrity.

VINCENT, N. 1983. The development of the auxiliaries *habere* and *esse* in Romance. In N. Vincent and M. Harris, eds. Studies in the Romance Verb, 71-95. Croom Helm: London

IMAGERY IN MOTION EVENT DESCRIPTIONS: GESTURES AS PART OF THINKING-FOR-SPEAKING IN THREE LANGUAGES[1]

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My approach to language is via the nonverbal as well as the verbal. I start from the premise that language is more than speech; that it is also gesture, and examine the gestures that co-occur with speech. Gestures, although they may seem accidental and peripheral, are components of speaking itself. By studying gestures in conjunction with speech we gain new insights into the nature of language and communication, how we produce speech, and how we use it in thinking. Basically, we discover that language is not purely words, phrases, sentences — it is also imagery: it has a global, instantaneous component that is as defining of language as is the familiar linguistic component.

What Kinds of Gestures Do I Mean?

This can be explained by reference to a continuum of gestures originally described by Adam Kendon (1981):

Kendon's continuum:

speech-synchronized —> linguistically-indexed—> emblems —> sign language gesture

semantic-pragmatic synchrony	gesture offset	rhetorical synchrony	without speech

Gestures are not identical across this continuum. Semiotic type, relationship to language and function all differ. I will focus on one end, gesticulation, and exclude the other types; this is a strategic limitation, valid for the time being. Gesticulations are highly frequent and should be distinguished from the other types of gesture that are rare in the forms of narrative discourse that I examine and require separate treatment in any case because they line up in time with speech in different ways:

- Rhetorical gestures (so-called EMBLEMS, Morris, et al. 1979, of which 'thumbs up' and 'OK' are examples) are temporally decoupled from speech, even spanning speech and silence and speaker turns (Kendon 1995).
- Linguistic indexing (or LANGUAGE-LIKE gestures, such as saying, *it was this big* followed by a gesture) shifts the timing so that the index (*this*) precedes the gesture (rather than coincides with or follows it, as is typical of unwitting gestures; Nobe 1996).

Speech-sychronized gesture is different. The gesture and the co-expressive speech are synchronous. An example of such synchrony is the following:

(1) *he grabs a big [oak tree <u>and</u> **bends it way** <u>back</u>] ...*

right hand rises up and moves to the front, palm turned to face the right; it waits; it moves back and down; it waits again; the gesture ends.

The brackets show when the hand was in motion; the boldface shows the STROKE— the meaningful part of the movement performed with 'effort' or purpose; underlining shows HOLDs— momentary cessations of movement to guarantee synchrony, the hand held in midair prior to and just after the stroke (Kita 1993). The stroke was executed precisely with the semantically co-expressive speech content, 'bends it'.

The prestroke hold is the crucial part of this example. The speaker's hand rose upward and forward during the preparation phase (the left bracket) for no other reason than to position it for the stroke. Yet the hand waited to start this stroke while the discourse marker, the conjunction *and* (meaning here that the following continues what came before), was uttered. Then, with this linkage to the discourse encoded, and only then, the stroke occurred. In other words, the speaker withheld the stroke until it could synchronize with its co-expressive speech. Such close synchrony strongly suggests the existence of a single integrated meaning process that has two components, the linguistic categorial (found in words) and imagery (realized in gesture). (The poststroke hold has a different meaning: that the content of the gesture was still valid during the word *back*, even though the movement of the arm had ceased.)

This example also demonstrates that gestures are not semantic imitations of speech — they are 'co-expressive' rather than redundant. The gesture showed that the speaker visualized the object being bent back as fastened at one end. In speech the verb phrase *bends it way back* could ambiguously describe bending an object held at both ends. The adverb *way* may have as an implicature that the object was fastened at one end; but this is implicature, not direct demonstration, as in the gesture. Speech and gesture typically express different aspects of the same meaning unit and comprise together a more complete meaning unit than either does alone. The gesture stroke went beyond speech to provide an imagistic representation of the event.

Gestures in Motion Event Descriptions.

Using this broader conception of language, I will compare the speech-gesture systems that appear to be engaged when describing motion events (viewed in an animated Tweety & Sylvester cartoon) across three languages—English, Spanish, and Mandarin Chinese. Such a comparison sheds new light on the phenomenon of thinking-for-speaking—thinking generated, as Slobin says, because of the requirements of a linguistic code (Slobin 1987). According to Talmy (1985, 1991), each language has a characteristic way of packaging motion event components, with languages falling into two broad classes: SATELLITE-FRAMED vs. VERB-FRAMED, depending on how the PATH component is packaged. English and Chinese are satellite-framed, meaning that path is coded in a particle or adjunct to the verb, like

down. Spanish is verb-framed in that path information is bundled into the verb itself.

MANNER and how it is presented is a second important difference associated with this typology. In contrast to path, manner in satellite-framed languages is encoded by the main verb. In a verb-framed language, manner is packaged outside the verb and introduced constructionally. Slobin (1996a) has commented on one effect of this typological difference, that novels written originally in English lose as much as half of their manner coloration in Spanish language translations, presumably because including manner is highly marked in Spanish and is accordingly used sparingly (as we will see, English has its own means of achieving somewhat similar effects).

Paths in English and Spanish.

In English, path content in gesture often involves synchrony with path content with satellites. In Spanish, on the other hand, path content is timed with verbs. The following examples illustrate the patterns; first, two English-language examples:

(2) *and Tweety Bird runs and gets a bowling*

b[all and drops ***it down*** *the drainpipe]*

When there are successive path gestures, the strokes line up with path satellites whenever possible (from a different speaker):

(3.1) *[but it* ***rolls]*** *[****him out*** *]*

(.2) *[****down****]*

(.3) *[the* ***rain****spout]*

(.4) *[****out*** *into the sidewalk]*

(.5) *[****in****to a bowling] alley*

Each gesture, semantically co-expressive with the path segment it accompanied, conveyed a different step in a complex trajectory that Sylvester followed as he left the drainpipe with the bowling ball inside him, rolled down a street, entered a bowling alley, and was heard to knock over bowling pins after a short delay.

Spanish does not break complex paths into segments. Rather, a complex gesture unfolds without breaks, as in the following example. In one continuous motion the speaker traces the curvilinear route that Tweety followed escaping from his cage:

(4) *y* ***[sale volando]***

and [exits flying]

'and flies out'.

hand moves back, down, arcs left and curves upward and forward, all in one continuous movement.

This contrasts with the highly segmented route shown in the English-language example.

Manner in English and Spanish.

We also see manner in the English *rolls him out down the rainspout* example. The hand rotated and the fingers wiggled while the hand also was moving outward to convey the path component. Thus, both path and manner appeared in synchrony with the manner verb.

In the next example, on the other hand, there was the same verb, but the gesture lacked any manner content and did not synchronize with the verb. The gesture, rather, coincided with the path element *down* and the GROUND element *the drainspout* (via the hold), but skipped the verb:

(5) *[and he rolls ... **down** <u>the drain</u> spout]*

loose A hand plunges straight down: path content only.

Thus the situation in English appears to be the following: English speakers seem to use gesture to highlight manner in the verb or to downplay it. In this way, manner can be highlighted with ordinary FIRST TIER manner verbs, verbs of minimal inherent marking whose manner component is brought out via the gesture.

In Spanish, we find somewhat the opposite picture — cases where gestural manner blankets a whole motion event description like a FOG. Although Spanish speakers tend to omit manner from their speech, as observed by Slobin and illustrated in the following example[2], in their gestures manner are present throughout the description of an entire episode.

(6.1) *e entonces busca la man[era **Silent Pause**]*[3]

and so he looks for the way

'and so he looks for a way'

Gesture depicts the shape of the pipe: ground.

(.2) *de entrar [**se mete por el**]*

to enter REFL goes-into through the

'to force himself into the'

Both hands rock and rise simultaneously: manner and path (left hand through *mete*).

(.3) *[**desague** ... si?]*

drainpipe ... yes?

'drainpipe ... right?'

Right hand continues to rise with rocking motion: path + manner.

(.4) *[desague entra]*

drainpipe enters

'enters the drainpipe'

Both hands briefly in palm-down position (clambering paws) and then rise with chop-like motion: path + manner.

Manner in gesture (a climbing motion) appeared throughout this description. A line-by-line transcription cannot reflect the continuity of the manner coloration. Basically, the hands displaying a clambering style of ascent never stopped their motion. This flexible application of manner in gesture is a widespread pattern in the Spanish narrations we have recorded.

It is likely that the existence in English of verbs with obligatory manner content sets the stage for a speech-gesture system focused on lexical manner. The 'problem' that English speakers face is when manner is not highlighted in their semantic intentions but they still find themselves using a manner verb, like "rolls". Verbs like "stumble" or "plod", verbs of the kind that Slobin calls Tier 2 verbs, are strongly marked for manner. If such a Tier 2 verb is selected in speech it almost certainly reflects the speaker's semantic intention. But Tier 1 verbs, those like "rolls and "climbs", are less marked. Less marking means such verbs also could also be used just for their motion content. One might say "rolls" and really only mean that something is moving. At other times, though, manner content may in fact be intended. With Tier 1 verbs, therefore, there is a problem of using a manner verb when manner is not intended and distinguishing it from when manner is intended.

This problem is solved by gesture. If semantic intention includes manner, a manner gesture reinforces the manner verb (as in the first "rolls" example). If intention doesn't include manner, no manner gesture is performed; rather, there is a gesture highlighting some other motion event component -- path, for example (as in the second "rolls").

Unintended manner is not a problem for Spanish speakers. For them the 'problem' is intended manner and how to incorporate it, since it is not usually built into the verb. A Spanish speaker may intend manner but steer clear of introducing it for stylistic reasons. It may be complicated and/or infelicitous to add it to speech. But, just as in English, when manner is part of the semantic intention it can emerge in gesture. However unlike English, Spanish need not focus gestural manner on linguistically encoded manner.

Imagery with respect to manner can thus move in opposite directions in English and Spanish —in English, gestural manner highlights manner in speech by focusing on the verb; in Spanish, manner can spread (diffusely) over an entire episode. Thus the typological contrast between English and Spanish influences how manner imagery is formed and related to language in thinking for speaking.

The English example in (3) involved one verb, *rolls*, applied to an entire path. This verb extended over the path regardless of several implicit boundaries—Sylvester leaving the pipe, entering the sidewalk, and entering the bowling alley. As is characteristic of satellite-framed languages, according to Slobin, boundaries, although signaled by prepositions, do not penetrate deeply into the formulation of English sentences—as, indeed, this ability to cover different boundaries with a single overt verb displays. In Spanish a new verb would be required after each boundary crossing. Thus another aspect of moving along paths is what occurs at boundary crossings. Gestures also signal BOUNDARY crossings. They do so by adding movements or changing rhythm and/or direction when the boundary is crossed. When do speakers of English and Spanish do this? Speakers of both languages register boundary crossings in gesture form, but there seem to be differences in when and how they do it.

In the following English-language example (from a different speaker) the first gesture indicated rolling, the two hands circling around each other in opposite phases. The second broke this pattern, the two hands rising up and moving forward together in phase. The effect was hopping over an imagined barrier even though no such barrier appeared in the stimulus:[4]

(7) *[and he **rolls on down**] [into **a bow**<u>ling all</u>]ey*

(1) (2)

1. hands circle alternatingly around each other (opposite phase).

2. hands move in unison and rise upward (in phase).

Note that the in-phase boundary gesture at (2) synchronized with *a bowl-ing*—the object entered—not with *into*, the preposition indicating movement toward a goal. This same speaker had previously described Sylvester leaving the pipe and before that had described the bowling ball entering Sylvester—two other boundary crossings. However, only the bowling alley was marked as a boundary gesturally. Arguably, it temporarily became for this speaker both a locus and a designated bar-rier. Why should this be so? A clue is that the preposition *into*, which also might have indicated the boundary, did not get the gesture; it conveyed goal orientation but not the boundary crossing as far as the gesture was concerned. The implication of this clue is that the goal of reaching the bowling alley itself created the idea of a boundary to be crossed. That is, the idea of the boundary was not primary, but was dependent. To the speaker, these were distinguishable concepts ordered temporally and causally. The gesture marked the dependent boundary and not the licensing goal. The two previous boundary crossings did not include reaching a goal—they were way-stations—and there was no gestural marking of a boundary with either of them.

This situation of a dependent boundary differs from the status of boundary crossing gestures in Spanish. In this language, boundary information seems to be regarded as more primary and is more widely present in gesture form. Rather than restriction to final goals, we observe examples in which gestures differentiate the

phases of boundary crossings—suggesting a considerably more elaborated system for thinking about boundaries. In the following, the speaker depicted in his gesture Sylvester entering the drainpipe. The gesture showed, in typical unbroken fashion, the curvature of the path as Sylvester entered the pipe, but there was first an initial dip of the hand that appeared to convey both crossing the boundary and the idea of Sylvester effortfully wadding himself into the pipe:

(8) *pe[ro se mete* **por** ***dentro*** ///]

b[ut REFL he-puts **through inside** ///]

'but he goes inside'.

hand first dips down and then moves across body and up, for the ascent.

This was immediately followed by a second description in which the hand again moved up but with, this time, a reduced dip for the boundary:

(9) *[o sea* ***él va*** ***así*** ***adentro*** *]*

[or it-is **he goes** **like-this** **in**side]

'I mean, he goes like this inside'.

flat hand, fingers pointing diagonally up dips down slightly then up.

The difference between (8) *se mete por dentro* and (9) *él va así adentro*, as described to me by two fluent Spanish speakers,[5] is that the two descriptions and their gestures reflected two phases of the boundary crossing—first passing through, and then having passed by the boundary. One gets the hint here of the salience of boundaries for speakers of Spanish, as distinguished from their more dependent importance for speakers of English.

Summary of English and Spanish.

The typological differences between satellite-framed and verb-framed languages have implications for the linking of gestures with the linguistic code. These effects show a linguistic influence on the imagery (visual, actional) generated during speech:

- Path is visualized as increments in one language, as nearer to an approximation to actual motion in the other. Paths are broken into segments correlated with path particles and prepositions in English. They are undivided wholes correlated with verbs in Spanish.

- Manner is concentrated at specific points in one language, is a coloration capable of being diffused over entire episodes in the other. Manner is used focally in English. It can form a manner 'fog' in Spanish.

- The visualization of boundaries is less elaborated in one language than in the other. Boundaries in gesture are dependent in English, linked to goals that may have already been introduced. Boundaries in Spanish may be more nearly universal and differentiate phases of boundary crossings.

Motion in Chinese.

Finally, we reach Chinese and find yet another thinking-for-speaking pattern involving imagery.[6] While English and Spanish motion event gestures focus on predicate elements (*rolls out, drops down*, etc.), we find in Chinese examples in which the gestures depicting motion events are synchronized with constituents not normally regarded as part of the predicate. An example is the following:

(10) *lao tai-tai [na -ge* ***da bang hao]*** *-xiang gei ta da-xia*
old lady hold CLASSIFIER big stick seem CAUSE him hit-down
VERB-SAT

'The old lady apparently knocked him down with a big stick'.

The gesture showed a downward blow but the blow accompanied the phrase meaning a big stick, not the phrase meaning hit-down. The hand then fell to the rest position, the gesture clearly over, and the verb-satellite (*da-xia*), when reached, was destressed, as if its semantic content had been already presented. As Duncan observes, it is as if the gesture had moved forward in the surface speech stream, toward the position characteristic of the TOPIC setting in Chinese speech, although no formal marking of topic was present. Alluding in this way to the typological distinction of topic- versus subject-prominence (Li & Thompson 1976, 1981) Duncan and I have called such combinations 'topic-like.'[7] We take this pattern to be a possible thinking-for-speaking mode available to Chinese speakers. In this mode, we imagine, the speaker thinks in terms of a frame that we can gloss something like, 'as for the blow given with a stick', and then move on to articulate this frame in the actual verb phrase, *da-xia* 'hit-down', destressed. In this case, the verb-satellite construction articulated the same content as the gesture but this does not mean the gesture+big stick combination was not topic-like (it means that the speaker did not follow through with fresh content about this speech-gesture 'topic'[8]). Other examples, moreover, do include explicit topic indicators while, like the above example, having gestures that appear in advance of the predicate. The following is an illustration (from McNeill & Duncan to appear):

(11) ***[mao ne*** ***/] [zai da jie shang] / gun-dong***[9]
(1) (2)
cat TOPIC-MARKER / at big street top / roll-move
'as for the cat, he / rolls around / on the roadway'.
1. Gesture shows rolling.
2. Gesture shows sweeping back and forth.

The gesture in (1) with *mao* 'cat' depicted Sylvester rolling; that is, showed an action not yet described in the speech flow. In this case, the reference was explicitly marked as a topic, glossed as 'as for the cat'. The hands made a second gesture in (2) with the reference to the roadway, and this combination was semantically co-expressive. The hands then returned to rest and the predicate *gung-dong* was uttered in destressed form. Thus, either with explicit indication of topic or without it,

gestures in Chinese can appear in topic-like locations and establish frames for later predications.

In English, too, gestures depicting events yet to be expressed in speech occasionally occur synchronized with other linguistic elements in the flow of speech, but when this occurs it is seemingly regarded by the speaker as an error to be repaired. Something like a minimal pair between English and Chinese exists in these examples. The following example from an English speaker does not show a speech-gesture combination being treated as a coherent topic-like package but rather as a combination in need of repair (despite the semantic appropriateness of pairing cause with effect):

(12.1) *[so it hits him on* ***the hea][d***

shows Sylvester sweeping to the right.

(.2) *and he winds up* ***rolling down the stre]et***

shows Sylvester sweeping to the right (larger).

The gesture in (12.1) showed Sylvester moving down the street and was paired with a description of the cause of this event (the bowling ball hits him on the head). The verb describing Sylvester's moving down the street, however, was not reached until (12.2). The pairing therefore was quite similar to that in the Chinese examples. The difference between the languages is apparent at the next step. Unlike the Chinese speaker, this English speaker, when she got out in front with her gesture and faced a violation of subject-predicate transformative semantics, held and then repeated the gesture in a larger version, as if reasserting the gesture when an improved placement for depicting a motion event had arrived in the speech stream with the predicate. Thus, an important difference between Chinese and English utterance dynamics is exposed by this contrast between seemingly similar speech-gesture combinations. Chinese speakers have available a thinking-for-speaking framework in which a speech-gesture combinations like stick-hit-down or blow-on-the-head-roll-down-the-street can be assimilated and be regarded as topic-like frames, but an English speaker had no comparable thinking-for-speaking framework.

Such examples suggest that English (and Spanish) speakers are committed to predication in the sense that they appear to feel a need to focus their motion event thinking onto the formal structures of predicates. Chinese in contrast, with its topicalizing style, provides a way to construct meaning packages that is lacking in English. This is to see the motion event itself as a discourse frame, with the verb-satellite structure relegated to afterthought status.

Possible mechanisms.

Gesture is geared to language and can thus be different in different languages. This is explained by positing a unit of mental processing in which linguistically categorized content and visuospatial content are related in the process of thinking and speaking. In this view of linguistic processing, we form mental units consisting of both visuospatial cognition and linguistic content. The speaker thus thinks in two forms of representation at once, linguistic and imagistic, and the thinking-for-speaking process brings these two kinds of representations together.

When languages differ in their structural and lexical possibilities, there is, in such an interactive system, the potential for an influence of language on realtime visual thinking. The nature of this simultaneous thinking in two modalities can be explicated from different points of view. Kita (to appear) has proposed that the function of representational gestures is to help get the 'organization of complex information into a message that can be verbalized within one formulation cycle' (p. 11). According to this hypothesis, the realtime influence of language on visual thinking arises from the adaptation of such thinking to the specific linguistic system in which gesture is performing its organizing function in utterances: the gesture is shaped 'so as to make its informational content as compatible as possible to linguistic encoding possibilities'.

A different slant on the mechanism takes the perspective in which an utterance is the outcome of a developmental process not unlike mental growth. This process begins in a GROWTH POINT and extends over the interval of time the utterance takes to be formed (centiseconds). A growth point is a type of idea unit encompassing both imagery and linguistic content and is proposed as the theoretical starting point of thinking-for-speaking (McNeill 1992; McNeill & Duncan to appear). The mixture of imagery and linguistic categorial content induces the development that results in both utterance and gesture. Kita's FORMULATION CYCLE appears to map onto this developmental process. According to the growth point hypothesis, the influence of language on thinking is via growth points. These differ across languages, implying different starting points of thinking-for-speaking.

Kita's hypothesis and the growth point hypothesis appear to be different perspectives toward the same underlying mechanism. In one (Kita), the perspective emphasizes the function of spatial-actional cognition while, in the other, it emphasizes that speaking, imbued with imagery, is a developmental process (a view based on Vygotsky's 1987 concept of microgenesis). In both perspectives, there is the idea that language is more than linguistic coding; that it includes visuospatial-actional representations—imagery—as an integral part.

Gestures as Material Carriers.

I will conclude with a further implication of this view: that gestures *themselves*, their performance as means of expression, is part of the speaker's meaning. If we entertain the broad question of why we perform gestures, several possibilities can be mentioned:

- Gestures are remnants of an early stage of the evolution of language capacity in our species (Armstrong, et al. 1995; Donald 1991).
- Gestures have communicative effectiveness (Kendon 1995; Streeck 1995).
- Gestures are an essential part of thinking. This explanation does not exclude the other two and I'd like to expand on it a bit.

To make a gesture is to bring a new idea into being on a concrete plane, just as writing out or speaking a word seems to have a similar effect. A Heideggerian echo in this statement is intended (Dreyfus 1994). Gestures are themselves thinking in one of its many forms — not only expressions *but components of thought, i.e.,*

cognitive being, itself. The greater the felt departure of the thought from the immediate context, the more likely its materialization in a gesture, because of this contribution to being, and thus to greater being. Thus gestures are more or less elaborated depending on the importance of material realization to the existence of the thought. The speaker who created a gesture of bowling ball going down was, according to this interpretation, creating a material carrier of her idea in gesture. This action — her thought in action — was a component of her cognitive being at that moment. There are deep and hitherto unexplored issues here, and possibly some contradictions, but considering gestures as material carriers of meaning, what we see through the gestural 'window' is the *creation* of meaning; a contribution in movement and space to actually bringing the meaning into being. Gestures as a window onto the mind thus offer new insights into the nature of human thinking with language.

Notes.

[1] The following individuals have collaborated on much of what is described in this paper: Susan Duncan, Karl-Erik McCullough, Lisa Miotto, Asli Ozyurek, Shuichi Nobe, and Nobuhiro Furuyama. The gestures in motion events research project is supported by a grant from the Spencer Foundation.

[2] Example provided by Gale Grubman-Stam and transcribed by her with further transcription by Karl-Erik McCullough.

[3] The stroke phase takes place in a silent pause. The pause marks a boundary between main and subordinate clause, and this is one possible source of this timing. Another possible source could be pragmatic, speech halting in part so that the listener may especially attend to the gesture that the speaker produces. Kendon (personal communication) believes that when speech halts like this, listeners have a tendency to shift their gaze to the speaker, and this could be such an occasion.

[4] I am grateful to Sue Duncan for this example.

[5] I am grateful to Lisa Miotto and Glenda Miranda for this description.

[6] This section is based on McNeill and Duncan (to appear).

[7] Chafe (1976) stated the sense of topicalization to which we allude: "What the topics appear to do is limit the applicability of the main predication to a certain restricted domain ... the topic sets a spatial, temporal, or individual framework within which the main predication holds." (p. 50; also quoted by Li and Thompson, 1976).

[8] We might have expected the speaker to continue on with additional predications within the blow-with-a-stick frame. But she interrupted her narrative immediately after our example, realizing that she had confused the order of events in the cartoon story. She broke in with an explicit self-correction: "wrong!", and then went on to straighten out the narrative.

[9] Transcription and translation by Susan Duncan.

References.

ARMSTRONG, D.F., STOKOE, W.C., & WILCOX, S.E. 1995. Gesture and the nature of language. Cambridge: Cambridge University Press.

CHAFE, W. L. 1976. Givenness, contrastiveness, definiteness, subjects, topics, and point of view. Subject and Topic, ed. by C.N. Li., 25-55. New York: Academic Press.

DONALD, M. 1991. Origins of the modern mind: Three stages in the evolution of culture and cognition. Cambridge, MA: Harvard University Press.

DREYFUS, H.L. 1994. Being-in-the-world: A commentary on Heidegger's being and time, division I. Cambridge, MA: MIT Press.

KENDON, A. 1981. Geography of gesture. Semiotica 37.129-163.

_____. 1995. Gestures as illocutionary and discourse structure markers in Southern Italian conversation. Journal of Pragmatics 23.247-279.

KITA, S. 1993. Language and thought interface: A study of spontaneous gestures and Japanese mimetics. Chicago, IL: University of Chicago dissertation.

_____. (to appear). How representational gestures help speaking. Gesture: An emerging field of study, ed by A. Kendon, D. McNeill, and S. Wilcox.

LI, C. N. & THOMPSON, S. A. 1976. Subject and topic: A new typology of language. Subject and Topic, ed. by C.N. Li., 457-489. New York: Academic Press.

_____. 1981. Mandarin chinese: A functional reference grammar. Berkeley: University of California Press.

MCNEILL, D. 1992. Hand and mind: What gestures reveal about thought. Chicago: University of Chicago Press.

_____, and DUNCAN, S.D. (in preparation). Growth points in thinking-for-speaking. Gesture: An emerging field of study, ed by A. Kendon, D. McNeill & S. Wilcox.

MORRIS, D., COLLETT, P., MARSH, P., AND O'SHAUGHNESSY, M. 1979. Gestures: Their origins and distribution. New York: Stein & Day.

NOBE, S. 1996. Cognitive Rhythms, Gestures, and Acoustic Aspects of Speech. Chicago, IL: University of Chicago dissertation.

SLOBIN, D. 1987. Thinking for speaking. Papers from the 13th annual meeting of the Berkeley Linguistics Society, ed by J. Aske, N. Beery, L. Michaelis, & H. Filip, 435-445. Berkeley, CA: BLS.

_____. 1996a. Two Ways to Travel: Verbs of Motion in English and Spanish. Grammatical constructions: Their form and meaning, ed by M. Shibatani and S. A. Thompson, 195-219. Oxford: Oxford University Press.

_____. 1996b. Mind, code, and text. Berkeley: University of California MS.

STREECK, J. 1995. The interactive production of visual communication. Austin: University of Texas MS.

TALMY, L. 1985. Lexicalization patterns: Semantic structure in lexical forms. Language typology and syntactic description. Vol. III. Grammatical categories and the lexicon, ed by T. Shopen, 57-149. Cambridge: Cambridge University Press.

_____. 1991. Path to realization: A typology of event conflation. Buffalo: University of Buffalo MS.

VYGOTSKY, L. S. 1987. Thought and language, trans. by A. Kozulin. Cambridge, MA: MIT Press.

How Thai Ties:
A Discourse Analysis of Tying Techniques in Thai

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Introduction

As Halliday and Hasan (1976) state, "cohesion refers to relations of meaning that exist within text, and that define it as a text" (p. 4). Not only in written text, "cohesion" or "tying" is also a basic phenomenon that is observed in conversational interaction. Conversation participants normally produce utterances that are meaningfully tied to each other. A conversation or a stretch of talk can be meaningful either because the utterances are built around the same topic of talk, or because there is strong cohesion on the level of action structure (Goodwin and Goodwin, 1990). As Sacks proposed in his *Lectures on Conversation* (1995), "fundamental to the working of the tying structures [is] that the operation of tying machinery serves as a basic means for showing understanding" (Vol. I, p. 733). Tying techniques are, therefore, procedures or strategies that participants employ to relate meaning between utterances or turns of talk in their conversation, and to demonstrate their understanding of the prior talk produced by the prior speaker. In other words, a conversational participant normally uses the prior speaker's materials to produce his/her own utterance and, at the same time, to demonstrate his/her understanding of the prior speaker's talk.

The purpose of this study is to investigate tying techniques used in native Thai speakers' conversations. In this paper, I analyze and discuss some of the tying techniques they use, from local tying techniques done in a next utterance, such as in adjacency pairs, to more global ones that tie across many turns of talk.

Data

The data used for the analysis are selected from audio-taped Thai conversations. The conversation used in this paper is between two native Thai speakers who lived in Los Angeles, Mac and Ad. The participants were brought together to share their experiences during and after the Northridge earthquake, which took place in Southern California in 1994.

Tying Techniques in Native Thai Conversation

As mentioned, tying techniques refer to procedures or strategies that co-participants use to relate meaning between utterances in their conversation in order to show their understanding. Following Sacks (1995), "pro-terms," i.e., pronouns and pro-verbs, are employed by co-participants as a basic tying technique for

achieving "economy in conversation." In other words, speakers do not have to use a word again and again to refer to the same person, object, or action. Pronouns are used as one of the prototypical tying terms. Co-participants' use of personal pronouns semantically ties utterances in their conversation by referring to the same person referent. For example, in data fragment (1), Mac asks Ad where he lives.

(1) EQ2: 323-324

	1	Mac:	*lέw nîi yù thĕw năy* CONJ this live area which "And where do (you) live?"
→	2	Ad:	*phŏm yù kay yù thĕw mɛnháttân biif* 1.m live far live area Manhattan Beach "I live far away. (I) live around Manhattan beach."

Mac's question in line 1, which is a first pair part of the adjacency pair, *lέw nîi yù thĕw năy* 'And where do (you) live?,' selects Ad to provide a second pair part to complete the adjacency pair, although a second person pronoun is not used in the question. In line 2, Ad responds to Mac's question *phŏm yù kay* 'I live far away' with the use of a first person pronoun for male *phŏm* 'I,' and further elaborates his answer by providing a more specific location, however, without any use of a personal pronoun in the second clause.

By using a personal pronoun, co-participants know that a person who has been established in the talk, and/or has been talked about, is now being referred to. When pronouns mark gender and number distinctions, this makes the tying clearer as to who is referred to in the conversational interaction. While the first person pronouns in English are distinguished in terms of number (*I* vs. *we*), some Thai first person pronouns are distinguished in terms of gender, some are not, and some are not distinguished in terms of number either. For example, *phŏm* refers to a male speaker, and *chán* or *dichán* refers to a female speaker, whereas *raw* refers to one or more speakers, male or female.

Even when a language makes pronouns available for its users as a means to semantically tie their utterances, speakers of some languages which are called "pro-drop languages" such as Spanish or Italian, or languages with "null subjects" such as Chinese, Malay, and Thai, tend to omit pronouns after the referent has been established and maintained in the conversation. Although there is no morphological marking for the subject on the Thai verb, the referent is normally understood among co-participants. Data fragment (2) gives an example of the optional use of personal pronouns in Thai conversation.

(2) EQ2: 304-305

1 Ad: *yù thěw nǎy há nîa*
live around which R.PRT PRT
"Where do (you) live?"

2 Mac: *yùu: toŋ nía keelîi yùu mm*
live at here Gayley live mm
"(I) live around here, Gayley, live mm ..."

In this stretch of talk, it is shown that the use of a second person pronoun in line 1 is omitted. However, the personal referent is recoverable through the pragmatic context, i.e., the context in which the question is directed to only one addressee, and perhaps via the spatial orientation of the participants. Therefore, the optional non-use of a second person pronoun does not result in any ambiguity in the conversation. Data fragment (1) also gives us the same type of example and omits a second person pronoun subject in a question (the first pair part), which requires the addressee to provide an answer (a second pair part). In fragment (2), after the referent is implicitly established in line 1, the first person pronoun is also optional in the answer and is not used.

Although personal pronouns are frequently omitted in Thai conversation when the referent is retrievable and not ambiguous, important information in the conversation can still be recovered via a wide range of resources. Other tying techniques are available to the speaker, so that his/her utterance is coherent in terms of the previous talk and thus understandable.

Reusing parts of a previous utterance to produce subsequent utterances is another common tying strategy. A speaker can reuse elements produced in prior talk, i.e., a word or words, or a syntactic construction, and this is called "format tying."

We will see that format tying, or the use of parallel constructions, is commonly found in Thai conversation. The adjacency pair in data fragment (2) (i.e., question - answer) shows a close relationship of one utterance to the other through the format tying strategy. Not only does Mac show his understanding of Ad's question and provide an answer to the question, but also he reuses the verb *yù* 'live' as well as produces his utterance by using the same basic syntactic construction, that is:

(2a) *locative verb + prep. + location*

1	Ad:	*yù*	*thěw*	*nǎy*	*há*	*nîa*
		live	around	where		R.PRT PRT
		"Where do you live?"				
2	Mac:	*yùu:*	*toŋ*	*nía*	*keeli yùu mm*	
		live	at	here	Gayley, live mm	
		"I lived around here, Gayley, live mm."				

In line 2, while the main verb is reused, the rest of the utterance is changed to more specific information. The basic syntactic structure of Ad's question *yù thěw nǎy* 'Where do you live?' is replaced by *yùu: toŋ nía* 'I live around here.' In Mac's answer, a more specific preposition replaces a general one, and a locative word replaces a locative question word in Ad's question.

We saw earlier how pronouns are used as a tying technique in Thai, which demonstrates some similarities to as well as differences from the use of pronouns in English. Like pronouns, pro-verbs are used as a basic tying technique as well. According to Halliday and Hasan's (1976) work on *Cohesion in English*, the DO auxiliary is used for verb or clausal substitution. The pro-verb DO "functions as a carrier for anaphoric items, especially *it* and *that*" (p. 125), and "may be anaphoric to any process of the action type" (p. 126). For example, in an answer to the question *Do you have $10?*, the *'do'* in *Yes, I do* is a pro-verb; the speaker does not have to repeat the verb phrase *'have $10'* in his/her answer. However, Thai is a language that lacks this kind of pro-verbs. Due to the lack of linguistic resources such as pro-verbs that English and some other languages have, Thai speakers make use of other tying techniques that are available in the language instead. The lack of pro-verbs in Thai results in the frequent reuse of words in a stretch of talk by co-participants in order to make their talk coherent.[1] Data fragment (3) gives us an example in which co-participants reuse words in their utterances due to the lack of pro-verbs in Thai.

(3) EQ2: 232-237

1 Mac: *ʔé- lɛ́w bèp sùan mâak* (*lúcàk*) *kan* *lɯ́ pàaw*
eh and like part many know each-other or not
"Eh, and- mostly (they) know each other or not ..."

2 *khon thay thîi [nûun]*
person Thai at there
"Thai people there?"

3 Ad: [*lúucàk*] *há* (*lúucàk*)
know R.PRT know
"I know, yes, I know (them)."

4 Mac: (*lúcàk*) *bèp phûak um (.) phɛm pûm ʔalay ŋía*
know like group um Pam Pum what like-that
lá pà
or not
"Do (you) know those guys, Pam, Pum,
something like that, or not?"

5 (*lúcàk*) *pà* *há*
know or-not R.PRT
"Do (you) know (them or not)?"

6 Ad: *tɔn ní kô yaŋ yùu* *lǎ*
at this HL still be.LOC Q
"Are (they) still (here) now?"

7 Mac: *tɔn ní kô yaŋ yùu*
at this HL still be.LOC
"(They) are still (here) now."

Inspite of the lack of pro-verbs in Thai, the participants manage to tie their utterances by reusing the same verb, in this case *lúucàk* 'know.' This is clear in line 3, where Ad has to repeat the main verb to answer the yes/no question in lines 1-2 asked by Mac, instead of using a pro-verb.

In addition to the frequent reuse of terms, full repetition, which is the simplest type of format tying, is also used as another tying strategy.

(3a) 6 Ad: *tɔn ní kồ yaŋ yùu lɤ̌*
at this HL still be.LOC Q
"Are (they) still (here) now?"

7 Mac: *tɔn ní kồ yaŋ yùu*
at this HL still be.LOC
"(They) are still (here) now."

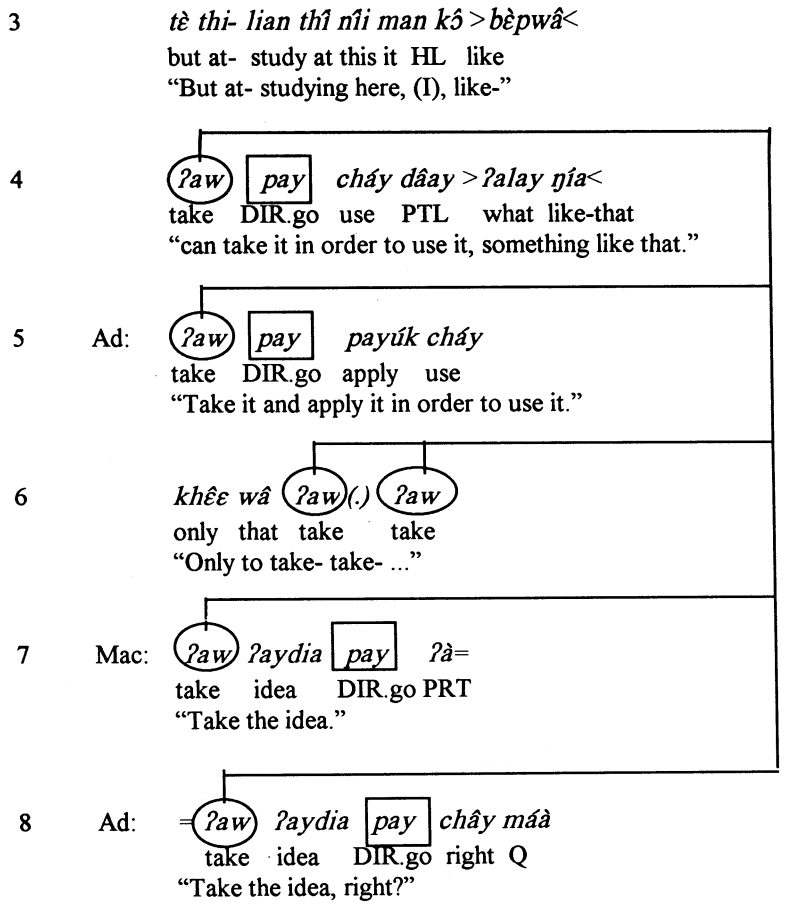
In line 7, Mac uses not only the same syntactic construction but also exactly the same words to answer Ad's question, except that he leaves out the question marker *lɤ̌*. That is, he reproduces the whole semantic segment of Ad's question *tɔn ní kồ yaŋ yùu* 'they are still here now.'

We have seen that the lack of pro-verbs in Thai results in the frequent reuse of a word or words, and enhances the use of parallel constructions, or the format tying technique. In addition, a word can be used to tie a stretch of talk across many turns to keep the talk topic coherent. In data fragment (4), where Mac has told Ad that his major is communication studies, and that his courses are not only about television and media but also about laws governing use of media, the co-participants employ both the word-reusing technique as well as parallel constructions with the verb *ʔaw* 'take, get' to tie the whole stretch of talk together.

(4) EQ584-591

1 Ad: *>kòtmăay thîi nîi kà mɯaŋthay mŭan kan lɤ̌<*
law at this and Thailand same each-other Q
"Are the law here and (the law in) Thailand the same?"

2 Mac: *tch! kồ mây mŭan*
HL NEG same
"Tch! Not the same."



In line 2 in this segment, Mac provides an answer to Ad's question by reusing the most salient word in his question, i.e., *mŭan* 'same,' which functions as an adjective. The word is reused in the answer because Thai does not make use of pro-verbs. And the fact that Thai syntax does not permit a copula to occur with an adjective predicate results in the recurrence of the adjective instead of a copular verb, as would be the case in English (e.g., *Is it the same?; No, it isn't)*.

What is of interest to me is the recurrence of *ʔaw* 'take, get' and its construction pattern, which are used to tie the stretch of talk from lines 4-8. *ʔaw* is used as a main verb, and it normally occurs with another verb *pay* 'go' in Thai serial verb constructions. In this serial verb construction, *pay* is used with a main verb such as *ʔaw*, 'take, get,' and functions as a directional marker rather than a main verb.

Observing the use of the verb *ʔaw* more closely, we can see parallel structure in lines 4-8. Not only is the verb *ʔaw* reused throughout the stretch of talk, and used with the directional marker *pay*, but also *ʔaw* is used in the same syntactic frame, that is, the serial verb construction:

(4a) *ʔaw* + (object) + *pay* + (verb) + (verb)

line 4	*ʔaw* -	*pay cháy*	'take it in order to use it'
line 5	*ʔaw* -	*pay payúk cháy*	'take it and apply it in order to use it'
lines 7, 8	*ʔaw ʔaydia*	*pay*	'take the idea'

In fact, the syntactic construction is created according to how the participants deconstruct and reconstruct each other's utterances by reusing the main verb *ʔaw*. According to Goodwin (1990), participants' syntactic deconstructions and reconstructions, such as those done in African-American children's arguments, can be viewed as syntactic drills for language users, and useful for language learners.

In addition to format tying, full repetition is employed as another tying strategy in the same segment as well. In line 8, Ad reproduces the same syntactic construction as well as using the same words from Mac's utterance *ʔaw ʔaydia pay* 'take the idea.' Ad's repeated segment is also followed by a question token *chây máà* 'right?' to confirm his understanding.

Conclusion

In summary, tying techniques used in Thai conversation have some similarities to as well as differences from those used in English conversation. One difference between tying in English and tying in Thai that we have seen in this paper is in the use of pro-terms, i.e., pronouns and pro-verbs, as a tying strategy. While English pronouns are not optional, pronouns in Thai are optional and tend to be omitted once the referent has been established and maintained in the conversation, causing no referent ambiguity. Moreover, since Thai lacks pro-verbs, format tying and parallel constructions as well as the reuse of words and phrases are frequently employed in Thai conversation. In place of pro-verbs, words, phrases and constructions are reused in a stretch of talk as resources to construct new utterances.

It is common that the repetition of a word, or words, or a part of an utterance is done to display a participant's understanding of a prior utterance. The syntactic construction of Thai also enhances repetition as a tying strategy. Since a subject-verb inversion rule is not employed to construct a question in Thai, for

example, and the language lacks pro-verbs, full or exact repetition would be more commonly found in Thai conversation than in English.

Notes

I am very grateful to Professor Charles Goodwin and Professor Marianne Celce-Murcia for their suggestions and comments on this research project.

1. The definition of pro-verb here is limited to auxiliary such as DO in English, excluding those auxiliary verbs that can be used as tense/aspect markers, modals, the copula and auxiliary BE. However, in Thai, several tense/aspect/mood markers have the same function as pro-verbs, i.e., subtituting a verb phrase or a clause mentioned in a prior turn, for example, the experiential marker *khəəy*, and potential markers *dâay, pen, wây*.

Appendix I
Transcription Conventions

[	A left bracket marks the point where a speaker's talk overlaps another speaker's.
]	A right bracket marks the point where the overlap ends.
:	Colon indicates a lengthened sound or syllable.
=	An equal sign indicates latched utterances.
!	An exclamation point marks an animated sound.
(.)	A period in parentheses marks a short pause or gap.
(.2)	A number in parentheses indicates a pause in tenths of a second.
man	An underline indicates increased volume or an emphesis of a word or sound.
> <	The talk speeds up.
( )	Parentheses indicate when a segnment of talk is uncertain.

Appendix II
Glossary

CONJ	conjunction	DIR	directional marker
HL	highlighting device *kɔ*	LOC	locative marker
NEG	negative marker	PRT	particle
PTL	potential marker	Q	question
R	register	1	first person pronoun
.	joins two meanings of one morpheme		

References

Goodwin, Charles. and Marjorie Harness Goodwin. 1990. Interstitial Argument. *Conflict Talk*, ed. by Allen Grimshaw (Ed.). Cambridge: Cambridge University Press.

Goodwin, Marjorie Harness. 1990. *He-Said-She-Said: Talk as Social Organization among Black Children*. Bloomington and Indianapolis, IN: Indiana University Press.

Halliday, M. A. K. and Ruqaiya Hasan. 1976. *Cohesion in English*. London: Longman.

Sacks, Harvey. 1995. *Lectures on conversation*. Edited by G. Jefferson. Oxford, UK: Blackwell.

THE EVOLUTION OF APPLICATIVE CONSTRUCTIONS AND PROTO-AUSTRONESIAN MORPHOSYNTAX*

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1. INTRODUCTION. *Applicative constructions* are a means some languages have for indicating that thematically peripheral objects have a morphosyntactic (and sometimes also discourse) status which differs from what would otherwise be expected for them. In terms of morphosyntax, thematically peripheral objects are treated in a more core or direct object manner, and in terms of discourse, they often have higher relative topicality in applicative constructions as compared to when they occur in non-applicative constructions.

One lexically restricted example of an applicative construction is the Dative Shift construction in English. In the non-Dative Shift example in 1a, the recipient is coded as an oblique, but in the Dative Shift case in 1b, the recipient appears as a bare noun phrase and can even be the subject of a passive version of the sentence, as seen in 2. Thus, in the Dative Shift example, the recipient has the status of a direct object rather than that of an oblique. Thompson 1990 also shows that there is a higher relative topicality for recipients in the Dative Shift-type sentences as compared to those in the non-Dative Shift-type sentences.

(1) a. Non-Dative shift: John gave the book to Susan.
b. Dative shift: John gave Susan the book.

(2) Susan was given the book (by John).

A more prototypical applicative construction is seen in 3 for Chaga (Bresnan and Moshi 1990:148-9). Here, a variety of thematically peripheral objects are able to display more direct object-like properties, and the verb is marked with what is at least superficially the same piece of morphology. In cases like this, the construction is often quite productive, capable of being used with all verbs of the language or with a significant subset of them (e.g. with all transitive verbs).

(3) a. Benefactive/malefactive applicative object:

n-á-í-lyì-ɨ́-à	*mì-kà*	*k-élyà*
FOC-1S-PR-eat-APP-FV	1-wife	7-food

'He is eating food for/on his wife.'

b. Locative applicative object:

n-á-í-lyì-ɨ́-à	*mì-ɾì-nyì*	*k-élyà*
FOC-1S-PR-eat-APP-FV	3-homestead	7-food

'He is eating food at the homestead.'

c. Instrumental applicative object:

n-á-í-lyì-ɨ́-à	*mà-wòkó*	*k-élyâ*
FOC-1S-PR-eat-APP-FV	6-hand	7-food

'He is eating food with his hands.'

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d. Circumstantial applicative object:

n-ã-ĩ-lyì-í-ˈá	*njáá*	*k-êlyâ*
FOC-1S-PR-eat-APP-FV	9.hunger	7-food

'He is eating the food because of hunger.'

The Nomatsiguenga case in 4 (Wise 1971, as cited in Payne 1990:222-223) is similar to the Chaga case in terms of the types of objects that can participate in applicative constructions. In this case, however, each applicative construction is marked by a unique piece of verbal morphology. From this it can be seen that languages differ as to the kind of overlap there is between morphology and thematic role of the relevant object.

(4) a. Benefactive applicative object:

pablo	*i-pë-ne-ri*	*ariberito*	*tiapa*	*singi*
Paul	HE-give-BEN.APP-HIM	Albert	chicken	corn

'Paul gave the chickens corn for Albert.'

b. Allative applicative object:

pablo *i-hoka-te-ta-be-ka-ri*
Paul HE-throw-TOWARD.APP-EP-FRUST-RFLEX-MASC

ariberito	*i-gotsirote*
Albert	HIS-knife

'Paul threw his knife toward Albert.'

c. Locative applicative object:

pablo	*i-kenga-mo-ta-h-i-ri*	*ariberito*
Paul	HE-narrate-IN.PRESENCE.OF.APP-EP-AGAIN-TENSE-MASC	Albert

'Paul narrated it in Albert's presence.'

d. Comitative applicative object:

Juan	*i-komota-ka-k-e-ri*	*pablo*	*otsegoha*
John	HE-dam.stream-COM.APP-INDIC-TENSE-MASC	Paul	river.branch

'John dammed the river branch with Paul.'

e. Reason applicative object:

pablo	*i-kisa-biri-k-e-ri*	*juan*
Paul	HE-be.angry-REASON.APP-INDIC-TENSE-MASC	John

'Paul was angry on account of John.'

f. Purpose applicative object:

ni-ganta-si-t-ë-ri	*hompiki*
I-send-PURP.APP-EP-TENSE-MASC	pills

'I sent him for pills.'

g. Instrumental applicative object:

ora *pi-nets-an-t-i-ma-ri*
that YOU-look.at-INST.APP-EP-TENSE-FUT.RFLEX-MASC

hitatsia	*negativo*
name	negative

'Look at it (the sun during an eclipse) with that which is called a negative.'

The goals of this paper are first to illustrate the types of morphology that markers of applicative constructions tend to grammaticalize from and to demonstrate what types of constructions applicative constructions evolve into. Then I will show how this development may be relevant to our understanding of the origin and later development of Proto-Austronesian verbal morphology.

2. THE EVOLUTION OF APPLICATIVE CONSTRUCTIONS. The issue of where the morphology which marks applicative constructions comes from has been dealt with in a number of papers (Garrett 1990, Craig and Hale 1988, Rude 1991), so I will just briefly touch on it here. Basically, when we can tell what the source of the morphology is, it is always either adpositional or verbal.

5 shows an instance of the adpositional source type in Kinyarwanda (Kimenyi 1980:89). 5a contains an allative argument in a prepositional phrase. In 5b the prepositional material is instead suffixed to the verb; the allative argument has the morphosyntactic status of a direct object, making this variant an applicative construction.

(5) Adpositional source:

a.	*úmwáana*	*y-a-taa-ye*	*igitabo*	*mú*	*máazi*
	child	HE-PST-throw-ASP	book	IN	water
	'The child has thrown the book into the water.'				

b.	*úmwáana*	*y-a-taa-yé-mo*	*ámáazi*	*igitabo*
	child	HE-PST-throw-ASP-APP	water	book
	'The child has thrown the book into the water.'			

On the other hand, the Papuan language Awtuw has a benefactive applicative marker (see 6) which is "transparently derived from the root kow 'give'" (Feldman 1986:102). This verb is an extremely common source for benefactive applicative markers.

(6) Verbal source:

wawpey	*yen-e*	*yaw*	*də-kə-kow-o*
Wawpey	2SG-O	pig	FA-get-BEN-P
'Wawpey got a pig for you (behalf/benefit).'			

It is thus fairly clear where applicative constructions develop from. However, what they develop into when they stop being synchronic applicative constructions is a less studied area. In what follows, I will show that the applicative morphology is often reinterpreted as marking a construction which indicates high topicality of an oblique.

2.1. NADËB: APPLICATIVE > RELATIVIZER. In the Brazilian language Nadëb, Weir 1986 has shown that there are a number of applicatives which derive from adpositions. 7 shows a non-applicative case, in which a locative is expressed obliquely. In 8, the adpositional morphology of 7 is either preposed to the verb or actually phonologically incorporated into the verb, and the locative argument has the usual sentence-initial position for direct objects, yielding an applicative construction.

(7) Non-applicative occurrence of an adposition:

kalapéé	*a-sooh*	*bxaah*	*yó*
child	FORMATIVE-be.sitting	tree	ON.TOP.OF
'The child is sitting on the tree.' (299)			

(8) Grammaticalized applicative occurrence of the adposition:

bxaah	*kalapéé*	*yó*	*sooh*
tree	child	ON.TOP.OF [APP]	be.sitting (299)

bxaah	*kalapéé*	*ya-sooh*
tree	child	ON.TOP.OF.[APP]-be.sitting

'The child is sitting on the tree.' (300)

But there are also adpositions in Nadëb, like the one in 9, which do not have a simple main clause applicative use corresponding to that in 8 (note the unacceptability of 10). Instead, such adpositions can *only* be found as applicatives which allow relativization on an appropriate oblique object, as in 11.

(9) Non-applicative occurrence of a different adposition:

éé	*a-gú*	*tób*	*bú*
father	FORMATIVE-be.in.hammock	house	ABLATIVE

'My father is in the house.' (305)

(10) Ungrammaticality of corresponding applicative in a main clause:

**tób*	*éé*	*ba-gú*
house	father	ABLATIVE [LOC APP]-be.in.hammock

'My father is in the house.' (305)

(11) The same applicative *allowed* in a relative clause:

éé	*ba-gú*	*doo*
father	ABLATIVE [LOC APP]-be.in.hammock	THE.ONE

'the one in which my father is' (305)

Nadëb applicatives like the one in 11 presumably had a main clause use (like the one in 8), but have come to be restricted to relative clauses, where they indicate relativization on an oblique.

2.2. KALKATUNGU: APPLICATIVE > RELATIVIZER/SUBORDINATOR. A similar development is seen in the Australian language Kalkatungu. What Blake 1977 describes as an instrumental applicative is almost always found in subordinate clauses, as seen in 12.

(12) Applicative restricted to a subordinate clause:

ŋa-ṯu	*ɲini*	*kunka*	*apa*	*ṯuku-u*	*a-ni*	*ḷai-manṯi*
I-ERG	YOU	stick	gave	dog-DAT	COMP-YOU	hit-INST APP

'I gave you a stick to hit the dog with.' (Blake 1977:50)

Like the applicative in Nadëb, the instrumental applicative in Kalkatungu was presumably once widespread in main clauses; however, it is now used almost exclusively in subordinate clauses.

2.3. CHICHEWA: APPLICATIVE > TOPICALIZER. A less commonly attested development is the one seen in 13a and b for one of the dialects of Chichewa. Here, a simple main clause use of one of the language's instrumental applicatives is impossible, as indicated in 13a. The instrumental applicative morphology must always be accompanied by the passive morphology (13b), so that, in effect, the applicative has been reanalyzed as part of a kind of complex instrument-topicalizer.

(13) Applicative restricted to use with passive:

a. **Joni a-ma-lemb-ets-a peni*
John HE-HABIT-write-INST APP-INDIC pen
'John writes with a pen.' (Trithart 1976:58)

b. *khasu li-ma-lim-its-idw-a ndi Joni*
hoe IT-HABIT-farm-INST APP-PASS-INDIC BY John
'The hoe is farmed with by John.' (57)

This instrumental applicative must have once occurred in non-passive clauses (as it still does in other Bantu languages with cognate instrumental applicative morphology), but has now been restricted to cooccurrence with the passive, i.e. to where there is topicalization of the instrument.

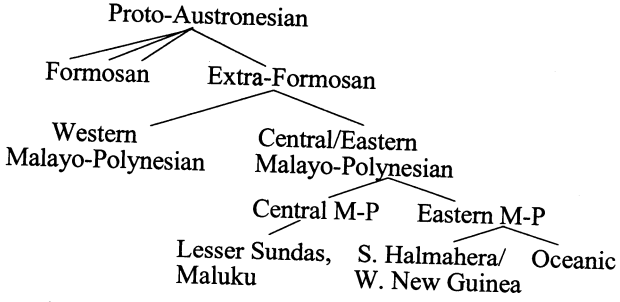
2.4. MAYAN: APPLICATIVE > RELATIVIZER/FOCUS CONSTRUCTION MARKER. In Western Mayan, there is a benefactive applicative construction (Aissen 1983). In the Mamean and Quichean languages of the *Eastern* branch of the family it is likely that the benefactive applicative use of this morphology found in Western Mayan languages previously existed. Dayley notes that in Tzutujil, for instance, non-productive uses of the cognate morphology have semantics "reminiscent of the dative or referential voice found in Western Mayan languages" (1985:124). The productive use of the applicative morphology in the Eastern part of the family, though, is not the marking of benefactive applicative constructions, but the marking of *instrumental* applicative constructions.

Norman 1978 has shown, however, that in many languages in this part of the family (e.g. in Quiché), this instrumental applicative is not found in main clauses. I do not have space to repeat his examples here, but he demonstrates that the applicative construction requires either concomitant relativization on the applicative object, focusing of the applicative object, or questioning of the applicative object. These last two constructions essentially require relativization. The point is that in this part of Mayan, what was presumably once a productive main clause applicative is now restricted to relative clauses and related contexts.

2.5. SUMMARY. We have seen in this section that applicative markers typically develop from either adpositional or verbal morphology. When they cease to be main clause applicative markers, they tend to develop into markers of constructions which indicate the high topicality of obliques. In particular, they evolve into markers of oblique relativization.

3. VERBAL MORPHOLOGY IN AUSTRONESIAN. In this section I look at how the evolutionary tendency seen for applicative constructions in the preceding section may be of relevance to us in accounting for the development of reconstructed Proto-Austronesian verbal morphology. Figure 1 (following Pawley and Ross 1993 and Ross 1995b) gives the higher order subgroupings for the family.

FIGURE 1. AUSTRONESIAN SUBGROUPING



In the discussion below, following Pawley and Reid 1980, I divide the languages into two groups. One type, including the Formosan languages and, to a greater or lesser degree, the Western Malayo-Polynesian languages, is made up of languages which exhibit variations on the well-known "focus" system. The second group includes Austronesian languages in which this system is absent.

3.1. THE "FOCUS" SYSTEM. The focus system comprises a complex array of verbal morphology indicating the semantic role of one of the arguments appearing in a clause. This argument (traditionally called, confusingly enough, the "topic") has special properties. In terms of morphosyntax, it often appears with a special preposed particle and is uniquely accessible to certain constructions, such as relativization. In terms of discourse, it is usually definite. This system is well-known, but I will illustrate it here with some familiar Tagalog examples.

Beginning with the morphology which is most relevant for my purposes, in the Tagalog example in 14, the verb has a suffix *-an*, and topic properties are associated with the location argument. Note that the location argument occurs as the object of the topic particle *ang* and that it is definite. Moreover, if we tried to relativize on any argument in 14, only the location would be accessible.

(14) Location topic:

d<-in->alh-an	*ng*	*lalake*	*ng*	*isda*	*ang*	*bata*
<PERF->bring-LOC TOPIC	PREP	man	PREP	fish	TOPIC	child

'The man brought some fish to the child.' (Foley 1976:110)

In 15, the verb has a prefix *i-*, which indicates that an instrument argument holds the topic properties.

(15) Instrument topic:

i-p<-in->utol	*ng*	*lalake*	*ng*	*isda*	*ang*	*kutsilyo*
INST TOPIC<-PERF->cut	PREP	man	PREP	fish	TOPIC	knife

'The man cut some fish with the knife.' (112)

Depending on the language, either the location or instrument topic morphology may also indicate that a *benefactive* argument is the topic.

Tagalog also has verbal morphology for signaling that an agent or actor is topic (16a), or for indicating that a patient or undergoer is topic (16b, from Schachter 1976:495).

(16) a. Agent topic:
p<-um->asok *sa* *bahay* *ang lalake*
<AGT TOPIC->enter PREP house TOPIC man
'The man entered the house.' (Foley 1976:106)

b. Patient topic:
aalis-in *ng* *babae* *ang bigas* *sa* *sako*
WILL.take.out-PAT TOPIC PREP woman TOPIC rice PREP sack
'A/The woman will take the rice out of a/the sack for a/the child.'

Finally, a verb marked with the "perfective aspect" infix typically indicates that a patient is the topic (17).

(17) Perfective aspect (Patient topic):
b<-in->asag *ng* *bata* *ang laruan* *ng* *tungkod*
<PERF->break PREP child TOPIC toy PREP cane
'The child broke the toy with the cane.' (Foley 1976:108)

Combinations of one of the affixes in 14-16a and the perfective aspect infix signify an action in the past which has a non-patient entity as its topic.

Of course, I do not claim to have described all of the intricacies of the focus system here. In particular, there is much more morphology to the Formosan/Philippine verb. There are also limitations on which focus morphology a particular stem may occur with. Finally, Tagalog is not itself the most representative of the languages with a system of this sort. The purpose of citing these examples is simply to introduce the morphology and to demonstrate its verbal function.

The use of the term *applicative* to describe the location and the instrument topic constructions has been gaining some currency in the literature on Austronesian languages. Mithun 1994, for instance, describes the location and instrument topic morphology as applicative markers, and their status as such is implicit in Gerdts 1992. If one adopts a view of Formosan/Philippine syntax as essentially ergative (as argued for by Gerdts 1988 and many others), this applicative characterization of the location and instrument topic constructions is straightforward. In an ergatively aligned language, the role of an applicative construction is to place an oblique in the absolutive relation. This is just what the location and instrument topic markers do, since, on an ergative analysis, the Formosan/Philippine topic corresponds to the absolutive relation.

3.2. OCEANIC REFLEXES. Because the morphology in 14 and 15 is found in multiple Formosan branches and also widely in Western Malayo-Polynesian, it is generally reconstructed to Proto-Austronesian, as we will see below. Here I will be concerned primarily with the instrument and location topic morphology.

The notable reflexes of this morphology outside of Western Malayo-Polynesian are in Oceanic instrument and location nominalizations (Pawley and Reid 1980:110). 18 shows reflexes of the instrument morphology, and 19 shows reflexes of the location morphology.

(18) a. Sa'a (South-East Solomonic, Ivens 1918:143):
käu 'to hook' *i-keu* 'a hook for gathering fruit'
dänu 'to bale' *i-denu* 'a baler'

b. Mota (Remote Oceanic, Codrington 1885:262):

sar 'to pierce'	*i-sar* 'a spear'
got 'to cut'	*i-got* 'a cutter'
ras 'to bale'	*i-ras* 'a baler'

c. Boumaa Fijian (Remote Oceanic, Dixon 1988:192):

sele 'cut, slice'	*i-sele* 'knife'
cula 'pierce'	*i-cula* 'needle'
'aba 'climb steep surface'	*i-'aba'aba* 'ladder'

(19) Roviana (Western Oceanic, Ray 1926:545):

habotu 'to sit'	*habohabotu-ana* 'sitting places'
sigoto 'to anchor'	*sigoto-ana* 'anchorage'
huvehuve 'to bathe'	*huvehuve-ana* 'bathing place'

The Central/Eastern Oceanic reflexes for the location morphology are not as obvious as the Western Oceanic reflexes in terms of their semantics (see 20). Here, the morphology has been reinterpreted as an abstract nominalizer.

(20) a. Baki (Remote Oceanic, Ray 1926:246):

ili 'say'	*ili-an* 'speech'
monea 'believe'	*monea-n* 'faith'
maro 'die'	*na mar-ian* 'death'

b. Inakona (South-East Solomonic, Capell 1930:114):

dona 'to know'	*dodon-ana* 'knowledge'
dou 'good'	*dou-ana* 'goodness'
vaulu 'new'	*vaulu-na* 'newness'

4. THE EVOLUTION OF PROTO-AUSTRONESIAN MORPHOSYNTAX. Both Wolff 1973 and Ross 1995a reconstruct the proto-paradigm shown in Figure 2 for Proto-Austronesian.

FIGURE 2. PROTO-AUSTRONESIAN VERB MORPHOLOGY

Indicative	**Actor voice**	**Undergoer voice**	**Location voice**
Neutral aspect	**<um>*	**-ən*	**-an*
Perfective aspect	**<um-in>*	**<in>*	**<in> -an*

Non-Indicative	**Actor voice**	**Undergoer voice**	**Location voice**
Atemporal	**∅*	**-u*	**-i*
Projective	**<um> -a*	**-a-u*	**-a-i*

The morphology in the indicative portion of the paradigm should by now be familiar. The non-indicative is apparently the remains of an earlier system for marking grammatical relations which the reconstructed indicative has replaced. The evidence for the non-indicative is found mostly in imperatives and some subordinate clause forms. In addition, a third 'durative' aspect in the indicative, involving reduplication of the neutral aspect form, is posited, but I have omitted it here for ease of exposition. It may be noted that the instrument topic morphology is missing from this paradigm, an issue to which I will return below.

The standard account of the indicative portion of this system (Ross 1995a, following Starosta, Pawley, and Reid 1982), is that the basic Pre-Proto-

Austronesian use of this morphology was *nominalizing*; perfective, patient, location and, in some cases, instrument nominalizations were reanalyzed as finite forms as a "strategy of diathesis" (Ross 1995a:753). In other words, the claim is that the pre-proto-language took these three or four nominalizations and made them into finite forms in order to make voice distinctions.

While I think this account may be justifiable in terms of the perfective and undergoer topic forms, I do not think that it is a likely route of development for the location and instrument topic forms. The alternative which I propose is that the location and instrument topic morphology in Proto-Austronesian arose via normal applicative grammaticalization routes and *not* from reanalysis of nominalizations as finite forms. The location topic morphology presumably came from a preposition, given its postverbal position in a verb-initial language. The instrument topic morphology probably came from an auxiliary; a good candidate is the reconstructed verbalizing element **Si-*, which meant something like 'have, possess, wear N' (Ross 1995a:758).

One of the uses for this morphology in Austronesian languages which retain it is for forming relative clauses on peripheral objects. For example, in the Formosan language Bunun (Jeng 1977:185-6), we see that relativization on a location and an instrument requires use of the location topic (21a) and instrument topic (21b) forms in the relative clause.

(21) a. Relativization on location:

m-unha?an	*sak*	*sia*	[*ba-baliv-an*	*sanglav*]
AGT TOPIC-go to	I	the one	RED-buy-LOC TOP	vegetable

'I (am) going to the place where vegetables (are) frequently bought.'
'I (am) going to the market.'

b. Relativization on instrument:

?uka? *a*	*sui*	[*is-baliv*	*ðaku*	*hulus*]
none NM	money	INST TOPIC-buy	me	clothes

'(There is) no money which (is to be) used by me to buy clothes.'

Now, a productive means of relativization like this could have easily been reinterpreted as nominalization, in particular if the relative clause was headless. It is likely that a nominalizing function had developed alongside the main clause use in Proto-Austronesian before its breakup, given that the focus morphology has a nominalizing function throughout the family.

We saw in section 2 that it is not uncommon for applicative morphology to become restricted to subordinate clauses, especially relative clauses. By, at latest, Pre-Proto-Oceanic, then, the applicative morphology was first restricted to relative clauses, and then it was reanalyzed as strictly nominalizing. In 22a and b, I show how this type of reanalysis of applicative morphology could have occurred using some modern forms.

(22) a. Roviana:

habotu 'to sit'	*habohabotu-ana* 'where one sits' > 'sitting place(s)'
sigoto 'to anchor'	*sigoto-ana* 'where one anchors' > 'anchorage'
huvehuve 'to bathe'	*huvehuve-ana* 'where one bathes' > 'bathing place'

b. Boumaa Fijian:

sele 'cut, slice'	*i-sele* 'what one cuts with' > 'knife'
cula 'pierce'	*i-cula* 'what one pierces with' > 'needle'
'aba 'climb steep surface'	*i-'aba'aba* 'what one climbs with' > 'ladder'

Concerning the instrument topic forms, Ross 1995a concludes that there is not sufficient representation of the verbal use of the instrument topic prefix to reconstruct this function of the morphology to Proto-Austronesian. It is found widely in nominalizations, however. His account of this state of affairs is that the main clause use of the instrument topic morphology had not arisen at the Proto-Austronesian stage, but that after the breakup of the proto-language, its main clause use developed independently in the languages which have it (756-760).

Independent development is also compatible with the account suggested here, but an alternative is that the verbal use of the instrument topic morphology is archaic, and the reason that nominalizations are more widely found than main clause uses is that it has become reanalyzed as a nominalizer from its relativization use even in otherwise more conservative languages. Instrumental applicatives in particular, if the available examples of applicative development serve as any indication, have a propensity for losing their main clause applicative status and becoming trapped in subordinate clauses. Difficulties in reconstructing the vocalism of the instrument topic element to Proto-Austronesian, however, may speak against this interpretation.

5. CONCLUSION. The standard account is probably correct for the patient and perfective forms, which in turn may account for the development of Proto-Austronesian ergativity. Aside from the development of ergativity, nominalizations *are* commonly reanalyzed as finite forms (see Matisoff 1972, for example, for some Sino-Tibetan cases). However, I know of no cases in which this type of reanalysis ends up making the diathesis distinctions that are relevant in the standard nominalization > finite form account of the Proto-Austronesian verbal system. There is at least as much precedent for the account I have proposed here as there is for the standard one, and in the interest of stimulating further investigation into the matter and into the diachrony of voice systems in general, I cast my vote for a normal applicative origin for the location and instrument topic morphology.

REFERENCES

AISSEN, JUDITH. 1983. Indirect object advancement in Tzotzil. Studies in Relational Grammar 1, ed. by David Perlmutter, 272-302. Chicago: University of Chicago Press.

BLAKE, BARRY. 1977. Case marking in Australian languages. Canberra: Australian Institute of Aboriginal Studies.

BRESNAN, JOAN and LIOBA MOSHI. 1990. Object asymmetries in comparative Bantu syntax. Linguistic Inquiry 21.147-185.

CAPELL, ARTHUR. 1930. The language of Inakona, Guadalcanar, Solomon Islands. Journal of the Polynesian Society 39.113-136.

CODRINGTON, R.H. 1885. The Melanesian languages. Oxford: Oxford University Press.

CRAIG, COLETTE and KEN HALE. 1988. Relational preverbs in some languages of the Americas: Typological and historical perspectives. Language 64.312-344.

DAYLEY, JON. 1985. Tzutujil grammar. UCPL 107. Berkeley: UC Press.
DIXON, R.M.W. 1988. A grammar of Boumaa Fijian. Chicago: University of Chicago Press.
FELDMAN, HARRY. 1986. A grammar of Awtuw. Pacific Linguistics Series B-94. Canberra: The Australian National University.
FOLEY, WILLIAM. 1976. Comparative syntax in Austronesian. UC Berkeley dissertation.
GARRETT, ANDREW. 1990. Applicatives and preposition incorporation. Grammatical relations: A cross-theoretical perspective, ed. by Katarzyna Dziwirik et al., 183-198. Stanford: CSLI.
GERDTS, DONNA. 1988. Antipassives and causatives in Ilokano: Evidence for an ergative analysis. Studies in Austronesian linguistics, ed. by Richard McGinn, 295-321. Athens: Ohio University Center for International Studies.
_____. 1992. Morphologically-mediated relational profiles. BLS 18.322-337.
IVENS, WALTER G. 1918. Dictionary and grammar of Sa'a and Ulawa, Solomon Islands. Carnegie Institute Publication 253. Washington.
JENG, HENG-HSIUNG. 1977. Topic and focus in Bunun. Taipei: Institute of History and Philology, Academia Sinica.
KIMENYI, ALEXANDRE. 1980. A relational grammar of Kinyarwanda. UCPL 91. Berkeley: UC Press.
MATISOFF, JAMES. 1972. Lahu nominalization, relativization, and genitivization. Syntax and semantics, vol. 1, ed. by John Kimball, 237-257. New York: Seminar Press.
MITHUN, MARIANNE. 1994. The implications of ergativity for a Philippine voice system. Voice: Form and function, ed. by Barbara Fox and Paul Hopper, 247-277. Philadelphia: John Benjamins.
NORMAN, WILLIAM. 1978. Advancement rules and syntactic change: The loss of instrumental voice in Mayan. BLS 4.458-476.
PAWLEY, ANDREW. 1972. On the internal relationships of Eastern Oceanic languages. Studies in Oceanic culture history, vol. 3, ed. by R.C. Green and M. Kelly, 1-142. Honolulu: Department of Anthropology, Bernice Pauahi Bishop Museum.
_____ and LAWRENCE REID. 1980. The evolution of transitive constructions in Austronesian. Austronesian studies: Papers from the Second Eastern Conference on Austronesian Languages, ed. by Paz Buenaventura Naylor, 103-130. Ann Arbor: The University of Michigan Center for South and Southeast Asian Studies.
_____ and MALCOLM ROSS. 1993. Austronesian historical linguistics and culture history. Annual Review of Anthropology 22.425-59.
PAYNE, DORIS. 1990. Morphological characteristics of lowland South American languages. Amazonian linguistics, ed. by Doris Payne, 213-241. Austin: University of Texas Press.
RAY, S.H. 1926. A comparative study of the Melanesian island languages. Cambridge: Cambridge University Press.
ROSS, MALCOLM. 1995a. Reconstructing Proto-Austronesian verbal morphology: Evidence from Taiwan. Austronesian studies relating to Taiwan, Symposium Series of the Institute of History and Philology, Academia Sinica, Number 3, ed. by Paul Jen-kuei Li, et al., 727-791. Taipei: Academia Sinica.
_____. 1995b. Some current issues in Austronesian linguistics. Comparative Austronesian dictionary: An introduction to Austronesian studies, Part 1: Fascicle 1, ed. by Darrell T. Tryon, 45-120. Berlin: Mouton de Gruyter.

RUDE, NOEL. 1991. Verbs to promotional suffixes in Sahaptian and Klamath. Approaches to grammaticalization, vol. 2, ed. by Elizabeth Traugott and Paul Hopper, 183-199. Philadelphia: John Benjamins.

SCHACHTER, PAUL. 1976. The subject in Philippine languages: Topic, actor, actor-topic or none of the above. Subject and Topic, ed. by Charles Li, 491-518. New York: Academic Press.

STAROSTA, STANLEY, ANDREW PAWLEY, and LAWRENCE REID. 1982. The evolution of focus in Austronesian. Papers from the Third International Conference on Austronesian Linguistics, vol. 2. Pacific Linguistics C-75, ed. by Amran Halim, et al., 145-170. Canberra: The Australian National University.

THOMPSON, SANDRA. 1990. Information flow and dative shift in English discourse. Development and diversity: Language variation across time and space, a festschrift for Charles-James N. Bailey, ed. by Jerold Edmondson et al., 239-253. Arlington: SIL and The University of Texas at Arlington.

TRITHART, MARY. 1976. Relational Grammar and Chichewa subjectivization rules. UCLA M.A. thesis.

WEIR, E.M. HELEN. 1986. Footprints of yesterday's syntax: Diachronic development of certain verb prefixes in an OSV language (Nadëb). Lingua 68.291-316.

WISE, MARY RUTH. 1971. Identification of participants in discourse: A study of aspects of form and meaning in Nomatsiguenga. SIL Publications in Linguistics 28. Norman: SIL and The University of Oklahoma.

WOLFF, JOHN. 1973. Verbal inflection in Proto-Austronesian. Parangal kay Cecilio Lopez: Essays in Honor of Cecilio Lopez on his seventy-fifth birthday, ed. by Andrew B. Gonzalez, 71-91. Quezon City: Linguistic Society of the Philippines.

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A Unified Account of the Japanese Causative, *Moraw*-Benefactive, and Passive Constructions[1]

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1. INTRODUCTION. This paper provides a Construction Grammar treatment of the Japanese Causative, *Moraw*-Benefactive, and Adversative Passive Constructions. Construction Grammar (Fillmore et al. 1988, Kay 1990, Fillmore & Kay 1995) is similar to HPSG (Pollard & Sag 1994) in that feature structures integrating phonological, syntactic, and semantic information are used to make formal and precise linguistic descriptions. Attributes of linguistic description are related not by movement but by unification.

Consider the following sentence:

(1) *Taroo ga piza o tabe-ta.*
Taroo SUBJ pizza OBJ eat-PST
'Taroo ate the pizza.'

Sentence (1) has two arguments and the verb stem *tabe-*.[2] Now look at sentences (2)-(4). If one wants to express someone else's relationship to the scene evoked in (1), there are at least three ways of doing so:

(2) causative *Akiko ga Taroo ni piza o tabe-sase-ta.*
Akiko GA Taroo NI pizza O eat-CAUS-PST
'Akiko made/let Taroo eat the pizza.'

(2) has the derived verb stem *tabe-sase-* and has three arguments instead of two. The third argument (here, Akiko) identifies someone who *brings about* an event of the type represented in (1).

(3) benefactive *Akiko ga Taroo ni piza o tabete-morat-ta.*
Akiko GA Taroo NI pizza O eat.GER-receive-PST
'Akiko received the benefit of Taroo eating the pizza.'

(3) has the derived verb stem *tabete-moraw-* and again has three arguments. The third argument identifies someone who *benefits from* an event of the type represented in (1).

(4) adversative passive *Akiko ga Taroo ni piza o tabe-rare-ta.*
Akiko GA Taroo NI pizza O eat-ADVPSS-PST
'Akiko was adversely affected by Taroo eating the pizza.'

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[2]The subject is marked by the particle *ga* and the object is marked by the particle *o*; henceforth, we will simply gloss *ga* and *o* as GA and O. We will also gloss *ni*, which marks Taroo in sentences such as (2)-(4), as NI.

(4) has the derived verb stem *tabe-rare-* and again has three arguments. The third argument identifies someone who is *psychologically affected by* an event of the type represented in (1).[3]

Sentences (2), (3), and (4) can be referred to as instances of the the Causative, the *Moraw*-Benefactive, and the Adversative Passive. They all have the same structure, "A(kiko) *ga* T(aroo) *ni* VP', where T always does the eating of P(izza), and A is an *added* argument. Semantically, the main difference between these expressions is that in the causative sentence, A instigates T's action; in the benefactive example, A receives the benefit of T's action; and in the adversative passive sentence, A is adversely affected by T's action.

1.1. OUR APPROACH. Although these three constructions have the same structure, they have traditionally been treated as different phenomena within the grammar of Japanese. The Construction Grammar framework, however, allows us to recognize what is common among them by defining an Argument Adding Construction (AAC) which provides:

- an added element to the valence of the verb
- an added argument to the semantics
- a means of incorporating the semantics of the stem verb as a component of a semantic structure involving the added argument
- a place for the phonological material which is added to the original stem to give the derived form

The mechanism of *construction inheritance* (if construction C *inherits* D, C contains all the properties of D) then allows us to define three other constructions (Causative, *Moraw*-Benefactive, Adversative Passive) which inherit all of the characteristics of the AAC but which themselves provide the phonology of the verb stem's augmentation, the semantic frame by which the added argument enters into a relation with the semantics provided by the verb stem, as well as certain other construction-specific information.

The advantages of our approach can be summarized as follows:

1. Using the mechanism of inheritance, we can recognize what is common among these sentence types and thereby give a unified account of the Causative, *Moraw*-Benefactive, and Adversative Passive Constructions. No previous work has proposed this.
2. Unlike some analyses (in particular Chung 1993), the morphology found in the regular and adversative passives is characterized as the same affix, rather than as distinct but coincidentally homophonous .
3. Transformational accounts of the adversative passive encounter problems with argument addition and absence of case absorption (Marantz 1984, Kang 1986, Miyagawa 1989, Kim 1990, Han 1991, Washio 1990). We avoid these problems, since our account explicitly involves an Argument Adding Construction in conjunction with the regular Passive, which, in Construction Grammar, does not rely on case absorption.

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[3]We retain the traditional name of *Adversative* Passive, since it is certain that the added argument is psychologically affected in some way, almost always negatively. However, see Alfonso 1966, Kuroda 1965, Shibatani 1972, and Shibatani 1990 for a more detailed discussion of the semantics of *-rare*.

2. THE ARGUMENT ADDING CONSTRUCTION (AAC). Before going into the AAC, we will first examine, in Figure 1, a simplified representation of *tabe-* 'eat' (inner box) derived as a causative (*tabe-sase-*) (outer box) and, in Figure 2, a representation of *tabe-* derived as a benefactive (*tabete-moraw-*) (outer box).

Figure 1. ***tabe-sase-.***

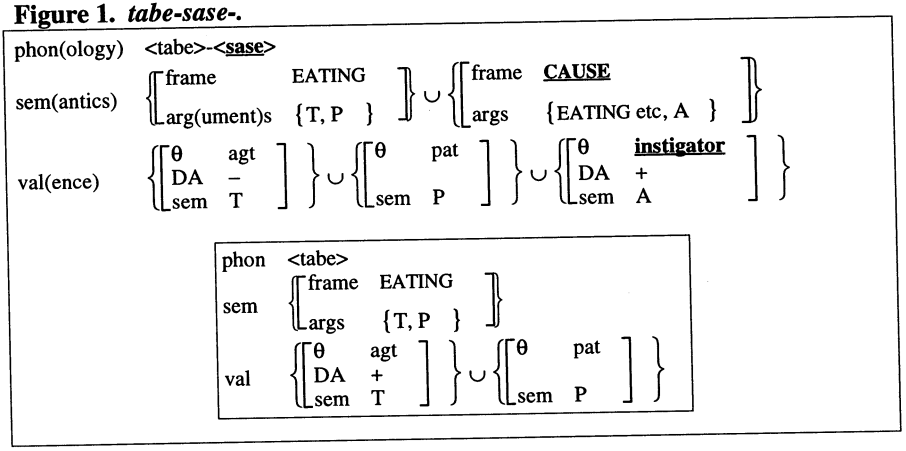
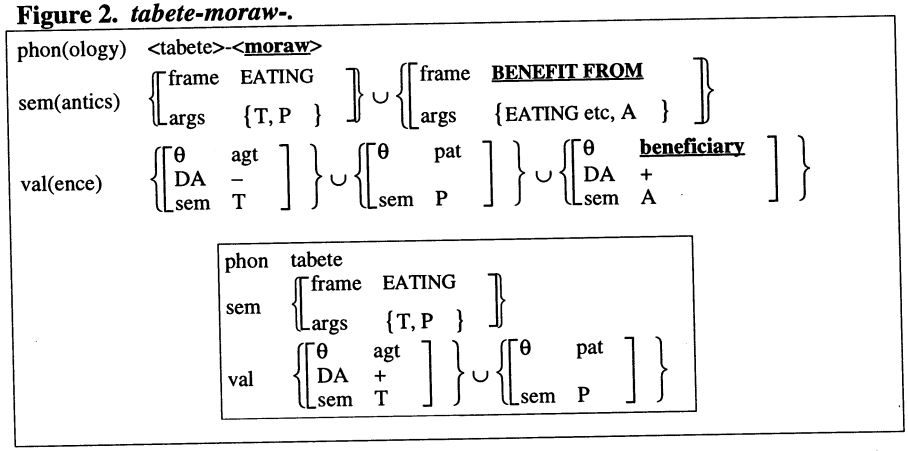


Figure 2. ***tabete-moraw-.***

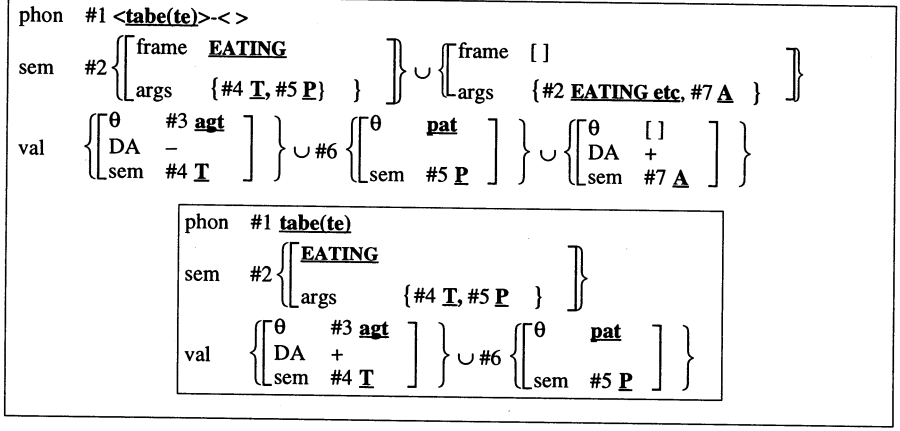


As can be seen, Figures 1 and 2 have much in common. In fact, the main differences are in those elements which are underlined, i.e.:

- the added phonological material (*sase* vs. *moraw*)
- the added semantics (the frame CAUSE vs. the frame BENEFIT FROM)
- the added argument's thematic role (instigator vs. beneficiary)

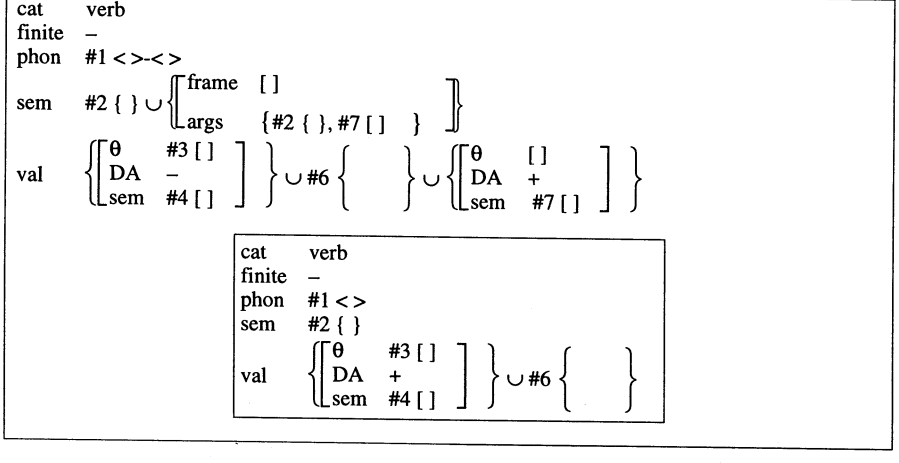
This is the information which will be added by the individual Causative, *Moraw*-Benefactive, and Adversative Passive Constructions. In the next figure, we remove this information added by the individual constructions and just show the features common to Figures 1 and 2.

Figure 3. The features common to Figures 1 and 2.



All of the underlined elements above (e.g., the phonological material of *tabe(te)*, the semantic frame of EATING, the semantics of T, P, and A) represent information which is contributed by individual lexical items (such as 'eat', 'pizza', 'Taroo', etc.). By removing this information, we end up with an abstract Argument Adding Construction. We use numerals prefixed by '#' to coindex the information which is shared between different parts of the construction. The resulting AAC (with some more details filled in) is shown below:

Figure 4. The Argument Adding Construction.



WHAT THIS MEANS:

	INSIDE	OUTSIDE
cat	Can only unify with a verb.	Also has the syntactic category of verb.
fin –	Cannot unify with a tensed verb.	Also tenseless.
phon	The verb supplies this (#1).	New phonology (e.g., *sase, moraw*) is added to #1.
sem	There are some semantics associated with the verb.	A union (∪) of the semantics associated with the inner verb (#2) and the added semantics contributed by *-rare*, *-sase*, or *moraw-*.
val	The valence of every verb consists of a union of the distinguished argument/ logical subject and zero or more additional arguments.	Basically a union of the verbal valence of the inner verb and the added argument; however, the distinguished argument (DA +) of the inner verb is no longer DA, and it is the *added* argument that takes over this role.

In sections 3, 4, and 5, we examine in detail the three lexical constructions (Causative, *Moraw*-Benefactive[4], Adversative Passive) which inherit all of the characteristics of the AAC.

3. THE CAUSATIVE CONSTRUCTIONS. The canonical morphological Causative Construction involves the suffix *-sase*. With transitive verbs, the causee must be marked with *ni*; however, with intransitive verbs, there is an alternation whereby the causee can be marked by either *o* or *ni*, with a slight semantic difference:

(5) *Watasi ga Ken o ik-ase-ta.*
I GA Ken O go-CAUS-PST
'I made Ken go.'

(6) *Watasi ga Ken ni ik-ase-ta.*
I GA Ken NI go-CAUS-PST
'I let Ken go.'

There has been a great deal of discussion about the semantic difference between sentences of the type shown in (5) and (6) (Kuroda 1965, Kuno 1973, Shibatani 1973, Tonoike 1978, Takahashi 1981, Nagai 1985). Typically, however, the *O*-Causative implies that the intention of the causee is ignored by the instigator (the *coercion* reading), while the *Ni*-Causative implies that the instigator appeals to the causee's intention to go (the *permission* reading). (The *Ni*-Causative with transitive verbs can have either the permission or the coercion reading.) For

[4]The reasons for treating the *Moraw*-Benefactive as a lexical (rather than phrasal) construction are: (1) [V-*te moraw*-] seems to be one constituent, in that *moraw*- can never be separated from the preceding verb by what is called *scrambling* in other frameworks (e.g., **Piza o tabe-te Akiko ga Taroo ni morat-ta*); (2) V-*te moraw*- is treated as a single word for purposes of accent assignment; (3) if we compare the three argument-adding morphemes, we see that they are at different points on the grammaticization continuum: with *-rare*, nothing can come between the verb and *-rare*, and, in addition, there is no lexical verb **rareru*; with *-sase* (which is somewhere in between *-rare* and *moraw*-), contrastive focus *wa* can occasionally come between it and the verb (as in *tabe wa saseta ga...* '[I] made [him] *eat* but [not] ...'), and, in addition, there *is* a lexical verb *saseru* 'make, cause, let, allow'; finally, with *moraw*-, the particles and negation can intervene, and there is also a lexical verb *morau* 'receive'. Our treating the three morphemes as inheriting the same construction predicts that *moraw*- will become more like *-sase* and *-rare* in the future.

purposes of this paper, we will simply say that the instigator causes—with "*ni*-" or "*o*-semantics"—some state of affairs.

3.1. THE *NI*-CAUSATIVE CONSTRUCTION. Figure 5 shows the *Ni*-Causative Construction:

Figure 5. *Ni*-Causative Construction.

inherit	Argument Adding Construction
cat	verb
finite	–
phon	#1 < >-<sase>
sem	#2 { } ∪ [frame CAUSE-NI ; args {#7 [ ], #2 { } }]
val	{ [θ #3 [ ] ; DA – ; sem #4 [ ]] } ∪ #6 { } ∪ { [θ instigator ; DA + ; sem #7 [ ]] }

cat	verb
trans(itivity)	¬ unacc(usative)
finite	–
phon	#1 < >
sem	#2 { }
val	{ [θ #3 [ ] ; DA + ; sem #4 [ ]] } ∪ #6 { }

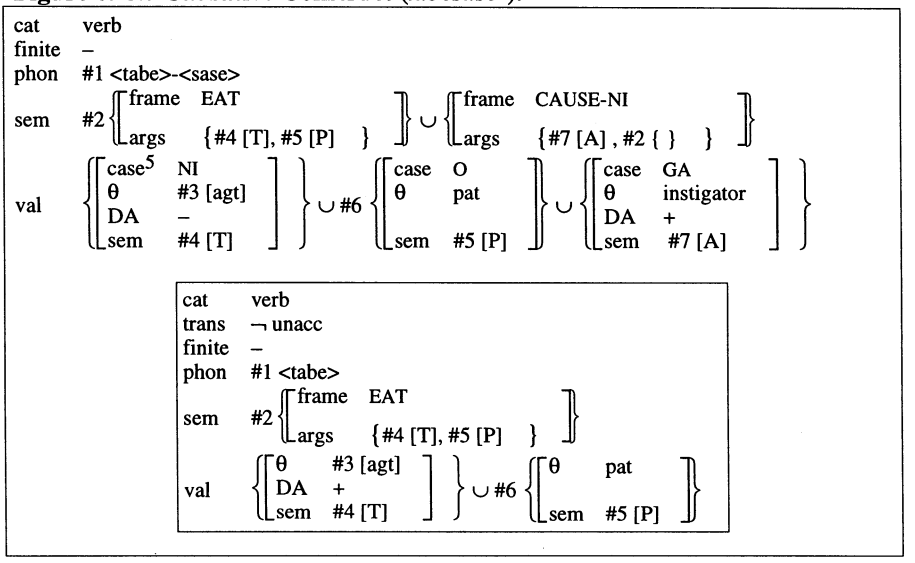
WHAT THIS MEANS:

	INSIDE	OUTSIDE
inherit		Inherits all the properties of the AAC.
transi-tivity	The verb may not be unaccusative (see Appendix II).	
phon	Supplied by the verb (#1).	#1 plus *sase* (see Appendix I).
sem		The added argument (#7) CAUSES (with *Ni*-Causative semantics) the state of affairs represented in #2 { }.
val		The added argument is linked to the thematic role of instigator.

To make things clearer, in Figure 6 we show what a *construct* licensed in part by the *Ni*-Causative Construction would look like. (Although it is not strictly necessary to include instances of coindexation and union in constructs, we include them for clarity.) The figure shows a detailed representation of the verb in (7):

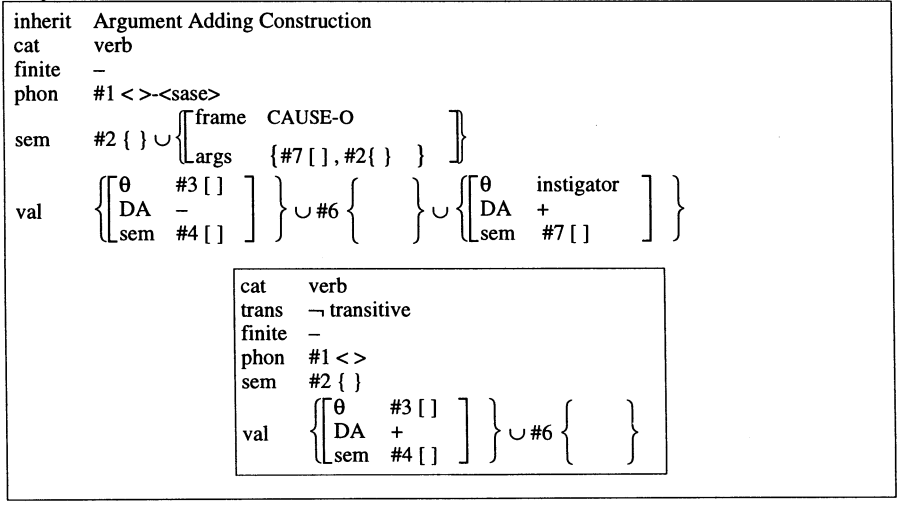
(7) *Akiko ga Taroo ni piza o tabe-sase-ta.*
Akiko GA Taroo NI pizza O eat-CAUS-PST
'Akiko made/let Taroo eat the pizza.'

Figure 6. ***Ni*-Causative Construct (*tabesase-*).**



3.2. THE *O*-CAUSATIVE CONSTRUCTION. Figure 7 represents the *O*-Causative Construction.

Figure 7. ***O*-Causative Construction.**



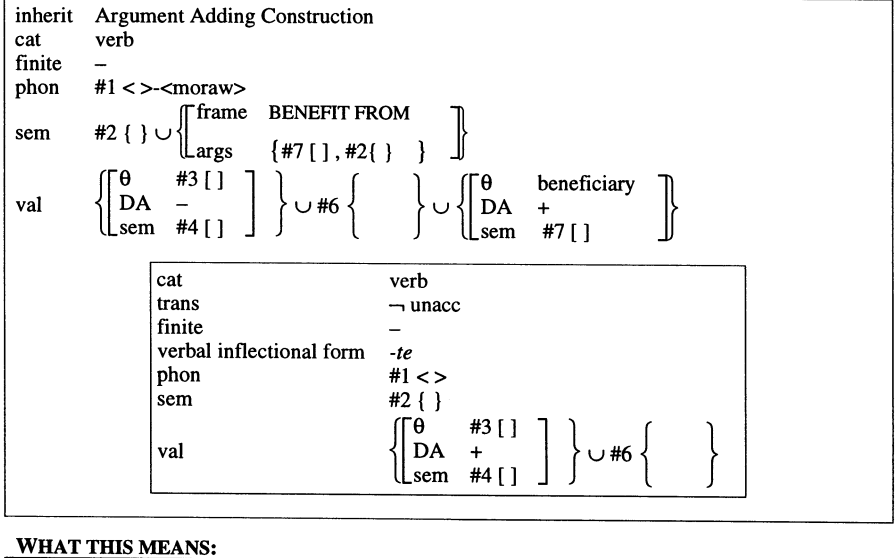
[5]Supplied by various Linking Constructions.

WHAT THIS MEANS:

	INSIDE	OUTSIDE
inherit		Inherits the AAC.
transi-tivity	Only intransitive verbs are permitted (see Appendix II).	
phon	Supplied by the verb (#1).	#1 plus *sase* (see Appendix I).
sem		The added argument (#7) CAUSES (with *O*-Causative semantics) the state of affairs represented in #2 { }.
val		The added argument is linked to the thematic role of instigator.

4. THE *MORAW*-CONSTRUCTION. Figure 8 shows the *Moraw*-Construction.

Figure 8. The *Moraw*-Construction.



WHAT THIS MEANS:

	INSIDE	OUTSIDE
inherit		Inherits the AAC.
transi-tivity	The verb may not be unaccusative (see Appendix II).	
v.i.f.	The *-te* form of the verb is required.	
phon	Supplied by the verb (#1).	#1 plus *moraw*.
sem		Argument #7 BENEFITS FROM the state of affairs represented in #2 { }.
val		The added argument is linked to the thematic role of beneficiary.

5. THE PASSIVE. For the treatment of the Adversative Passive Construction, we must first illustrate the ordinary passive in Japanese. We will use the verb *nagur-* 'hit' as an example. The minimal valence for *nagur-* is shown below:

Figure 9. The minimal valence for *nagur-* 'hit':

[ ]	[ ]
agt	pat
DA +	

nagur-

The Passive Linking Construction, which links the Distinguished Argument to case NI is shown next:

Figure 10. The Passive Linking Construction.

phon #1 < >-<rare>

val #2 { [case NI ; DA +] } ∪ #3 { }

phon #1 < >

val #2 { [DA +] } ∪ #3 { }

WHAT THIS MEANS:

	INSIDE	OUTSIDE
phon	Supplied by the verb (#1).	#1 plus *rare*; see Appendix I.
val	There is a distinguished argument and zero or more other arguments.	Case NI is assigned to the DA.

In the next figure, we show the unification of *nagur-* and the Passive Linking Construction.

Figure 11. Unification of *nagur-* and the Passive Linking Construction.

phon #1 <nagur>-<rare>

val #2 { [case NI ; θ agt ; DA +] } ∪ #3 { [case [ ] ; θ pat] }

phon #1 <nagur>

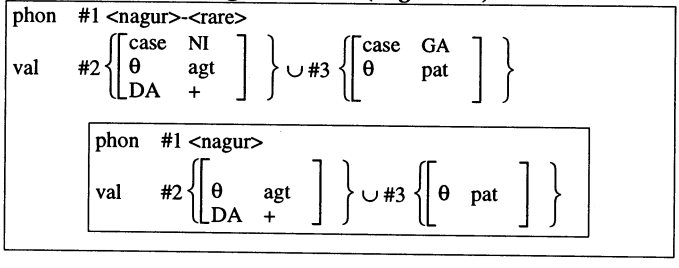
val #2 { [θ agt ; DA +] } ∪ #3 { [θ pat] }

The Japanese equivalent of the Subject Principle says that every fully specified verbal valence has at least one argument linked to case GA. By this principle, the patient argument is linked to case GA. This Passive Linking Construction, together with the Subject Principle, is what licenses sentences such as:

(8) *Taroo ga Akiko ni nagur-are-ta.*
Taroo GA Akiko NI hit-PSS-PST
'Taroo was hit by Akiko.'

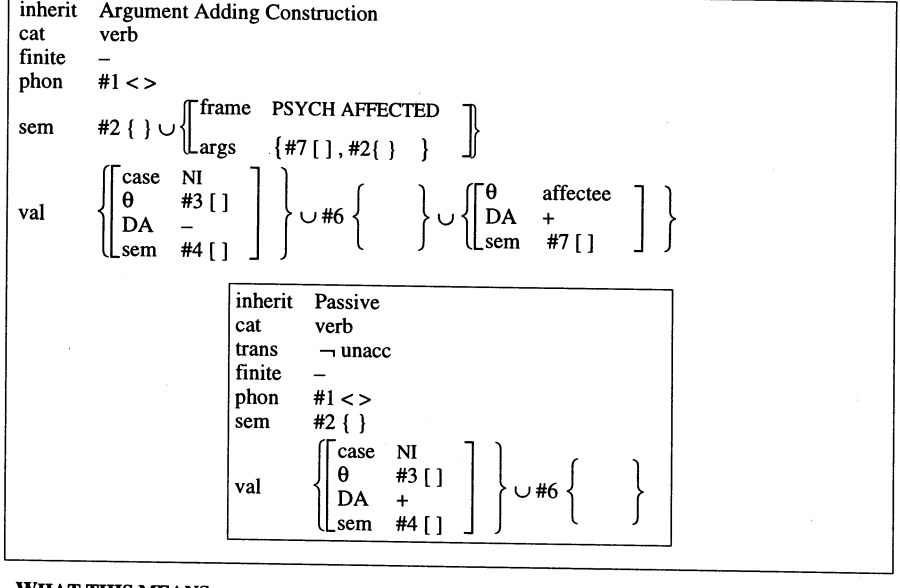
Figure 12 is a detailed representation of the verb in (8).

Figure 12. Passive Linking Construct (*nagurare*-).



5.1. THE ADVERSATIVE PASSIVE CONSTRUCTION. Figure 13 represents the Adversative Passive Construction. In addition to inheriting the AAC—like the Causative and *Moraw*-Benefactive Constructions—this construction also inherits (in the inner box) the Passive Linking Construction from Figure 10.

Figure 13. The Adversative Passive Construction.



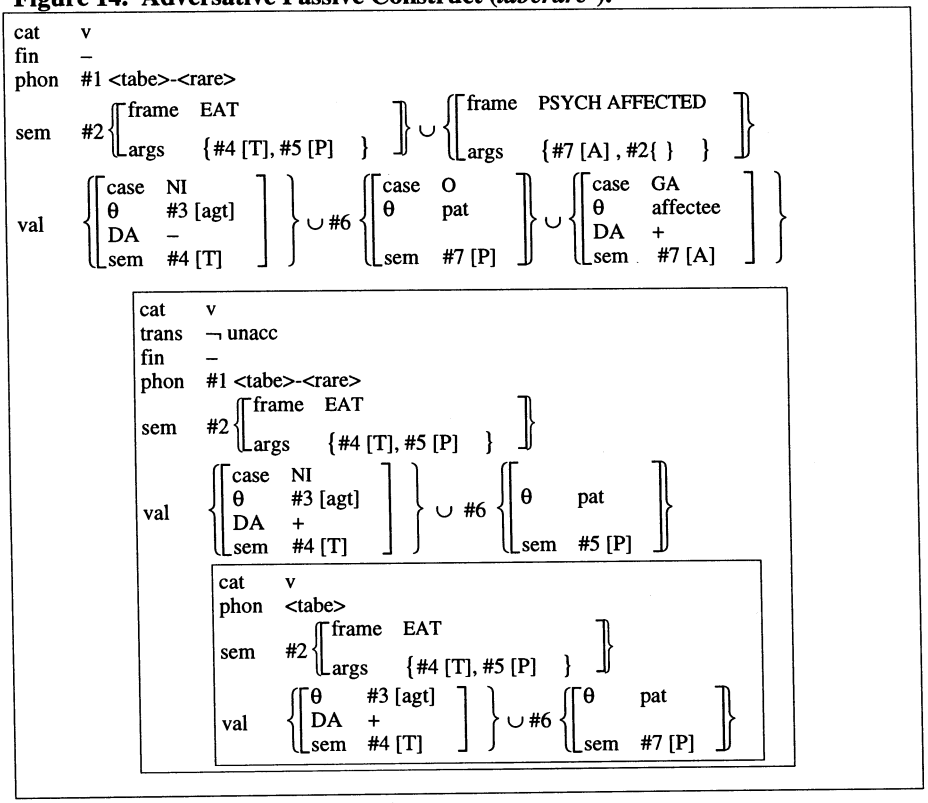
WHAT THIS MEANS:

	INSIDE	OUTSIDE
inh	Inherits the Passive Linking Construction.	Inherits the AAC.
phon	<V-rare> (#1). (*-rare* is from the inherited Passive Linking Construction.)	<V-rare> (#1) is copied.
unacc	The verb cannot be unaccusative (see Appendix II).	
sem		The added argument (#7) is PSYCHOLOGICALLY AFFECTED by the state of affairs represented in #2 { }.
val		The added argument is linked to the thematic role of affectee.

Figure 14 is a detailed representation of the verb in (9):

(9) *Akiko ga Taroo ni piza o tabe-rare-ta.*
Akiko GA Taroo NI pizza O eat-ADVPSS-PST
'Akiko was adversely affected by Taroo eating the pizza.'

Figure 14. Adversative Passive Construct (*taberare-*).



6. SUMMARY. We have proposed a single Argument Adding Construction (AAC) inherited by three other constructions (Causative, *Moraw*-Benefactive, and Adversative Passive) which provide more specific information. By means of construction inheritance, we have been able to give a unified account of these constructions that allows us to see how they are related syntactically and semantically. Finally, we have succeeded in positing one single morpheme for both the adversative and regular passives.

7. APPENDIX I: RULES APPLYING TO THE PHONOLOGY. The phonology is a function of the verb stem plus the phonology of *-sase/-rare*. The basic rule is: if the stem ends in a vowel, *-sase* surfaces as [sase] and *-rare* surfaces as [rare]; however, if the stem ends in a consonant, they surfaces as [ase] and as [are], respectively (*tabe-* 'eat' becomes *tabe-sase* and *tabe-rare*, but *yom-* 'read' becomes *yom-ase* and *yom-are*).

8. APPENDIX II: TRANSITIVITY. As shown in the following examples, the Adversative Passive and the *Ni*-Causative may not be used with unaccusative verbs (at least not without giving them an unergative interpretation, as in fairy tales where flowers can bloom to please you, etc.). The *O*-Causative may only be used with intransitive verbs. Consider the following sentences:

transitive

(10) *Watasi ga ani ni nikki o yom-are-ta.*
I GA brother NI diary O read-ADVPSS-PST
'I was adversely affected by my brother's reading my diary.'

(11) *Watasi ga ani ni nikki o yom-ase-ta.*
I GA brother NI diary O read-CAUS-PST
'I made/let my brother read my diary.'

(12) **Watasi ga ani o nikki o yom-ase-ta.*
I GA brother O diary O read-CAUS-PST
*'I made my brother read my diary.'

intransitive, unergative

(13) *Watasi ga ani ni gakkoo e ik-are-ta.*
I GA brother NI school E go-ADVPSS-PST
'I was adversely affected by my brother's going to school.'

(14) *Watasi ga ani ni gakkoo e ik-ase-ta.*
I GA brother NI school E go-CAUS-PST
'I let my brother go to school.'

(15) *Watasi ga ani o gakkoo e ik-ase-ta.*
I GA brother O school E go-CAUS-PST
'I made my brother go to school.'

intransitive, unaccusative

(16) **Watasi ga hanà ni sak-are-ta.*
I GA flowers NI bloom-ADVPSS-PST
*'I was adversely affected by the flowers' blooming.'

(17) **Watasi ga hana ni sak-ase-ta.*
I GA flowers NI bloom-CAUS-PST
*'I let the flowers bloom.'

(18) *Watasi ga hana o sak-ase-ta.*
I GA flowers O bloom-CAUS-PST
'I made the flowers bloom.'

(For lack of space, we did not give any example sentences using the *Moraw*-Benefactive; however, it behaves like the Adversative Passive and the *Ni*-Causative.) These data are summarized below.

verbs	*O*-CAUSATIVE	*NI*-CAUSATIVE	ADVERSATIVE PASSIVE	*MORAW*-BENEFACTIVE
transitive ('read')	*	√	√	√
unergative ('go')	√	√	√	√
unaccusative ('bloom')	√	*	*	*

REFERENCES

ALFONSO, ANTHONY. 1966. Japanese language patterns. Tokyo: Sophia University Press.

CHUNG, TAEGOO. 1993. The affected construction in Korean and Japanese. Japanese/Korean Linguistics 3:154-170.

FILLMORE, CHARLES et al. 1988. Regularity and idiomaticity in grammatical constructions: the case of *let alone*. Language 64:501-38.

_____ AND PAUL KAY. 1995. Construction Grammar. Ms., University of California, Berkeley.

HAN, HAK-SUNG. 1991. The case of Korean adjectives and passive verbs. Studies in Generative Grammar. Seoul: Kul Press.

KANG, YOUNG-SE. 1986. Korean syntax and universal grammar. Harvard University diss.

KAY, PAUL. 1990. Even. Linguistics and Philosophy 13:59-111.

KIM, YOUNG-JOO. 1990. The syntax and semantics of Korean case: the interaction between lexical and syntactic levels of representation. Harvard University dissertation.

KUNO, SUSUMU. 1973. The structure of the Japanese language. Cambridge: MIT Press.

KURODA, SHIGE-YUKI. 1965. Causative forms in Japanese. Foundations of Language 1:1-30.

MARANTZ, ALEC. 1984. On the nature of grammatical relations. Cambridge: MIT Press.

MIYAGAWA, SHIGERU. 1989. Structure and case marking in Japanese. Syntax and Semantics 22. New York: Academic Press.

NAGAI, NORIKO. 1985. Japanese passives and causatives. University of Michigan diss.

POLLARD, CARL AND IVAN SAG. 1994. Head-Driven Phrase Structure Grammar. Chicago: University of Chicago Press.

SHIBATANI, MASAYOSHI. 1972. Remarks on the controversy over the Japanese passive. Papers in Japanese Linguistics 1:145-66.

_____. 1973. Semantics of Japanese causativization. Foundations of Language 9:327-73.

_____. 1990. The languages of Japan. Cambridge: Cambridge University Press.

TAKAHASHI, KUNITOSHI. 1981. On the semantics of causatives in Japanese. Descriptive and Applied Linguistics 14:139-48.

TONOIKE, S. 1978. On the causative constructions in Japanese. In Problems in Japanese Syntax and Semantics, ed. by John Hinds and I. Howard. Tokyo: Kaitakusha.

WASHIO, RYUICHI. 1990. The Japanese passive. The Linguistic Review 6:227-63.

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Syntactic or Non-Syntactic Reconstruction?

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1. INTRODUCTION. This paper is concerned with reconstruction effects: Scope Reconstruction Effects and Connectivity (or Connectedness) Effects. The aim of it is to explore two kinds of drawbacks that a non-syntactic approach to reconstruction presents and that do not arise in a syntactic account.

SCOPE RECONSTRUCTION (ScopeRE) is the effect of having the SCOPE of overtly moved material interpreted not in its S-Structure site, but in a previous site it visited on its way to S-Structure position. In (1), for instance, the existential quantifier *n-many students* --about whose exact amount *n* we are asking-- can be understood as having scope over *should* (wide reading (1a)) or with reconstructed scope under the modal (reconstructed reading (1b)):

(1) How many students should I talk to?
   a. For what number n: there are n-many particular students x such that I should talk to x.
   b. For what number n: it is necessary for there to be n-many students x such that I talk to x. (E.g., how many students/which amount of students should I talk to in order to have a representative survey?)

Another example of ScopeRE is shown under (2), where the variable bound pronoun *his* takes scope under its binder *every boy*:[1]

(2) Which relative of his_1 do you think every boy_1 likes the most?

CONNECTIVITY (ConnE), on the other hand, is the effect for evaluating BINDING THEORY (BT, henceforth) for an overtly moved constituent not with respect to its S-Structure site, but with respect to (one of) its prior site(s). For example, the clefted constituents under (3) are evaluated for BT Principles C and A as if they were in D-Structure position, locally c-commanded by the coindexed subject *she*. Similarly, in (4), the anaphor *himself* is able to find a local c-commanding antecedent not just in its S-Str position (*John*), but also in its D-Str and intermediate site (*Tom* and *Peter*, respectively).

(3) a. * It's about $Mary_1$ that I think she_1 likes writing the most.
   b. It's about $herself_1$ that I think she_1 likes writing the most.

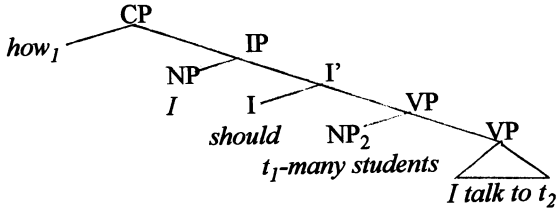
(4) $John_1$ knows which picture of $himself_{1,2,3}$ $Peter_2$ said Tom_3 likes the best.

To account for all these reconstruction effects, two kinds of strategies have been pursued in the literature: the Syntactic Reconstruction approach and the Non-Syntactic Reconstruction approach.

In the SYNTACTIC RECONSTRUCTION (SynR) approach, the overtly moved constituent is placed back in its reconstruction site at LF, either by LF-lowering of the overtly moved phrase (Longobardi 1987, Cinque 1990) or by Copy Theory (Chomsky 1995). The LF-representation under (5) illustrates this type of

reconstruction operation for (1). Once the moved constituent is placed back at the reconstruction site, ScopeRE derive from the usual assumption that scope is read off LF (the scope of a QuNP is its sister node at LF) and ConnE follow from the quite extended view that BT applies at LF too.

(5)

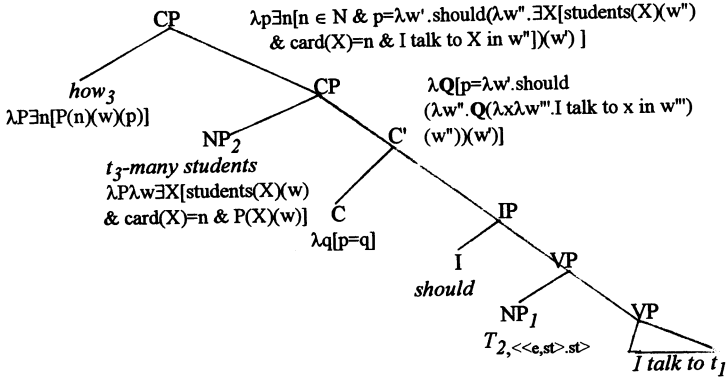


However, a second approach has been developed in the literature that does not involve any syntactic LF-reconstruction and that keeps the two reconstruction phenomena as derived from very different mechanisms: the NON-SYNTACTIC RECONSTRUCTION (Non-SynR) approach.[2]

How are the reconstruction facts derived without any syntactic LF-reconstruction?

ScopeRE, on the one hand, follow from the use of two semantic types of traces (Cresti 1995, Rullmann 1995): individual type *e* (lower case *t*) and generalized quantifier type $\langle\langle e,\langle st\rangle\rangle, \langle s,t\rangle\rangle$ (upper case *T*). When a constituent moves leaving a trace *t*, it is interpreted as having scope in its landing site (wide reading); when it leaves a trace *T*, instead, the compositional interpretation assigns it scope in the site of *T* (reconstructed reading). This interpretative device involving higher type traces *T* is known as SEMANTIC RECONSTRUTION (SemR). The LF corresponding to (1b) under this account is given in (6), with the semantic computation annotated for the relevant nodes.[3]

(6)



ConnE, on the other hand, can be derived from a non-local account of Binding Theory, as in Barss 1986. Barss defines the notion of chain accessibility sequence to account for Principle A ConnE (but it can be easily extended to cover Principle

C and B, too). Intuitively, a chain accessibility sequence is a path starting from the anaphor up the tree that leaps from nodes that have moved to their traces and continues from there. The technical definition is provided under (7) and illustrated under (8). The BT-condition on anaphors --given in (9)-- dictates that a local antecedent for the anaphor has to be found as the sister to a node in that path, requirement that is fulfilled for (8), since the coindexed DP *John* is the sister of I', which is a link in the chain (8b).

(7) Chain Accessibility Sequence (Barss 1986):
S = (a_1, ..., a_n) is a well-formed chain accessibility sequence for an NP A only if :
i. A is a_1,
ii. some a_i is a projection of the governor of A,
iii. for every pair (a_i, a_{i+1}), either (1) or (2):
1) a_{i+1} immediately dominates a_i
2) (a_i, a_{i+1}) is a link of a well-formed A' or A (movement) chain,
iv. and a_n is the root node of a Complete Functional Complex.

(8) a. $[_{\mathbf{WhP}}$Which $[_{\mathbf{NP}}$pictures $[_{\mathbf{PP}}$of **himself**$_1]]]_2$ did you think $[_{\mathbf{IP}}$John$_1$ $[_{\mathbf{I'}}$would $[_{\mathbf{VP}}$ like $\mathbf{t_2}$]]]

b. Chain accessibility sequence:
(*himself*, P', PP, N', NP, Wh', WhP, t_2, V', VP, I', IP)

(9) Chain Accessibility Condition on Anaphors:
An anaphor A is licensed only if there is a coindexed NP that is minimally chain accessible to A.

The aim of this paper is to surview two difficulties that the Non-Syntactic approach to reconstruction encounters and that do not arise in the SynR account. The first one, topic of section 2, concerns the relation between ScopeRE and ConnE, and, hence, between the mechanisms deriving the two phenomena. Unexpectedly under the NonSynR account, ScopeRE and ConnE will be shown to correlate and, thus, ConnE will have to be made dependent on scope (by stipulating sensitivity of chains to higher type traces or by reformulating LF c-command conditions in terms of the notion of Semantic Scope). The second problem, discussed in section 3, is a problem for the SemR interpretive device itself: some sloppy readings will be presented that cannot be derived by SemR without violating independently motivated assumptions about VP-Ellipsis. Again, this problem does not arise in the SynR approach.

2. LF-CONDITIONS BASED ON C-COMMAND

2.1. CORRELATION BETWEEN SCOPE AND CONNECTIVITY. It has been noted (Heycock 1995; Fox 1997, Romero 1997) that there is a correlation between the reconstructed scope a phrase takes and its Principle C ConnE. The example under (10), for instance, is grammatical, but it only has the wide scope reading spelled out in (10a) and not the reconstructed "amount" reading (10b):

(10) How many pictures of $Anna_1$ does the committee think that she_1 should publish?

a. √ Wide reading of *how many*:
"For what n: there are n-many particular pictures of Anna that the committee thinks that Anna should publish."

b. * Reconstructed reading of *how many*:
"For what n: the committee thinks that it should be the case that Anna publishes n-many pictures of Anna (e.g., n-many per month)."

This correlation is totally expected under the SynR account: only the reconstructed reading involves syntactic (LF) presence of *n-many pictures of Anna* under the modal *should* and, hence, under the coindexed subject *she*. Thus, only the reconstructed reading yields a Principle C LF-violation.

The Non-SynR account, instead, generates the LF-representations (11a-b). This time, what determines the ConnE of the moved phrase is not its LF-site, but the site of its lowest higher type trace *T*. In (11b), $[t_3$*-many pictures of Anna*$_1]_2$ is evaluated with respect to Principle C as if it were in the lowest *T*-site under *should*, hence c-commanded by the coindexed subject *she* and yielding a violation. In (11a), since there is no higher type *T*, the moved phrase is evaluated for Principle C in its S-Str position, which produces no violation.

(11) a. LF for the wide reading of *how many*:
$[_{CP}$ how$_3$ $[_{CP}$ $[t_3$-many pictures of $Anna_1]_2$ does the committee think $[_{CP}$ $\mathbf{t_2}$ $[_{CP}$ that she_1 should $\mathbf{t_2}$ publish t_2]]]]

b. * LF for the reconstructed reading of *how many*:
$[_{CP}$ how$_3$ $[_{CP}$ $[t_3$-many pictures of $Anna_1]_2$ does the committee think $[_{CP}$ $\mathbf{T_2}$ $[_{CP}$ that she_1 should $\mathbf{T_2}$ publish t_2]]]]

More generally, if we allow for higher type traces *T* in our grammar, LF c-command conditions can be vacuously fulfilled, since the offending constituent need not be in the conflictive site at LF for it to be semantically interpreted there.[4] In order to rule out LF representations like (11b), hence, we need to ensure that Principle C and, in general, c-commnad conditions are checked at LF AS IF the moved constituent were in the site of its lowest *T*-site.

2.2. MODIFICATION OF BARSS' ACCOUNT. A possible solution is to extend Barss' chain accessibility strategy --that he used for anaphors-- to cover Principle C and, crucially, to allow chain accessibility sequences to contain only higher type traces. That is, Principle C should be restated in terms of chain accessibility, as in (12), and the condition (7.iii.2) on chains should be replaced by (13), where α is the same semantic type for both the moved phrase and its trace:

(12) Chain Accessibility Condition on R-expressions:
An R-expression R is licensed only if there is no coindexed NP chain accessible to R.

(13) Chain accessibility Sequence:

iii.2. $(XP_{\alpha,i}, T_{\alpha,i+1})$ is a link of a well-formed A' or A (movement) chain.

In this way, the Principle C facts would follow: the name *Anna* in (10b) would fatally find the coindexed NP *she* accessible through the *T*-chain; in (10a), instead, no *T*-chain would connect it to any coindexed NP, since no higher type trace is left under *she*.[5]

2.3. LF C-COMMAND AS SEMANTIC SCOPE. A second possibility is to use the notion of Semantic Scope from Heim 1995, reproduced under (14). Then, Principle C could be defined as follows:[6]

(14) The **semantic scope** of a phrase α is the sister constituent of the lowest trace of α's own type that α binds at LF. (If α does not bind any trace of its own type, then α's semantic scope is its sister constituent at LF.)[7]

(15) Principle C:

a. An R-expression cannot be c-commanded at S-Str by an NP coindexed with that R-expression.

b. A phrase containing an R-expression cannot have its semantic scope contained within the semantic scope of an NP coindexed with that R-expression.

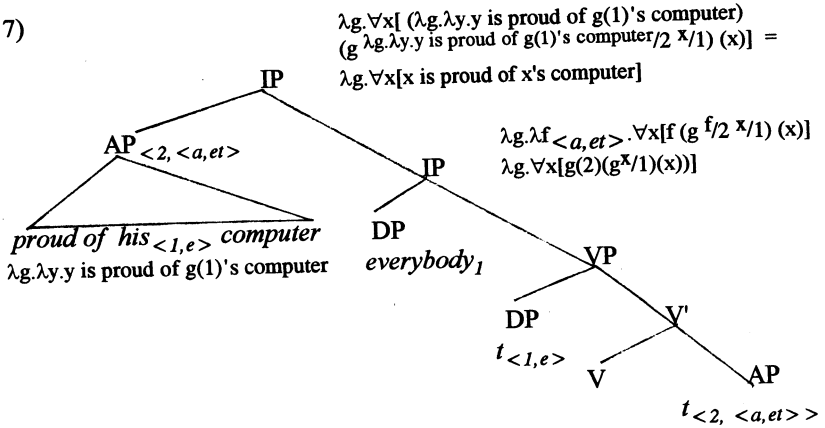
In summary, in this section 2 we have seen that ScopeRE and ConnE correlate: the quantificational scope a phrase takes determines the position from where Binding Theory LF requirements are evaluated. This parallelism, which is predicted under the SynR account and totally unexpected under the NonSynR approach, already makes NonSynR look rather dubious. However, and for the sake of exploring all possibilities, we showed how LF-conditions based on c-command can be reformulated through chain accessibility or in terms of semantic scope, so that the sensitivity of ConnE to scope can be derived.

In the next section, NonSynR encounters another problem, this time left without solution: reconstructed scope sloppy readings in VP-ellipsis.

3. SLOPPY READINGS IN VP-ELLIPSIS. This section is concerned with the binding of variables located in the moved phrase. To achieve this binding, our current denotations need to be shifted into dynamic denotations, that is, each constituent will denote a function from variable assignments into its usual denotation.[8] The computation under (17) illustrates how this binding is done in a dynamic SemR framework:[9]

(16) Proud of his$_1$ computer everybody$_1$ is.

(17)

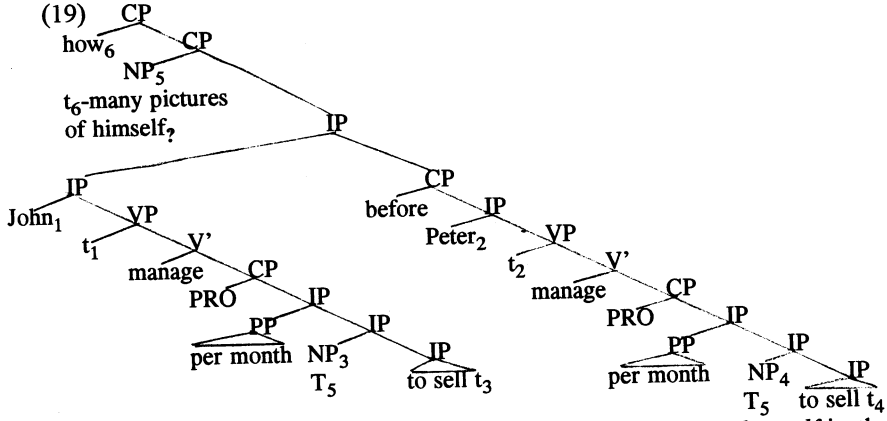


As announced, the second problem that (dynamic) SemR has to face is reconstructed scope sloppy readings in VP-ellipsis. The reading at issue is illustrated under (18), with the corresponding LF-representation under (19):

(18) How many pictures of himself did John manage to sell per month before Peter did?

a. √ "For which n: John manage to sell n-many pictures of John per month before Peter managed to sell n-many pictures of Peter per month."

(19)



The problem is that there is only one occurrence of the anaphor *himself* in the whole LF-representation (19) and yet the sloppy reading is possible. In other words, under the assumption that *John* and *Peter* have different movement indices, there is no index that the single occurrence of *himself* could bear that would yield it bound by *John* in the first clause and by *Peter* in the second.

Note that, under the SynR approach, this problem does not arise. The moved phrase syntactically reconstructs into the embedded CP in the first conjunct. Hence, since the antecedent VP is *[t_1 manage PRO per month [t_6-many pictures of himself$_1$]$_3$ to sell t_3]*, the elided VP --which needs to be LF-identical to the antecedent VP, except maybe for the indices-- will contain an occurrence of the anaphor too. Once we have two anaphor occurrences, we can coindex one of them with *John* and the other one with *Peter* and so derive the sloppy reading (18a).

Two possible solutions will be pursued in the NonSynR account, and both of them will fail. First, we will try dropping the assumption that *John* and *Peter* should be contraindexed; i.e., we will allow for accidental coindexing in VP-Ellipsis. Second, we will allow for vehicle change between a higher type trace *T* and a full QuNP.

3.1. ACCIDENTAL COINDEXING. Dynamic SemR cannot derive the sloppy reading from the LF in (19), where the two subjects *John* and *Peter* bear different movement indices, but it certainly can if the same index is assigned to the anaphor and to BOTH moved subjects.

The problem with this approach, however, is that there are independent reasons to disallow accidental coindexing between the binders of sloppy pronouns in VP-Ellipsis. More concretely, if accidental coindexing is allowed, parallelism between the binders is no longer enforced, contrary to what the examples in (20)-(21) show:

(20) Norma told Beth$_1$'s boyfriend to give her$_1$ a dime, and Judy told Lois's boyfriend to. (from Ross and Sag 1976)
   a. √ Strict reading: {to give Beth a dime}.
   b. √ Sloppy reading with respect to to Lois: {to give Lois a dime}.
   c. * Sloppy reading with respect to Judy: {to give Judy a dime}.

(21) John$_1$ wants Susan to water his$_1$ plants, but/and my father said Peter wants Mary to. (inspired by Jacobson 1992)
   a. √ Strict reading: {water John's plants}
   b. √ Sloppy reading with respect to Peter: {water Peter's plants}.
   c. * Sloppy reading with respect to my father: {water my father's plants}.

Let us assume we were to allow two nodes in separate clauses to accidentally have the same index of movement *i* or the same referential index *j* (even if those two occurrences of *j* get bound by different binders). Then, for instance, we could index the second conjunct of (20) as in (22), make the elided VP exactly identical to the overt VP and derive the grammatical sloppy reading (20b):

(22) ... and Judy told Lois$_1$'s boyfriend to {[$_{VP}$give her$_1$ a dime]}.

Unfortunately, nothing would then prevent us from using the indexing in (23) too, which again makes the two VPs identical but this time yields the missing sloppy reading (20c). Note that assuming VP-internal subjects would not help,

since the indexation in (24) would still be possible and again result in the unavailable sloppy reading (20c). The same argumentation holds also for (21).[10]

(23) ... and $Judy_1$ told Lois's boyfriend to {[$_{VP}$give her_1 a dime]}.

(24) Norma told [$Beth_1$'s boyfriend]$_2$ [$_{CP}$ PRO_2 to [$_{VP}$ t_2 give her_1 a dime]], and $Judy_1$ told [Lois's boyfriend]$_2$ [$_{CP}$ PRO_2 to {[$_{VP}$ t_2 give her_1 a dime]}].

In conclusion, since accidental coindexing makes the wrong predictions about possible binders of sloppy pronouns, we abandon it as a possible avenue to derive sloppy readings in a dynamic SemR framework.

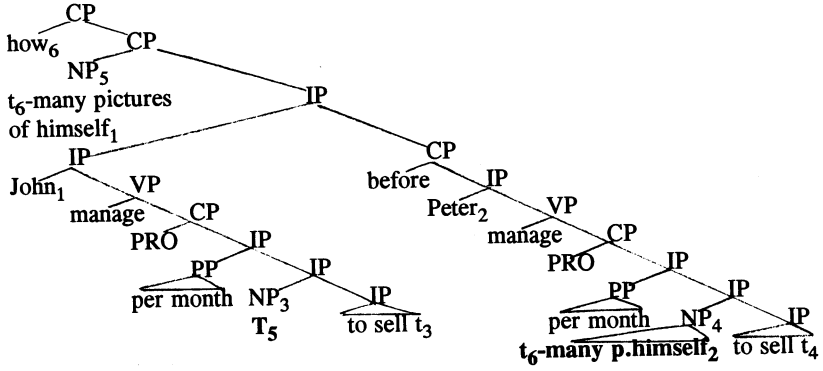
3.2. VEHICLE CHANGE. Other possibility is to allow **vehicle change** between a generalized quantifier trace *T* and the phonologically full quantifier. The notion of vehicle change is introduced in Fiengo&May 1994 in order to derive the fact that, as far as VP-Ellipsis is concerned, a trace and a pronoun count as identical. One of their examples is given under (25), where him_1 and t_1 do not prevent the two VPs from behaving as identical:

(25) a. Mary introduced every boy to someone his mother did.

b. [$_{IP}$ every boy_1 [$_{IP}$ someone$_2$ his_1 mother did **introduce him$_1$ to t$_2$** [$_{IP}$ Mary introduced t_1 to t_2]]]

Let us assume, for the sake of trying, that a *T* and a full QuNP also count as identical, so that, in (26), the elided VP *[manage PRO per month t_6-many pictures of himself$_2$ to sell t_4]* can be recovered from the antecedent VP *[manage PRO per month T_5 to sell t_3]*:

(26)



However, the configuration in (26) would run into problems once we try to check Rooth's 1992 focus condition, given under (27). Intuitively, (27) requires that the denotation of the antecedent clause be the same as the denotation of second clause except for the constituent denotation of the focused material. For instance, in (28), the function denoted by the first conjunct is the same as the

function denoted by the second conjunct, except that in the former we talk about Mary and, in the second, about Lucy:

(27) Focus Condition on VP-Ellipsis:
There must be LF-constituents α and β dominating the antecedent VP and the elided VP respectively such that the ordinary semantic value of α ($[[\alpha]]$) belongs to the focus semantic value of β ($[[[\beta]]^f$).

(28) Mary visited his$_1$ parents and LUCY did, too.
a. Denotation of first conjunct:
$g_1 \rightarrow$ "that Mary visited Joshua's parents"
$g_2 \rightarrow$ "that Mary visited Peter's parents"
$g_3 \rightarrow$ "that Mary visited Marcel's parents"
...
b. Denotation of second conjunct:
$g_1 \rightarrow$ "that Lucy visited Joshua's parents"
$g_2 \rightarrow$ "that Lucy visited Peter's parents"
$g_3 \rightarrow$ "that Lucy visited Marcel's parents"
...

However, this condition is not fulfilled for the two compared clauses in (26), since, besides the difference permitted by the focus, they diverge in the value of their indices for each assignment, as can be seen in (29):

(29) [[*John$_1$ managed PRO to per month T_3 sell t_3*]] $\notin$
[[*PETER$_2$ managed PRO to p. month n-many pictures of himself$_2$ sell t_5*]]^f
a. Denotation of first conjunct:
$g_1 \rightarrow$ "that John managed to sell **a house** per month"
$g_2 \rightarrow$ "that John managed to sell **my pictures of John** per month"
$g_3 \rightarrow$ "that John managed to sell **few picture of Peter** per month"
...
b. Denotation of second conjunct:
$g_1 \rightarrow$ "that Peter managed to sell **2** pictures of Peter per month"
$g_2 \rightarrow$ "that Peter managed to sell **4** pictures of Peter per month"
$g_3 \rightarrow$ "that Peter managed to sell **1** picture of Peter per month"
...

4. CONCLUSIONS. Two problems have been presented for the Non-Syntactic account of reconstruction phenomena that do not arise within the Syntactic approach.

First, there is a correlation between the reconstructed scope of a phrase and its Connectivity Effects. This parallelism is totally unexpected under the NonSynR approach, which derives the two kinds of reconstruction phenomena from independent mechanisms. We saw two posible ways to fix NonSynR: redefinition

of LF c-command conditions in terms of chain accessibility (where chains contain only higher type traces) and in terms of Semantic Scope.

Second, reconstructed scope sloppy readings cannot be derived through SemR without bending independently motivated assumptions about VP-Ellipsis. At this point, we do not have a possible solution that would account for this reading within the NonSynR framework.

ENDNOTES

[1] This type of reconstruction --variable binding without c-command-- is classified as ScopeRE rather than as ConnE given that, in the non-syntactic approach to reconstruction, its solution relies on the mechanism yielding the quantifier scope facts rather than on the mechanism yielding ConnE.

[2] The split of the two reconstruction phenomena in the literature stems from Cinque's 1990 observation that, whereas ScopeRE are blocked by *whether* islands (as noted in Longobardi's 1987 example in (i)), ConnE are not, as shown in (ii). However, Romero 1997 argues that the noted asymmetry does not reside on the type of reconstruction phenomenon, but on the type of moved constituent, since the cleft in (iii) can also scopally reconstruct through the island. Whether ScopeRE and ConnE pattern together and how their correlation could be derived in the Non-SynR aproach will be the subject of section 2.

(i) How many students do you wonder whether I should talk to?
√ wide reading of how many, * reconstructed reading

(ii) It is to herself$_1$ that I don't know whether she$_1$ wrote.

(iii) It is three BOOKS that I don't know whether you can check out at once (...but, three magazines, I'm sure you can).

[3] See Cresti (1995:100, 102) and Rullmann (1995:184) for details, and also Beck (1996:137). For variable binding without c-command, see section 3 in this paper.

[4] The same point that we made for Principle C can be made for Positive Polarity Item (PPI) licensing as well (Beck, p. c.). The PPI *someone* under (i) only has the wide reading *someone^not*, given under (i.a), but not the narrow reading *not^someone* in (i.b). If we do not have SemR in our grammar, the facts follow from LF c-command: the *not^someone* reading is ruled out because PPIs cannot be c-commanded by clausemate negation at LF. But, if we allow SemR of LF-movement, then the missing reading *not^someone* could be derived from the LF in (ii.b). Hence, if we allow for LF-movement to leave a higher type trace *T*, moved constituents have to be evaluated with respect to PPI-licensing as if they were in their lowest *T*-site.

(i) I didn't see someone.
a. "There is somebody that I didn't see."
b. * "It's not the case that there is somebody that I saw" / "I didn't see anybody."

(ii) a. Wide reading of *someone*:
[$_{IP}$ someone$_1$ [$_{IP}$ I didn't (**t$_1$**) see t$_1$]]
b. * Narrow reading of *someone*:
[$_{IP}$ someone$_1$ [$_{IP}$ I didn't **T$_1$** see t$_1$]]

[5] Another modification of Barss' account involves his condition on anaphors. As it stands in (9), Barss' condition does not explain Lebeaux' "Trapping Effect", which consists in the antecedent of an anaphor being unable to have reconstructed scope under the anaphor. For example, (9) by itself does not rule out the LF-representation under (i.a), since the coindexed NP *some people* is certainly accessible to the anaphor through the chain in (i.b), given that *some people* is the sister of the link *I'*. But then the semantic computation of (i.a) wrongly predicts the reading (i.c) to be possible, where the reference of the anaphor -- like of any constituent bearing an unbound index-- is provided by the context assignment.

(i) Some people$_2$ seem to themselves$_2$ to be deserving of the Nobel Prize.
a. [$_{IP}$ Some people$_2$ [$_{I'}$ seem to themselves$_2$ [$_{IP}$ **T$_2$** [$_{I'}$ to be deserving of the Nobel Prize]]]]
b. (*themselves*, P' PP, V', VP, I', IP)
c. * "It seems to them (reference provided by context assignment) that some people are deserving of the Nobel Prize."

In order to rule out the LF-representation in (i.a), we need to impose a second condition on anaphors, which we state under (ii) (Lebeaux actually makes it follow from a Coherence Principle) and we need to

ensure that syntactic binding has semantic consequences, as Heim&Kratzer (*forth.*) propose by means of (iii)-(iv) (see their chapter 10 for details):

(ii) Second Condition on Anaphors:
An anaphor needs to be syntactically bound by its antecedent at LF.

(iii) Binding Principle:
Let α and β be DPs, were β is not phonetically empty. Then α binds β syntactically iff α binds β semantically .

(iv) A DP α semantically binds a DP β iff β and the trace of α are bound by the same variable-binder.

[6] The notion of semantic scope and the reformulation that will follow from it is of no use in Cresti's second possible implementation of SemR (pp. 101-2), since there the *how many* phrase and its *T*- trace do not have the same semantic type.

[7] With this reformulation of LF c-command, the two-fold condition on anaphors would look as follows:

(i) Conditions on anaphors:
a. Principle A: An anaphor needs to be c-commanded by a coindexed NP in its governing category at some stage of the derivation (Lebeaux).
b. There has to be a node containing the anaphor such that its semantic scope is within the semantic scope of an NP coindexed with the anaphor.

[8] This further refinement is needed in order to overcome a ban on λ-conversion: no free variable should get accidentally bound in λ-converting. If we just apply the standard SemR framework to e.g. (16), the pronoun *his*, which is free within the fronted AP, will have to stay free after λ-conversion –as (i) shows–, and thus there is no way for it to get bound by *everybody*.

(i) $[[\textit{Proud of his}_1 \textit{ computer } 2 [\textit{ everybody}_1 \textit{ is } T_{2,<e,t>}]]]^g = 1$ iff
$[[2 [\textit{ everybody}_1 \textit{ is } T_{2,<e,t>}]]]^g$ ($[[\textit{proud of his}_1 \textit{ computer}]]^g = 1$ iff
λP.∀x[P(x)] (λy.y is proud of g(1)'s computer) = 1 iff
∀x[x is proud of g(1)'s computer]

In a dynamic framework, instead, the AP *proud of his computer* is not an open predicate, but a closed predicate denoting a function from variable assignments to properties. That is, the pronoun *his* is not free in the fronted AP and hence can come out bound by *everybody* after λ-conversion.

[9] For details, see Chierchia 1995.

[10] If we disallow accidental coindexing, instead, the parallelism between binders of sloppy pronouns follows easily from Rooth's 1992 Focus Condition on VP-Ellipsis: the antecedent VP and the elided VP may differ in the indices of the pronouns they contain, but the Focus Condition ensures that the antecedent proposition and the proposition with the ellipsis are completely parallel, varying only in the denotation of the focused material (see Rooth and subsection 3.2 of this paper for the formal definition and illustration of this idea).

Note that, without the ban of accidental coindexing, Rooth's Focus Condition will not derive the desired facts. In (i), the only focus is placed on *Mary* and, hence, the Focus Condition only requires a proposition parallel to "that Susan waters g(1)'s plants". This is fulfilled regardless of who binds the index *1* higher up in the tree in the second sentence. Thus, the sloppy readings with respect to *Mike* and *nobody* are not ruled out, contrary to intuitions:

(i) John_1 will ask Susan to water his_1 plants. Mike_{*1} said nobody_{*1} believed MARY would {water his_1 plants}.

REFERENCES

BARSS, ANDREW. 1986. Chains and Anaphoric Dependence. Cambridge, MA: M.I.T. Dissertation.

BECK, SIGRID. 1996. Wh-constructions and transparent Logical Form. Tuebigen: Eberhard-Karls-Universitaet Tuebingen.

CHIERCHIA, GENNARO. 1995. Dynamics of Meaning. Anaphora, Presupposition and the Theory of Grammar. Chicago, London: The University of Chigago Press.
CINQUE, GUGLIELMO. 1990. Types of A'-Dependencies. Cambridge, MA: M.I.T. Press.
CHOMSKY, NOAM. 1995. The Minimalist Program. Cambridge, MA: M.I.T. Press.
CRESTI, DIANA. 1995. Extraction and Reconstruction. Natural Language Semantics 3.79-122.
FIENGO, ROBERT, and ROBERT MAY. 1994. Indices and Identity. Cambridge, MA: M.I.T. Press.
FOX, DANNY. 1997. Reconstruction, Binding Theory and the Interpretation of Chains. Cambridge, MA: M.I.T., MS.
HEIM, IRENE. 1995. Lecture Notes on Questions. Amherst, MA: University of Massachusetts.
HEIM, IRENE, AND ANGELIKA KRATZER (*forth.*). Introduction to Semantics. Oxford, Cambridge: Blackwell.
HESTVIK, ARILD. 1995. Reflexives and Ellipsis. Natural Language Semantics 2.1-27.
HEYCOCK, CAROLINE. 1995. Asymmetries in Reconstruction. Linguistic Inquiry 26.547-570.
HIGGINS, F. ROGER. 1979. The Pseudo-Cleft Construction in English. New York: Garland.
HUANG, JAMES. 1993. Reconstruction and the Structure of VP: Some theoretical consequences. Linguistic Inquiry 24.103-138.
LEBEAUX, DAVID. 1994. Where does the Binding Theory Apply?. College Park, MD: University of Maryland, MS.
LECHNER, WINFRIED. 1995. On Syntactic and Semantic Reconstruction. Amherst, MA: University of Massachusetts, MS.
LONGOBARDI, GIUSEPPE. 1987. Extraction from NP and the Proper Notion of Head Government. The Syntax of Noun Phrases, ed. by in Alessandra Giorgi and Giuseppe Longobardi, 57-112. Cambrigde: Cambridge University Press.
PARTEE, BARBARA H. 1975. Deletion and Variable Binding. Formal Semantics of Natural Language, ed. by Edward Keenan. Cambridge: Cambridge University Press.
REINHART, TANYA, and ERIC REULAND. 1993. Reflexivity. Linguistic Inquiry 24.657-720.
ROMERO, MARIBEL. 1997. The correlation between Scope Reconstruction and Connectivity Effects. Proceedings of the West Coast Conference in Formal Linguistics 16.
ROOTH, MATS. 1992. Ellipsis Redundancy and Reduction Redundancy. Proceedings of the Stuttgart Ellipsis Workshop.
RULLMANN, HOTZE. 1995. Maximality in the Semantics of wh-constructions. Amherst, MA: GLSA.
SAG, IVAN. 1976. Deletion and Logical Form. Cambridge, MA: M.I.T. Dissertation.
TAKANO, YUJI. 1995. Predicate Fronting and Internal Subjects. Linguistic Inquiry 26.327-340.

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Multiple Correspondence in Reduplication*

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1. Introduction

This paper addresses the problem of double reduplications, in particular whether languages might avoid such reduplications. It is well attested that languages like Lushootseed have cases of double reduplications, as illustrated in (1) from Urbanczyk (1996:278), where each prefix represents a reduplicative morpheme. The outermost prefix is the distributed morpheme and the prefix adjacent to the stem is the diminutive morpheme:

(1)	a.	bí-bi-bəda?	'small children'
	b.	pí-pi-pšpiš	'kittens'
	c.	yú-yu-yəbil	'children are starving'

In this paper I will show that double reduplications are actually a disfavored configuration and I will argue for a constraint penalizing multiple correspondence between base and reduplicants. I will illustrate this with comparative data from three Ethiopian Semitic languages which use various strategies to avoid the creation of double reduplications. Optimality Theory, with its emphasis on violable constraints, allows us to capture why in certain cases, double reduplications are attested.

2. Double reduplications and violations

We can define double reduplications in one of two ways:

(2) a. two repetitions of a base consonant in the output form; or
b. two reduplicative affixes

The second definition in (2b) is the more familiar scenario and is that found in (1) above, but the definition in (2a) is more appropriate for Ethio-Semitic languages, where there may not always be a clear reduplicative affix triggering reduplication. Urbancyzk (1996) defines the base as 'the string immediately adjacent to the reduplicant', implying the relationship in (3b) rather than (3c). Correspondence between segments is indicated with numerical subscripts. In other words, for each affix, there is a one-to-one correspondence between base and reduplicant, irrespective of the fact that the base for the outermost affix itself is part of a base-reduplicant relationship. The outermost affix has no correspondence relationship with the original base.

(3) a. p_1i-[p_1špiš]
b. p_2i-[p_{12} i-p_1špiš]
c. p_1i-[p_1i[p_1špiš]

But, in languages which penalize double reduplications, the base-reduplicant correspondence relationship must be cumulative in the sense of (3c). Given this cumulative effect, we can penalize double reduplications by extending the constraint INTEGRITY to the base-reduplicant relationship, where S1 = input base and S2 = reduplicants:

(4) INTEGRITY No element of S1 has multiple correspondents in S2
McCarthy & Prince (1995)

This constraint will capture any configuration of double reduplication, whether one affix copies another (5a) or whether two affixes copy the input base (5b). Both configurations are found in Ethio-Semitic. Thus, the S2 comprises all reduplicants corresponding to the base[1]:

(5) a. s_1i-[s_1i[$s_1$ikan]
b. s_1i-[[$s_1$ikan]-s_1i]

There are three major kinds of reduplication in Ethio-Semitic, all occurring within the verb stem. The following examples are from Tigrinya.[2] As is well-known, the basic Semitic root has three consonants, normally assuming a disyllabic shape with the aspectual vowel melody. Reduplication occurs when the root has too few segments and expands to fill a triconsonantal template (6a), or when the root expands to fill a quadriconsonantal template (6a-c).

(6)

			Root	Stem	
a.	Final Doubling	biliteral:	zl	zəlәl	'jump'
			nd	nədəd	'burn'
		triliteral:	brg	bərgəg	'bolt (in fright)'
			dnz	dənzəz	'be numb'
b.	Total copy		mr	mərmər	'examine'
			rs	rəsrəs	'spray'
c.	Frequentative		grf	gərarəf	'whip again'
			sbr	səbabər	'break in pieces'

The reduplicated biliterals in (6a) are usually analyzed as spreading of the final consonant to fill a triconsonantal template (McCarthy 1981). I will argue that this is not spreading to create a long-distance geminate, but rather copying to fill the template (see Rose 1997 for additional arguments). In this manner, there is no reduplicative affix which triggers the reduplication, and it can be termed 'phonological reduplication'.[3] On the other hand, the biliterals in (6b) which expand to fill a quadriconsonantal template, as well as the triliterals in (6a) which also fill a quadriconsonantal template, are instances of lexical or morphological reduplication. Prunet & Petros (1996) argue that these verbs in Gurage share a common semantic notion of localized movement, or describe audio or visual properties. There is usually no corresponding non-reduplicated verb, even with the triliterals which reduplicate. For example, there is no verb bərəg corresponding to bərgəg.

Finally, the 'frequentative' verbs in (6c) are more transparently morphological in the sense that there is a corresponding non-reduplicative verb and the frequentative conveys the notions of iteration, intensity or distributive. Some representative examples are given in (7) from three Ethio-Semitic languages:

(7)

	root	regular		frequentative	
Muher	sbr	səbbər	'break'	sɨβəbbər	'break in pieces'
(W. Gurage)	grf	gərrəf	'whip'	gɨrərrəf	'whip again'
Tigrinya	grf	gərəf	'whip'	gərarəf	'whip again'
	sbr	səbər	'break'	səbabər	'break in pieces'
Tigre	kdm	kədəm	'work'	kədadəm	'work on and off'
	ħrs	ħarəs	'plough'	ħararəs	'plough a little'

The frequentative is characterized by a quadriconsonantal template; in most languages, a vowel [a] appears between the second and third consonants, and the penultimate root consonant is copied and occupies the second position. The North Ethio-Semitic perfective template represented by Tigrinya and Tigre is CəCaCəC whereas the South Ethio-Semitic perfective template is CəCaCCəC in Amharic or CɨCəC(C)əC in Western Gurage. One could analyze the frequentative as having a reduplicative infix inserted before the final syllable of the regular stem, i.e. gərəf --> gə-Ca-rəf --> gərarəf. However, only the root is copied and the remaining vowels are determined by the output template; extracting the root from the regular verb stem and mapping it to the frequentative template therefore avoids problems of overwriting when there are too few vowels in the frequentative template to systematically overwrite all the vowels in the basic stem.

Because the frequentative is fairly productive, it can potentially cooccur with the other two types of reduplication, total copy and final doubling. I now turn to those cases.

2.1. Biliteral roots

I begin with an examination of biliteral roots and the frequentative. In Western Gurage, as exemplified by Chaha, the frequentative cannot be formed from a biliteral final doubling stem (R represents a coronal sonorant which may be realized as [n] or [r] depending on context - see Petros (1996)). While not all verbs will form a frequentative due to their semantics (i.e. statives and resultatives tend not to), it is categorically true that no biliteral doubled verb will form a frequentative in Chaha:

(8) Chaha

root		regular			frequentative	
Rd	a.	nədəd	burn	d.	*nɨdədəd	burn again
Rk'	b.	nək'ək'	detach	e.	*nɨk'ək'ək'	detach again
t'm	c.	t'əməm	bend	f.	*t'ɨməməm	bend again

In contrast, in Tigrinya, frequentatives of biliteral final doubling stems are attested. The reduplicant and frequentative [a] vowel are underlined:

(9) Tigrinya

root		regular			frequentative	
ħt	a.	ħatət	ask	f.	ħa<u>ta</u>tət	ask many people
k'd	b.	k'ədəd	tear	g.	k'ə<u>da</u>dəd	tear again
wt'	c.	wətt'ət'	pull, force	h.	wə<u>t'a</u>t'ət	force many people
gf	d.	gəfəf	collect, amass	i.	gə<u>fa</u>fəf	collect from many sources
fk'	e.	fək'ək'	pry open	j.	fə<u>k'a</u>k'ək'	pry open many places

The formation of the Tigrinya frequentatives in (9) violates Integrity, since the input base consonant corresponds to two reduplicants, the final doubled one and the frequentative reduplicant. What would drive the language to violate Integrity in this manner? I argue that this is due to a constraint requiring the frequentative to be expressed in the output:

(10) **Morphological Expression**: An input morphological category must be expressed in the output

This constraint is useful in cases of multiple exponence (see Rose 1997) in which there may be two possible methods of expressing a morphological category. If only one method is utilized but the input morpheme remains unparsed, a violation of M-Parse (Prince & Smolensky 1993) results, but not a violation of Morphological Expression. The difference between Chaha and Tigrinya with respect to Integrity and Morphological Expression is captured by a difference in ranking. In Tigrinya it is more important to realize the category of frequentative than to satisfy Integrity:

(11) Chaha: Integrity > Morphological Expression
Tigrinya: Morphological Expression > Integrity

Other means of satisfying Morphological Expression are ruled out because they have no reduplication of the penultimate consonant as well as other higher-ranked violations.[4] I give both the Chaha and Tigrinya candidates:

(12)

	Chaha	Tigrinya	
a.	nɨnədəd	nənadəd	Anchor violation
b.	nɨʔədəd	nəʔadəd	DEP violation
c.	nɨədəd	nəadəd	ONSET violation
d.	nadəd	nadəd	Template violation

In (12a), the wrong consonant has been reduplicated. Assuming that the base is the string to the right of the reduplicant, this can be expressed as an Anchor-L violation, since the reduplicant does not correspond to the consonant at the left edge of the base. The candidates in (12b) and (12c) represent straightforward violations. (12d) has a smaller template than is necessary to convey the frequentative; the frequentative requires at least three syllables. Furthermore, it is identical to the Type C verb, violating Morphological Expression.

2.2 Quadriliterals in Tigrinya

Quadriliteral roots in Tigrinya can form the frequentative by one of two methods, either the quadriliteral root maps to the frequentative template and there is no reduplication as in (13a), or reduplication occurs and the frequentative has a longer quadrisyllabic shape instead of trisyllabic as in (13b):

(13)

a) a frequentative template with no reduplication (CəCaCəC) OR
b) reduplication to form a longer frequentative stem ($CəCəC_1aC_1əC$)

In (14) I give examples of both kinds:

(14)

root		**regular**			**frequentative**	
glbt'	a.	gəlbət'	turn over (tr.)	i.	gəlabət'	turn over and over
				ii.	gələbabət'	
fnčl	b.	fənəčəl	break off, chip	i.	fənačəl	break off many pieces
				ii.	fənəčačəl	
fns'g	c.	fəns'əg	penetrate	i.	fənas'əg	keep penetrating
				ii.	fənəs'as'əg	
g^{w}ndb	d.	g^{w}əndəb	cut in half	i.	g^{w}ənadəb	cut in half again
				ii.	g^{w}ənədadəb	

The longer form in (15a) fares better on the constraint $MAX_{B\text{-}R}$ which requires the frequentative to be expressed by reduplication, but the shorter form in (15b) obeys the templatic constraint which restricts the frequentative to its normal trisyllabic shape (I label this informally Template):

(15) a) gələbabət' $MAX_{B\text{-}R}$ > Template

b) gəlabət' Template > $MAX_{B\text{-}R}$

Both forms are attested because *both* forms satisfy Morphological Expression as well as Integrity. The shorter form is distinguished from the regular quadriliteral by the presence of the vowel [a] between the second and third root consonants; therefore, Morphological Expression is satisfied:

(16) **glbt'- Frequentative**

glbt' Freq	MORPH EXPR	INTEGRITY
a. ☞ gələbabət'		
b. ☞ gəlabət'		
c. gəlbət'	*!	

Selection of one form or the other will depend on the ranking of $MAX_{B\text{-}R}$ and Template. My consultants tended to prefer the shorter form, whereas in Leslau's (1941) description of Tigrinya, the longer form is given.

2.3 Reduplicative quadriliterals in Tigrinya

Total copy quadriliterals already have one form of reduplication. Those that do form the frequentative do so by selecting the regular frequentative template with no reduplication:

(17)

root		regular			frequentative	
bs'	a.	bəs'bəs'	mix	f.	bəs'abəs'	mix many things/ continuously
t'b	b.	t'əbt'əb	pat	g.	t'əbat'əb	pat continuously
k^{w}s	c.	k^{w}ək^{w}əs	antagonize	h.	k^{w}əsak^{w}əs	antagonize continuously
tb	d.	təbtəb	beat	i.	təbatəb	beat continuously
tx	e.	təxtəx	tickle/ pick on weak points	j.	təxatəx	tickle a lot or pick on many weak points

It is systematic that total copy verbs may never form a frequentative by copying the penultimate consonant and adopting the longer form:

(18) *bəs'əbabəs'
*k'ətək'ak'ət
*təbətatəb

This is because the longer form would violate Integrity. Given that there is an alternate method of conveying the frequentative, through adopting the frequentative template with no reduplication, this is the candidate which is preferred:

(19) **tb - Frequentative**

tb Freq	MORPH EXPR	INTEGRITY
a. təbətatəb		*!
b. ☞ təbatəb		
c. təbtəb	*!	

This predicts that triliterals with final doubling should behave the same way:

(20)

root		regular			frequentative	
šrm	a.	šərməm	chip	e.	šəraməm	chip many times
k'rd	b.	k'ərdəd	dice	f.	k'əradəd	dice a lot
ʕbl	c.	ʕablәl	dominate	g.	ʕabalәl	be dictatorial
zrt	d.	zərt'ət'	disrespect elders	h.	zərat'ət	disrespect many elders

Indeed they do, and there is no double reduplication possible:

(21) *šərəmaməm
*k'ərədadəd
*ʕabəlaləl
*zərət'at'ət

In conclusion, Tigrinya quadriliterals may all form frequentatives by selecting the regular frequentative template with the characteristic vowel [a] between the second and third consonants, but forgo the reduplication. Only regular quadriliterals may form the longer stem with reduplication because doing so will not violate Integrity. Additional reduplication in the case of total copy or final doubling will violate Integrity, so the shorter form is the only one attested. This shows that there is nothing inherent in the semantics of the reduplicative roots which prevents the reduplicative frequentative, but rather their phonological makeup.

2.4 Chaha quadriliterals

No frequentatives, either with a short or a long template, are formed from any kind of quadriliteral in Chaha, including the regular quadriliteral:

(22)

regular	**total copy**	**final doubling**
*mɨsakər	*kɨmakəm	*gɨradəd
*mɨsəkakər	*kɨməkakəm	*gɨrədadəd

It turns out that, unlike Tigrinya, Chaha quadriliterals have the same templatic shape as the frequentative as shown in (23) (except in the jussive: sɨbəbɨr vs. məskɨr):

(23)

		CɨCəCəC
a.	Frequentative	sɨbəbər
b.	Quadriliteral	mɨsəkər
c.	Total copy	kɨməkəm
d.	Doubled	bɨrəgəg

Forming the frequentative by adopting the regular template with no reduplication does not adequately express the frequentative, because there is nothing to distinguish it from the regular quadriliteral. Besides the fact that the syllable structure of quadriliterals and frequentatives is identical, the vowel [a] between the second and third consonants is not a consistent exponent of the frequentative in Chaha, as it is in Tigrinya. For example, we find the frequentatives sɨbəbər 'break in pieces' kɨfəfət 'chop again' mɨzəzər 'count again' but only occasionally one with a vowel [a]: nɨgagəd 'touch again'. Furthermore, many non-frequentative quadriliterals have [a] between C_2 and C_3:

(24)

a.	šɨrašər	level ground	
b.	zɨrasər	scatter objects	(cf. zɨrəsər cut meat into strips)
c.	tə-dβatəβ	hesitate	
d.	a-xramət'	chew	

Therefore, the presence of the vowel [a] does not satisfy Morphological Expression. As for the longer template with reduplication, Chaha places a strict limit on the size of the template. Chaha has no stems with five surface consonants whereas Tigrinya has many $C_1C_2C_3C_2C_3$ stems, usually with the auxiliary bələ 'to say': sələmləm bələ 'to yawn', kəfətfət 'open here and there' < kəfət 'open'.

We can conclude that the constraint on the size of the frequentative template outranks Morphological Expression in Chaha. Since the regular quadriliteral cannot use /a/ nor make the template bigger to form the frequentative, neither of these are options for reduplicated quadriliterals either.

2.5 Amharic

Amharic shares certain properties with Tigrinya and certain properties with Chaha in the formation of frequentatives.

2.5.1 Frequentatives

In Amharic, the long frequentatives are formed from quadriliterals:

(25)

root	regular			frequentative	
frks	a. fərəkkəs	crack	e.	fərəkakkəs	crack in pieces
gnt'l	b. gənətt'əl	tear off	f.	gənət'att'əl	disassemble
glbt'	c. gələbbət'	turn over (tr)	g.	gələbabbət'	turn over many things
fnk'l	d. fənəkk'əl	uproot	h.	fənək'akk'əl	uproot several things

The short form with no reduplication is used only when Integrity prevents the longer form:

(26)

root	regular		frequentative	
mr	a. mərəmmər	research	i. mərammər	do a cursory study
			ii. *mərəmammər	
sb	b. səbəssəb	gather	i. səbassəb	gather here and there
			ii. *səbəsassəb	

In this manner, Amharic resembles Tigrinya, but only uses the short form as a last resort strategy. Like Chaha, Amharic disallows frequentatives formed from biliteral final doubled verbs:

(27)

root	regular		frequentative	
ks	a. kəssəs	accuse	c. *kəsassəs	
sd	b. səddəd	banish	d. *sədaddəd	

2.5.2 Reciprocals

Reciprocals are another class of verb forms which utilize reduplication (Leslau 1995). Triliterals form the reciprocal by either a short form with the vowel [a] tə-CaCəC or a longer form with reduplication tə-C$_1$aC$_1$C$_1$əC (note: tə- alone is the passive prefix).

Quadriliterals either have the tə-CəCaCCəC form with no reduplication or a longer form with reduplication. With regular triliterals and quadriliterals, either of the forms is possible, but a verb will usually select just one:

(28)

root		regular			reciprocal	
gdl	a.	gəddəl	kill	d.	tə-gaddəl	kill each other
nks	b.	nəkkəs	bite	e.	tə-nəkakkəs	bite one another
sdb	c.	səddəb	insult	f.	tə-sədaddəb	insult one another
fnkt	g.	fənəkkət	break heads	j.	tə-fənakkət	break each other's heads
dblk'	h.	dəbəlləkʼ	mingle	k.	tə-dəbəlalləkʼ	mingle with one another
mskr	i.	məsəkkər	testify	l.	tə-məsəkakkər	testify against one another

In contrast, only the form with no reduplication is possible with total copy and final doubling verbs:

(29)

regular					reciprocal	
lf	a.	ləfəlləf	chatter	i.	tə-ləfalləf	argue (chatter with
				ii.	*tə-ləfəlalləf	one another)
db	b.	dəbəddəb	hit	i.	tə-dəbaddəb	hit one another
				ii.	*tə-dəbədaddəb	
ks	c.	kəssəs	accuse	i.	tə-kassəs	accuse one another
				ii.	*tə-kəsassəs	
lkʼ	d.	ləkkʼək'	let go	i.	tə-lakkʼək'	let go of one another
				ii.	*tə-ləkʼakkʼək'	

This shows that even if Amharic allows a longer template with frequentatives and reciprocals, it never allows Integrity to be violated in any winning candidate. We can summarize the rankings for the three languages as follows:

(30) Summary of Rankings:

Tigrinya	Morph Expr > Integrity, Template
Chaha	Template > Integrity > Morph Expr
Amharic	Integrity > Morph Expr > Template

In Tigrinya, the high ranking Morphological Expression allows Integrity violations in some cases, and a longer template which does not meet the trisyllabic requirement of the frequentative. In Chaha, the high ranking of Template and Integrity prevents the frequentative from being formed from any stem other than regular triliterals which can satisfy both of these constraints. Finally, in Amharic, high-ranking Integrity disallows frequentatives and reciprocals with double reduplications but its ranking of Template below Morphological Expression allows longer templates to accommodate reduplication.

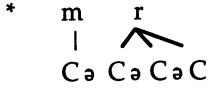
3. Final Doubling as Copying

Before concluding, I will give a brief rundown of why final doubling is interpreted as copying. Prunet & Petros (1996) observe that a biliteral root √mr will never expand to fill a quadriconsonantal template by spreading (31a) but will do so by total copy (31b):

(31) a. *mirərər b. ✔ mirəmər 'examine'

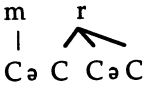
In order to explain this under the spreading account, there must be a ban on *long-distance* triple linking:

(32)



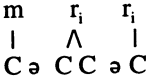
The ban must be long-distance, i.e. a link with a vowel position intervening, in order to license a geminate with double linking which occurs in Muher, a Western Gurage dialect with gemination as in (33):

(33)



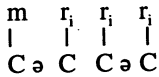
mərrər 'be bitter, become angry'

This problematic formulation disappears if we analyze all putative long-distance spreading as **copying** (see Gafos 1995, Rose 1997 for rejection of long-distance geminates). A local geminate and a copy do not violate Integrity (34a), but a double reduplication does (34b):

(34) a. 

b. 

This formulation accounts for two properties that the linking account cannot capture. First, verb forms which do not have intervening vowels between copied segments are still ruled out. This would rule out Tigrinya or Tigre quadriliterals <u>mərrər</u> based on the quadriliteral shape <u>məskər</u> (as different from Type B verbs which have medial gemination):

(35) 

*mərrər

Second, the copying analysis unites the double reduplication avoidance found with both final doubling and total copy cases. The triple-linking account could only rule out final doubling + frequentative but not total copy + frequentative, since total copy does not involve linking but copying in any analysis.

Several strong arguments for spreading as opposed to copying can be reanalyzed. Coincidentally, some of the strongest arguments for linking come from Chaha itself. First, the double labialization and palatalization found in Chaha morphophonology, i.e. nɨzəz --> nɨžəž 'dream! (2sf)' (McCarthy 1983, Rose 1994) can be reanalyzed as involving Reduplicative Identity (Rose 1997). Second, Chaha devoicing, a historical process which devoiced and simplified a penultimate geminate, was argued not to apply to long-distance geminates due to a strict interpretation of the linking constraint (McCarthy 1986): i.e. zəggər --> zəkər 'jump' but fəggəg --> fəgəg 'die without being slaughtered' and not *fəkəg. However, Petros (1997) shows that devoicing is blocked when the final consonant is any obstruent, not just an obstruent identical to the penultimate one, so zəggər --> zəkər 'jump' but nəggəd --> nəgəd 'touch' with no devoicing because the final consonant is an obstruent.

4. Conclusion

In conclusion, the analysis of double reduplication using the constraint Integrity coupled with Morphological Expression accounts for a number of properties of reduplication in Ethio-Semitic languages. It explains why biliterals do not form quadriconsonantal stems by double reduplication but by total copy. The ranking of the two constraints captures the difference between Tigrinya and Chaha in the formation of biliteral frequentatives and explains why Tigrinya only allows double reduplications under duress. And finally, it explains why all kinds of double reduplications are penalized, be they doubling or total copying. Extending this analysis to other languages would be relatively straightforward. Languages which allow double reduplications sacrifice Integrity violations for higher ranked constraints such as Morphological Expression or MAX.

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1. Another possible formulation of the constraint would be to penalize multiple relationships, ie. a constraint like 'No Bigamy' - no element involved in one relationship can be involved in another.
2. All verbs are given in the bare perfective stem with no inflectional affixes. While I elicited the forms in the gerundive, because the perfective is not commonly used in Tigrinya, I place the stems in the perfective for easy comparison with other languages.
3. An important piece of evidence for treating the final doubling cases on a par with total copy cases as reduplication is the overapplication of palatalization which occurs with both in W. Gurage: nɨzəz --> nɨžəž 'dream! (2sf)' kʼətʼkʼɨtʼ --> kʼəčʼkʼɨčʼ 'hammer! (2sf)'
4. Another possible analysis would be to place Integrity in CONTROL in Chaha but not in Tigrinya. CONTROL is a separate level of unviolable constraints proposed by Orgun & Sprouse (1996) to account for morphological gaps which are not rescued by independently available repair mechanisms in the language. Frequentatives of biliterals would be formed in the regular constraint system and then rejected in CONTROL by Integrity. I do not adopt this analysis because it runs into problems in accounting for Amharic. If Integrity were in CONTROL to account for Amharic final doubled biliterals, it could not capture quadriliterals, for which a form with no reduplication is adopted only when a longer form with reduplication cannot be produced. If Integrity is in CONTROL, then the output should be no attested form and not an alternate form.

References

Angoujard, Jean-Pierre. 1988. Gémination et redoublement. *Langues Orientales, Ancienne Philologie et Linguistique* 1: 1-15.

Gafos, Adamantios. 1995. On the proper characterization of non-concatenative languages. Ms. Johns Hopkins University.

Leslau, Wolf. 1941. *Documents tigrigna (éthiopien septentrional)*. Paris: Klincksieck

Leslau, Wolf. 1995. *Reference Grammar of Amharic*. Wiesbaden: Harrassowitz.

McCarthy, John. 1981. A prosodic theory of nonconcatenative morphology. *Linguistic Inquiry* 12:373-418.

McCarthy, John. 1983. Consonantal Morphology in the Chaha Verb. *Proceedings of WCCFL* 2.176-188.

McCarthy, John. 1986. Lexical Phonology and Nonconcatenative Morphology in the History of Chaha. *Revue québecoise de linguistique* 16:209-228.

McCarthy, John & Alan Prince. 1993a. *Prosodic Morphology I: Constraint Interaction and Satisfaction*. Technical Report 3, Rutgers Center for Cognitive Science.

McCarthy, John & Alan Prince. 1995. Faithfulness and Reduplicative Identity. *UMOP* 18: 249-384.

Orgun, Orhan & Ronald Sprouse. 1996. When the best isn't good enough. Paper presented at WECOL, Santa Cruz.

Petros, Degif. 1996. Sonorant Alternations in Chaha. In G. Hudson (ed.) *Essays in Gurage Language and Culture*. Wiesbaden: Otto Harrassowitz, pp. 153-173.

Petros, Degif. 1997. *Word Formation in Chaha (Gurage)*. PhD Dissertation, Université du Québec à Montréal.

Prince, Alan & Paul Smolensky. 1993. *Optimality Theory: Constraint Interaction in Generative Grammar*. Ms, Rutgers University and University of Colorado, Boulder.

Prunet, Jean-François & Degif Petros. 1996. L'interaction entre schèmes et racines en chaha. In Jacqueline Lecarme, Jean Lowenstamm & Ur Shlonksy (ed.) *Studies in Afroasiatic Grammar*. The Hague: Holland Academic Graphics, pp. 302-336.

Rose, Sharon. 1994. Plane Conflation and Palatalization in Chaha. *Proceedings of WCCFL* 12:101-116.

Rose, Sharon. 1997. *Theoretical issues in comparative Ethio-Semitic phonology and morphology*. PhD dissertation, McGill University.

Urbanczyk, Suzanne. 1995. Double reduplications in parallel. *UMOP* 18:499-531.

Urbanczyk, Suzanne. 1996. *Patterns of Reduplication in Lushootseed*. PhD Dissertation, UMass, Amherst.

RULES VERSUS CONSTRAINTS IN PLAINS CREE PHONOLOGY

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This study points out various ways in which the optimality theoretic handling of opacity and abstractness, here in relation to absolute neutralization and palatalization in Plains Cree, suffers in comparison to an ordered rule approach to these phenomena.

1 Absolute neutralization and palatalization in Plains Cree

The surface vowel inventory of Plains Cree is not entirely symmetrical. While there are four distinct long vowels, there are only three distinct short ones:

(1) *surface vowel inventory*

i		*ii*
o		*oo*
	ee	
a		*aa*

Wolfart (1973) assumes that the underlying vowel inventory is symmetrical, though, and contains an /e/, which merges with /i/ to surface as *i*. Other Algonquianists who have studied related languages with identical surface inventories have been likewise convinced that these languages have an underlying /e/ that undergoes absolute neutralization, yielding *i*. Piggott (1980) cites palatalization evidence in favor of /e/ to *i* absolute neutralization in the Odawa dialect of Ojibwa, for example. We find the same sort of evidence in Plains Cree, where there is a palatalization rule that turns /θ/ into *s* (a fricative varying from alveolar to alveopalatal, actually) in front of all instances of *ii* but only some instances of surface *i*:

(2) *palatalization of* /θ/ (Dahlstrom 1991)

/ki - naaθ - i - n/	_	*kinaasin*	'you fetch me'
/ki - naaθ - eti - n/	_	*kinaatitin*	'I fetch you'

Any /θ/ that is not in the palatalization environment surfaces as *t*.

It makes sense to recognize those *i* that trigger palatalization as coming from /i/, and those *i* that fail to trigger palatalization as coming from /e/, as has been indicated in (2). Indeed, further support for positing this underlying distinction comes from data showing that exactly those /e/ that fail to trigger palatalization participate in coalescence, while exactly those /i/ that trigger palatalization resist coalescence:

(3) *coalescence* (Dahlstrom 1991)

/ki - peehtaw - i - n/	→ *kipeehtawin*	'you hear me'
/ki - peehtaw - eti - n/	→ *kipeehtatin*	'I hear you'

It so happens that Plains Cree also palatalizes underlying /t/. Once again, palatalization is sensitive to the underlying distinction between /e/ and /i/. Underlying /t/ becomes *c* (an alveolar to alveopalatal affricate) in front of /i/ and /ii/, but not in front of /e/ or /ee/:

(4) *palatalization of* /t/ (Dahlstrom 1991)

/api - t - ik/	→	*apicik*	'they are sitting [conjunct form]'

That palatalized /t/ surfaces as *c*, and not as *s*, motivates the assumption of an underlying distinction between /t/ and /θ/. As noted with respect to (2), abstract /θ/ undergoes absolute neutralization to surface as *t* when not palatalized. Underlying /t/, of course, also surfaces as *t* when not palatalized:

(5) *unpalatalized* /t/ (Wolfart 1973)

/ni - sit - ehk/	→	*nisitihk*	'on my foot'

The results of Plains Cree palatalization and intersecting patterns of absolute neutralization are summarized in (6):

(6) *summary*

/...t - i.../	→	*...ci...*		/...θ - i.../	→	*...si...*
/...t - e.../	→	*...ti...*		/...θ - e.../	→	*...ti...*

1.1 The rule-based account of opaque interactions in Plains Cree

An ordered rule analysis of these phenomena is very straightforward. The absolute neutralization of /e/ to *i* and of /θ/ to *t* both follow palatalization, resulting in counterfeeding:

(7) *ordered rule account*

	/...t - i.../	/...t - e.../	/...θ - i.../	/...θ - e.../	
→	...c - i...	--	...s - i...	--	(pal.)
→	--	...t - i...	--	...θ - i...	(abs. neut.)
→	--	--	--	...t - i...	(abs. neut.)
	...ci...	*...ti...*	*...si...*	*...ti...*	

Palatalization is opaque in Plains Cree in that we observe instances of surface *...ti...*, produced by absolute neutralization, which are not subject to palatalization despite their meeting the relevant structural description.

1.2 Optimality Theory and opacity in Plains Cree

Opacity is, by definition, the manifestation of anticonspiratorial relationships. In Plains Cree, one pattern, observed as palatalization, alters what would otherwise surface as *...ti...*. Another pattern, observed as absolute neutralization, creates surface *...ti...*. Opacity is an expected result of the ordered application of rules that share no common goal orientation, freeing them to do perverse things like counterfeed one another. But opacity is not an expected result of the optimality theoretic model, which stresses the homogeneity of output goals. Optimality Theory is tailor-made to deal with conspiracies, not anticonspiracies.[1]

An optimality theoretic mechanism for handling opacity effects has, of course, been invented; opacity is so pervasive in segmental phonology that it could not go ignored. The correspondence approach to opacity advocated by McCarthy (1995) yields correct results in a number of cases where anticonspiratorial relationships hold. So let us explore an optimality theoretic analysis of Plains Cree opacity along the lines suggested by the correspondence approach.

A constraint against surface *e*, NoShortE, is well motivated in its conception even if, as we will see in a later section, its formulation is problematic. NoShortE, in concert with appropriate faithfulness constraints, enforces the absolute neutralization that accounts for the absence of *e* in Plains Cree's surface vowel inventory. We shall in addition to NoShortE assume another constraint that enforces absolute neutralization, NoTheta. NoTheta, in concert with lower ranked faithfulness constraints for place and continuancy features, enforces the absolute neutralization that accounts for the absence of surface θ.

The surface realization of underlying /...t - i.../ shows the need for a constraint NOTI. NOTI, in a first approximation, simply penalizes output candidates containing the string *...ti...*:[2]

(8) *palatalization of* /t/ *by* NOTI

/...t - i.../	NOTHETA	NOSHORTE	**NOTI**	IDENT(CONT)	IDENT(PL)
...si...				*	*!
☞ *...ci...*					*
...ti...			*!		

Continuancy and place faithfulness constraints correctly choose a different optimal output candidate for underlying /...θ - i.../:

(9) *palatalization of* /θ/ *by* NOTI

/...θ - i.../	NOTHETA	NOSHORTE	**NOTI**	IDENT(CONT)	IDENT(PL)
☞ *...si...*					*
...ci...				*	*!
...ti...			*!		

Trouble comes when output candidates for underlying /...t - e.../ are evaluated:

(10) *problem tableau*

/...t - e.../	NOTHETA	NOSHORTE	**NOTI**	IDENT(CONT)	IDENT(PL)
...si...				*	*!
⊗ *...ci...*					*
...ti...			*!		

Underlying /...t - e.../ actually surfaces as *...ti...*. But in (10), *...ti...* has been ruled out for violating NOTI, and the incorrect *...ci...* has been selected instead. In (11), the incorrect *...si...* is selected, while *...ti...* is again inappropriately ruled out for violating NOTI:

(11) *problem tableau*

/...θ - e.../	NOTHETA	NOSHORTE	**NOTI**	IDENT(CONT)	IDENT(PL)
⊛ ...*si*...					*
...*ci*...				*	*!
...*ti*...			*!		

Here is where the correspondence approach to opacity comes in.

Under the correspondence approach to opacity, the characteristics of the featural composition of affected and affecting segments are notated for level. Some characteristics are recognized as relevant in candidate evaluation only if they occur in the candidate's underlying representation, and others only if they obtain at the surface. Analogizing from comparable analyses presented in McCarthy (1995), the modification of NOTI to yield the opacity effects observed in Plains Cree requires a constraint that checks for the following mix of underlying and surface characteristics:

(12) NOTI *reconceived as* NOT(S)I(UR)

NOT(S)I(UR)	condition	level
α	(unpal'd) *t*	surface
β	V [+front, +high]	underlying
linear order	α > β	surface
adjacency	strict	surface

NOT(S)I(UR) restricts the occurrence of a surface level unpalatalized *t* which is in front of a segment whose *underlying correspondent* is a [+high, +front] vowel. By thus introducing global power, NOT(S)I(UR) seems to avoid the problems brought on by the original NOTI, which had no access to underlying representation.

With NOT(S)I(UR) the optimal output candidate selected for underlying /...t - e.../ is now the correct one:

(13) *absolute neutralization of* /e/, *sidestepping palatalization*

/...t - e.../	NoTheta	NoShortE	**NoT(s)I(ur)**	Ident(cont)	Ident(pl)
...*si*...				*!	*
...*ci*...					*!
☞ ...*ti*...					

And once we fix the extrinsic ranking of the faithfulness constraints for place and continuancy, the correct optimal candidate for underlying /...θ - e.../ is selected:[3]

(14) *absolute neutralization of* /e/, *sidestepping palatalization*

/...θ - e.../	NoTheta	NoShortE	**NoT(s)I(ur)**	Ident(pl)	Ident(cont)
...*si*...				*!	
...*ci*...				*!	*
☞ ...*ti*...					*

In neither (13) nor (14) does ...*ti*... violate NoT(s)I(ur), because this structural constraint is not really interested in *output* structure after all; the surface characteristics of the vowel are completely ignored.

The introduction of global power into structural constraints, as opposed to confining globality to the faithfulness constraints, obscures insight into the obviously counterfeeding relationship typical of anticonspiratorial phonological processes. It is also an obvious compromise of Optimality Theory's advertised reliance on output goals. To make matters worse, the global power of NoT(s)I(ur) might still not be enough to account for what goes on in Plains Cree.

Unlike Dahlstrom (1991), Wolfart (1973) analyzes the Plains Cree 3pl suffix as /-k/, and the *i* triggering palatalization in words like the one in (15) as epenthetic:

(15) *palatalization of* /t/ *by epenthetic i*

/api - t̲ - k/ → *apic̲ik* 'they are sitting [conjunct form]'

If Wolfart is right, and the triggering *i* is in fact epenthetic, then it is not present in underlying representation. This is nothing difficult for the rule-based analysis, which simply lets palatalization apply after epenthesis has taken place. But things are not so simple in the optimality theoretic analysis we have been exploring.

NOT(S)I(UR) fails to penalize an unpalatalized *t* if it is not next to a segment whose underlying correspondent is /i/. For the optimality theoretic analysis to get palatalization of a *t* that is in front of an *epenthetic* vowel *i* (while continuing to avoid the pitfalls of the original NOTI) a rather unsettling sort of constraint has to be formulated to take care of what NOT(S)I(UR) cannot:[4]

(16) *constraint for palatalizing /t/ in front of epenthetic i*

NOT(S)C{C,#}(UR)	condition	level
α	(unpal'd) *t*	surface
β	C{C,#}	underlying
linear order	α > β	surface
adjacency	strict	underlying

NOT(S)C{C,#}(UR) does its trick by pushing globality into yet *another* dimension of analysis. NOT(S)C{C,#}(UR) penalizes an unpalatalized *t* whose underlying correspondent occurs in one specific instantiation of the more general environment into which syllable structure constraints motivate the epenthesis of *i*. That is, NOT(S)C{C,#}(UR) forces palatalization while looking ahead for other constraints to set up the context in which palatalization would most naturally take place.

Optimality Theory may eschew the up-front serialism of ordered rules, but we see from this example that the correspondence approach to opacity requires a suspiciously recursive exploitation of global power to be able to accomplish what is so elegantly captured in a derivation.

2 Absolute neutralization and the diacritic use of phonological features

If opacity effects such as naturally result from absolute neutralization challenge the explanatory adequacy of Optimality Theory, so too does the abstractness problem that accompanies most absolute neutralization analyses.

In Plains Cree, all /e/ become *i*. If such absolute neutralization means that underlying [-high] in the context of [-back] always changes to [+high] before surfacing, then this [-high] is being used, inappropriately, as a diacritic (Kiparsky 1968).

Nevertheless, as I have elsewhere argued with respect to Hungarian (Schmidt 1996a) and Basaa (Schmidt 1996b), an ordered rule approach incorporating a very principled version of underspecification makes it possible to construct absolute neutralization analyses in which there is neither reversal nor deletion of phonological feature specifications, and therefore no diacritic use made of them. But the optimality theoretic translation of this type of analysis severely

compromises Optimality Theory's advertised dissociation of repair strategies from constraints.

2.1 A rule-based account of absolute neutralization in Plains Cree

Given that length distinctions are a function of the association of vowel matrices to skeletal slots or mora nodes, Plains Cree needs employ only two phonological features to differentiate its four underlying vowel matrices:

(17) *Plains Cree vowel matrices*

	i/ii	e/ee	o/oo	a/aa
front	+	+		
high	+		+	

I assume a model of underspecification that uses monovalent features in a binary manner. Each feature may be either present or absent in a matrix. The matrices in (17) show all four logically possible combinations of the presence or absence of [+front] and [+high]. I follow Piggott (1980) in assuming that backness and height are the two relevant dimensions for a vowel system like this one. Because there is no other back vowel in Plains Cree that is higher than *o* or *oo*, we may safely characterize this vowel as phonologically [+high]. Piggott points out, incidentally, that /i/ and /o/ behave as a natural class with respect to a rule lowering word-final [+high] vowels in the Odawa dialect of Ojibwa.

Those matrices that emerge from the phonology without a [+front] specification will be *phonetically* interpreted as back, and those that emerge without [+high] will be *phonetically* interpreted as nonhigh. There seems no need to posit any *phonologically* overt [-front] or [-high] for Plains Cree.

As previously discussed, palatalization of /θ/ and of /t/ in Plains Cree takes place in the environment of /i/ and /ii/, but not in the environment of /e/ or /ee/, and so must be sensitive to the combination [+front, +high]. Of course, we still find instances of unpalatalized *t* (from either /θ/ or /t/) in the environment of surface *i*, due to a process of absolute neutralization, which turns all /e/ into *i*. This absolute neutralization, I propose, is effected by an immediately pre-phonetic feature-filling rule that supplies monomoraic [+front] matrices with [+high]:

(18) *feature-filling rule*

$0 \rightarrow$ [+high] / [+front]
(short vowels only)

	/e/		*i*
front	+	→	front +
high			high +

This analysis makes no diacritic use of any putative [-high] specification. There is no need to assume that a [-high] is what prevents palatalization from taking place in the environment of /e/ or /ee/. Palatalization just doesn't happen unless the triggering vowel is [+front, +high], and, in this analysis, /e/ and /ee/ are characterized only by [+front]. Eventually, the immediately pre-phonetic feature-filling rule illustrated in (8) supplies monomoraic [+front] matrices with [+high], accomplishing the absolute neutralization of /e/ to *i* by *feature-filling*, rather than by reversing or deleting a diacritic [-high] specification.[5]

2.2 Optimality Theory and abstractness in Plains Cree

The absolute neutralization of /e/ to *i* accounts for the absence of surface *e* in Plains Cree and, at the same time, for why some instances of surface *i* do not trigger palatalization. To accomplish the absolute neutralization of /e/ to *i* using Optimality Theory, it would seem we need an output constraint like NoShortE, penalizing surface *e*:

(19) NoShortE *(negative formulation)*

* μ
| =
| /
[+front, -high]

Appropriate faithfulness constraints will also be needed to ensure that the optimal candidate generated from underlying /e/ is one that maintains its underlying monomoraic length and [+front] specification. The optimal candidate must comply with NoShortE only by sacrificing its [-high] specification.

As long as NoShortE is conceived of as a negative constraint, mention of [-high] in the formulation of NoShortE is unavoidable. Leaving mention of the height feature out of the formulation of NoShortE would not achieve the desired effect, as the constraint would then inappropriately penalize all monomoraic front vowels.[6] Problem is, mention of [-high] in the formulation of NoShortE amounts to diacritic use of [-high]. A [-high] feature specification must characterize the underlying correspondent of all instances of surface *i* that are products of absolute neutralization via NoShortE, but putative [-high] is never seen in the surface matrices of the vowels affected by NoShortE, and seems to be otherwise phonologically inert in Plains Cree phonology.

In being forced to make diacritic use of [-high], the optimality theoretic analysis of absolute neutralization that expresses NoShortE as a negative constraint can be accused of excessive abstractness, and therefore suffers in comparison to the feature-filling rule analysis described in the previous section.

Diacritic use of [-high] can be avoided in the optimality theoretic analysis of Plains Cree absolute neutralization, but only if NoShortE is expressed as an if-then statement:

(20) NoShortE *(if-then formulation)*

if [+front] and monomoraic, then [+high]

This if-then formulation would allow those instances of surface *i* that fail to trigger palatalization to be underlyingly underspecified for height, just as they are in the previous section's feature-filling rule analysis, thus avoiding diacritic use of [-high]. The if-then expression of NoShortE, obviously a close analog of the feature-filling rule itself, runs very much counter to the spirit of Optimality Theory, though. To repair a matrix that might otherwise surface as the non-optimal vowel *e*, the if-then expression of NoShortE mandates the insertion of [+high]. Thus, unlike the negative formulation of NoShortE in (19), and not at all in keeping with the conceptual foundations of Optimality Theory, the if-then formulation of NoShortE in (20) prescribes a precise repair.

In short, with an optimality theoretic analysis of absolute neutralization, we either make diacritic use of a phonological feature specification, or we depart from the conceptual foundations of Optimality Theory by formulating structural constraints that dictate their own repairs.

3 So why not Optimality Theory?

We have seen that in order to handle opacity, Optimality Theory must countenance *globality* in candidate evaluation (i.e. sneak in *derivations*). And to get around abstractness, we have seen that Optimality Theory must formulate constraints that *prescribe precise repairs* (i.e. sneak in *rules*). Let's come clean. The most direct analysis of absolute neutralization and palatalization in Plains Cree is an ordered rule analysis.

If conceptual coherence and analytical elegance are what count toward explanatory adequacy, then the ordered rule model of segmental phonology should not be too hastily abandoned.

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[1] Significantly, most all the phonological conspiracies identified in the decades-old literature on that topic involve syllable structure as opposed to feature content (eg. Kisseberth 1970). For this and other reasons Optimality Theory is, I think, the best model of syllabification we have to date. But Optimality Theory's success in explaining syllable structure should not lead us to assume that it is an appropriate model of segmental phonology. Syllabification is very different from segmental phonology. Syllabification organizes segments into constituency relationships, while segmental phonology manipulates the content of segments. Syllable structure is predictable, while feature specification is not. Syllabification

has also been understood, even prior to the advent of Optimality Theory, to operate outside the rule-ordering mode. Schmidt (1992), in a view similar to that of Hayes (1989), describes syllabification as an "everywhere" algorithm that (optimally, I would now say) constructs syllable structure fresh each time for the segmental strings that result from each ordered rule application.

[2] As usual, dotted lines between columns indicate indeterminate or irrelevant dominance relationships among constraints.

[3] If continuancy faithfulness remained higher ranked than place faithfulness, then *...si...* would be selected as optimal.
Interestingly, the optimality theoretic perspective criticizes rule-based analyses for conflating constraint violations (= structural descriptions) and their repairs (= structural changes) into a single phonological statement (= rule). But rather than making any more general contribution, the extrinsic ranking of the faithfulness constraints in (14) plays *no other role* in the phonology of Plains Cree than to determine *exactly how to repair* violations of NOTHETA.

[4] Or else epenthetic vowels must be stipulated to count as underlying, as in Cole & Kisseberth's (1995) analysis of Yawelmani. See, however, Archangeli & Suzuki's (1996) argument that such a stipulation actually fails to account for the Yawelmani facts.

[5] The absolute neutralization of /θ/ to *t* can be likewise effected by an immediately pre-phonetic feature-filling rule supplying all [+dental] matrices with [+stop]: $0 \rightarrow$ [+stop] / [+dental]. Consonant matrices that emerge from the phonology without a [+dental] specification will be phonetically interpreted as nondental, and those that emerge without [+stop] will be interpreted as continuant, there being no phonologically overt [-dental] or [-stop] feature specifications in Plains Cree. As for palatalization, it might be analyzed as involving the displacement of [+dental] in front of a [+front, +high] vowel segment.

[6] Intended explicit reference to the *absence* of a height feature, or explicit reference to [0 high], is at the very least a questionable tactic, and would in any case be equivalent to the mention of [-high].

References

ARCHANGELI, DIANA & KEIICHIRO SUZUKI. 1996. Yokuts templates: Correspondence to neither input nor output. UCI Working Papers in Linguistics. 17-28.

COLE, JENNIFER & CHARLES KISSEBERTH. 1995. Restricting multi-level constraint evaluation: Opaque rule interaction in Yawelmani vowel harmony. Ms. University of Illinois. ROA.

DAHLSTROM, AMY. 1991. Plains Cree morphosyntax. Garland Publishing, Inc.

HAYES, BRUCE. 1989. Compensatory lengthening in moraic phonology. Linguistic Inquiry 20. 253-306.

KIPARSKY, PAUL. 1968. How abstract is phonology? IULC.

KISSEBERTH, CHARLES. 1970. On the functional unity of phonological rules. Linguistic Inquiry 1. 291-306.

MCCARTHY, JOHN. 1995. Remarks on phonological opacity in optimality theory. In Jacqueline Lecarme, Jean Lowenstamm, & Ur Shlonsky, eds. Proceedings of the second colloquium on Afro-Asiatic linguistics. ROA.

PIGGOTT, GLYNE. 1980. Aspects of Odawa morphophonemics. Garland Publishing, Inc.

SCHMIDT, DEBORAH. 1992. Compensatory lengthening in a segmental moraic theory of representation. Linguistics 30. 513-534.

___. 1996a. Absolute neutralization and underspecification in Hungarian vowel harmony. Proceedings of ESCOL 1995. 279-286.

___. 1996b. Vowel raising in Basaa: A synchronic chain shift. Phonology 13. 239-267.

WOLFART, H.CHRISTOPH. 1973. Plains Cree: A grammatical study. Transactions of the American Philosophical Society. Volume 63 part 5.

Antipassivization and the Morpheme -si in Inuktitut*

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1. Introduction

In this paper we will examine some cases of unexpected appearances of antipassive morphology in Inuktitut, an Inuit(Eskimo) language spoken in Northeastern Canada and in the very closely-related language West Greenlandic.

The tokens to be examined are mostly from naturally-occurring Inuktitut texts in Kalmár (1979b) and from Fortescue's (1984) grammar of West Greenlandic. Other sources are cited below.

Antipassivization is canonically a valency-changing operation that intransitivizes a transitive verb by "demoting" the direct object to an oblique Case or omitting it altogether.

In Inuktitut, the antipassive is marked by a suffix which has several allomorphs. Many researchers claim that the specific allomorph which appears is lexically governed to some extent and is at least partially arbitrary or idiosyncratic and not necessarily conditioned by phonological or other factors. Bittner (1987) and Johnson (1980) argue that the different antipassive morphemes are not allomorphs, but actually are used in different discourse contexts. The most common overt antipassive marker is *-si*, the one that we will focus on in this paper.

2. The Data

There are many examples in Inuktitut of *-si* appearing in places that are unexpected given the standard function and distribution of antipassivization. [1]

2.1. Prototypical Antipassivization

Before discussing the unexpected cases of antipassive morphology, I will first review what Inuktitut sentences without special valency-changing morphology look like. Then I will show an example of prototypical intransitivizing antipassivization.

2.1.1. Ergativity

Inuktitut is an ergative language, so the subjects of transitive verbs are marked with Ergative Case and the subjects of intransitive verbs and the objects of transitive verbs are marked with Absolutive Case.

The sentence in (1) shows a typical intransitive verb. The subject is marked with Absolutive Case, which has no overt realization in Inuktitut. The verb has a suffix which fuses together subject agreement and mood.

(1) Jaani tikittuq

Jaani tikit -juq
Johnny(ABS) arrive -PAR,3s
'Johnny arrived.'

I: (*Allen*, 15)

The sentence in (2) shows a typical transitive verb. The subject is marked with Ergative Case, the object is marked with Absolutive Case. The suffix on the verb fuses together both subject and object agreement (along with mood).

(2) arnaup qimiq takuvaa

arnaq -up qimiq taku -vaa
woman -ERG dog(ABS) see -IND,3s/3s
'A/the woman saw the dog'

I: (*Kalmár, 87*)

2.1.2. Antipassivization

Antipassivization is a way of intransitivizing a transitive verb. The subject is realized in Absolutive Case and the object can either appear in an oblique Case (usually Modalis(Instrumental) in Inuktitut) or be omitted. The verb agrees only with the subject. In other words, the Case and agreement pattern of an antipassive sentence is the same as that of a normal intransitive, and there is typically antipassivizing morphology on the verb.

The sentence in (3) illustrates a standard antipassive sentence in Inuktitut with the morpheme *-si* being used in its standard object-demoting antipassive use.

(3) Inunnik tuqutsivuq

(Inuk -nik) tuqut -si -vuq
(person -MOD,PL) kill -ANTIPASS -IND,3s
'He killed people'

WG: (*Fortescue, 86*)

2.2. Non-typical Use of Antipassive Morphology

There are many examples of antipassive morphology being used in Inuktitut that do not fit in with the standard antipassivization pattern described above.

2.2.1 Intransitive Verbs

There are examples of what appears to be the antipassive morpheme *-si* suffixed to intransitive verbs (as in (4), (5), (6)[2] and (7)). This is clearly unexpected given the nature of antipassivization.

(4)

iqlaq -si -kallak -pak -łunga
laugh -ANTIPASS -suddenly -FREQ -ICM,1s ...
'I'd suddenly have to laugh, ...'

I: (*Kalmár, 127, line 36 of Text II*)

(5)

qilalukka -nik pui -si -vuq
whale -MOD,PL come up to surface -ANTIPASS -IND,3s
'There appeared whales on the surface (of the sea)'

WG: (*Bittner(1988) as cited in Bok-Bennema, 263*)

(6) natsiqannaavaa

natsiq anna -i -vaa
ringed seal(ABS) get away -ANTIPASS -IND,3s/3s
'The ringed seal got away from him'

WG: (*Fortescue, 269*)

(7)

ammalu tuavirnaq -tuqaa -si -kaatla -k -pat
CONN -emergency -there is -ANTIPASS -suddenly -REL -3s
'And when all of a sudden there is an emergency...'

I: (*Kalmár, line 41 of Text III*)

(8) Taania -p qajar -taa -ni asiru -i -vaa
Taania -ERG kayak -new -his(REFL)(ABS) break -AP -IND,3s/3s
'Taania had his new kayak destroyed (unintentionally).'

WG: (*Fortescue, 269*)

2.2.2. Antipassivization/Causative Interactions

Other unexpected occurrences of the morpheme *-si* include some puzzling interactions between the antipassive and other valency-changing operations, especially causativization (as in (9)). We will not discuss these cases here.

(9)

sunauvva siqinir -mut immur -naq -si -tit -lugu
CONN sun -ALL water -make -ANTIPASS -CAUS -ICM,X/3s
'I melted water with the sun'

I: (*Kalmár, 121, line 47 of Text I*)

2.2.3 Antipassivization and Inceptive Aspect

There are also many examples of *-si* in sentences in which I will argue it is being used to convey aspectual information (as in (4), (7), (10) and (11)). In this use, the verb is often modified by 'suddenly' .

This use is found with both transitive and intransitive verbs and sometimes corresponds (in terms of argument structure and Case) to a standard antipassive and sometimes does not.

(10)

jo qukiq -si -ju -kulu -u -tainna -r -mat
Joe(ABS) shoot -ANTIPASS -PART,3s -DIM -BE -suddenly -REL -3,CONJ
'All of a sudden Joe fired, and ...'

I: (*Kalmár, 130, line 74 of Text II*)

(11)

utuqaat aliikkutaSSaraluwatik
the old couple those who should have been an entertainment for them
taSSaŋŋannaq aniSigamikkik
suddenly when they had them go out for them
'When they had the bad luck that those who should have been an entertainment for them suddenly went out.'

WG: (*Bugge & Lynge(1934-44) as cited in Bergsland, 109*)

2.2.4. "Detrimental Use"

The example in (13) illustrates another use of the antipassive morpheme, one that Fortescue (1984) calls a highly lexicalized "detrimental use" (p. 269). The example in (12) shows the typical intransitive form of the sentence. It de-agentivizes the subject. [3]

(12) qajar -taa -va asirur -sima -vuq
kayak -new -his(ABS) break -PERF -IND,3s
'His new kayak has been destroyed (broke).'

WG: (*Fortescue, 269*)

(13) Taania -p qajar -taa -ni asiru -i -vaa
Taania -ERG kayak -new -his(REFL)(ABS) break -AP -IND,3s/3s
'Taania had his new kayak destroyed (unintentionally).'

WG: (*Fortescue, 269*)

2.3. Potential Analyses

Given this pattern, one possibility would be to say that the uses of *-si* which do not correspond to the standard properties of the antipassive are evidence for accidental homophony, i.e. the

existence of at least one other morpheme which has the same phonological form as that of *-si* but which is unrelated to antipassivization.

The other, more interesting possibility is that *-si* is present in the seemingly disparate cases for the same reason(s).

In this paper we will investigate whether unification of the different uses of *-si* is possible or not. We will argue that the seemingly disparate cases of *-si* are not purely cases of accidental homophony. We will show that it is possible to collapse, at least partially, the uses of *-si*. This clearly has implications for the morphosyntactic treatment of antipassivization. This paper can be seen as a first step at investigating the contribution of the Inuktitut data to such an analysis.

3. Antipassivization and Aspect

The antipassive morpheme *-si* can be used to mark aspectual information, even in the absence of the object-demotion that is typical of the antipassive.

The particular aspectual information is to describe the *inception* of the action. This ties in with the observation in Dowty (1987) that adverbs such as 'suddenly' have a pragmatic effect that induces an inceptive interpretation on states.

(14)

iqlaq -si -kallak -pak -łunga
laugh -ANTIPASS -suddenly -FREQ -ICM,1s ...
'I'd suddenly have to laugh, ...'

I: (*Kalmár, 127, line 36 of Text II*)

(15)

ammalu tuavirnaq -tuqaa -si -kaatla -k -pat
CONN -emergency -there is -ANTIPASS -suddenly -REL -3s
'And when all of a sudden there is an emergency...'

I: (*Kalmár, line 41 of Text III*)

(16)

jo qukiq -si -ju -kulu -u -tainna -r -mat
Joe(ABS) shoot -ANTIPASS -PART,3s -DIM -BE -suddenly -REL -3,CONJ
'All of a sudden Joe fired, and ...'

I: (*Kalmár, 130, line 74 of Text II*)

The link between voice and aspect in West Greenlandic has been discussed in Bittner (1987), although I argue that the relationship is somewhat different than the one that she posits. What I propose here is not necessarily incompatible with Bittner's (1987) analysis, but can be seen as an extension of it.

3.1. Cross-Linguistic Connections between Voice and Aspect

There is also cross-linguistic support for the relationship between voice and aspect.

In the Mayan language Tzutujil, there is a 'completive passive' which emphasizes the result and the termination of the activity and a 'simple passive' which "simply defines and describes the activity"(Dayley (1985) as cited in Dixon (1994), 148)

Russian reflexive morphology can used for passivization, but only in the imperfective (Geniušiene (1987)).

(17) a. Sosed stroit dom
neighbor-NOM builds house-ACC
'The neighbor is building a house.'

b. Dom stroit -sja sosed -om
house-NOM builds -REFL neighbor -INS/SG
'The house is (being) built by a neighbor.'

3.2. Summary: Antipassive and Inceptive Aspect

- In Inuktitut, the antipassive morpheme *-si* can be used to mark inceptive aspect.
- There is cross-linguistic support for the connection between voice and aspect.

4. Antipassive Morphology and Verb Classes

We have shown that the Inuktitut and West Greenlandic data indicate that antipassive morphology can be used to mark inceptive aspect. However, there are remaining cases of non-canonical uses of antipassive morphology that do not seem related to this aspectual use.

I will argue that we can get insight into these cases by investigating the nature of the verb roots themselves, not just at the antipassive.

Specifically, if we look at the way that verb roots pattern based on what happens when the object is dropped, we can gain some insight into some of the functions of *-si*.

4.1. Likely Reflexives

In Inuktitut, it is sometimes possible to make a transitive verb become reflexive by omitting the object and using only subject agreement morphology on the verb. No overt reflexive marker is needed. An example of this is shown in (18).

(18) kapivunga
kapi -vunga
stab -IND,1s
'I stab myself'

I: (*Kalmár, 17*)

Compare (18) with the corresponding canonical antipassive given in (19).

(19) kapisivunga

kapi -si -vunga
stab -ANTIPASS -IND,1s
'I stab something/someone'

I: (*Kalmár, 18*)

So the example in (18) has the same Case and agreement pattern as an antipassivized transitive verb, but there is no overt antipassive morphology.

4.2. Not-So-Likely Reflexives

However, in other cases, using the Case and agreement patterns found with antipassivized verbs, without using antipassive morphology, results in an antipassive interpretation of the sentence, not a reflexive one. An example of this is shown in (20).

(20)

arnaq miqsuq -tuq japa- mik
woman(ABS) sew -PART,3s parka -MOD
'The woman sews a parka'

I: (*Bok-Bennema, 47*)

This type of sentence has been analysed as having a null antipassive (Woodbury (1977), Jensen and Johns (1989), Allen (1994)). The verbs meaning 'eat', 'chew' and 'bite' and are in this class also (Allen (1994) and Bok-Bennema (1991)).

So, perhaps this pattern can give us some hints about some of the remaining cases of non-canonical antipassivization.

I propose that it is the class of verbs which are not likely to be used reflexively which allow the "null antipassive" to be used. For the class of verbs which are more likely to be used reflexively, overt antipassivization must be used. This means that *-si* is used to force the non-reflexive reading

There is also cross-linguistic support for the idea that the object-suppressing functions of antipassivization and reflexivization are closely connected

4.2.1. Cross-Linguistic Connections between Reflexive and Object-Suppression

There are cross-linguistics connections between reflexivization and object-suppression. One example can be seen with the case of the Lithuanian 'Absolutive' Reflexive construction (from Geniušiene (1987)). The example in (21a) shows a Lithuanian sentence with a transitive verb. The example in (21b) shows the Lithuanian 'Absolutive' Reflexive construction. This is a case of reflexive morphology on a transitive verb resulting in an object-suppressing habitual reading. The example in (22) shows the typical reflexivizing use of this same eflexive morphology which appeared in the object-suppressing habitual reading in (21b).

(21) a. Berniuk-as muša vaik-us
boy-NOM beats child-ACC/PL
'The boy beats children.'

b. Berniuk-as muša-si
boy-NOM beats-REFL
'The boy fights (is pugnacious)'

(22) Av-ys bado-si
sheep-NOM-PL butt-REFL
'Sheep butt', 'Sheep are butting one another'

This type of formation is lexically limited. The verbs that can be used in this construction are verbs that are unlikely to be used with a reflexive interpretation; *fight*, *curse*, *tease*, *pester*, *pinch*, etc. So this parallels the Inuktitut case where reflexive morphology (or lack thereof, in the Inuktitut case) can be used to give a non-reflexive object suppression reading in cases where the verb is not likely to have a reflexive interpretation.

This configuration is also incompatible with perfectivizing morphology as the examples in (23) show. This gives us another link between aspect and voice, as I argued there was in Inuktitut.

(23) a. Šu-o ap- kandžio-j-o vaik-us
dog-NOM PERF bite-PAST-3 child-ACC/PL
'The dog bit the children.'

b. * Šu-o ap- si kandžio-j-o.
dog-NOM PERF REFL bite-PAST-3
'The dog bit.'

Russian also has reflexive morphology which can be used with verbs that are unlikely to be reflexivized to give an object-suppression reading. This can be seen in (24). The examples in (25) illustrate the reflexive use of this morphology.

(24) Sobaka kusaet-sja
The dog bites-REFL
'The dog bites (habitually).'

(25) a. Ona odevaet kuklu
she dresses doll
'She dresses the doll.'

b. Ona odevaet-sja
She dresses-REFL
'She dresses herself.'

4.2.2. Summary: Antipassive and Reflexive

- Inuktitut transitive verbs can be grouped on whether they are likely to be reflexivized or not.

- Dropping the object of the verbs that are likely to be reflexivized results in a reflexive interpretation, but *-si* can be used to force the non-reflexive object-suppression reading (antipassive or habitual).
- There is cross-linguistic support for this connection between the use of a reflexive configuration with certain verbs and a non-reflexive object-suppression meaning.

4.3. Transitivity Alternation Verbs and De-Agentivizing

Transitivity Alternation verbs provide further support for the idea that dividing verbs into classes based on their behavior when the object is dropped will help with the seemingly disparate uses of antipassive morphology in Inuktitut.

With transitivity alternation verbs like 'break', omitting an argument and using the case and agreement patterns of the antipassive does not result in an antipassive interpretation as it does for the "unlikely reflexivizers", nor in a reflexive intrepretation as it does for the "likely reflexivizers".

But, this makes sense given the fact that the object-dropped, intransitive form of the verb is the anticausative form, as can be seen in (26).

(26) qajar -taa -va asirur -sima -vuq
kayak -new -his(ABS) break -PERF -IND,3s
'His new kayak has been destroyed (broke).'

WG: (*Fortescue, 269*)

In this case, then addition of the antipassive morpheme seems not to intransitivize the verb (the Case and agreement pattern is that of a transitive), but to contribute to the meaning by de-agentivizing the subject, i.e. making the subject into an experiencer or patient.

It is not clear, a priori, whether *-si* is being affixed to the intransitve form of the verb and adding an argument, an experiencer subject, or whether is is being added to the transitive form of the verb, and not demoting the object, but instead, de-agentivizing the subject.

If the former explanation were true, we would expect any intransitive verb to be able to take the *-si* suffix, and then turn into a transitive verb with an experiencer subject, but this is clearly not the case. So, we can be certain that the latter possibility is the correct one. We can then account for the "detrimental" or de-agentivizing uses of the antipassive morpheme *-si*, illustrated in (27).

(27) Taania -p qajar -taa -ni asiru -i -vaa
Taania -ERG kayak -new -his(REFL)(ABS) break -AP -IND,3s/3s
'Taania had his new kayak destroyed (unintentionally).'

WG: (*Fortescue, 269*)

We can include in this use of the antipassive morpheme *-si*, the example in (6), repeated here as (28).

(28) natsiqannaavaa

natsiq anna -i -vaa
ringed seal(ABS) get away -ANTIPASS -IND,3sgS/3sgO
'The ringed seal got away from him.' (i.e. 'He had the ringed seal get away from him.')

WG: (*Fortescue, 269*)

There is another example of what seems to be the antipassive morpheme serving to de-agentivize the subject, or indicate that the subject is not in control of the action. This is the case in (4), repeated here as (29). Interestingly, this example also has the inceptive aspect meaning.

(29)

iqlaq -si -kallak -pak -ɬunga
laugh -ANTIPASS -suddenly -FREQ -ICM,1s ...
'I'd suddenly have to laugh, ...'

I: (*Kalmár, 127, line 36 of Text II*)

Although the example in (29) is an unergative and not a transitivity alternation verb as are the other de-agentivized cases in (27) and (28), the fact that these two classes of verbs pattern together may not be unexpected.

This relates to work on Salish by Demirdache (1996) where unergatives and certain transitives pattern together to get a meaning where the subject is de-agentivized with the addition of an "out of control" morpheme.

So, it may be that example (29) shows that unergatives pattern with Transitivity Alternation verbs in Inuktitut, or it may be that (29) is simply a case of the inceotive aspect use of *-si*. It is not clear how to choose between these possibilities at this point.

4.4. Summary: Antipassive and De-Agentivization of the Subject

- When the antipassive morpheme *-si* is added to transitivity alternation verbs and unergative verbs, it does not result in reading in which the object is "demoted", but one in which the subject is de-agentivized.

5. Conclusions

I have shown that there is good reason to believe that the seemingly disparate uses of *-si* are not all cases of accidental homophony. One use of the antipassive morpheme *-si* is to contribute an inceptive aspect meaning. The other meanings can be grouped by dividing the verb stems to which *-si* attaches into classes depending on the patterns seen when the object of the verb is omitted. If the verb is of the class that gets a reflexive interpretation when the object is omitted, the addition of *-si* can rule out the reflexive reading resulting in "demoted" object or a habitual reading. In the case of transitivity alternation and possibly unergative verbs, when

the default interpretation of the dropped object/intransitive case is an anticausative or spontaneous reading, addition of *-si* de-agentivizes the subject. There is cross-linguistic support for these patterns.

6. Remaining Issues

- Formalization of the verb classes; lexical vs. syntactic properties etc.
- Examination of the interaction between 'suddenly' and *--si* in the inceptive aspect cases.
- Relating the inceptive aspect cases to the verb classes. Can the inceptive aspect uses of *-si* be linked to the de-agentivizing uses?

Notes

*My foremost debt in writing this paper is to the researchers cited throughout whose fieldwork I am relying on for data and for insights into Inuktitut and West Greenlandic grammar; I am grateful for their work. For helpful comments and discussion I would also like to thank Dave Embick, Alec Marantz, Rolf Noyer, Don Ringe and Robin Clark. Thanks also to Roumi Izvorski for help with the Russian data. I take full responsibility for any errors in fact or interpretation.

[1] The examples are in the maximum amount of detail allowed by the original source. The following abbreviations and notational conventions are used:

ABS=Absolutive Case, ANTIPASS=Antipassive Suffix (may or may not be canonical case of antipassivization), CAUS=Causative, CONJ=Conjunction, CONN=Connective, FREQ=Frequentative, ICM=Incontemporative Mood, IND=Indicative Mood (Mood and Agreement morphology appear as a fused suffix on the verb), MOD= Modalis(Instrumental) Case, PART=Participle, {1,2,3}{S,PL}=Subject person & number agreement), {1,2,3}{S,PL}/{1,2,3}{S,PL}=Subject and Object person & number agreement)

[2]The antipassive morpheme *-si* surfaces as *-i* here, as it does occasionally elsewhere, due to phonological factors.

[3]The construction shown in (13) is similar to the Japanese adversative passive, an example of which (from Kubo (1990)) is given below.

Taro-ga Hanako-ni shinkoushukyoo-o hajime-rare-ta
Taro-NOM Hanako-DAT new-religion-ACC begin-PASS-PAST
'Taro had Hanako start a new religion on him.'

References

Allen, S. E. M. (1994) *Acquisition of Some Mechanisms of Alternation in Arctic Quebec Inuktitut*, Doctoral dissertation, McGill University.

Baker, M. (1988) *Incorporation: A Theory of Grammatical Function Changing*, University of Chicago, Chicago.

Bergsland, K. (1955) *A Grammatical Outline of the Eskimo Language of West Greenland*, Doctoral dissertation, University of Oslo, microfiche copy from Inter-Documentation Company, Zug.

Bittner, M. (1987) "On the Semantics of the Greenlandic Antipassive and Related Constructions," *International Journal of American Linguistics* 53:2, 194–231.

Bok-Bennema, R. (1991) *Case and Agreement in Inuit*, Studies in Generative Grammar, 38, Foris, Dordrecht.

Demirdache, H. (1996) "'Out of Control' in Salish and Event (De)Composition," in A. Mendikoetxea and M. Uribe-Etxebarria, eds., *Issues in the Morphology-Syntax Interface*, Forthcoming.

Dixon, R. M. W. (1994) *Ergativity*, Cambridge University Press, Cambridge.

Dowty, D. (1986) "The Effects of Aspectual Class on the Temporal Structure of Discourse: Semantics or Pragmatics?" *Linguistics and Philosphy* 9:1, 37–61.

Fortescue, M. (1984) *West Greenlandic*, Croon Helm, London.

Geniušiene, E. (1987) *The Typology of Reflexives*, Mouton de Gruyter, Berlin.

Jensen, J. T., and A. Johns (1989) "The Morphosyntax of Eskimo Causatives," in D. B. Gerdts and K. Michelson, eds., *Theoretical Perspectives on Native American Languages*, State Uiversity of New York Press, Albany, 209–229.

Johnson, M. (1980) *Ergativity in Inuktitut(Eskimo)*, Indiana University Linguistics Club, Bloomington, IN.

Kalmár, I. (1979a) "Antipassive and Grammatical Relations in Inuktitut," in F. Planck, ed., *Ergativity*, Academic Press, New York, 117–143.

Kalmár, I. (1979b) *Case and Context in Inuktitut(Eskimo)*, Canadian Ethnology Service Paper No.49, National Museums of Canada, Ottawa.

Kleinschmidt, S. (1851) *Grammatik der Grönlandischen Sprache*, Berlin, Reissued by Georg Olms Verlagsbuchhandlung, Hildescheim, 1991.

Kubo, M. (1990) "Japanese Passives," ms., MIT.

Marantz, A. (1984) *On the Nature of Grammatical Relations*, MIT Press, Cambridge, MA.

Mennecier, P. (1995) *Le* Tunumiisut, *Dialecte Inuit du Groenland Oriental: Description et Analyse*, Klincksieck, Paris.

Siegel, L. (1995) "The Morpheme *-si* in Inuktitut," ms., University of Pennsylvania.

Smith, C. (1983) "A Theory of Aspectual Choice," *Language* 59:3, 479–501.

Woodbury, A. (1977) "Greenlandic Eskimo, Ergativity, and Relational Grammar," in P. Cole and J. M. Sadock, eds., *Grammatical Relations*, volume 8 of *Syntax and Semantics*, Academic Press, New York, 307–336.

Formal Symmetry in American Sign Language*

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1 Introduction

Our primary goal in this paper is to account for a puzzling alternation found in the class of two-handed signs in American Sign Language. To account for the data we present an analysis of two-handed signs, based on a formal interpretation of *symmetry* and grounded in a geometry-based model of sign (Uyechi 1996).

Battison (1978) was the first to recognize that symmetry is a crucial property for analyzing two-handed signs. As a result, he introduced a three way typology that routinely serves as a basis for discussions about the phonological representation of two-handed signs (e.g., Sandler 1989, 1993, Blevins 1993, Brentari and Goldsmith 1993, Brentari 1995). However, Battison's interpretation of symmetry is informal and not discriminating enough to account for the puzzling variation that we discuss in this paper. A review of related typologies (Sandler 1993, van der Hulst 1996) reveals similar problems.

In formalizing the notion of symmetry we extend Battison's typology beyond a three class system to a continuum in which Type 1 signs (maximally symmetric) serve as one endpoint of the continuum and Type 3 signs (maximally nonsymmetric) serve as the other endpoint. This new approach accounts for the puzzling properties of two-handed signs while formally capturing Battison's original observations on the crucial role that symmetry plays in the linguistic functioning of two active articulators.

2 Previous Analyses of Two-Handed Signs

Battison (1978) identifies three classes of signs using the Symmetry and Dominance Conditions, given in (1).

(1) I. **Symmetry Condition** (Battison 1978:35)

a. If both hands of a sign move independently during its articulation, then

b. both hands must be specified for the same location, the same handshape, the same movement (whether performed simultaneously or in alternation), and the specification for orientation must be either symmetrical or identical.

II. **Dominance Condition** (Battison 1978:35)

a. If the hands of a two-handed sign do not share the same specification for handshape (i.e., they are different), then
b. one hand must be passive while the active hand articulates the movement, and
c. the specification of the passive hand is restricted to be one of a small set: A, S, B, 5, G, C, O.

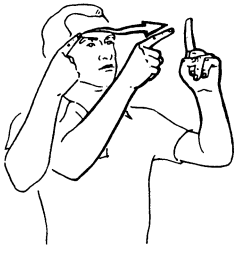
Battison uses these conditions to differentiate between Type 1, Type 2, and Type 3 signs. A Type 1 sign obeys the Symmetry condition. This means that both hands have the same handshape and perform the same movement. This is illustrated by the sign ALIKE in (2a). In this sign, the index fingers of both hands are extended while the remaining fingers are curled under the thumb. The fingertips of the index fingers point away from the signer and the palms of the hands face down. To articulate the sign the hands move towards each other until the sides of the index fingers touch.

A Type 2 sign obeys neither the Symmetry condition nor the Dominance condition. It is articulated with the hands in the same handshape; one hand is static while the other hand moves. For example, to articulate GOAL, (2b), the hands are in the same handshape as for (2a). One hand is held static with the index finger pointing upward while the other hand moves towards it with the tip of the index finger pointed towards the tip of the static index finger.

A Type 3 sign obeys the Dominance condition. It is articulated with the hands in different handshapes; one hand is static while the other hand moves, as illustrated by DISCUSS in (2c). One hand is held static with the palm facing upward and the fingers and thumb extended to form a flat surface. The moving hand is held with the index finger extended and the palm facing the signer. To articulate the sign the hand moves up and down so that the side of the index finger touches the open palm of the static hand.



(2) a. ALIKE
Type 1
Both hands active.
Same HS, LOC, OR, "MOV".



b. GOAL
Type 2
One hand passive.
Same handshape.



c. DISCUSS
Type 3
One hand passive.
Diff. handshapes.

More recent typologies are variations of Battison's approach.[1] Sandler (1993) argues convincingly that the non-dominant, or static hand, acts either as a place of articulation (2P signs), or an active articulator (2E signs), essentially recasting Type 1 signs as 2E signs and Types 2 and 3 signs as 2P signs. In Sandler's model, the two sets of signs have distinct representations. Echoing Sandler's account, van der Hulst (1996) refers to Type 1 signs as "balanced", and Type 2 and 3 signs as "unbalanced". He offers a head-dependency analysis in which the phonological representations of the two types of signs are more similar.

3 Problems with these Typologies

In this paper we are concerned with just one problematic aspect of the typologies introduced in the previous section[2]: they fail to provide insight into the puzzle described below, namely why some Type 2 signs have Type 1 pronunciations and other Type 2 signs do not.[3]

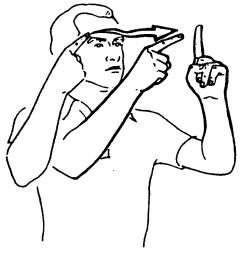
3.1 Puzzle: Type 2 signs with a Type 1 alternation

On any interpretation, both of the signs in (3) fall into the same category; either Type 2 (Battison 1978), unbalanced (van der Hulst 1993) or 2E (Sandler 1993). In each case, the sign is articulated with the hands in the same handshape while one hand is static. For both signs, the index fingers of both hands are extended while the remaining fingers are curled against the palms with the thumbs folded on top. To articulate (3a), the palms of the hands face their respective sides while the tips of the index fingers point away from the signer's body. The bottom hand is static while the top hand moves from above and ends in contact with the bottom hand. (3b) is described above (as (2b)).

(3)



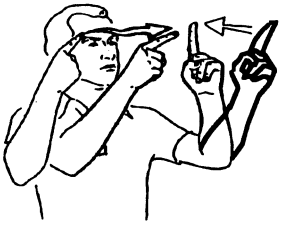
a. RIGHT/CORRECT



b. GOAL

However, as shown in (4a), (3a) also has a Type 1 pronunciation; it can be articulated with both hands moving toward each other. In contrast, (3b) does not have a Type 1 pronunciation. As shown in (4b), the pronunciation of this sign with both hands moving is unacceptable.





(4) a. RIGHT/CORRECT$_{Type1}$ b. *GOAL$_{Type1}$

The Type 1 alternation of only some Type 2 signs is a property of two-handed signs that must be accounted for, but current analyses lack the explanatory power to account for it. In each case both signs in (3) are members of the same class (Type 2, unbalanced, 2E) and, therefore, structurally undifferentiated. Thus the Type 2/Type 1 alternation described above is a puzzle for these analyses.

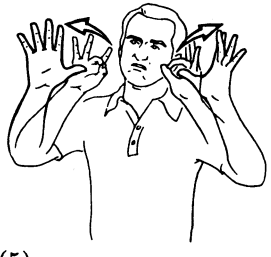
We propose that the first step towards understanding the underlying structure of the two-handed sign is not to focus on the difference between the active and static hands but rather to formalize the symmetric properties of the whole gesture. To that end we present a completely formal re-interpretation of the symmetry of two-handed signs. The result is the introduction of a binary symmetry feature for each component of the sign and the recognition of a symmetry continuum that leads to an explanatory account of the Type 2/Type 1 alternation. To do this we adopt a geometry-based model of signs (Uyechi 1996) that both captures their spatial properties and is appropriate for formalizing their symmetries.

3.2 Uyechi's Geometry-based Model

Stokoe (1960) identified three main components of a lexical sign: handshape, location and movement. Battison (1978) introduced a fourth parameter, hand orientation. More recently, Stack (1988), Hayes (1993), and Uyechi (1996) argue that of the four parameters, only handshape, location and orientation are phonological primitives. On this analysis, movement is not a primitive. Rather, it is derived from changes in the other three parameters, as illustrated by the signs in (5).

(5a) is an example of a change in handshape. For this sign the hands are held on either side of the head with the tips of the middle finger and thumb initially in contact with each other and the other fingers extended. To articulate the sign, the middle finger and thumb open up so that at the end of the gesture they, too, are extended. (5b) is an example of a change in location, and is described above as (2a). (5c) is an example of a change in orientation. To articulate it the hands start in a position in which one palm

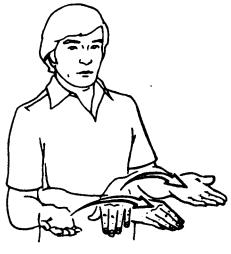
faces up and the other down. The hands then rotate 180 degrees so that each palm faces the other way. All movements articulated in monomorphemic lexicalized signs can be represented by these three transitions: change in location, change in handshape, and change in orientation (Uyechi 1996). It is this analysis of phonological primitives that we take as our starting point.



(5) a. AWFUL
Change in Handshape

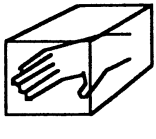


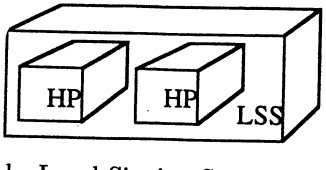
b. ALIKE
Change in Location

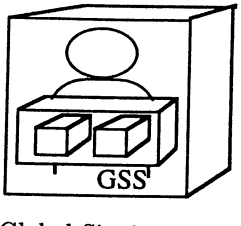


c. DIE
Change in Orientation

The geometry-based model is based on a three-dimensional rectangular representation of signing space. The hands are represented as hand prisms, (6a), embedded in rectangular prisms of signing space that correspond to distinct morphological levels. A monomorphemic sign is articulated in local signing space, (6b), which is in turn embedded in global signing space, (6c). Morphologically complex signs are specified for positions in both local and global signing space.[4] Of interest here is the representation of monomorphemic signs, so the discussion will focus on the relation between the hand prisms and local signing space.

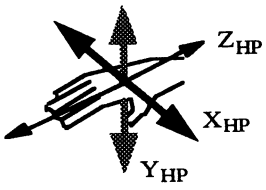


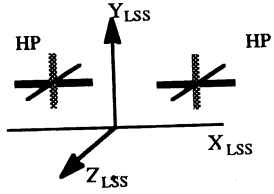




(6) a. Hand Prism b. Local Signing Space c. Global Signing Space

The dimensions of the hand prisms, local signing space, and global signing space can also be represented in terms of the axes which define them. For example, the hand prism in (6a) is represented by its axes in (7a). (7b) illustrates the axial representation of two hands in local signing space.





(7) a. Hand Prisms b. Hand Prisms in Local Signing Space

The position of LSS does not change during the articulation of a monomorphemic sign, rather, it carves out the relevant part of signing space, (8), within which the hand prisms move. Thus, the planes of LSS serve as references for determining the relative posture of the hands.



(8) Local Signing Space

Using this model we can formalize symmetry for each of the components of a sign, namely handshape, location, orientation, and "movement".

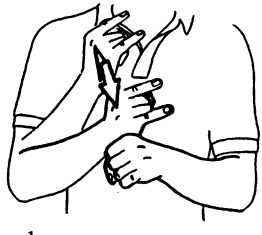
4 Formalizing Symmetry

The formal interpretation of symmetry for handshape, orientation, location, and movement is based on the geometry-based model. In each case, the symmetry of each component of the sign can be captured by a binary feature.

Handshape. Although not discussed in detail here, handshape in the geometry-based model is captured formally in terms of *specified fingers*, the *joint positions* of the fingers and thumb, and the relation of the thumb to the fingers. Handshape is symmetric if those characteristics of the hands are identical. By this metric, (9a) has symmetric handshape, but (9b) does not. (9a), ALIKE, is described above as (2a). WHISKEY, (9b), is articulated with the fingers and thumb of the static hand closed in a fist. The index and pinky fingers of the active hand are extended while the other fingers are curled and tucked under the thumb. Both hands are held so the palms face to the sides. To articulate the sign the active hand moves in a straight line towards the static hand, touches it, and then repeats the movement.

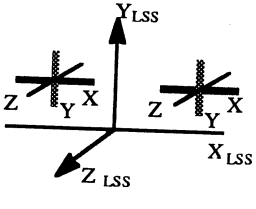


(9) a. ALIKE
HS: +SYM

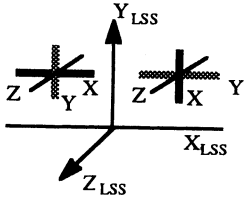


b. WHISKEY
HS: −SYM

Orientation. As argued in Toole and Uyechi (1995), a sign is articulated with symmetric orientation if the corresponding axes of the hands are parallel at the beginning and end points of the sign, where by "corresponding axes" we mean both X-axes, both Y-axes, and both Z-axes of the hand prisms. In (10a) all three axes are parallel to each other during the articulation of ALIKE. In contrast, in (10b) only the Z-axes are parallel during the articulation of GOAL; the X and Y-axes are perpendicular to each other. Hence, (10a) is articulated with symmetric orientation, but (10b) is not.

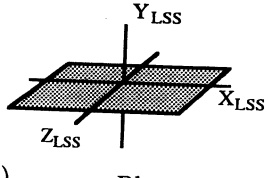


(10) a. ALIKE
OR: +SYM

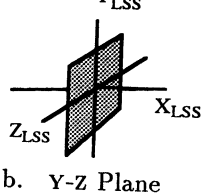


b. GOAL
OR: −SYM

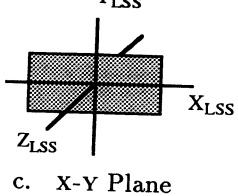
Reference Planes. To discuss the symmetry of location and movement requires the identification of reference planes in signing space. The planes defined by the axes of local signing space provide the formal reference planes, (11). For the sake of convenience we refer to (11a) as the *base plane*, (11b) as the *center plane*, and (11c) as the *local plane*.



(11) a. X-Z Plane
Base



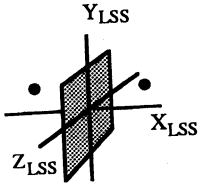
b. Y-Z Plane
Center



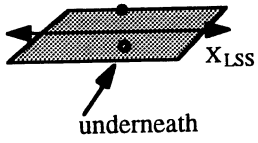
c. X-Y Plane
Local

Location. Given the reference planes identified above, the symmetry of the location of the hands is determined by the relative position of the origins of the hand prisms, where the "origin" is the point at which the X, Y, and Z-axes intersect each other. If, at the beginning or the end of the sign, the origin of one hand prism is a reflection of the origin of the other hand prism about a reference plane, then location is symmetric.

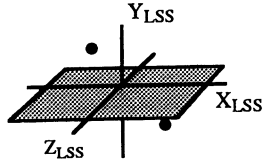
For example, to articulate ALIKE the origins of the hand prisms are reflected about the center plane throughout the articulation of the sign, (12a), so location is symmetric. To articulate RIGHT the origins of the hand prisms are reflected about the base plane at the end of the sign, (12b), so its location is also symmetric. In contrast, even at the points where the hands are closest during the articulation of DISCUSS, the origins of the hand prisms are skewed with respect to the base plane, (12c), and are not reflected about any of the other reference planes, so location is not symmetric.



(12) a. ALIKE
LOC: +SYM

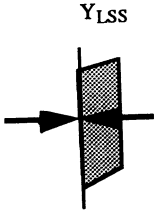


b. RIGHT
LOC: +SYM

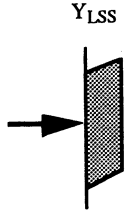


c. DISCUSS
LOC: −SYM

Movement. A movement is symmetric if the transition, a change in handshape, change in location, or change in orientation, is symmetric about a reference plane. For example, both signs in (13) are articulated with a change in location. The movement vectors for the sign ALIKE are reflected about the center plane, (13a). In contrast, only one hand moves during the articulation of GOAL so the vectors are not reflected about any of the planes of reference, (13b). Hence (13a) is articulated with symmetric movement but (13b) is not.



(13) a. ALIKE
"MOV": +SYM



The dark arrows represent the transitions of the hands.

b. GOAL
"MOV": −SYM

4.1 The Symmetry Continuum

With these formal definitions of symmetry for each component of the sign, a sign's symmetry can now be determined in terms of a cluster of binary features, where + is symmetric and − is not. We summarize the symmetry of relevant signs in (14), organized in a table so that the signs reflect a continuum of symmetry. On the leftmost side of the table all components of the sign are symmetric; on the rightmost side of the table no component of the sign is symmetric. We refer to the former as "maximally symmetric", and the latter as "maximally nonsymmetric".

(14)

	Maximally Symmetric				Maximally Nonsymmetric
	[Type 1] [2E]	[Type 2] [	[Type 3] ← 2P →	[Type 2]	[Type 3]]
	a. ALIKE	b. RIGHT	c. WHISKEY	d. GOAL	e. DISCUSS
OR	+	+	+	−	−
LOC	+	+	+	−	−
HS	+	+	−	+	−
"mov"	+	−	−	−	−

With Battison and Sandler's classes of signs mapped onto the table, a problem with Battison's Type 2 and Type 3 categories, and Sandler's 2P signs is immediately apparent. Whereas the Type 1 class picks out signs that are completely symmetric, neither Battison's Type 2 and Type 3 categories nor Sandler's 2P classification pick out natural classes of signs. For example, (14c) and (14e) are both Type 3 signs, yet WHISKEY has two symmetric parameters while DISCUSS has none. Similarly, (14b) and (14d) are both Type 2 signs, yet RIGHT has three symmetric components but GOAL has only one. It is this second pair of signs that provides insight into the puzzling alternation described in Section 3.1.

Whereas neither Battison nor Sandler's classifications can account for this observation, the symmetry features reveal an obvious and quantifiable difference between these signs. Recall that RIGHT has a Type 1 pronunciation but GOAL does not. The decomposition of RIGHT in (14b) reveals that all of its basic parameters, handshape, location, and orientation, are symmetric. In contrast, for GOAL, (14d), only handshape is symmetric. We propose that the symmetry of the change in location only follows with maximal symmetry of the primitive parameters. To capture this interpretation we propose the principle in (15).[5]

(15) If HS, OR, and LOC are [+SYM], and change in location is [−SYM], then the sign has an alternation in which change in location is [+SYM].

In sum, our approach to the symmetry of two-handed signs which led us to the symmetry features and Symmetry Continuum provides specific advantages over previous approaches: (i) it captures the status of each parameter in terms of a formal definition of symmetry, revealing the range of symmetry that two-handed signs have, and (ii) it provides an explanation to the puzzling Type 2/Type 1 alternation.

5 Consequences of the Analysis

Internal to sign language analysis our results are straightforward. They provide greater insight into the internal structure of signs while accounting for a previously unexplained puzzle. However, our proposal appears at first a bit less appealing when we compare it to spoken language phonology.

Specifically, distinctive features are commonly associated with *segments.* And, as noted above, the symmetry feature is associated with the sign gesture. Yet a large number of proposals in sign language phonology (e.g., Sandler 1989, Wilbur 1990, Perlmutter 1992, Brentari and Goldsmith 1993, Blevins 1993, van der Hulst 1993) support the idea that there is roughly a one-to-one mapping of the sign gesture to the syllable. If that is the case, then our proposal appears problematic because it implies that we are proposing a set of distinctive features that associate with the *syllable* rather than the segment.

In light of the fact that there are proposals in spoken language phonology to associate features with the syllable (summarized in Blevins 1995), our proposal may appear less problematic. But those proposals are restricted to a few languages in a few specific cases. In contrast, we are dealing with a widespread phenomenon. A survey of sign languages in the Netherlands, Germany, Quebec, Britain, and Hong Kong indicates that they have two-handed signs that exhibit symmetric properties similar to ASL (Linguistics 369, Linguistics Institute, University of New Mexico 1995). Indeed, a sign language without symmetric characteristics of two-handed signs has not yet been reported. Thus, we are introducing the possibility of rampant feature-syllable association for sign languages. This poses a significant difference from the phonological organization of spoken language.

This leads us to consider at least three alternatives. First, we could maintain the view that distinctive features associate with segments and conclude that previous formulations of sign syllables are incorrect. Second, we might accept previous formulations of sign syllables and conclude that this analysis lends support to the (few) arguments in spoken language phonology that some features associate with syllables. Or we could consider the possibility that the underlying phonological structure of the sign differs from the underlying structure of the spoken word in significant ways.

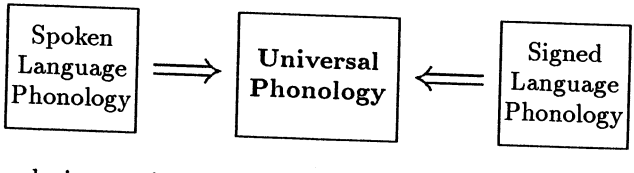
We favor the latter alternative. The first two alternatives are consistent with what we refer to as the "transfer-and-test" approach to sign language phonology, schematized in (16). This is an approach based on the premise that what we know about spoken language phonology is equivalent to our knowledge about universal phonology. In turn, because a universal theory of phonology should hold for all natural languages, it follows that theoretical models of spoken language phonology should apply to sign languages. Thus the "transfer-and-test" approach encourages the search for a one-to-one mapping of spoken language constructs and their principles onto sign language phenomena.

(16) "Transfer-and-Test"



But the two types of natural language are fundamentally different, so we believe that the discovery of a distinct class of natural languages provides the unprecedented opportunity to reinforce a theory of universal phonology with independent evidence. To that end, we advocate the approach in (17), where the relation between universal phonology and signed language phonology is turned around. Distinct theories of both signed and spoken language phonology are formulated in modality-specific frameworks and contribute independent evidence to a modality-independent theory of universal phonology. The expectation is that – at some level of organization – we will find common principles that bridge the signed and spoken modes.

(17) *Preferred Approach*: Independent Evidence



In conclusion, rather than dwell on the segment-like or syllable-like structure of two-handed signs, we prefer to withhold judgment until we have the opportunity to fully explore the ramifications of the symmetry feature and the Symmetry Continuum for ASL as well as other signed languages. We approach this task with the firm belief that mode-insensitive phonological principles exist – but with a healthy skepticism that what we discover through signed languages need not be just as we've found it in spoken languages.

Endnotes:

*The research reported in this paper was supported in part by an Australian Federation of University Women Fellowship to Janine Toole. The authors also wish to acknowledge their colleagues at the Fifth International Conference on Theoretical Issues in Sign Language Research in Montreal September 1996 where the ideas in this paper first started taking shape: Onno Crasborn, Kelly Stack, and Lorna Rozelle. We would also like to thank Diane Brentari for bringing us all together (if even unwittingly) at the 1995 Linguistics Institute in Albequerque, New Mexico.

[1] Reiterating Battison's original typology, Brentari (1995) argues for the stability of the Type 2 classification based on two trends in historical change: (i) some signs with Type 3 characteristics become Type 2 signs, and (ii) some signs with Type 1 characteristics become Type 2 signs.

[2]We discuss other problematic aspects of the Battison typology in Toole and Uyechi 1995.

[3]For the sake of convenience we use Battison's terminology to refer to the sets of two-handed signs. Although we ultimately argue against it, the typology provides a convenient shorthand for the descriptive properties of the signs.

[4]At an even higher level of representation, discourse is represented as instances of global signing space embedded in a discourse signing space.

[5]Note that an alternative interpretation is that RIGHT is inherently a symmetric (two-handed) sign that undergoes a process of Weak Freeze (Padden and Perlmutter 1987). We suspect, in fact, that the alternation has this alternative interpretation because the other signs that we have identified with this alternation (e.g., MOST, GHOST, THIN, RESIDENTIAL-SCHOOL, WORLD) are also articulated with changes in location that are symmetric with respect to the base plane. We contrast this with the absence of alternations for (Type 1) signs whose transitions are symmetric with respect to the center plane (e.g., WITH, FAIR, BREAK, DIFFERENT). Differences between the symmetries of the reference planes are explored in Uyechi (1995). Resolution of these alternatives is a topic of our ongoing work.

References:

Battison, R. 1978. *Lexical Borrowing in American Sign Language.* Linstok Press, Silver Spring, MD.

Blevins, J. 1995. The syllable in phonological theory. In Goldsmith, J. (Ed.), *The Handbook of Phonological Theory.* Blackwell. pp. 206-244.

Blevins, J. 1993. The nature of constraints on the nondominant hand in ASL. In Coulter. pp. 43-62.

Brentari, D. 1995. A prosodic account of two-handed signs. UC Davis, ms.

Brentari, D. 1990. *Theoretical Foundations of American Sign Language Phonology*. Ph.D. thesis, University of Chicago.
Brentari, D. and J. Goldsmith. 1993. Secondary licensing and the nondominant hand in ASL. In Coulter. pp. 19-41.
Coulter, G.R., Ed. 1993. *Phonetics and Phonology: Current Issues in ASL Phonology*. Academic Press.
Hayes, B. 1993. Against movement: Comments on Liddell's article. In Coulter. pp. 213-226.
van der Hulst, H. 1993. Units in the analysis of signs. *Phonology* 10:2. pp. 209-241.
Humphries, T., Padden, C., O'Rourke, T.J. 1980. *A Basic Course in American Sign Language*. T.J. Publishers: Silver Spring, MD.
Padden, C. and D. Perlmutter. 1987. American Sign Language and the architecture of phonological theory. NLLT 5. pp. 335-375.
Perlmutter, D. 1992. Sonority and syllable structure in American Sign Language. LI 23. pp. 407-442.
Sandler, W. 1993. Hand in hand: The roles of the nondominant hand in sign language phonology. *The Linguistic Review* 10, 337-390.
Sandler, W.1989. *Phonological Representation of the Sign*. Dordrecht: Foris.
Stack, K. 1988. Tiers and sullable structure in American Sign Language:Evidence from phonotactics. M.A. thesis, UCLA.
Stokoe, W. 1960. *Sign language structure*. 2nd Edition 1978. Linstok Press: Silver Spring, MD.
Toole, J. and L. Uyechi. 1995. Another perspective on hand orientation in American Sign Language. WECOL 1995.
Uyechi, L. 1995. The symmetry of two-handed signs in American Sign Language. ms. Linguistics Institue, University of New Mexico.
Uyechi, L. 1996. *The Geometry of Visual Phonology*. CSLI: Stanford, CA.
Wilbur, R. 1993. Syllables and segments: hold the movement and more the holds! In Coulter. pp. 135-168.

(Pictures from: Humphries, Padden, and O'Rourke (1980), illustrated by Frank A. Paul.)

Recognition of Accent Patterns across Dialects in Japanese

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I. Introduction

Most studies of Japanese pitch accent, even when discussing dialectal differences, focus on speakers with minimal variation and minimal exposure to other dialects (Sibata 1958 and Sugito 1982 are exceptions). However, contact between speakers of different dialects is extremely common in modern Japanese society. Most sociolinguistic studies of dialect contact, on the other hand, emphasize speech production, not the speaker's perception of other dialects, and investigate segmental dialectal differences, not differences in suprasegmentals. Previous work on speakers' acquisition of new dialects from the perspective of production, as well as the rare work on perception of segmental differences in a non-native dialect (Labov 1989), has identified several factors which influence speakers' and listeners' ability to acquire the features of another dialect which differ from their own dialect. In this paper, I will report on an experiment which investigates the applicability of those factors to perception of a non-native dialect and to suprasegmental dialectal differences. Because the Japanese dialects display important differences in their pitch accent systems, and because there is considerable contact between speakers of different dialects, Japanese lends itself well to this investigation.

When speakers of one dialect talk with speakers of another dialect, to which they have some exposure, how do they use phonetic information from the other dialect which conflicts with what they would have heard from a speaker of their own dialect? Or do listeners use the conflicting phonetic information at all? Labov (1989) proposes three possibilities. Taking the example of how Birmingham listeners understand Chicago speakers, who have a very different vowel system, he suggests that first, the Birmingham listeners "may have already built a pan-dialectal phonology that includes the Chicago realizations of English vowels," second, "they may deduce the systems by observing several correlated changes," or third, "failing to decode the vowels in an appropriate way, they may discard the vowel information and use morphological, syntactic, semantic and pragmatic information to deduce the meaning" (Labov 1989:176). That is, listeners may already know enough about the other dialect's phonology to use the conflicting phonetic information, they may figure out the mapping from the phonemes of the other dialect to their own from "correlated changes," or they may simply ignore the conflicting phonetic information and use higher order information (top-down processing) instead. Labov found that rather than any of these possibilities leading to successful understanding, listeners were surprisingly unsuccessful at decoding words of the other dialect at all.

The case Labov was investigating involved a chain shift in the vowel system, and there was relatively little contact between the two dialects, at least for the subjects who participated in the experiment. The second possibility Labov proposes, that listeners deduce the system of the other dialect while hearing it by noticing the pattern of changes, seems to apply only to chain shifts, where there is such a pattern to notice. In addition, if there is extensive contact between the two dialects, the first and second possibilities (already knowing the phonology of the other dialect and deducing it) would probably not be distinct. Thus, in a situation without chain shifts

and with more contact, there are just two possibilities, namely that the listener knows enough about the phonology of the other dialect to use the phonetic information, or that the listener cannot use that information and must rely on higher order information instead.

The situation in Japan is quite different from the Birmingham and Chicago situation Labov was investigating. The differences between the major dialect groups of Japan are largely in the suprasegmentals, and there is no chain shift. Labov's study also involved a sound change in progress, which is not the case in Japan. Finally, there is far more contact between speakers of different dialects in Japan than between Birmingham and Chicago speakers of the advanced stages of the vowel shifts. Sankoff (1968) shows that the degree of contact has a strong influence on degree of passive understanding between speakers of different dialects, so one might expect passive understanding between Japanese dialects to be more successful than between Chicago and Birmingham based just on degree of contact.

There has been little previous work on this topic. Sugito (1982) reports several experiments on cross-dialect pitch accent perception in Japanese, but she uses synthesized speech continua between different pitch contours instead of natural speech, and she reports her results in terms of where the boundary between categories falls for listeners of various dialects, not as percentage correctly identified. Thus, her purpose and experimental design make it difficult to interpret her results with regard to the question of whether listeners can use phonetic information from another dialect. Sibata (1958) discusses acquisition of Japanese pitch accent in dialect contact situations, but only from the perspective of production, and mostly in an anecdotal fashion. Graff et al. (1986) and Niedzielski (1997) both show that speakers of one English dialect have passive knowledge of another in a contact situation, but do not show whether listeners have enough knowledge of the other dialect to use it in speech perception, for example to identify minimal pairs. Both of these studies also involve only segmental differences.

II. Background on Japanese dialects

The dialects of Japanese are divided into three main groups, the Tokyo-type dialects, the Kansai-type dialects, and the accentless dialects. The differences between these three groups are primarily in their pitch accent systems, not in the segmental phonology. This paper addresses the Tokyo-type and Kansai-type dialects. The Tokyo dialect itself (although not all Tokyo-type dialects) is the prestige dialect for most situations and forms the basis of Standard Japanese. The Tokyo dialect is used for most television programming. However, in the Kansai region, the Kansai dialect has some prestige as the descendant of the language of the ancient court. There is considerable contact between speakers of Tokyo-type and Kansai-type dialects: people are transferred by their employers, go to colleges outside their own dialect area, and travel frequently for business. There is also considerable lexical variation in pitch accent placement even within a dialect (Sugito 1995, Vance 1995, Sibata 1958).

For the Tokyo-type dialects, the only aspect of the pitch accent system which is distinctive is the place of pitch fall within a word. Pitch falls after the accented mora, and the first mora of a word is predictably low unless the word has initial accent, so in a word with an accent somewhere other than the first mora, the first mora is low,

all moras from the second to the accented one are high, and all moras after the accented one are low. Words with no accent remain high through the last mora. Examples (from Vance 1987:89) appear in 1.

1.	/ma'kura/	HLL	'pillow' (1st mora accent)
	/koko'ro/	LHL	'heart' (2nd mora accent)
	/sakana/	LHH	'fish' (unaccented)

The Kansai-type dialects have this same distinction, but in addition, they distinguish between high-beginning and low-beginning words (examples in 2). The Kansai dialects also have surface final contour tones (rising or falling, abbreviated A for ascending and D for descending) which the Tokyo-type dialects lack. Thus, several of the same tone patterns, such as HLL or LHL, can appear in both dialects, as shown in 3, but the Kansai-type dialects also have several patterns which Tokyo-type dialects do not (all examples in 2 except the first)[1].

2.	/ke'eki/	HLL	'cake' (high beginning, 1st mora accent)
	/keeki/	HHH	'business conditions' (high beg., unaccented)
	/'kanzi/	LLH	'Chinese character' (low beg., unaccented)
	/'aka'/	LD	'red' (low beg., 2nd mora accent)
3.	/ma'kura/ (T)	HLL	'pillow' (1st mora acc.)
	/ka'nzi/ (K)	HLL	'manager' (high beg., 1st mora acc.)

In the remainder of the paper, I will give only representations of the surface tones, not the underlying accent pattern, for simplicity.

Both dialects make the distinction of pitch fall location within the word, so there is no question in this case of the listeners being able to perceive the distinction, but that does not necessarily mean that they have enough lexical knowledge of the other dialect to make use of that distinction. As for the high-beginning versus low-beginning distinction and the final contour tones of the Kansai dialects, Tokyo-type dialect listeners do not have those distinctions.

Turning to the question of the mapping between the dialects, some words have the same tones in both dialects (4a), some have opposite tones in the two dialects (4b), and some have some other pattern (4c). Thus, there is no predictable mapping from one dialect to the other for tones, at least not for all words.

4.	word	gloss	tones in Tokyo	tones in Kansai
4a.	/kanzi/	'manager'	HLL	HLL
4b.	/aki/	'autumn'	HL	LH
4c.	/kanzi/	'Chinese character'	LHH	LLH
	/hi/	'fire'	H	A

Chambers (1992) and Payne (1980) have shown this sort of difference to be relatively hard for speakers learning a new dialect to acquire (from the perspective of production).

Although pitch accent is distinctive both in the Tokyo-type and Kansai-type dialects (but not in the accentless dialects), it has low functional load (Vance 1987:107).

There are quite a few minimal pairs (5a, 5c) and even some minimal triplets, but there are also many homophones (5b, 5d). It is not clear that listeners need to use pitch accent information to understand speech.

5.	for Tokyo		
5a.	/kanzi/	HLL	'manager'
	/kanzi/	LHH	'Chinese character'
5b.	/kaku/	HL	'each'
	/kaku/	HL	'to write'
	for Kansai		
5c.	/keeki/	HHH	'business conditions'
	/keeki/	HLL	'cake'
5d.	/kami/	HL	'paper'
	/kami/	HL	'god'

III. Experimental design

In order to find out whether speakers of Tokyo-type and Kansai-type dialects can make use of pitch accent information from the other dialect, I constructed two word lists, one to be read by a Tokyo speaker and heard by Kansai listeners (6), and one to be read by a Kansai speaker and heard by Tokyo listeners (7).

6. words read by Tokyo speaker, heard by Kansai listeners

	word	gloss	tones in Tokyo	tones in Kansai
6a.	/hasi/	chopsticks	HL	LH
	/hasi/	bridge	LH	HL
	/kata/	shoulder	HL	LH
	/kata/	shape	LH	HL
	(/ame/	rain	HL	LD)
	(/ame/	candy	LH	HH)
6b.	/isi/	thought	HL	HL
	/isi/	stone	LH	HL
	/kami/	god	HL	HL
	/kami/	paper	LH	HL
	/kati/	value	HL	HL
	/kati/	winning	LH	HL

7. words read by Kansai speaker, heard by Tokyo listeners

	word	gloss	tones in Tokyo	tones in Kansai
7a.	/hasi/	chopsticks	HL	LH
	/hasi/	bridge	LH	HL
	/kata/	shoulder	HL	LH
	/kata/	shape	LH	HL
	/ima/	now	HL	LH
	/ima/	living room	LH	HL

7b.	/ito/	string	HL	LH
	/ito/	intention	HL	HL
	/kaku/	to write	HL	LH
	/kaku/	each	HL	HL
	/katu/	to win	HL	LH
	/katu/	cutlet	HL	HL
7c.	/e/	picture	H	A
	/e/	handle	L	H
	/hi/	fire	H	A
	/hi/	sun	L	D
	/haru/	spring	HL	LH
	/haru/	to stick	HL	HH

D=descending tone, A=low ascending tone

The pitch accent dictionary used was Sugito (1995) for both dialects. In the case of the Kansai dialect, the pitch accent dictionary lists the pronunciations used by six speakers (three younger, three older) for each word. I attempted to use words for which all six speakers agreed on the tone pattern.

The first half of the Tokyo speaker's words (6a) have opposite tones in Tokyo and Kansai dialects (with the exception of /ame, ame/ which was later found to have other problems, as well). In Labov's terms, these words have lexical opposition for the Kansai listener: when the Kansai listener hears the Tokyo speaker's pronunciation of one of these words, it is the same as a word in the Kansai listener's own lexicon, but that is a different word from the one intended by the Tokyo speaker. For example, when a Kansai listener hears the Tokyo pronunciation of /kata/ HL 'shoulder,' it is a word for the Kansai listener, but it is the word 'shape,' not 'shoulder.' When the Kansai listener hears the Tokyo pronunciation of /kata/ LH 'shape,' it is also a word in the Kansai listener's lexicon, but it is 'shoulder,' not 'shape.' The words in 7a, similarly, have lexical opposition for the Tokyo listener.

The words in 6b are distinguished in the Tokyo dialect, but are homophones in the Kansai dialect, and there is no lexical opposition for these words. When a Kansai listener hears the Tokyo speaker's pronunciation of /isi/ HL 'thought,' it could be either 'thought' or 'stone' in the Kansai listener's lexicon. For the Tokyo pronunciation of /isi/ LH 'stone,' however, there simply is no such item in the Kansai listener's lexicon. The words in 7b present the same situation for the Tokyo listener. The words in 7c are homophones or near homophones[2] in the Tokyo dialect, but are distinguished in the Kansai dialect through a distinction which does not exist in the Tokyo dialect. Here, there is also no lexical opposition. Since the Kansai dialect has all the pitch accent distinctions the Tokyo dialect does, there is no such category (of words with a distinction the listener does not have) for the Kansai listeners.

Labov (1989) has shown that lexical opposition makes it more difficult for listeners to acquire forms of another dialect, even for perception. However, when words which are distinguished in another dialect are homophones in one's own dialect, learning the forms of the other dialect requires the equivalent of undoing a merger, and Chambers (1992) has found that this sort of dialectal difference is relatively difficult to acquire (for production). When the other dialect uses a distinction which

is not made in one's own dialect, this also makes it more difficult to acquire the forms of the other dialect. Thus, none of the categories of tone mappings between the Japanese dialects should be easy for speakers of the other dialect to acquire.

The words in 6 were read by one female speaker of the Tokyo dialect, and the words in 7 by one female speaker of the Kansai dialect. 12 to 15 repetitions of each word in isolation were recorded, with the words read in a different random order for each repetition. Both speakers were native speakers from their respective areas of the country, the Tokyo area for the Tokyo speaker, and the Kyoto-Nara area for the Kansai speaker. Before recording, the word lists were checked with the speakers to make sure they used the pattern listed in the pitch accent dictionaries for all the words they were to read. The Kansai speaker was able to produce the word list in the Kansai dialect, despite the extremely formal speech situation. (This was not a problem for the Tokyo speaker, as she spoke the standard dialect.)

Ten different tokens of each word were digitized at 16,000 Hz, randomized, and recorded onto a tape with a pause of approximately 2 seconds between tokens. An additional token of one word from each pair was included to provide an unbalanced experiment, but this eleventh token was not included in the results. In the case of the Kansai reader, there were originally six additional words in the word list, and tokens of these words were included in the experiment, but they are omitted from the results because of an experimental design problem.

Eight speakers of Kansai-type dialects and eight speakers of Tokyo-type dialects participated in the experiment as listeners (hereafter referred to as Kansai listeners and Tokyo listeners). All were employees of ATR, which is in Kyoto (Kansai area). The Kansai listeners had all lived (nearly) their entire lives in the Kyoto, Osaka, Nara, or Wakayama areas[3] (the main areas of the Kansai-type dialects), so their exposure to the Tokyo dialect was primarily through television and through working at ATR, which has many employees on temporary assignments from the Tokyo area. Tokyo listeners came from a variety of areas in which Tokyo-type dialects are spoken (Tokyo, Kanagawa, Nagoya, Okayama). The Tokyo listeners were all living in the Kansai area at the time of the test, since all were employees of ATR, and they thus had daily exposure to the Kansai dialect. They had lived in the Kansai area for three months to three years at the time of the experiment, and none could speak the Kansai dialect. None had lived in the Kansai area as children except subject T7, who had lived in Osaka from age 13 to 18 and thus had the most exposure to Kansai dialect of any of the Tokyo listeners.

All of the listeners first took a short pretest (12 items) on their own dialect, in which they heard tokens spoken by the reader of their own dialect. They then took the full length test on the opposite dialect. For both the pretest and the main part of the experiment, listeners were seated in a sound booth and heard tokens over headphones. The answer sheet showed the Chinese characters (which disambiguate meaning) for the two members of each pair, and listeners circled the character of the word they thought had been said. The first page of the answer sheet was for the pretest, and taking the Kansai listeners as an example, the first page was clearly labeled "Kansai dialect" in Japanese. The remaining pages of the answer sheet were used for the main test, and the second page was clearly labeled "Tokyo dialect." Kansai listeners were instructed that the first 12 items would be in the Kansai dialect, and the remaining items in the Tokyo dialect, and the separate parts of the

answer sheet were pointed out. They were instructed that they should respond by circling what the word they heard was in the dialect they were hearing. A translation of part of the instructions to Kansai listeners appears in 8. Listeners were given a written copy of the instructions, and I also read the instructions aloud, except for the portion of the instructions giving examples, which was not read aloud in order to avoid influence from my own pronunciation of the example words. Instructions and methods were identical, in reverse, for Tokyo listeners.

8. Translation of part of instructions to Kansai subjects (presented in Japanese)

"The first 12 words will be in Kansai dialect. After that, you will hear about 130 words in the Tokyo dialect. . . .On the answer sheet, please circle the word you heard on the tape. **When you are hearing the Kansai dialect, please answer what the word you heard was in the Kansai dialect, and when you are hearing the Tokyo dialect, please answer what the word you heard was in the Tokyo dialect.** The order is as in the following example:

Tape:	Answer sheet:			
/ima/ (in syllabary)	今	'now'	居間	'living room'
/hasi/ (in syllabary)	橋	'bridge'	箸	'chopsticks'

The purpose of the pretest was to make sure that that none of the listeners were ignoring pitch accent information completely, even in their own dialect, and to make sure that listeners were able to do the task. After the experiment, I had each listener read both word lists out loud in order to find out whether the forms they produced themselves for these words agreed with the pitch accent patterns expected for their dialect.

IV. Results

The results, in percent correct for the various word types and dialects of listeners, appear in Table 1 and graphically in Figures 1a and 1b.[4]

TABLE 1. Results, in % correct for different word types and listeners. (K=Kansai listener, T=Tokyo listener)

listener	own dialect	6a words (lex. opposition)*	6b words (no lex. opposition)
K1	75.0	51.7 (40.0)	73.3
K2	33.3	83.3 (75.0)	88.3
K3	58.3	70.0 (67.5)	96.7
K4	83.3	81.7 (75.0)	93.3
K5	58.3	18.3 (25.0)	16.7
K6	75.0	46.7 (37.5)	83.3
K7	41.7	86.7 (80.0)	86.7
K8	100.0	100.0 (100.0)	100.0
average	65.6	67.3 (62.5)	79.8

*(in parentheses, results without ame/ame pair)

listener	own dialect	7a words (lex. opposition)	7b words (no lex. opposition)	7c words (dist. does not exist in own dialect)
T1	100.0	88.3	75.0	55.0
T2	100.0	0.0	83.3	41.7
T3	100.0	48.3	96.7	46.7
T4	100.0	6.7	63.3	58.3
T5	100.0	0.0	25.0	43.3
T6	100.0	6.7	66.7	38.3
T7	100.0	10.0	98.3	78.3
T8	100.0	91.7	71.7	58.3
average	100.0	31.5	72.5	52.49

Figure 1a. Kansai listeners' results.

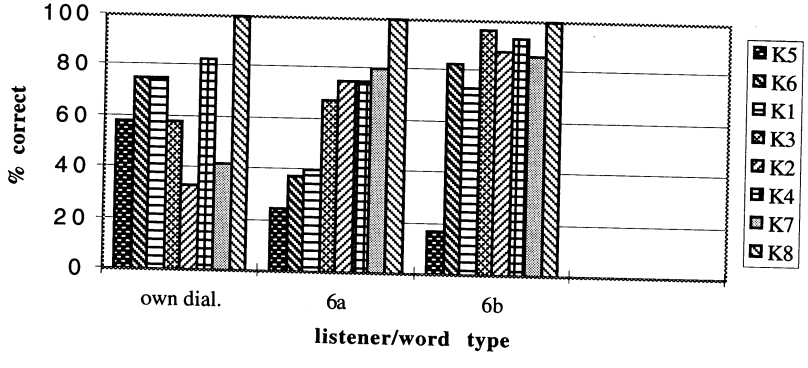
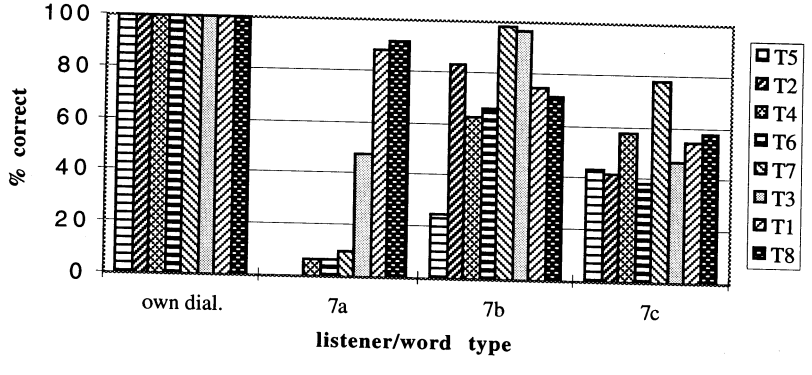


Figure 1b. Tokyo listeners' results.



In the post-test elicitation (in which each listener produced all the forms on the word lists), I found that the Tokyo listeners for the most part produced the same forms the

dictionary lists for the words in question, except for the word /haru/ 'to hang,' which they pronounced LH instead of HL (in agreement with another pitch accent dictionary, NHK 1985). Among the Kansai listeners, some consistently produced Kansai forms, but some produced half or more Tokyo forms. Not surprisingly, it seems that some Kansai speakers use the standard Tokyo forms in the formal speech situation of reading a word list.

V. Discussion

There is a great deal of individual variation in the results shown above, but some patterns do emerge. First, there is a slight tendency for Kansai listeners to be more successful at using pitch accent information from the Tokyo dialect than vice versa. Some Tokyo listeners can identify words in the 7a and 7b groups correctly with more than chance frequency, but more Kansai listeners than Tokyo listeners score above chance. This tendency is not significant, however (between subjects ANOVA for Kansai and Tokyo listeners using the average of 6a/6b and of 7a/7b: $F=2.88$, $p>0.05$).

Second, both Kansai and Tokyo listeners are better able to identify words with no lexical opposition (6b, 7b) than those with lexical opposition (6a, 7a). This difference is significant, as tested by a mixed ANOVA with dialect as the between subjects factor and word type (6a and 7a against 6b and 7b) as the within subjects factor ($F=12.30$, $p<0.005$). This effect matches Labov's (1989) results.

Third, Tokyo listeners score around chance on words with a pitch accent distinction their own dialect does not have (7c words). This group of words is harder for them than the words with no lexical opposition and a distinction they do have in their own dialect (7b), but easier than the words with lexical opposition (7a). For the Tokyo listeners, the difference between the three word types (7a, 7b, 7c) is significant (within subjects ANOVA, $F=5.57$, $p<0.02$). Since the results are not normally distributed, however, this effect should be considered marginally significant.

Finally, the pretest yielded an unexpected result: Tokyo listeners find it easy to identify pitch accent minimal pairs in their own dialect, but Kansai listeners do not. The difference between the two dialect groups' performance on their own dialects is significant ($F=19.51$, $p<0.001$). The surprisingly low scores of the Kansai listeners for their own dialect are not due to regional differences within the Kansai dialects: the Kansai accent dictionary is based on productions by Osaka speakers, but Kansai listeners K4 and K8 are from Wakayama and Kyoto, respectively, and scored quite high on the pretest, while K2 is from Osaka, but had the lowest score on the pretest. There may be some correlation between ability to produce words in isolation in Kansai dialect and high scores on the pretest (K2 and K7, the two lowest scorers on the pretest, both produced many Tokyo forms), but several listeners who were able to produce Kansai forms for the word list also scored rather low on the pretest (K5, K3).

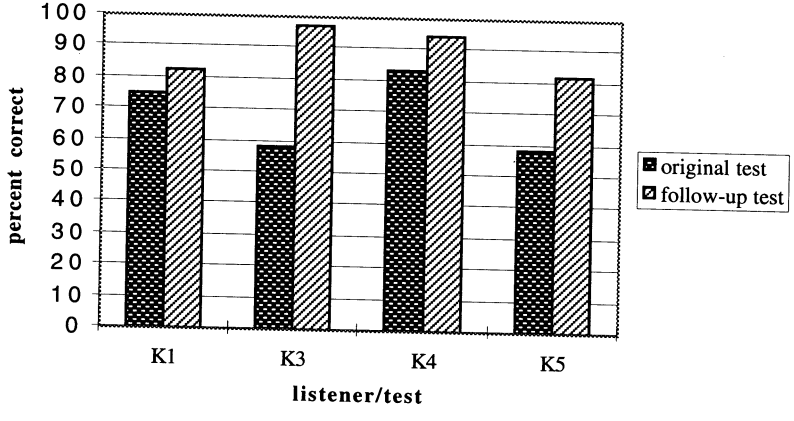
VI. Follow-up test

Because the pretest, on which the Kansai listeners showed poor identification of minimal pairs in their own dialect, was so short, I conducted a follow-up test on a subset of the Kansai listeners. These listeners were given the full length test on the Kansai dialect (all of the stimuli from the Kansai reader originally presented to the Tokyo listeners). The format of the test and instructions were as above, except that the test involved only the Kansai dialect. The results are shown in Table 2, and Figure 2 gives a comparison for each listener of the original pretest and the average for all parts of the longer follow-up test.

TABLE 2

listener	7a words	7b words	7c words
K1	75.0	86.7	86.7
K3	96.7	100.0	95.0
K4	95.0	98.3	90.0
K5	68.3	86.7	91.7
average	83.8	92.9	90.9

Figure 2. Kansai listeners-comparison of original and follow-up tests on own dialect.



One can see that these Kansai listeners are better able to identify minimal pairs distinguished by pitch accent in their own dialect when given the full-length test than they were during the pretest. I do not believe this could reflect confusion about which dialect they were hearing and responding to during the pretest, because of the precautions taken to make clear which dialect was being used for which part of the test, as discussed above. In addition, if Kansai listeners' low scores on the pretest had been due to simple confusion about the format of the test, Tokyo listeners might have shown the same effect of confusion, but Tokyo listeners identified all minimal pairs correctly on the pretest. Instead, I believe that the higher scores of Kansai listeners on the longer follow-up test on their own dialect reflects the additional

practice these listeners had had: by the time of the follow-up test, these listeners had participated in the original experiment, and had been asked to read all the words of the list out loud (at which point they knew that pitch accent and dialect were at issue). The follow-up test gave them further opportunity for practice. However, even in this follow-up test, the Kansai listeners are still less successful at identifying minimal pairs of their own dialect than the Tokyo listeners were on their pretest.

VII. Conclusions

Several conclusions can be drawn from the results of these two experiments. First, the relative prestige levels of two dialects have an effect on how much speakers of one dialect know about the other, for passive understanding of the other dialect as well as for production. This is true despite extensive contact between the dialects.

For speakers of either dialect, it is harder to learn a form of the other dialect which is also a form (of a different word) in one's own dialect. That is, it is harder to learn forms which have lexical opposition. This is true for suprasegmental dialectal differences as well as for the segmental differences Labov (1989) investigated. In the case of Tokyo speakers, it is also harder to learn forms of the other dialect which use a distinction not present in the Tokyo dialect. This result is similar to the findings of Labov (1989) and Payne (1980) for speech production and segmental differences.

Perhaps because the Kansai dialect is not the standard dialect and is less likely to be used in formal speech settings, Kansai listeners appear to need more practice in order to do a task like the one in the experiment for their own dialect than Tokyo listeners do. A listening test probably corresponds to a formal speech situation, and Kansai listeners may try to use the standard dialect for this formal situation, even in listening.

Returning to the overall question of whether listeners in this contact situation have enough knowledge of the other dialect to make use of phonetic information which conflicts with their own dialect (in this case the pitch accent information) in speech perception, I have found that at least some listeners can make use of that phonetic information. I have explored factors which influence the listeners' ability to acquire passive knowledge of the other dialect, and have shown that the same effects hold for suprasegmental dialectal differences and for speech perception as do for segmental differences and speech production.

This work was done while I was at ATR, Kyoto, Japan, and was supported by the NSF Summer Institute in Japan Program. I am grateful to Nick Campbell, Norio Higuchi, and Charles Fillmore for discussions of this paper, to the speakers and listeners who participated in the experiments, and especially to Ms. Ohta and Ms. Shimoda of ATR for all their help.

[1] In the Tokyo-type dialects, words beginning with a heavy syllable and without initial accent have traditionally been said to begin high, without an initial L, making HHH also a possible pattern for Tokyo-type dialects if the first syllable is heavy. However, Pierrehumbert and Beckman (1988) and Poser (1984) have shown that even these words do have an initial rise in pitch. Also, an initial heavy syllable in a Tokyo-type dialect is not phonetically the same as a high-beginning Kansai dialect form, even if both are represented as having HH on the first two moras.

[2] The one mora words with H or L as the only tone do not appear to be homophonous in the Tokyo dialect, but it is unclear how an H or L tone is realized on one mora words spoken in isolation in the Tokyo dialect. Sugito (1982) and Vance (1995) have shown that many Tokyo

speakers do not maintain a distinction between such words in isolation, and cannot perceive a distinction even when hearing the speech of a speaker who does make the distinction.

[3] Subject K4 had lived in Tokyo for four years as an adult, but had moved back to Nara five years before the time of the experiment. Subject K6 lived in Tokyo until age three, but both her parents were from the Kansai area.

[4] The pair /ame, ame/ in the Tokyo reader's list presented a problem: after the experiment, Kansai listeners mentioned that that pair is the one used to teach children in school about the difference between Tokyo and Kansai dialects. Therefore, Kansai listeners tended to know the Tokyo pitch accent pattern of these two words very well, and this pair inflated their scores for the 6a words. The results for the /ame, ame/ pair were therefore excluded from all analyses.

References

Chambers, J.K. 1982. Dialect acquisition. *Language* 68.673-705.

Graff, David, William Labov, and Wendell A. Harris. 1986. Testing listeners' reactions to phonological markers of ethnic identity: A new method for sociolinguistic research. In Diversity and Diachrony, ed. D. Sankoff. 45-58. Amsterdam: John Benjamins Publishing Company.

Labov, William. 1989. The limitations of context: Evidence from misunderstandings in Chicago. CLS 25.171-200.

Niedzielski, Nancy. 1997. Social factors and phonetic perception. Presentation at the LSA Annual Meeting, Chicago, 2-5 January 1997.

Nihon Hoosoo Kyookai. 1985. Nihongo hatsuon akusento jiten [Japanese pronunciation and accent dictionary]. NHK Press.

Payne, Arvilla C. 1980. Factors controlling the acquisition of the Philadelphia dialect by out-of-state children. In Locating language in time and space, ed. W. Labov. 143-178. Academic Press.

Pierrehumbert, Janet B., and Mary E. Beckman. 1988. Japanese tone structure. Linguistic Inquiry, Monograph 15. Cambridge: MIT Press.

Poser, William J. 1984. The phonetics and phonology of tone and intonation in Japanese. MIT dissertation.

Sankoff, Gillian. 1968. Social aspects of multilingualism in New Guinea. McGill University dissertation.

Sibata, Takesi. 1958. Nihon no hoogen [Japanese dialects]. Tokyo: Iwanami Shoten.

Sugito, Miyoko. 1982. Nihongo akusento no kenkyuu [Research on Japanese pitch accent]. Tokyo: Sanseido.

Sugito, Miyoko. 1995. Osaka Tokyo akusento onsei jiten [Osaka Tokyo accent phonetic dictionary]. CD ROM. Maruzen.

Vance, Timothy. 1987. An introduction to Japanese phonology. Albany: SUNY Press.

Vance, Timothy. 1995. Final accent vs. no accent: utterance-final neutralization in Tokyo Japanese. Journal of Phonetics, 23.487-499.

PARASESSION:
PRAGMATICS
and
GRAMMATICAL STRUCTURE

Three Frequency Effects in Syntax

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The primary hypothesis of functionalist or usage-based linguistics is that language use shapes grammar. The recognized mechanism by which this language-shaping process occurs is frequent repetition (Givón 1979, DuBois 1985, Hopper 1987, Hopper and Thompson 1993). In this paper we will look at the three types of repetition or frequency effects that have been identified as important in phonology and morphology, and demonstrate that these same effects are operative in the shaping of the grammar of larger units, that is, in syntax.

First it is important to distinguish two kinds of frequency: token frequency and type frequency. Token frequency is the count of the occurrence in texts of particular words, such as *broken,* or *have*, or of specific phrases, such as *I don't think.* Type frequency, on the other hand, counts how many different lexical items a certain pattern or construction is applicable to. Using a morphological example, regular English Past Tense *-ed* has a very high type frequency because it applies to thousands of different verbs. The vowel-change pattern exemplified by *strung* and *stung* has a much lower type frequency since it applies to fewer than twenty verbs. Type frequency in syntactic constructions would count how many distinct items of a particular lexical or grammatical class (e.g. verbs) can be used in the construction.

In this paper we discuss two effects of token frequency, and show how these effects interact with a third effect, which is due to type frequency. The three effects we have chosen to discuss are not the only frequency effects important in shaping grammar, but we have chosen these three for a specific reason: the Reduction Effect and the Conserving Effect of high token frequency appear to condition opposite results, i.e. on the one hand, high token frequency promotes change and on the other hand it renders constructions resistant to change. We demonstrate that these two effects of high token frequency are applicable at different stages in the life of a construction, and the two types of change involved are very different in nature. The Reduction Effect plays a major role in grammaticization, where high token frequency promotes all types of reductive change, while the type of change that is resisted by old, highly entrenched constructions is change on the basis of productive patterns with high type frequency.

1. The Reduction Effect

First we consider the Reduction Effect of high token frequency, which has a phonetic, a syntactic, and a semantic dimension. Phonetic change often progresses more quickly in items with high token frequency. This effect is particularly noticeable in grammaticizing elements or phrases which undergo

drastic reduction as they increase in frequency. Thus *be going to,* which is becoming a future marker in English, is reduced to ['gʌnə] or even further reduced in phrases such as *I'm gonna* to ['aiməne]. Similarly the conventionalized contractions of English are reduced due to their high frequency: *I'm, I'll, I've, can't, don't, won't*, etc. But the effect occurs on a more subtle level as well: regular sound change in many cases progresses more quickly in items of high token frequency. For instance, there is a tendency in American English for the loss of syllabicity in post-stress schwa + resonant sequences, as in *every, camera, memory, family.* This reduction is more advanced in words of higher frequency (such as those just named) than in words of lower frequency, such as *mammary, artillery, homily* (Hooper 1976). The loss of final [t] or [d] after a consonant is also more common in words of higher frequency, such as *went, just,* and *and*; in fact a general effect of token frequency on the rate of deletion has been found for 2000 tokens of final [t] or [d] (Bybee 1997).

If sound changes are the result of phonetic processes that apply in real time as words are used, those words that are used more often will have more opportunity to be affected by phonetic processes. If representations are changed gradually, with each token of use having a potential effect on representation, then words of high frequency will change at a faster rate than words of low frequency. The streamlining of high frequency words and phrases has the effect of automating production. Any motor activity that is repeated often will become more efficient (Bybee 1997).

The automation of processing has effects well beyond phonetics: the processing of frequently-used sequences as single chunks also leads to the loss of internal constituent structure. This effect is observable in grammaticization (Heine and Reh 1984, Heine, Claudi and Hünnemeyer 1991). Consider, for example, the grammaticizing phrase *(be) supposed to*, which is reduced to [sposte]. It comes from a passive construction with an infinitive, as shown in (1), but now the *to* of the infinitive is phonologically fused with the verb, as in the case of other developing auxiliaries, such as *have to* [hæfte], *want to* [wɑne], *going to* [gəne]and so on, perhaps indicating a change in the affiliation of *to.* Additionally, in *(be) supposed to* the syntactic status as a passive has also been lost, as shown by the unacceptability of a passive agent with the reduced form:

(1) He is supposed by most people to be very knowledgeable.

(2) He's s'posed to be very knowledgeable *by most people.

Where formerly this phrase was an instantiation of a construction involving *be + Past Participle*, functioning as a main verb with an embedded clause complement expressed as an infinitive, it now has been fused into a single auxiliary, *s'posta*, which is structurally parallel to *gonna, wanna*, etc.

Accompanying phonological reduction and loss of internal structure of high frequency phrases is the well-known phenomenon of semantic bleaching. Bleaching is due to habituation whereby organisms cease to respond at the same level to repeated stimuli (Haiman 1994). Words or phrases that are much repeated lose their semantic force, which, in a spiraling effect, allows them to occur more often, which in turn conditions further semantic bleaching.

Some of the clearest examples of bleaching are cases in which formerly emphatic expressions lose their special status as emphatics and become the unmarked way to express certain concepts. For example, it is common for negative markers to be reinforced by the addition of emphatic elements, such as other negators combined with nouns, as in French *ne ... pas* 'not a step' or English *ne + a + wiht* 'not at all' which gave rise to *not.* Traugott (1972) reports that in Old English *noht* always had its full emphatic force, but in Middle English it gradually lost this force and came to be used as the normal, non-emphatic negation.

Phonetic reduction, loss of internal constituency, and bleaching all occur together in grammaticization because they are all promoted by frequent repetition, which is the mechanism that produces automation and habituation.

2. The Conserving Effect

The second effect of the repetition of tokens is due to the increased lexical strength (Bybee 1985) or entrenchment (Langacker 1987) of a particular word or phrase. Using a morphological example again, high frequency forms with alternations resist analogical leveling: while English *weep / wept, creep / crept,* and *leap / leapt* have a tendency to regularize to *weeped, creeped,* and *leaped* respectively, the high frequency verbs with the same pattern, *keep / kept, sleep / slept* show no such tendency (Hooper 1976, Bybee 1985). As a result, morphological irregularity is always centered in the high frequency items of a language.

In Bybee (1985), this conservative behavior of high frequency forms is related to the faster lexical access of high frequency forms: the more a form is used, the more its representation is strengthened, making it easier to access the next time. Words that are strong in memory and easy to access are not likely to be replaced by new forms created with the regular pattern. This effect of frequency on the strength of representation in memory we dub The Conserving Effect.

This conservatism of much-used expressions can also be found on the syntactic level: it has often been observed that pronouns show more conservative behavior than full noun phrases (Givón 1979). Pronouns and full NPs are related in the sense that pronouns diachronically derive from nouns, and synchronically, in that pronouns and NPs often occupy the same positions. However, a major difference between nouns and pronouns is that the latter are much more frequent than the former. This fact can be used as an explanation for why English pronouns

maintain distinct forms for nominative vs. dative/accusative case, while nouns have lost these case distinctions. It can also be used to explain why the position of pronouns sometimes reflects an earlier word order, as in Spanish, where object clitic pronouns occur before the verb (reflecting, it is argued, an older OV word order) while full NP objects occur after the verb (Givón 1979).

Similarly, verbal auxiliaries, which are highly frequent, often retain old conservative syntactic characteristics. The English auxiliaries, for instance, retain the ability to invert with the subject (which all verbs had previously, e.g. [3]) and they are followed, rather than preceded by, the negative, another property once shared by all verbs, as shown in (4) and (5) from Middle English (Mossé 1952).

(3) Gaf ye the chyld any thyng?
'Did you give the child anything?'

(4) My wyfe rose nott.

(5) cry not so

This, then, is the Conserving Effect: the idea that high frequency sequences take on a life of their own, and resist change on the basis of newer productive patterns for juxtaposing words and morphemes.

3. The Subjunctive in Canadian French

As an example of the conserving role of token frequency in syntax we take the example of the use of the Subjunctive mood in Canadian French, as studied in Poplack (1992, 1995). We choose this example because Poplack's study is based on a corpus of three and a half million words of naturally occurring spoken language from 120 adult native speakers, and because the use of the Subjunctive involves long-distance dependencies of main verb on complement verb, a canonical syntactic issue.

In general, subjunctive verb forms tend to be very old forms which have come to be used in subordinate clauses after a long history of main clause use as futures or other indicative forms (Bybee et al. 1994). So in Canadian French, the meaning and form of the Subjunctive have been highly eroded. Indeed, we argue, along with Poplack, that the Subjunctive has basically been lost, but residue remains in the most frequent contexts, with some indications of minor productivity.[1] The study we cite here shows that Subjunctive verb forms now occur only in the most frequent syntactic contexts and with the most frequent verbs.

Poplack's study focuses on noun clauses embedded as complements to certain matrix verbs. In her corpus, Poplack identified 6000 sentences with a matrix verb governing the Subjunctive at least once. It is important to note,

however, that one factor leading to the demise of the Subjunctive/Indicative distinction is the fact that for most verbs there is no phonological distinction between mood forms. So in this set of sentences, about half of the embedded verbs were ambiguous between Subjunctive and Indicative. This left 2694 instances in which Subjunctive and Indicative usage could be distinguished. It is particularly important for our point here to note that the verbs that do maintain a formal contrast between Indicative and Subjunctive are irregular and among the most frequent verbs of the language. That is, the maintenance of the mood distinction in a subset of verbs is at least in part due to the Conserving Effect of high token frequency.

In the sentences to be analyzed, then, the main verb is one which was used with the Subjunctive at least once and the embedded verb was one which distinguishes mood formally. In these sentences the Subjunctive was used 77% of the time. The goal of Poplack's study was to determine what factors prevent the Subjunctive from occurring in these positions 100% of the time.

A statistical analysis of a number of factors led Poplack to conclude that the Indicative/Subjunctive distinction is not performing any particular functional or semantic work. This conclusion is supported by examples such as those in (6) and (7) in which the same speaker repeats essentially the same message to the same interlocutor but alternates between Indicative and Subjunctive:

(6) a. Faut que je lui *dis (I)* c'est vrai.
'I have to tell him it's true'.

b. Faut je lui *dise (S)* c'est la vérité.
'I have to tell him it's the truth'.

(7) Fallait qu'elle *répond (I)* 'oui, tu peux faire trois pas de géant.' Fallait qu'elle *réponde (S)* la phrase complète.
'She had to say "yes, you may take three giant steps." She had to say the whole sentence'.

The critical question here is: if there is no functional difference in mood choice, why are French speakers still using Subjunctive verb forms? The evidence suggests that the answer lies in the fact that most of the Subjunctive forms occur in certain highly entrenched phrases with particular matrix verbs and particular embedded verbs. Thus, as we would predict from the Conserving Effect, these high-frequency expressions have maintained their traditional form despite general changes which allow the construction of sentences with Indicative verb forms in comparable, but less frequent contexts.

The most commonly occurring matrix verb is impersonal *falloir* 'have to', which accounts for 62% of the 2694 matrices, and is followed by a Subjunctive verb form in 89% of the cases. The main verb *falloir* is always impersonal,

meaning that if the subject is expressed, third person masculine singular *il* is always used, but different tense/aspect forms can also be expressed, such as Present *il faut* and Imperfect *il fallait*. The embedded verbs that occur most frequently in the Subjunctive are high frequency irregular verbs. In fact, only ten verbs account for two-thirds of the examples with Subjunctive, among these are *avoir* 'to have', *être* 'to be', *aller* 'to go', *faire* 'to make, do', etc. See the examples in (8).

(8) a. Même pour un job aujourd'hui, faut tu *sois (S)* bilingue.
'Even for a job these days, you have to be bilingual'.

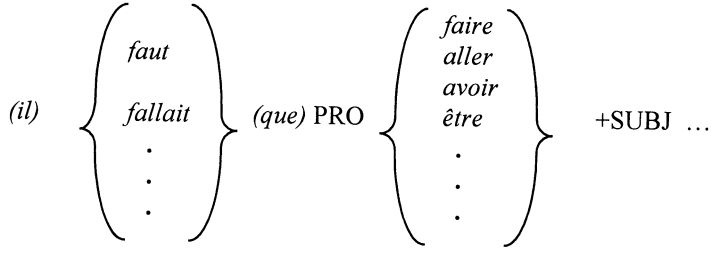
b. Bien certain, faut qu'ils *aient (S)* une place eux-autres aussi pour vivre.
'Well, of course, they should have a place to live, too'.

c. Faut j'*aille (S)* voir pour de l'ouvrage.
'I have to go look for a job'.

d. Bien ça, fallait tu *fasses (S)* ton huit heures par jour.
'Well, there you had to do your eight hours a day'.

These facts suggest that these main verb - complement constructions are not generated from highly generalized syntactic schemas of the form [verb [S]], but rather that very specific constructions ('routines' in Poplack's terms), with some lexical items indicated, are stored and accessed in production, as shown in (9).

(9)



Further support for the position that constructions, complete with very specific lexical items, are accessed in these cases comes from the second factor that Poplack found to be significant, the distance factor. That is, if a word or some parenthetical material intervened between the main verb and the subordinate one, it was more likely that the Indicative form would be used. Since we are claiming entrenchment of the sequences in storage, much as though they were lexical items

rather than hierarchical syntactic structures, it is significant that intervening material favors the productive form, the Indicative. That is, if the speaker gets derailed from an automated sequence such as *Il faut que* ... then s/he is less likely to resume with the routinized form and more likely to access the more generally used Indicative form.

The importance of particular lexical items is also evident in the other 38% of the matrix verbs. Two verbs, *vouloir* 'to want' and *aimer* 'to like', make up 11% of the remaining cases and they show a high percentage of Subjunctive usage (91% and 67% respectively) (Poplack 1995). With these verbs, too, the irregular embedded verbs favor Subjunctive use.

Our point in this section is that distributions that appear to be very arbitrary should be checked for this conserving effect of token frequency. While grammatical analysis should proceed with the working hypothesis that formal distinctions represent functional distinctions, we also have to bear in mind that not all contrasts and distributions are meaningful or functional. Some patterns represent a lexically-arbitrary residue of formerly productive patterns.

4. Type Frequency

The type of change that is resisted by words or phrases of high token frequency is change on the basis of combinatorial patterns or constructions that are productive. To return to a morphological example, high frequency English Strong Verbs resist regularization by the productive suffixation pattern. But frequency also plays a role in the determination of productivity, where productivity is defined as the likelihood that a pattern will apply to new forms. However, in this case it is type frequency: the type frequency of a pattern determines its degree of productivity (MacWhinney 1978, Bybee 1985, 1995).

It is easy to see why type frequency determines productivity: type frequency refers to the number of distinct lexical items that can be substituted in a given slot in a construction, whether it is a word-level construction for inflection, or syntactic construction specifying the relation among words. The more lexical items that are heard in a certain position in a construction, the less likely it is that the construction will be associated with a particular lexical item and the more likely it is that a general category will be formed over the items that occur in that position. The more items the category must cover, the more general will be its criterial features and the more likely it will be to extend to new items. Furthermore, high type frequency ensures that a construction will be used frequently, which will strengthen its representational schema, making it more accessible for further use, possibly with new items.

As type frequency can range from one to a very large number, so there are varying degrees of productivity associated with ranges of type frequency. The relationship between type frequency and degree of productivity among English Strong Verbs has been shown by Bybee and Moder (1983) and Moder (1992).[2]

The most productive Strong Verb class, exemplified by *strung*, is the only class that has added new members since the Old English period, and also has the highest type frequency of any Strong Verb class. As a result, we expect to find a relation between the existing type frequency of a syntactic construction and its ability to apply to novel lexical items.

Some of the most difficult problems in syntax concern the competition among functionally similar constructions with varying degrees of productivity due to type frequency. For instance Goldberg (1995) argues that type frequency affects the productivity of the ditransitive construction (as in [10]). This construction is the continuation of an old construction that is gradually being replaced by the construction in which the dative is marked with the preposition *to* (as in [12]). In the ditransitive construction, which was common in Middle English, the indirect object noun phrase was formerly marked with the dative suffix, which explains why no preposition is present today. The ditransitive construction has some of the features of an archaic construction preserved through high frequency; in particular, it occurs only with specific lexical verbs, and most of these are of Germanic origin and of very high frequency. Thus, for instance, as has often been observed, this constructions is not used with a verb such as *whisper,* as in (11). The prepositional construction in (12), on the other hand, is perfectly general, occurring with all verbs that can take a patient and recipient argument. Its high type frequency gives it full productivity, allowing it to be used productively, even with nonce forms (Gropen et al. 1989).

(10) He told the woman the news.

(11) *He whispered the woman the news.

(12) He whispered the news to the woman.

However, this case is made complex by the fact that the ditransitive construction does have some limited productivity, as evidenced by its occurrence with certain new verbs such as *to telephone, to e-mail* and *to fed-ex,* (see [15]). Goldberg (1995, Chapter 5) points out that this limited productivity corresponds to the type frequency of the semantic verb classes that occur in the ditransitive construction. Classes with large membership are able to attract new members to a limited extent while classes with smaller membership do not appear to attract new members. For example, a small class of verbs that can be found in the ditransitive construction is the class of verbs of permission. Only a very few verbs of this class can occur in the ditransitive, as illustrated in (13) and (14):

(13) Sally permitted/allowed Bob one kiss.

(14) *Sally let/enabled Bob one kiss.

Larger classes of verbs that can be used in the ditransitive construction are verbs of sending and communicating. This high type frequency is what allows the construction to be used with new verbs with related meanings, as in (15).[3]

(15) Sally telephoned / e-mailed / fed-exed Sam the offer.

The literature on the ditransitive construction shows that some arbitrariness must be recognized in the categorization of verbs according to whether or not they are permitted in this construction. On the other hand, certain generalizations have also been shown to be valid: that verbs indicating eventual possession of the object can be used in the ditransitive construction and that monosyllabic verbs are favored over polysyllabic verbs (Gropen et al. 1989). The existence of exceptions, arbitrariness, and non-categorical tendencies in productivity are properties of lexical classes. In fact, these are the properties found with morphological classes, such as the classes of English irregular verbs. It is not surprising, then, that type frequency in these classes affects productivity, just as it does in morphological classes.

5. Conclusion

Recognizing the two effects of token frequency on syntax and their interaction with type frequency over time allows us to explain many situations in language that otherwise appear very arbitrary. Not only can frequency be viewed as an integral part of an explanation for these situations, the effects of frequency have important implications for our notions of mental representation. There is not necessarily just one representation per construction; rather, a specific instance of a construction, with specific lexical items in it, can have its own representation in memory if it is of high frequency. As a result, it can undergo phonological reduction, and change in meaning or function independently of other examples of the same construction. At a later stage, highly entrenched examples of constructions with particular lexical items can continue to be used even though new productive patterns have become current in the language.

We are thus recognizing that some constructions are relics from earlier stages of a language, but they are not just arbitrary historical residue, rather such structures are still subject to categorization and generalization. There are not just two choices: fossilization or productivity, but many intermediate possibilities, depending both on categorization in terms of either meaning or form and in the type frequency of the construction.

On a more general level, we hope to have supported and further articulated John Haiman's (1994) claim that grammatical constructions, as conventionalized patterns of language use, are created and maintained through the same mechanisms associated with repetition as are other patterns of human culture, as well as ritualistic behavior found in animals other than humans.

Notes

[1] Poplack's interpretations of descriptions of other dialects of French (including the standard) suggest that the same situation holds elsewhere.

[2] In these studies, other factors are also shown to interact with type frequency in determining productivity, i.e. phonological properties and high token frequency of individual types, which can detract from productivity. See also Bybee (1995).

[3] Other properties of the two constructions, such as restrictions on the use of pronouns, appear to be less related to their relative age and frequency than to notions of topicality (Thompson 1990). In fact, this example shows that any two competing constructions can be affected by issues of semantics and pragmatics in addition to the complex interaction between token and type frequency.

References

Bybee, Joan. 1985. *Morphology: a study of the relation between meaning and form.* Amsterdam: John Benjamins.

Bybee, Joan. 1995. Regular morphology and the lexicon. *Language and Cognitive Processes* 10 (5).425-455.

Bybee, Joan. 1997. The phonology of the lexicon: evidence from lexical diffusion. *Usage-based models of language*, ed. by M. Barlow and S. Kemmer, Stanford: CSLI.

Bybee, Joan L., and Carol Lynn Moder. 1983. Morphological classes as natural categories. *Language* 59.251-270.

Bybee, Joan, Revere Perkins, and William Pagliuca. 1994. *The evolution of grammar: tense, aspect and modality in the languages of the world.* Chicago: University of Chicago Press.

DuBois, John. 1985. Competing motivations. *Iconicity in syntax*, ed. by John Haiman, 343-365. Amsterdam: John Benjamins.

Givón, Talmy. 1979. *On understanding grammar.* San Diego: Academic Press.

Goldberg, Adele. 1995. *Constructions: a construction grammar approach to argument structure.* Chicago: University of Chicago Press.

Gropen, Jess, Steven Pinker, Michelle Hollander, Richard Goldberg, and Ronald Wilson. 1989. The learnability and acquisition of the dative alternation in English. *Language* 65(2).203-257.

Haiman, John. 1994. Ritualization and the development of language. *Perspectives on grammaticalization,* ed. by William Pagliuca, 3-28. Amsterdam: John Benjamins.

Heine, Bernd, Ulrike Claudi, and Friederike Hünnemeyer. 1991. *Grammaticalization: a conceptual framework.* Chicago: University of Chicago Press.

Heine, Bernd, and Mechtild Reh. 1984. *Grammaticalization and reanalysis in African languages.* Hamburg: Helmut Buske Verlag.

Hooper, Joan B. 1976. Word frequency in lexical diffusion and the source of morphophonological change. *Current progress in historical linguistics*, ed. by William Christie, 96-105. Amsterdam: North Holland.
Hopper, Paul J. 1987. Emergent grammar. *Berkeley Linguistics Society* 13.139-157.
Hopper, Paul J., and Sandra A. Thompson. 1993. Language universals, discourse, pragmatics, and semantics. *Language Sciences* 15(4).357-376.
Langacker, Ronald. 1987. *Foundations of cognitive grammar, Vol. 1. Theoretical prerequisites.* Stanford: Stanford University Press.
MacWhinney, Brian. 1978. *The acquisition of morphophonology.* Monographs of the Society for Research in Child Development, 43 (1).
Moder, Carol Lynn. 1992. Productivity and categorization in morphological classes. Buffalo: SUNY at Buffalo Dissertation.
Mossé, Fernand. 1952. *A handbook of Middle English.* Baltimore: The Johns Hopkins Press.
Poplack, Shana. 1992. The inherent variability of the French subjunctive. *Theoretical analyses in Romance linguistics*, ed. by Christiane Laeufer and Terrell A. Morgan, 235-263. Amsterdam: John Benjamins.
Poplack, Shana. 1995. The sociolinguistic dynamics of apparent convergence. *Towards a social science of language: papers in honor of William Labov,* ed. by G. Guy, J. Baugh and D. Schiffrin, 285-309. Amsterdam: John Benjamins.
Thompson, Sandra. 1990. Information flow and dative shift in English discourse. *Development and diversity: variation across time and space*, ed. by Jerold Edmonson, Crawford Feagin and Peter Mühlhäusler, 239-253. Dallas, Texas: SIL.
Traugott, Elizabeth C. 1972. *A history of English syntax*. New York: Holt Rinehart and Winston.

The Interplay of Syntax and Prosody in the Expression of Thoughts

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There has always been a tendency in linguistics to pay more attention to aspects of language that are present for everyone to observe and less attention to its more hidden aspects: more attention to form and less to meaning. But behind the form lie thoughts, and thoughts are as much a part of language as what can be heard or (when it has been transcribed) seen. Language is fundamentally a way of organizing both thoughts and sounds, more or less independently, and associating the thoughts and sounds with each other, as suggested in figure 1.

Thoughts <—> Sounds

Figure 1. Basic Components of Language

There is an important sense in which the thoughts have priority over the sounds. It seems obvious, once one stops to think about it, that it is the flow of thoughts that keeps language moving, not the flow of sounds, whose function is only to express the thoughts. Linguistic form exists in the service of the thoughts, not vice versa.

The situation just described creates a problem for linguistic research. Because sounds are publicly observable and thoughts are not, it is the overt form of language that has greater research tractability, that makes researchers feel they are doing real science. But if the thoughts have priority as the driving force of language, linguistics faces a situation in which the greater functional importance belongs to the part of language that is less easy to investigate. It is a problem that has always kept us from understanding language as well as we might if things were reversed.

The sound side of language has itself two aspects. One dominates the kinds of things that are usually written down, the "segments" of language that are represented in writing systems: vowels, consonants, and syllables. The other aspect is slighted in writing systems. It falls under the heading *prosody*: the variations in pitch, loudness, duration, and voice quality that provide the support on which the vowels and consonants and syllables ride along. Curiously, we don't have a fully satisfactory term for sound minus prosody. Perhaps we are so accustomed to thinking of syntax and grammar independently of prosodic

considerations that it has not seemed necessary to have a term for non-prosodic form. Like others I will speak of *segmental* sounds, but a better term is needed. It is interesting to reflect on the fact that prosodic sounds are produced largely by the lungs and larynx, while segmental sounds are produced mainly in the mouth. Prosodic sounds have a longer evolutionary history, associated especially with the basic organization of thoughts and with emotions, and having more in common with animal calls and music, for example. Segmental sounds are evidently associated more closely with the unique evolution of the human cortex.

Again there is a difference in research tractability. It has always seemed easier to deal with the segmental aspects of sound than the prosodic. Just as writing systems have done a better job of representing the former than the latter, more linguistic research has gone into aspects of language that are represented segmentally. One reason may be that segmental phenomena are mostly discrete, whereas prosodic phenomena are more likely to be continuous. But contributing to this picture has also been the fact that the segmental and prosodic aspects of sound express different aspects of thought. There seems to be a natural affinity between segmental sounds and certain components of thought, between prosodic sounds and certain other components. This paper is an attempt at exploring these different contributions of segmental and prosodic sounds to the expression of different aspects of thoughts.

If sounds can be divided into their segmental and prosodic aspects, is there an analogous dichotomy in the realm of thoughts? The answer appears to lie in distinguishing the *content* of thoughts on the one hand from what I will call their *infrastructure* on the other. Content involves above all the kinds of things we experience through our senses in our interactions with the world around us: perceptions of events (things that happen) and of states (the way things are), as well as of the people, objects, and abstractions that participate in events and states. I have found it useful to use the word *idea* as a technical term to refer to our experiencing of events, states, and their participants (Chafe 1994: 80). So far as *content* is concerned, then, thoughts involve the manipulation of ideas in that sense.

The infrastructure of thoughts includes their organization and evaluation. It includes, for example, an organization of thoughts into content *units* of various sizes and properties, along with what I will call *signposts* that guide the flow of thoughts from one unit to another. It includes as well the evaluation of thoughts: their assignment to

different *weights* and different manifestations of *affect.*

Just as prosodic sounds have been less tractable to research than segmental sounds, the infrastructure of thoughts has been less easy to deal with than their content. We have not succeeded as well in understanding how thoughts are organized and evaluated as we have in understanding the semantics of ideas, in the sense described above. It is then interesting to note that the content aspect of thoughts is associated largely with the segmental aspect of sounds, whereas their infrastructure is ex- pressed to a large extent by prosody. Language uses pitch, loudness, duration, and voice quality to convey the organization and evaluation of ideas, though often in concert with segmental phenomena. Figure 2 is an attempt to sort out these components of language. Those with greater research tractability have been placed in boldface on the right of each branch.

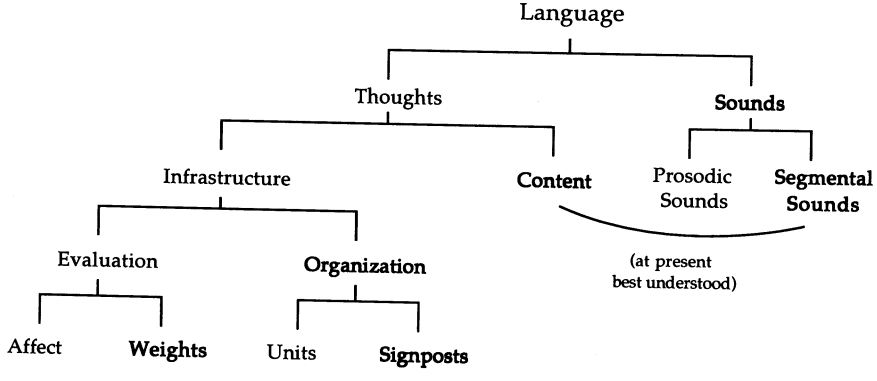


Figure 2. More Detailed Components of Language

I will limit the discussion here to the nature of the infrastructure, and particularly to the question of how its ultimate components (signposts, units, weights, and affect) are expressed by prosody, while at the same time considering some of the contributions made by segmental sounds. In order to illustrate some of the ways in which these two aspects of sound are distributed, I will make use of the following excerpt from a conversation that I (speaker W) recently had with a woman (speaker M) who was talking about her childhood on the Allegany Reservation in New York State. Divisions into topics and subtopics (discussed below) are indicated with heavy and light horizon-

tal lines respectively. M had just been talking about how her father managed a Studebaker dealership.

1	M	Yeah,	
2	M	[he did] thát,	
3	W	[/???/]	
4	M	.. and he .. rùn the garáge,	
5	W	.. yeah,	
6	M	and= Róscoe was the mechánic,	
7	M	.. cause he jùst frèsh out of cóllege,	
8	W	wéll.	
9	M	... and he .. he tòok càre of àll the bóok work.	
10	W	... Yéah.	
11	M	.. Uh= Róscoe did.	
12	W	.. Well góod.	
13	M	My óldest bróther.	End Subtopic INTRODUCE ROSCOE
14	M	... He was réal .. réally níce,	Begin Subtopic ROSCOE'S NICENESS
15	M	and wéll réad and,	
16	W	Mm,	
17	M	... and èverybody líked hím and,	
18	M	... é éverything went over góod.	
19	M	... And hè was the búsiness mánager;	
20	M	... and so=,	
21	M	.. hím and Dád got along réal fíneˇ	
22	M	réal góodˇ	End Subtopic ROSCOE'S NICENESS
23	W	Hmh.	and End Topic STUDEBAKER DEALERSHIP
24	M	... So hé was a Sny´der;	Begin Topic MYRTLE'S SIBLINGS
25	M	shé=	and Begin Subtopic FIRST HUSBAND
26	M	.. My móther was màrried twíce.	
27	W	... Yéah.	
28	M	.. Her fírst hùsband was-	
29	M	.. Jèwett Sny´der from-	
30	M	... Cattaráugus Reservàtion.	
31	W	.. Mhm,	End Subtopic FIRST HUSBAND
32	M	.. So she had uh-	Begin Subtopic FIRST SIBLING SET
33	M	... she had uh-	
34	M	Róscoe,	
35	M	... and= Jím,	
36	M	... and my síster,	
37	M	... and .. Mílford.	
38	M	She had fòur chíldren.	
39	M	... From her fírst húsband [.. see?]	
40	W	[Mhmh.]	
41	W	Mhmh,	End Subtopic FIRST SIBLING SET
42	M	... So thén uh,	Begin Subtopic SECOND HUSBAND
43	M	... after hé-	AND SECOND SIBLING SET
44	M	... after hé passed away,	
45	M	why then,	
46	M	when shé got acquainted with Dád,	
47	M	why then,	

48 M ... she had just-
49 M ... mé,
50 M and Bábe,
51 M and Vín;
52 M .. there's thrée of us.
53 M .. [So],
54 W [mhmh,]
55 M .. the Símcox. End Subtopic SECOND HUSBAND
56 W ... Mhmh, AND SECOND SIBLING SET
57 M So uh- Begin Subtopic HARMONY
58 M ... but wé never thought we were any dífferent.
59 M ... We álways thought we were a=ll-
60 M ... [all the] sáme,
61 W [No dífferent.]
62 M you know,
63 W Mhmh,
64 M .. wé never thought we had different fáther or different-
65 M .. anything élse,
66 W mhmh,
67 M .. Néver thóught of that.
68 W .. mhmh,
69 M .. Néver néver thought of it.
70 W .. mhmh,
71 M Cause we áll= ... were háppy and,
72 W .. mhmh,
73 M and .. we were ráised togéther,
74 M and [éverything],
75 W [mhmh],
76 W well thát was góod.
77 M .. It was áll ríght;
78 M we néver thought ánything dífferent of;
79 M ány of the chíldren;
80 M you know.
81 W Yéah;
82 W that was góod.
83 M .. But ít was níce,
84 M .. we all got along good together,
85 W ... Hmh, End Subtopic HARMONY
86 M .. but thát was a long long ... tíme agó. Begin Coda LONG TIME AGO
87 W ... hmh.
88 M .. I thínk of it nów, End Coda LONG TIME AGO
89 M it's been a ló=ng tí=me. End Topic MYRTLE'S SIBLINGS
90 W Whát was that about a- Begin Topic AB ROTH PLACE
91 W ... remember there was a-
92 W ... some mán that,
93 W ... showed úp at the dóor thére,
94 W ... at the Ab Róth place.
95 M Oh thát was up thére.
96 M At that Ab Róth place.

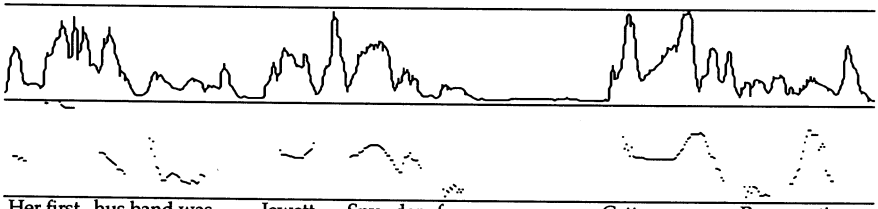
Organization: Units. Thoughts are organized into units at several levels. Space limitations will force me to discuss and illustrate other aspects of the infrastructure in a sketchier fashion, but this aspect demands a more extended treatment that will provide a background against which the others can be more briefly placed.

In Chafe (1994) and elsewhere I have emphasized the way the stream of speech naturally segments itself on prosodic grounds into short phrases of a type I have been calling *intonation units*, the boundaries of which are identifiable on the basis of various prosodic criteria: pausing, distinctive final intonation contours, baseline pitch changes, initial acceleration and final deceleration, boundary changes in voice quality, etc. These intonation units are usefully hypothesized to be expressions of individual foci of consciousness, minimal units of thought organization. Each line in the excerpt above represents a separate intonation unit.

If each intonation unit expresses a momentary focus of consciousness, the content of such a focus is variable, ranging from a brief regulation of the interaction as in 1 (*yeah*), to an event as in 4 (*he run the garage*), or a state as in 6 (*Roscoe was the mechanic*), or a participant in either an event or state as in 13 (*my oldest brother*). Every language has its own way of assembling the content elements within an intonation unit, and the result provides the basis for what is traditionally regarded as *syntax*. There is no single syntactic structure that is associated with a focus of consciousness, as can be seen by comparing 1 with 4 or 13. But when the content elements organize an event or state, as often happens, they are expressed in a syntactic *clause*, as in 4 or 6. More than half the intonation units in a typical sample of English conversation form clauses, but the proportion varies with speakers and genre, as well as across languages. Chinese, for example, appears to devote fewer intonation units to clauses (Tao 1996).

Instead of being constrained by a single syntactic structure, the foci of consciousness that are expressed in intonation units are constrained by an inability of speakers to verbalize more than one new idea at a time, more than one idea that has been activated from a previously inactive state (Chafe 1994, chapter 9). This constraint is well illustrated by the sequence 28-30, represented here with amplitude above and pitch below (displayed with the help of Eric Keller's program "Signalyze"):

28-30



In the entire sequence there were three new ideas: that of the first husband, of his name, and of his place of origin. Because of the one-new-idea constraint they were necessarily expressed in three intonation units, none of which was a clause. A syntactic analyst would not segment the sequence in this way. 28-30 provide an excellent example of the difference between the grammar of ordinary spoken language and the kind of grammar we have learned to expect from several millenia of studies based on written language.

As people talk they constantly face the problem that individual foci of consciousness have a capacity too small to accommodate the amount of information they might wish to focus on, an amount comprising what I have been calling a *center of interest*: a kind of superfocus of consciousness that attempts to go beyond the constraints imposed by the evolution of human information-processing abilities (Chafe 1994: 139-44). When speakers decide, as they proceed from one focus of consciousness to the next, that a larger center of interest has been adequately verbalized, they signal that fact with a falling pitch perceived as sentence-final prosody. At the same time, ideally, they close off the syntax too, ending a complete sentence. This closure is often briefly acknowledged by an interlocutor, as it was, for example, with the *yeah* in 10.

It happens frequently, however, that these two devices, the prosodic closure and the syntactic closure, fail to coincide. Evidence from repeated tellings of the same experience suggests that sentences do not reflect a consistent unit of cognitive processing, but rather an on-line judgment that something has been completed (Chafe 1994: 143-44). It is a judgment that has both prosodic and syntactic consequences, but there may be difficulty in pulling the two together. This speaker finished a sentence prosodically and syntactically at the end of 9 (*he took care of all the book work*), but then tacked on two clarifications in 11 (*Roscoe did*) and 13 (*my oldest brother*), having decided she had not quite verbalized everything necessary. Functionally, the entire se-

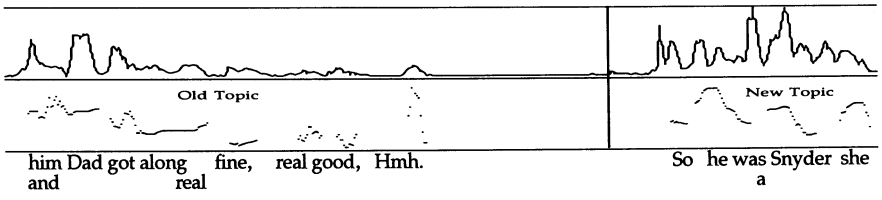
quence 1-13 expressed a single center of interest, but the syntactic result was less coherent. This kind of mismatch between prosody and syntax is typical of ordinary speech.

Aside from syntactic closure, there can be other manifestations of the closure of centers of interest. For example, listeners often acknowledge their awareness of such closures by inserting backchannel expressions. I mentioned above the *yeah* in 10, but this listener was particularly fond of saying *mhm* or *mhmh*, as in 31, 40-41, 54, 56, and so on. Other segmental sounds may be used to initiate new centers of interest, for example the word *so* that occurred at the beginning of 24, 32, 42, and 57.

Although a speaker decides on the run, as it were, to close a center of interest, larger discourse *topics* constitute more stable units of mental representation. They qualify as another kind of *idea*, in the sense that they too are a way of organizing content that remains stable throughout successive activations and verbalizations of the same material. They differ from the ideas expressed in the smaller intonation units in that they cannot be in fully active consciousness all at once. Most of spoken language consists of speakers navigating through these semiactive topics, illuminating first one area and then another with a series of fully active foci expressed in intonation units.

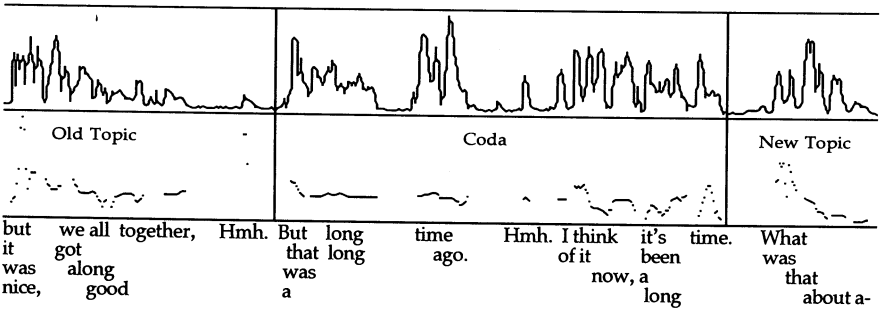
Like foci of consciousness and centers of interest, topics also have prosodic manifestations. They typically begin with heightened volume, pitch, and tempo, and peter out when speakers decide they have been adequately verbalized. Often they end with creaky voice. Often they are followed by significant pausing before a new topic is introduced. There are two topic boundaries in this excerpt. The first insertion of a new topic occurred at 23. The following display suggests the petering out that preceded this boundary, and shows the significant pause that occurred before the next topic was taken up with renewed vigor in 24:

21-25



The other introduction of a topic in this excerpt occurred at 90. It can be noted that the prosody of the portion labeled Old Topic here (83-85) matched closely the portion with the same label in 21-23, differing only in the more compressed scale of the display. This time the petering out of the previous topic was followed by wistful coda, where there was an iconic lengthening of the words *long time* in 89. At this point the listener recognized an opportunity to jump in with a topic-changing question:

83-90



The entire excerpt contained within it one complete topic, extending from 24 through 89. As speakers develop a topic each focus of consciousness does not jump around randomly, but follows a trajectory based on some already familiar schema. In this case the highest level divisions of the schema can be seen as a sequence of thesis, antithesis, and synthesis. First came a subtopic involving the mother's first husband and the children of that marriage, then a second subtopic involving her second husband and the children of that marriage, and finally a subtopic dealing with the harmony that existed among the step-siblings.

The first-husband subtopic ended with 39, followed by the listener's segmental recognition of the boundary with two *mhmh's* in 40 and 41. The second-husband subtopic ended with the afterthought in 55, preceded and followed by two *mhmh's* in 54 and 55. The harmony subtopic had a long drawn-out ending, with much repetition and elaboration of a single idea that was first verbalized in 58 at the beginning of the topic: *we never thought we were any different*. Everything that followed was a repetition of that idea, viewed from different angles. It is interesting to see how many *mhmh's* were produced by the interlocutor during this sequence, with six repetitions that began in 63

and were supplemented by two monosyllabic *hmh's* in 85 and 87. The listener had already caught the gist of the subtopic in 63, and continued to acknowledge his understand of it throughout the elaborations that followed.

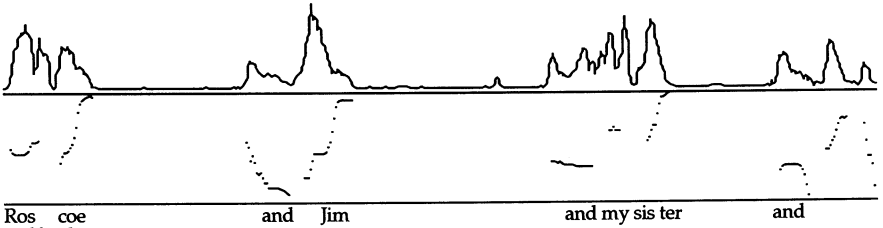
Topics often begin with a temporal setting, orienting what is to follow. This one *ended* with a temporal orientation in 86-89 (*but that was a long long time ago. I think of it now, it's been a long time*). The speaker had already established a frame involving the family of her childhood, and here she provided a metacomment on the experience of reactivating a remote past.

In summary, the organization of thoughts into foci of consciousness, centers of interest, subtopics, and topics is to a large extent expressed prosodically, but is supported by segmental phenomena such as the use of *discourse markers* (Schiffrin 1987) like *so*, of backchannel responses, and of syntactic closure.

Organization: Signposts. The organization of thoughts involves not only the presence of thought units at various levels of organization, but also connections between those units. The most obvious way way in which a connection is marked by prosody appears at the ends of intonation units, where amplitude, duration, and voice quality all play a role, but where the terminal pitch contour is especially salient. This contour may be either forward-looking or backward-looking; that is, it may anticipate something to come, or may show that something has arrived at closure.

The sequence 34-37 provides a simple example of how prosodic and segmental sound can support each other in showing connections between foci of consciousness:

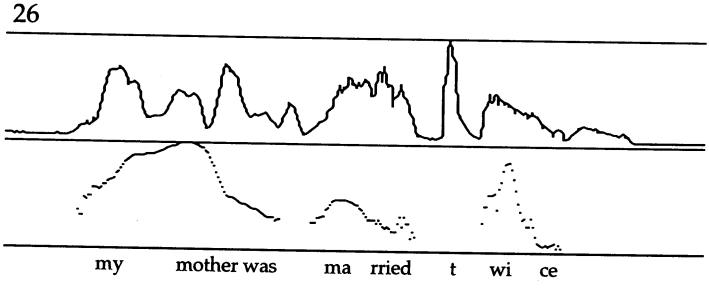
34-37



The rising pitch on all but the last of these four intonation units indicated that "this is one in a sequence of parallel items" (a list intonation), followed by closure with a falling pitch on *Milford* when the list

was complete. There was a symbiosis between the prosody (anticipating more to come) and the conjunction *and*, which, looking back rather than forward, connected its own focus to the one that immediately preceded.

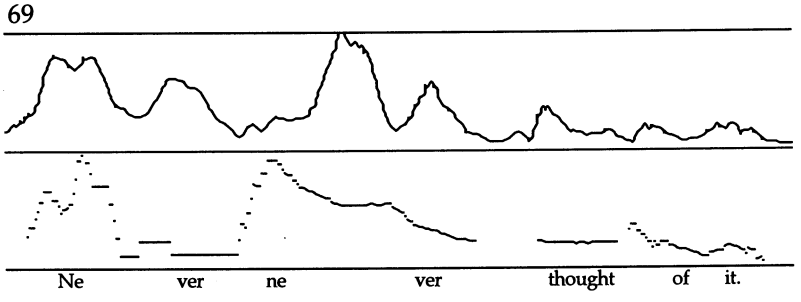
Evaluation: Weights. Turning now from organization to evaluation as another component of the infrastructure of thoughts, we can note briefly how both prosodic and segmental sounds support each other in the attachment of differing degrees of prominence to different thought elements. In 26 a new referent, *my mother*, was given higher pitch as shown in the following display, but was also expressed segmentally with a full noun phrase. Subsequent mentions of the same referent were pronounced at a lower pitch, and were expressed segmentally with the pronoun *she* as in 6 (*she had four children*).



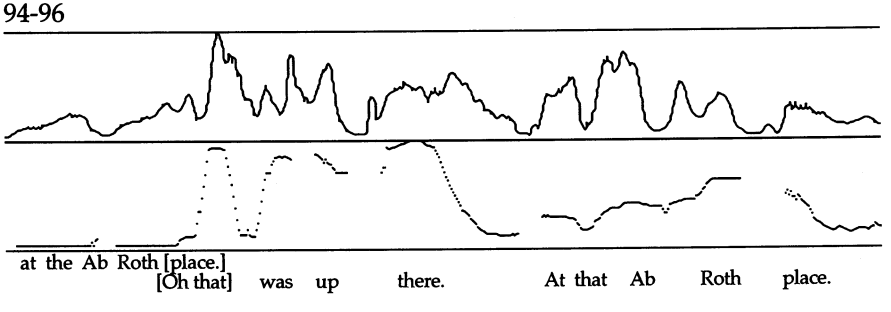
Evaluation: Affect. The other aspect of evaluation included in figure 1 was affect. It is obvious that one of the major functions of prosody is to express emotions and attitudes, but those are properties of thought that remain the least tractable of all as suggested by their placement on the far left in figure 1. We still don't know very well how to describe emotions, much less how to relate specific prosodic patterns to them. One reason may be that emotions are gradient and not discrete. Another may be that they are contextually determined, so that, for example, the same physiological state might be interpreted as excitement in one context, fear in another. Although all speech may have some affective content, one wonders if there is for each speaker a baseline emotional level from which he or she may sometimes depart. I will focus here on what seem to be two cases of such a departure in the excerpt above.

In 69 there was an expression of strong commitment that was expressed by an increased pitch range extending up to 263 Hz (this speaker's peak was usually around 215 Hz), along with a falsetto voice

quality. Segmental phenomena also contributed to the effect of heightened emotion, especially in the repetition of the word *never*. (In fact, *never* occured a total of six times during this subtopic.)



A different emotion was expressed in 95 at the introduction of a new topic, where the speaker voiced her recognition of that topic along with surprise at its introduction. Again there was an increased pitch range, this time extending up to 268 Hz. At the same time the emotion was manifested segmentally in her use of the word *oh*:



This has been a quick look at a few examples of ways in which prosodic sound expresses the infrastructure of thought, while interacting in that function with segmental sound. The total contour of pitch, amplitude, duration, and voice quality that emerges is determined in multiple ways, all of which operate in concert with segmentally expressed aspects of thought to produce the total effect that language achieves. Understanding better how these phenomena are distributed will require careful attention to details of real language, as well as an open mind and a willingness to explore multiple pathways of investigation.

References

Chafe, Wallace. 1994. *Discourse, Consciousness, and Time: The Flow and Displacement of Conscious Experience in Speaking and Writing*. Chicago: The University of Chicago Press.

Schiffrin, Deborah. 1987. *Discourse Markers*. Cambridge: Cambridge University Press.

Tao, Hongyin. 1996. *Units in Mandarin Conversation: Prosody, Discourse, and Grammar*. Amsterdam/Philadelphia: John Benjamins.

ELABORATION: A FUNCTION AND A FORM

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I. Introduction

The term 'elaboration' has been used in work on Rhetorical Structure Theory (cf. Mann and Thompson (1987, 1988) and Thompson and Mann 1989), as well as in related work by Hobbs (1983, 1990) and Polanyi (1988), to refer to a particular type of relation that may hold between two or more utterances. In this paper, I discuss a *construction* in English which is distinguishable from sentences with null subjects primarily by a pragmatic constraint limiting its use to situations in which the phrase will bear an elaborative relation to the previous phrase (cf. Cote 1996).[1]

II. The Relation

An elaboration is one of many types of rhetorical relationships that have been argued to affect discourse structure. Though there is a clear area of overlap in the formal definitions of elaboration, there are also significant differences.

Mann and Thompson, in their work on Rhetorical Structure Theory (RST), define the effect of elaboration as follows: 'R [a reader] recognizes the situation presented in S [a 'satellite' utterance] as providing additional detail for N [a 'nucleus']. R identifies the element of the subject matter for which detail is provided.' (Mann and Thompson 1987:273).

Under their definition, elaboration is a fairly broad relation, subsuming more specific relations such as set-member, whole-part, process-step, and object-attribute, which all provide additional detail about a nucleus situation. Mann and Thompson also propose that both clause combining and general text combining may use the same relations. Example 1 is one instance of a text which they characterize in this way.

1. [name], Sweden, will be the site of the 1969 International Conference on Computational Linguistics, September 1-4. It is expected that some 250 linguists will attend from Asia, West Europe, East Europe including Russia, and the United States. The conference will be concerned with the application of mathematical and computer techniques to the study of natural languages, the development of computer programs as tools for linguistic research, and the application of linguistics to the development of man-machine communication systems. (Mann & Thompson 1987:273)

Hobbs, in his work on coherence and text-building, offers another definition of elaboration: 'A segment of discourse S1 is an elaboration of segment S0 if the same proposition if inferred from both S0 and S1, and one

[1]I would like to thank members of the audience at the Berkeley Linguistics Society's annual meeting, as well as Ellen Prince and the participants in the discourse seminar at the University of Pennsylvania, for helpful comments on this research. I'd also like to express appreciation to the Institute for Research in Cognitive Science for providing access to the switchboard database.

of the arguments in P is more fully specified in S1 than in S0.' (Hobbs 1983:31)

Polanyi (1988) adopts the same definition for a type of discourse embedding, and an example from her work is given in 2 below.[2]

2. John is a great cook.
He took all the home economics courses in High School.
He was a cook in the army.
He took the Cordon Bleu course in France last year.
(Polanyi 1988:609)

Despite differences, each of these theories of elaboration is concerned with a particular relation and with how it and other relations build discourse or text structure, They are not concerned with the characteristics of a particular syntactic form. Mann and Thompson state this explicitly: 'The schemas which compose the structural hierarchy of a text describe the functions of the parts rather than their form characteristics.' (Mann and Thompson 1987:85) Nevertheless, given that sentence structure is one of the tools used to structure discourse, it should not be surprising to find a construction in English which indicates this relation.

In particular, two phrases bound together intersententially may bear a different or more explicit relation than those that are independent but immediately adjacent to each other. Chafe argues that even after a period intonation a speaker may 'tack on' another intonational unit which 'conveys a piece of supplementary information relevant to that same sentence.' (1988:6) He suggests that this structure may be used to note afterthoughts and wheel-spinning. Examples of each of these are given in 3 and 4 respectively.

3. a. ... it was quite .. striking when we were .. the year we were in Japan.
b. ... three years ago. (Chafe 1988:6)

4. a. ... yeah.
b. ... that's right.
c. ... yeah ... that's the idea. (Chafe 1988:7)

Though Chafe is concerned in this work with just spoken language and how intonational units convey the flow of ideas, it should be noted that there are similarities between his examples and the construction I describe below.

III. The Construction

In appropriate contexts, conversational English permits utterances with phonologically-null subjects. Naturally-occurring examples of this construction are given in 5-7 below.

5. Okay, well, **0** enjoyed it. (0 = I)
6. **0** Have to make sure they don't get out of hand. (0 = you)
7. **0** Beats me. (0 = it)

Discussions of the nature and function of utterances of this type can

[2]It should be noted however, that Polanyi re-labels what Hobbs calls an elaboration as an 'ISA' relation.

be found in Cote (1996), Thrasher (1974), Napoli (1982), Zwicky and Pullum (1983), and Zwicky (1987). The exact analysis given for these utterances varies, but they are consistently described as either being or being derived from syntactically complete and independent sentences.

There is, however, a superficially similar construction which has some unique properties. Utterances of this type are given, with some context, in examples 8-11.

8. A: And then they changed the game.
   B: and they changed it and gave us another game in the middle of another, you know, one that was going on.
   A: Right.
   B: ***0?*** *Cut us off right there in the last few seconds.*

9. A: But they had [laughter] the time of their lives, you know.
   B: Oh, yeah [laughter].
   A: ***0?*** *Had the boat just pulled up right by the tents.*
   B: Uh-huh.
   A: It wasn't bad.

10. A: Well, we're, we're moving to a new house, and so, we'll have to get started over there --
    B: Oh.
    A: -- *0? decide what we're going to plant and everything.* At the old house we had a lot of roses.

11. A: Well, you've really got a handle on this stuff I've noticed.
    B: Not, not,
    A: ***0?*** *Got the vocabulary down and everything.*

Like examples 5-7 above (henceforth referred to as null subject utterances), these tokens are lacking overt subjects (or subj-aux), but they differ in substantive ways from the earlier examples and also form a clear functional class. A priori, it is neither certain that these utterances are full sentences nor even clear that they are structurally distinct from the speaker's previous utterance. In fact, I argue they represent instances of a different type of construction and suggest that this construction has a specific elaborative function associated with it. I will therefore refer to them from this point on as elaborations.

The data on null subjects used here was taken from the switchboard corpus, a text and audio database of 5-10 minute telephone conversations on a variety of everyday topics. The construction examined in this paper was first noticed in this database and additional examples were then overheard or found in other sources.[3]

The first immediately noticeable difference between null subject utterances and utterances like those in 8-11 is that the null subject in null subject utterances need not refer to the the same entity as the subject of the previous phrase. The highlighted phrase in examples 8-11 is, in constrast, necessarily the same as the subject of the previous utterance spoken by the same speaker. In addition, it turns out that there are feature differences in the referent of the subject of the two types, as shown in figure 1 below.

[3]All tokens taken from sources other than the switchboard corpus have the source cited.

% 3rd Person Referential Subjects

NULL SUBJECTS = < 20%
ELABORATIONS = 60%[4]

% 3rd Person Animate Subjects

NULL SUBJECTS = near 0%
ELABORATIONS = > 75%

[Figure 1]

Elaboration constructions also differ from null subject utterances in that they readily occur in written and even very formal registers. Example 12 is one token which demonstrates how acceptable and felicitous an elaboration may sound even in a clearly literary construction, and example 13 is also a written token, taken from a newspaper article.

12. 'Because then your hands are clean, so you can wash your face with them.' This was pure mentation, since Claude seldom washed at all, *was, in fact, slovenly and far beyond such niceties of personal hygiene.* (Conroy 1993:10)
13. [Name] gave his 1951 Heisman Trophy to the Princeton football program, gave it to his alma mater rather than have it on display at his home or place of work.

The frequency of the elaboration construction and its use in written contexts make it unlikely that they should be treated as instances of performance error. The fact that the subjectless phrase in each case consistently occurs bound in a specific, elaborative relation to the previous phrase is further evidence that these phrases are part of a well-defined construction.

Coordination constructions (or parataxis) may also appear without an explicit conjunct joining the two phrases, as shown in 14 below.

14. She leaned forward, kissed him full on the mouth to the cheers of the crowd, and broke away. (Conroy 1993)

In addition, elaborations seem like implicit coordination in that there are examples that occur with other types of phrases besides tensed verb phrases. For instance, examples 15 -18 contain tokens with untensed verb phrases, noun phrases, and prepositional phrases. Example 19 is arguably even an elaborative construction formed of two full sentences.

15. The sound itself seemed to wrap him in a kind of protective cloak, *to encase him in a bubble of invisible energy.* (Conroy 1993)
16. B: You know, I can remember as a child,
    A: [Throat_clearing].
    B: uh, spending summers at my grandfather's place, and I'd be running around with nothing but a bathing suit, *no shoes, socks, shirts, or anything.*

[4]The control data (all overt pronominal subjects had 33% 3rd person referential subjects.

A: Uh-huh.
B: Uh, I mean, from dawn till dusk.

17. If anyone paused he could see detail -- *straps, eyelets, a worn heel, or cracked leather with the sock showing through* -- but it was the movement that he liked, *the passing parade of color and motion.* (Conroy 1993)

18. B: Uh, yeah, well I've got, uh, oh, several shrubs outside,
A: Uh-huh.
B: uh, *out there*, uh, #depending on,#
A: #Have you# ever tried any vegetables?
B: No, I never have, uh,

19. A: It gets a little dusty there -- *Lubbock blows by there about once a month*, if I remember [laughter].

Finally, like coordinations, one elaboration may be embedded inside of another, as in example 20.

20. B: Right, so and we, uh, we try to teach our kids as much as we can at home, *you know, we have, we try to spend like Monday nights, we call it family home evening,*
A: *Uh-huh.*
B: *and, have our kids, uh, you know, have little lessons with them, and, you know, just see, count, see how things are going in our family and, you know, teach them about their grandparents or something like that.* ***Bring out pictures of them so they get to know them*** *and, we just do all kinds of fun things like that an.*

Of course, an elaboration differs from a coordination in that the overt conjuncts that may occur with a coordination are infelicitous with an elaboration. In other words, elaborations either do not sound right or do not retain the same meaning when, for instance, and, or, or but is placed in between the two parts or too is inserted at the end. Note how odd 8 (repeated here as 21) sounds with and placed before the second component of the elaboration, and how the meaning of 11 (repeated here as 22) is changed.

21. A: And then they changed the game.
B: and they changed it and gave us another game in the middle of another, you know, one that was going on.
A: Right.
B: ??and *Cut us off right there in the last few seconds.*

22. A: Well, you've really got a handle on this stuff I've noticed.
B: Not, not,
A: ??and *Got the vocabulary down and everything.*

Example 21 is odd because the insertion of and makes it seem as if B doesn't know that he has already told us that the television station stopped showing the game he wanted to watch right at the end of it. In example 22, A seems to be making a second observation about B now, rather than clarifying what she meant before. The effect of the and in these cases is explained by the fact that, unlike coordination, the two parts of an elaboration overlap in content.

Grimes (1975) describes a number of examples similar to elaborations as instances of hypotaxis of various types. In particular, he gives examples of attributive, equivalent and 'specifically' hypotaxis, shown here as examples

23, 24, and 25 respectively.

23. Oh! but he was a tight-fisted hand at the grindstone, Scrooge! - a squeezing, wrenching, grasping, scraping clutching, covetous old sinner! Hard and sharp as flint, from which no steel had ever struck out generous fire; secret, and self-contained, and solitary as an oyster.
24. We planned to leave on May 1, the day of the spring celebrations.
25. He was not a very ceremonious beau; he never sent her flowers or whispered silly things in her ear...

Elaborations also bear some similarity to syntactic amalgams as described in Lakoff (1974) and Lambrecht (1988). One reason not to treat elaborations as the same phenomenon is that, unlike amalgams and like coordination and subordination, elaborations may be marked by specific lexical discourse cues. Some examples include you know, like, just, and in fact. Further study of elaborations may reveal others.[5]

Whether elaborations should be thought of as instances of subordination/hypotaxis or coordination/parataxis is an open issue and crucially dependent on a very clear treatment of the difference between the these two types of conjoined phrases.[6] For my purposes here, I will simply say that elaborations consist of conjoined phrases, and propose the following definition:

> **Elaborations** are conjoined phrases lacking an overt conjunction but having a covert connective (ELAB) that is constrained (roughly) as follows:
>
> > ELAB conjoins two phrases F0 and F1 if the same proposition P is stated by, entailed by or strongly inferable from both F0 and F1, and some aspect of P is more detailed, clearer or made more relevant in F1.

IV. The Connection

How does this elaboration construction relate to the elaboration *relations* discussed before? Clearly, not all units of text or discourse that may be said to be related to each other in exactly the way described in the definition of ELAB above are represented (grammatically) as a single complex construction. Equally clearly, less than the full range of relations defined as elaborations even appear to be acceptable environments for elaboration constructions.

There are at least three factors which, together, may effect the limited use of elaboration constructions. First, the 'same subject' requirement prevents sentences that may otherwise meet the constraints for an elaboration construction from combining in this way. This rules out a number of cases immediately. Second, the existence of a marked form highly associated with a particular function does not mean that a speaker/writer is required to use this form in all environments where its use

[5]I'm calling these discourse cues rather than conjuncts because at least some of these same cues may occur along with an overt conjunct in a coordination.

[6]See Matthiessen and Thompson (1988) for one discussion of the distinction as applied to full clauses.

is felicitous. As with other marked constructions, such as topicalization, it-cleft, etc..., elaboration is rarely the only appropriate form available. Finally, it is possible for the constraints on the use of a particular form to be at least partially distinct from its function. In other words, the elaboration construction may do more than indicate that the two phrases are bound in a particular type of elaboration relation; it may have attentional, attitudinal or other effects on the discourse as well.

The observation that the elaboration construction is only available as on option under a subset of the elaboration relations discussed in the literature also raises some interesting points. It turns out that the elaboration construction discussed here is, in fact, very closely related to the elaboration relation defined by Hobbs and adopted by Polanyi. Indeed, in Hobbs (1990) there is even an example of an elaboration construction used to illustrate the elaboration relation. This token, taken from Chomsky's 'Reflections on Language', is provided in example 26 below.

26. I would like now to consider the so-called 'innateness hypothesis,' *to identify some elements in it that are or should be controversial, and to sketch some of the problems that arise as we try to resolve the controversy.* (Hobbs 1990:83)

Though Hobbs does not address the use of the marked construction as an indicator of the elaboration relation, it is clear that the relation he has in mind is somewhat more specific than the one discussed by Mann and Thompson and is closely associated with the elaboration construction. The apparent parallel between my definition of ELAB and his definition of the elaboration relation is therefore not unintentional.

The one noticeable difference between Hobbs' discussion of the elaboration relation and my own discussion of the constraints on the elaboration construction is that he includes repetitions as well. Though it is possible that there is a functional overlap between the two, I am not yet ready to collapse them. I did find some repetitions in the switchboard corpus which involved an apparently subjectless sentence identical in other ways to the previous utterance, but it is not clear that they occurred in the same contexts.[7] In addition, there are production issues that can be involved in the use of repetition in speech. Nonetheless, it may be that at least some instances of phrase repetitions should be treated as elaboration constructions and, it is quite likely that the two relations may be collapsed for Hobbs' purposes.

Finally, though Mann and Thompson's definition of elaboration clearly allows for a broader range of contexts than those which allow the elaboration construction, the definition is not necessarily too broad in an absolute sense. The level of detail specified by the elaboration construction is not necessarily the minimally sufficient one for structuring text at any level. On the hand, the fact that the elaboration construction is constrained to a particular subset is strong evidence that this subset is the relevant one, at least at some level of discourse/text representation.

More generally, the existence of the elaboration construction may be

[7]For instance, the original utterance and the repeated phrase were not always uttered by the same speaker. (See Walker (1993) for one good discussion of the functions of repetition.)

taken as new evidence that rhetorical notions such as elaboration, like information status and other pragmatic data, can be relevant to the structuring of sentences and discourse in the English language. A worthwhile subject for future study would be to see to what extent constructions of this type are found in other languages.

V. Summary

I have argued that elaborations involving subjectless clauses are a distinct phenomenon from null subjects utterances in conversational English. This is an analysis of a syntactic form but it is also crucially related to the notion of elaboration as a relation.

References

Chafe, Wallace. 1988. Linking Intonation Units in Spoken English. Clause Combining in Grammar and Discourse, ed. by John Haiman and Sandra A. Thompson, 1-27. Philadelphia: John Benjamins.

Conroy, Frank. 1993. Body and Soul. Boston: Houghton Mifflin/Seymour Lawrence.

Cote, Sharon. 1996. Grammatical and Discourse Properties of null arguments in English. Ph.D. Dissertation, University of Pennsylvania, Philadelphia.

Grimes, J.E. 1975. The Thread of Discourse. The Hague: Mouton.

Hobbs, J.R. 1983. Why is Discourse Coherent? Coherence in Natural-Language Texts, ed. by F. Neubauer, 29-70. Hamburg: Buske.

Hobbs, J.R. 1990. Literature and Cognition. Menlo Park: CSLI/SRI International.

Lakoff, George. 1974. Syntactic Amalgams. Papers from the Tenth Regional Meeting of the Chicago Linguistic Society, ed. by Michael W. LaGaly, Robert A. Fox and Anthony Bruck. Chicago.

Lambrecht, Knud. 1988. There Was a Farmer Had a Dog: Syntactic Amalgams Revisited. Proceedings of the Fourteenth Annual Meeting of The Berkeley Linguistics Society, Parasession on Grammaticalization, ed. by Shelley Axmaker, Annie Jaisser, and Helen Singmaster. Berkeley.

Mann, William C., and Sandra A. Thompson. 1987. Rhetorical Structure Theory: Description and Construction of text Structures. Natural Language Generation: New Results in Artificial Intelligence, Psychology and Linguistics, ed. by Gerard Kempen, 85-95. Boston: Martinus Nijhoff Publishers.

Mann, William C., and Sandra A. Thompson. 1988. Rhetorical Structure Theory: Towards a functional theory of text organization. Text 8, 3, 243-281.

Matthiessen, Christian, and Sandra A. Thompson. 1988. The Structure of Discourse. Clause Combining in Grammar and Discourse, ed. by John Haiman and Sandra A. Thompson, 275-329. Philadelphia: John Benjamins Publishing.

Napoli, Donna Jo. 1982. Initial Material Deletion in English. Glossa 16, 1, 5-111.

Polanyi, Livia. 1988. A Formal Model of the Structure of Discourse. Journal

of Pragmatics 12, 601-638.
Thompson, Sandra A., and William C. Mann. 1987. Clause Combining and Discourse Structure. Language Topics: Essays in Honour of Michael Halliday, ed. by Ross Steele and Terry Threadgold, 359-381.
Walker, Marilyn 1993. Informational Redundancy and Resource Bounds in Dialogue. Ph.D. Dissertation, University of Pennsylvania, Philadelphia.

Genre and Grammar: Predicative and Attributive Adjectives in Spoken English

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This paper examines the distribution of predicative versus attributive adjectives in a corpus of 51,852 words of naturally-occurring spontaneous English conversation.[1] I demonstrate that the frequency of each type of adjective is related to aspects of the interactional situation, specifically to the amount of shared experience, and likewise shared referents, among the interlocutors. I claim that it is the discourse-pragmatic functions of adjectives which leads to this correlation; namely to introduce a new referent for attributive adjectives, and to predicate a property on an already-established referent for predicative adjectives (cf. Thompson 1988). This paper demonstrates a specific way in which the distribution of grammatical forms is shaped by discourse-pragmatic factors, and depends on the type of interaction being observed.

The data consists of ten separate speech events, comprising 51,852 words of naturally-occurring conversational English. These 10 segments are part of the Corpus of Spoken American English being collected and transcribed at the University of California at Santa Barbara. Appendix A. gives a brief overview of the transcription system. Names of speech events used in this paper are the titles given to the segments by the Corpus of Spoken American English. Appendix B. lists a brief summary of each of the ten speech events.

In this paper I follow the standard classification of English adjectives into two main types (cf. Quirk et al 1972). Attributive adjectives are those which occur within a noun phrase, as in (1).

(1) **attributive adjectives**
("Conceptual Pesticides" IU 1307-1308)
but part of the time I got to be a worker,
and do the really *fun* work,

("Conceptual Pesticides" IU 40)
(H) Ma=n that's a *big* hunk of fish.

("Deadly Diseases" IU 327)
(H) it was even more corrupt than the usual *corrupt* election.

There are three types of predicative adjectives in my data, as shown by (2). The overwhelming majority of predicative adjectives in my data (around 96 percent) are of the linking-verb variety as in (A.) Those adjectives illustrated in (B.) act as predicate complements without a linking verb. Those in (C.) are assessments, predicating a property on a referent from previous discourse or in the situational context.

(2) **predicative adjectives**
A. Linking-verb Predicates
("Ancient Furnace" IU 621)
The return grill's plenty *big* enough.

("Conceptual Pesticides" IU 867)
Oh that sounds *great.*

("Cuz" IU 116-117)
... (TSK) And of course Jo=hn,
who's just as *ba=d,*

B. Complement Predicates
("Hey Cutie Pie" IU 933, talking about a refrigerator)
I keep it really *cool.*

("Deadly Diseases" IU 1579)
.. cause it'll only eat it *live.*

C. Assessment Predicates
("conceptual Pesticides" IU 266)
How *bizarre.*

("Conceptual Pesticides" IU 1197)
.. *Yummy.*

At least two linguists (cf. Croft 1991, Bhat 1994) have proposed that the `primary function' of adjectives is to serve as grammatical modifiers. One justification for this claim is based on frequency. As Bhat summarizes (1994:12, emphasis mine): "In English, for example, *adjectives occur primarily as modifiers of nouns in noun phrases*, whereas nouns and verbs occur primarily as heads of noun phrases and the nuclei (predicates) of sentences or clauses respectively." But what does `occur primarily' mean, and is it empirically true for naturally occurring language? Bhat presents semantic and grammatical evidence (the discussion of which lies outside the scope of this paper) to support his claim of modification as the `primary function' of adjectives, but he does not support his claim that English adjectives `occur primarily' as modifiers. The main question I am posing in this paper is: in naturally occurring conversational English, do adjectives 'occur primarily' as modifiers within noun phrases?

Two previous studies shed light on this issue. However, both of these studies seem to arrive at diametrically opposite conclusions. Chafe, (1982) in conjunction with the findings of a study comparing informal spoken English with formal written English, finds a greater than two-to-one ratio of attributive to predicative adjectives in his sample of 9,911 words of informal spoken English.[2] For attributive adjectives, Chafe reports 33.5 occurrences per thousand words, and

15.8 occurrences per thousand for predicative adjectives. This shows a percentage difference of 35.8 percent more attributive than predicative adjectives in Chafe's data.[3] Thompson, (1988) in a study of property concepts in conversational English and Mandarin Chinese, finds a ratio exactly opposite that reported by Chafe. Of the 308 total adjectives in Thompson's database of conversational English, 32 percent are what would be traditionally defined as attributive (66 modifiers in new NPs, and 33 modifiers of predicate nominals), while 68 percent (209 occurrences) are grammatical predicates.[4] Thus, Thompson's data show 35.8 percent more predicative than attributive adjectives.

The findings of my current study add even more disparity in this area. Out of a total of 2,006 adjective tokens in my database, 968 (48.3 percent) occur attributively, while 1,038 (51.7 percent) occur as predicates. Thus, in my data there are 3.4 percent more predicative than attributive adjectives. This is not a very significant difference given the number of adjective tokens in my data, or as compared with the extremely large differences observed in Chafe's or Thompson's data. Table (3) lists the results of these three studies for ease of comparison.

(3.) **Summary of adjective distribution in three studies**

STUDY	TOTAL-WORDS		TOTAL-ADJ.	ATTRIB.	PRED.%-DIF.
Chafe	9,911	(489)	(332) *67.9%*	(157) *32.1%*	*+35.8%*
Thompson[5]	(8,000)	308	99, *32.1%*	209, *67.9%*	*-35.8%*
Englebretson	51,852	2,006	968, *48.3%*	1,038, *51.7%*	*-3.4%*

Based on the figures listed in table (3), the next logical question is whether there is an explanation for the large amount of variation across these three studies. I can think of at least three possibilities. First, perhaps all three researchers used different criteria to determine what counted as an adjective. However, I attempted to follow the coding methodology outlined in both Chafe's and Thompson's studies--e.g., including highly-lexicalized participles as adjectives (such as *exciting, depressing, dead, rotten, married*, among others), and by not coding attributive nouns, etc. The number of borderline cases was too small to account for the range of variation among the three studies. A second possible explanation concerns sample size. My database is over six times larger than either Chafe's or Thompson's. The third explanation, which I believe to be most tenable, is related to interactional differences among speech events. My database contains several different types of conversational English, as shown in Appendix B. In personal communication with both Chafe and Thompson, I have learned that, unlike the varied speech events in my database, the data for each of their studies is fairly homogenous. Both are definitely conversational English, but the data for Chafe (1982) is heavy on personal experience narratives, while the data for Thompson (1988) is very much oriented toward participatory, interactional conversation. Thus I believe this third hypothesis, that distribution of attributive and predicative adjectives is related to the type of speech event, is worthy of further investigation.

Table (4) presents a breakdown of adjective distribution in my data, in terms of the ten separate speech events.

(4) **Summary of adjective distribution by Speech Event**

TITLE	WORDS	ADJ	ATTRIB.	PRED.	%-DIF.
"Bank Products"	4,986	125	79, *63.2%*	46, *36.8%*	+26.4%
"Fiesta Party"	5,964	192	119, *62.0%*	73, *38.0%*	+24.0%
"Ancient Furnace"	4,938	123	75, *61.0%*	48, *39.0%*	+22.0%
"Conceptual Pesticides"	4,699	264	137, *51.9%*	127, *48.1%*	+3.8%
"Deadly Diseases"	6,551	294	151, *51.4%*	143, *48.6%*	+2.8%
"Cuz"	5,953	210	104, *49.5%*	106, *50.5%*	-1.0%
"Appease the Monster"	6,390	305	131, *43.0%*	174, *57.0%*	-14.0%
"Actual Blacksmithing"	5,049	193	78, *40.4%*	115, *59.6%*	-19.2%
"Runway Heading"	2,604	89	29, *32.6%*	60, *67.4%*	-34.8%
"Hey Cutie Pie"	4,718	211	65, *30.8%*	146, *69.2%*	-38.4%
TOTAL	51,852	2,006	968, *48.3%*	1,038, *51.7%*	-3.4%

Note the wide range of variation across transcripts, in terms of the percentage difference between attributive and predicative adjectives. On one end of the spectrum, "Bank Products" displays 26.4 percent more attributive than predicative adjectives. On the other end of the spectrum, "Hey Cutie Pie" shows a percentage difference of 38.4 percent more predicative than attributive adjectives. Looking at the percentage differences in table (4), these ten speech events can be divided fairly neatly into three discrete groups. One group ("Bank Products", "Fiesta Party", and "Ancient Furnace"), displays considerably more attributive than predicative adjectives. The second group ("Conceptual Pesticides", "Deadly Diseases", and "Cuz") shows roughly equal distribution, while the remaining four speech events show significantly more predicative than attributive adjectives.

Based on the distribution illustrated by table (4), the obvious next question is whether there is an explanation for the range of variability among these ten speech events. For instance, what characterizes the difference between the two extremes--"Bank Products" and "Hey Cutie Pie"? In order to answer this question fully, one would need to have an in-depth understanding of the interactions taking place in each of the ten speech events. Due to limitations of space, it is unfortunately not possible to discuss each speech event in detail, but Appendix B. gives a brief overview.

So, what is the difference between "Bank Products" (with 26.4 percent more attributive than predicative adjectives) and "Hey Cutie Pie" (with 38.4 percent more predicative than attributive adjectives)? One observation is related to social intimacy and formality level. "Bank Products" is a formal meeting of loan officers at a bank, discussing loan applicants. This is work-related interaction, and the participants are all employees at the bank. On the other hand, "Hey Cutie Pie" is an informal telephone conversation between a romantically involved couple who know each other very intimately. Thus the two ends of the continuum in table (4) are quite different, both in terms of formality level, as well

as the social relationship among participants. Therefore, one hypothesis could be that, in conversational interaction, the distribution of predicative and attributive adjectives depends on formality level and social intimacy; a greater number of attributive adjectives corresponds to increased formality level and social distance, while a greater number of predicative adjectives correlates with informal interaction among intimates. This hypothesis is in keeping with much sociolinguistic research that correlates social factors with language variation.

For this hypothesis to be true, in this case one would expect the speech events within each of the three groups in table (4) to be similar in terms of these social factors. However, this correlation unfortunately does not hold true within each of the groups. For instance, not all of the speech events in the high-predicative group are informal interactions among social intimates. "Hey Cutie Pie", "Actual Blacksmithing", and "Appease the Monster" are, but "Runway Heading" is a work-related performance evaluation. "Runway Heading" has two participants: one is training to be an air-traffic controller, and the other is his mentor. The trainee has just successfully completed a mission, directing the takeoff and landing of several aircraft. The mentor has observed this mission, and this speech event consists of the mentor giving feedback to the trainee. Thus "Runway Heading" is not informal conversation among social intimates, and the hypothesis needs revision.

Before continuing, however, it is important to understand the discourse-pragmatic functions that have been proposed for attributive and predicative adjectives. One approach has been articulated by two researchers from very different theoretical orientations. Thompson (1988:180, emphasis mine) characterizes the discourse-pragmatic functions of adjectives as follows: "in ordinary conversational language, Property Concept Words, or adjectives if we're talking about English, have exactly two functions, ... One, *to predicate a property of an established discourse referent*, and two, *to introduce a new discourse referent*." According to this view, predicative adjectives tend to discuss a property of an already-established referent, while attributive adjectives tend to help introduce new referents into the discourse. Thompson uses text counts of given and new referents in her data to establish this correlation. Ferris (1993) also claims that the pragmatic function of attributive adjectives is referent identification, while the pragmatic function of predicative adjectives is to add information to an already-identified subject. With this background in mind then, I would like to propose that the distribution of predicative and attributive adjectives in the different speech events in table (4) is due to the amount of shared referents among the interlocutors. Example (5) below is a brief snippet from the "Cuz" transcript, which is informative in terms of these adjective types.

(5) ("Cuz" IU 570-576)
@(H) (H) He had on a *white* suit,
Liza had on a um,
.. a *black* suit,

and then he stands there and <VOX tells her how it's not --
.. it needs to be *baggier* here VOX>,
and they're analyz- --
(H) [They are so *superficial*],

Note the use of the attributive adjectives *white* and *black* to introduce the two suits into the discourse. Then, the predicative adjective *baggier* is used to discuss the already-identified referent of suit (the pronoun *it*), and then *superficial* to evaluate the people who were introduced earlier into the discourse.

In many cases, such as the "hey Cutie Pie" transcript, the social situation already suggests that the interlocutors have a great deal of shared knowledge about referents--simply by knowing each other intimately, having many of the same friends, and having shared many experiences. A short sample from this interaction appears below in (6).

(6) ("Hey Cutie Pie" IU 764-790)
JILL: I gave Keri a call,
[(H)] and um,
JEFF: [Wow=].
.. At Michael's?
JILL: ... Unhunh.
.. And [she was] so *m=iserable*,
JEFF: [Wow].
JILL: cause she's studying.
.. (H) But she only has two weeks left.
JEFF: ... (H) [Wow=].
JILL: [(TSK) Only two weeks] left,
and,
... I was just thinking,
gosh,
and then she has .. off,
and,
(H) she has vacation,
and,
.. %oh,
it just sounded so *good.*
JEFF: (TSK) What's she --
Oh=.
She must be so *excited* though.
JILL: .. Well she sounded really .. *bummed.*
.. Actually,
just cause school is so *tough* right now?

Here, both Jeff and Jill are talking about a mutual friend. Both know this person, and both know she is in medical school. All adjectives in this example are predicative, and all are commenting on the referent *Keri* (who was introduced into the discourse in the first line of the example, but is already familiar to both interlocutors), or on school (in the last line of the example, which is already a topic of discussion). This example illustrates that social factors (i.e. intimacy and formality level as discussed above) can lead to shared discourse referents--which in turn leads to a greater ratio of predicative to attributive adjectives.

In addition to social factors leading to more shared referents, situational context may contribute to this as well. Such is the case of "Runway Heading." In this speech event, the entire background of the air-traffic control mission is what constitutes shared referents, since both the mentor (Randy) and trainee (Lance) were present, and therefore the situation is familiar to both of them. (7), below, is a short excerpt from this speech event.

(7) ("Runway Heading" IU 308-333)
LANCE: ...(H) Yeah,
I think I was a little bit *rigid* in my planning of that,
cause I wanted to --
had to plan,
... to get him out at that point.
... a=nd,
.. I should've been more *flexible* and,
RANDY: ... But uh,
you know (HX),
.. everything else I saw,
.. (H) you- your separation was,
.. was really *good* this morning.
I mean you really tightened em up.
.. Maybe a couple times almost a l=ittle bit [too @*tigh=t*.
LANCE: [<@ a little to *tight* @>.
@@@ @@@ (H)
RANDY: @@@@]
Cause uh],
(H) % --
... I don't know,
y- a couple times you had,
like one just barely at departure end,
a jet at departure,
and you cleared another jet for takeoff.
.. (H) And it worked out *great*.

In this example, predicative adjectives are used to discuss and evaluate events from the training mission. This demonstrates that situational background can lead

to sharing of referents, and so is related to the distribution of predicative and attributive adjectives.

On the other end of the spectrum, speech events which contain a higher ratio of attributive to predicative adjectives involve a high number of referents being introduced into the discourse, as they are not shared by virtue of social intimacy (as in "Hey Cutie Pie") or prior context (as in "Runway Heading"). For instance, "Bank Products" is a meeting of loan officers at a bank. Each of the loan officers is presenting information about a loan applicant, and then the bank president is presenting information about new policies at the bank. None of this information is shared knowledge among all the participants, and so the point of this speech event is to make this information explicit. Similarly, in "Ancient Furnace", a heating/air-conditioning sales representative is at the home of a client, in order to assess the best type of furnace for the client's newly-purchased, soon-to-be-remodeled house. In this case, many referents--namely factors related to the design of the home and to the clients desires--are not shared knowledge between the two interlocutors. The third speech event in this group, "Fiesta Party", involves three neighbors having a conversation at a neighborhood party. These interlocutors are talking about their experiences in World War II, their children, and their houses--these personal experiences are not shared knowledge among the three participants. Thus this exchange involves the introduction of many referents which are not already shared background knowledge among the interlocutors.

In summary, interactions where participants are evaluating and commenting on shared referents *tend* to be heavy on predicate adjectives, while interactions such as narrative or conference, which involve the introduction of new referents into the discourse, *tend* to be heavier on attributive adjectives. It is easy to relate this observation back to the previous studies listed in (3) above. It is not surprising that Chafe's 1982 data tends to be heavy on attributive adjectives, since in the kind of conversational English in Chafe's study (predominantly personal experience narratives) the referents are generally not shared knowledge among the interlocutors. Similarly, since Thompson's 1988 data is predominantly interactional, with a great amount of shared referents among interlocutors, the high ratio of predicative to attributive adjectives is not surprising.

In conclusion, do my findings suggest that adjectives in English `occur primarily' as modifiers within NPs? I would contend that they do not. My findings suggest that the occurrence of predicative or attributive adjectives in conversational English depends on the nature of the particular speech event. One finds a greater number of predicative adjectives when interlocutors are discussing referents that are shared knowledge among themselves (either based on social intimacy or situational context). One finds a greater number of attributive adjectives when interlocutors are introducing new referents into the discourse that are not shared background knowledge. My findings do not support the view that adjectives have a single `primary function' in discourse. Frequency of attributive and predicative adjectives varies considerably based on the type of interaction.

But this variation gives us important supporting evidence as to the discourse-pragmatic functions of each type of adjective.

This study further suggests that when discussing a genre of language (such as conversation), one must consider additional factors such as type of interaction, which may influence the distribution of grammatical forms. It is not simply social factors, such as formality and intimacy, which lead to variation across speech events; discourse-level factors, in this case related to information flow and shared referents, may also contribute to language variation.

Finally, this study suggests that researchers should be especially conscious of interactional factors such as genre, social intimacy, and situational context, and should keep in mind that distribution of grammatical forms may be influenced by the type of interaction in the data. This paper demonstrates a specific way in which the distribution of grammatical forms is indeed shaped by discourse-pragmatic factors. Specifically, the occurrence of predicative versus attributive adjectives is shaped by the discourse-pragmatic factors related to the number of shared referents in a particular interaction.

Appendix A.
Summary of Transcription Notation

The transcription conventions used in this paper are fully described in Du Bois et al (1992, 1993). This is merely a brief summary for convenience of reference.

Each transcript line represents a single Intonation Unit.

Speaker labels appear in uppercase, and are followed by a colon.

Simultaneous speech is indicated by square brackets, aligned to show the beginning of each overlap.

. Final intonation contour.
, Continuing intonation contour.
? Appeal intonation contour.
-- Truncated Intonation Unit.
- Truncated word.
@ One pulse of laughter.
% Glottal stop.
= Prosodic lengthening.
.. Short pause
... Long pause
(TSK) Tongue click.
(H) In-breath.
<VOX VOX> Speech has unique voice quality.

Appendix B.
Brief overview of speech events

"Bank Products" An official board meeting recorded at a bank. The loan officers present details on clients seeking bank loans, then the bank president briefs the officers on new developments in bank policy.

"Fiesta Party" Three men in their late sixties, recorded while drinking at a neighborhood party. The three are acquaintances and are talking about wartime experiences, careers, their children, and their houses.

"Ancient Furnace" A heating/air-conditioning engineer is consulting with a customer about the best heating system for the customer's newly-purchased and soon-to-be-remodeled home.

"Conceptual Pesticides" Conversation and small talk among three friends who are preparing dinner together.

"Deadly Diseases" Interaction among three friends, discussing recent travels, vitamins, mutual friends, and pets.

"Cuz" Interaction between two cousins who are gossiping and catching up on each others' lives.

"Appease the Monster" Events after a family birthday dinner; opening gifts, talking about mutual acquaintances, and small talk.

"Actual Blacksmithing" Face-to-face interaction between two near strangers. One is a student of equine science and is telling the other about her classes and about life on a ranch. The student's mother also joins the conversation, talking about the weather and family friends.

"Runway Heading" Work-related interaction with two participants: one is training to be an air-traffic controller, and the other is his mentor. The trainee has just successfully completed a shift, with his mentor observing, and the recording is of the mentor evaluating the shift and giving feedback on the trainee's performance.

"Hey Cutie Pie" Very intimate telephone conversation between a romantically involved couple in their early twenties. Topics include a possible pregnancy, mutual friends, and small talk.

References

Bhat, D.N.S. 1994. *The adjectival category: Criteria for differentiation and identification.* Amsterdam: John Benjamins Publishing Co.

Chafe, Wallace L. 1982. "Integration and involvement in speaking, writing, and oral literature." in Deborah Tannen, (Ed). *Spoken and written language: Exploring orality and literacy.* Norwood NJ: Ablex Publishing Corp. 35-54.

Chafe, Wallace L. and Jane Danielewicz. 1987. "Properties of spoken and written language." in Rosalind Horowitz and S. Jay Samuels, (Eds.) *Comprehending oral and written language.* San Diego: Academic Press.

Croft, William. 1991. *Syntactic categories and grammatical relations: The cognitive organization of information.* Chicago: The University of Chicago Press.

Du Bois, John, Stephan Schuetze-Coburn, Danae Paolino, and Susanna Cumming. 1992. *Discourse transcription.* Santa Barbara Papers in Linguistics Vol. 4, University of California at Santa Barbara.

Du Bois, John, Stephan Schuetze-Coburn, Danae Paolino, and Susanna Cumming. 1993. "Outline of discourse transcription." In Jane A. Edwards and Martin D. Lampert, (eds.) *Talking data: Transcription and coding methods for language research.* Hillsdale, NJ: Lawrence Erlbaum. 45-89.

Ferris, D. Connor. 1993. *The meaning of syntax: A study in the adjectives of English.* London: Longman Group Ltd.

Quirk, Randolph, S. Greenbaum, G. Leech and J. Svartvik. 1972. *A grammar of contemporary English.* London: Longman Group Ltd.

Thompson, Sandra A. 1988. "A discourse approach to the category 'adjective'." In John A. Hawkins (ed.) *Explaining language universals.* Oxford: Blackwell. 167-210.

Notes

[1] I would like to thank Jack Du Bois for access to these ten speech events from the Corpus of Spoken American English, and for providing me invaluable experience working with spoken language. I would also like to thank Susanna Cumming and Sandy Thompson for their helpful comments on this paper.

[2] In recent personal communication, Chafe has brought to my attention the results of a later, more in-depth study (Chafe and Danielewicz, 1987). Although the published version of this paper does not address the issue of attributive and predicative adjectives, Chafe provided me with the following unpublished figures. Of the 562 total adjectives in the database of 13,327 words of conversational English, 278 are attributive and 284 predicative--giving a percentage difference of 1.0 more predicative.

[3] Chafe lists the distribution in terms of occurrences per thousand words: 33.5 attributive adjectives, and 15.8 predicative. Since the total size of the database is given as 9,911 words, I have calculated the actual occurrences for ease of comparison among studies using the following proportions. For attributive: 33.5/1000 = A/9911; for predicative: 15.8/1000 = P/9911.

[4] Thompson's study demonstrates that some attributive adjectives do not "modify."--specifically, modifiers in NPs with relatively non-informational heads, and adjectives in predicate nominals. Since my study is concerned with the syntactic functions of attributive versus predicative adjectives, and not with the semantic function of modification, I have followed traditional definitions and included such non-modifying attributives in the class of attributive adjectives, since both occur attributively within the NP. Although outside the scope of this paper, I believe it would be a worthwhile study to examine the functional characteristics of such non-modifying attributive adjectives.

[5] The actual total word count for Thompson's transcripts is unavailable. However, since Thompson gives the total number of adjective tokens as 308, based on the distribution in my own data, I would estimate that Thompson's corpus would contain approximately 8,000 words.

Discourse Motivations for Productive Verbalization in Bikol[1]

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This paper describes the phenomenon of *verbalization* in Bikol, a Philippine language spoken on the southern peninsula of Luzon. I will use the term *verbalization* as parallel to *nominalization*: cases where constituents which usually do not function as verbs take on verbal morphosyntax, but there is no explicit derivation in verbalization. Verbalization is a subtype of a phenomenon which is pervasive in Bikol and other Philippine languages, such as Tagalog (Schachter 1985): constituents which tend to receive a particular morphosyntactic categorical treatment can and, with some frequency, do receive others in discourse with no special derivational morphology. Consequently, there is little evidence of types being assigned to lexical categories.

Ordinary Bikol verbs contain roots which usually function as verb stems and bear verbal morphology. In the following example, *ali'* 'leave' is an ordinary verb bearing the future tense verbal prefix *ma:-*.[2]

(1) Sonny: ***ma:-ali'*** *na ako sa aga,*
FUT:AGT-leave now 1s:TOP LOC morning
'I'm gonna leave tomorrow.' [sraf:1299]

In the following example, the presence of *ma:-* on *bayani* 'hero' and *boy scout* indicates that these items (usually nouns) are verbalized. Martin is explaining how he offered his seat on a jeep to a woman.

(2) Martin: I really wanted to--. I thought that I would be a **hero** (lit.: '**I will hero**'). I will stand.
Buboy: You were gonna be a **boy scout** (lit.: '**will boy scout**').
Martin: I thought, "I'll be a **boy scout** (lit.: '**I will boy scout**') and let her sit."

Martin: *ta muya ko talaga-ng mag-ano,*
because want 1s:AGT really-LNK NOT.BGN:AGT-what
→ ***ma:-bayani*** *niyako' ako a,*
FUT:AGT-hero RPT:1 1s:TOP ah
ma:-[tindog niyako'] ako,
FUT:AGT-stand RPT:1 1s:TOP

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[1] I thank Patricia Clancy, Marianne Mithun, Carl Rubino, Ivo Sanchez, Sandra Thomspon, and, especially, Susanna Cumming for their helpful comments and advice. I take full responsibility for all errors remaining herein.

[2] The database for this analysis consists of 10 natural interactions containing a total of 13,018 intonation units and 520 tokens of verbalization. All data were collected in Sto. Domingo, Albay, the Philippines. See appendices for explanation of abbreviations for glossing and transcripts. Examples are presented according to the transcription conventions of Du Bois *et al.* 1993.

Buboy: *[ma:-boy s-]*
FUT:AGT-boy s-

→ ***ma:-boy scout,***
FUT:AGT-boy scout

→ Martin: ***ma:-boy scout*** *niyako' ako,*
FUT:AGT-boy scout RPT:1 1s:TOP

ta pa-tukaw-on ko talaga siya.
so CAUSE-sit-NOT.BGN:PAT 1s:AGT really 3s:TOP [tambay:535-41]

In this paper, I will show that there are two discourse motivations for verbalization in Bikol.

A- Ensure that the stem of the morphosyntactic verb conveys new, focused and/or contrastive information.
B- Ensure that the stem of the morphosyntactic verb is semantically rich and is not predictable from other sentence constituents.

The properties of the verb stem specified in Motivation A all can be subsumed under the functional category of *newsworthiness* (Mithun 1992). Moreover, instances of verbalization vary according to what kind of information the verbalized stem indicates about the event. Taking these factors into account, we can distinguish three types of verbalization: Adverbial, Schematic, and Verbalization Constructions.

Type 1: 'Adverbial'

'Adverbial' verbalizations are expressions of manner, extent or duration. Their use usually satisfies Motivation A: information indicated by the verbalized constituent is usually newsworthy.

In the following example, a group of women are discussing the introductory visit of a priest, who had just been assigned to the community, to the barrio of Calayucay. In the first portion, they discuss a party in which the people, assembled together, met the priest. At the end, Thelma contrasts this with the phase of the visit in which the priest met the people at their homes, going door to door. Here, she verbalizes the manner expression *saro'-saro'* 'one by one,' which is in contrastive focus.

(3) Ching: She said, "There were a lot of people there at Calayucay."
Lilian: There were a lot of people there.
Thelma: Probably, when they had their meeting--
Ching: He danced the Macarena. Mrs. De la Cruz said, "Why did Father Ramon dance the Macarena?"
Pen: Maybe--
Ching: She said, "No--" She said, "They gathered the people together."
Thelma: They visited the houses, **one by one** (lit.: 'They **one by oned** the houses.)

Ching: *ma-tawo ngani ngaya,*
ADJ-person indeed RPT:3
duman sa [Kalayukay].
DEM.D.LOC LOC Calayucay

Lilian: *[ma-tawo duman.]*
ADJ-person DEM.D.LOC

Thelma: *su may [2u{ru}ron gayod kan--2]*
TOP EXIST {DIST}-converse probably NT

Ching: *[2nag-balye ngani2]ngaya an kan*
BGN:ACT-dance indeed RPT:3 DEM.M.TOP NT
Makarena,
Macarena
sabi ni Mrs. Dela Cruz.
say NT Mrs. De la Cruz
nata' ngaya nag-bayle si Father Ramon ki Makarena?
why RPT:3 BGN:AGT-dance TOP Father Ramon NT Macarena

Pen: *[ay baka'.]*
oh maybe

Ching: *[ay dai nga]ya,*
oh NEG RPT:3
pagpa-
nag-t{ir}ipon ngaya kan tawo.
BGN.AGT-{DIST}-gather RPT:3 NT person

Thelma: *nagpara-*
*aw s{in}**aro-saro'** garo su mga arong.*
o {BGN:PAT}-**DIST-one**EPIST TOP PL house

[sroq:948-52, 954-9, 961-2]

In the next example, a focused temporal expression is verbalized as part of an answer to a question about time in reported discourse.

(4) Impay: *an pag-pa-ilaw ngaya ano-ng oras,*
TOP TEMP-CAUSE-light RPT:3 what-LNK hour
'S/he said, "What time (should I) turn on the lights"'
basta niyako' nag-diklom na,
as.long.as RPT:1 BGN:AGT-dark already
'I said, "As long as it has already gotten dark."'
*mag-**alas** **sais** niyako',*
AGT-**at.hour six** RPT:1
'I said, "(Turn the lights on) at **six o'clock**."' (lit.: '**Six o'clock** (it).')

[sraf:1149-1151]

The use of verbalizations for focused elements can also be found in question-word questions.

(5) Baby: *[Ma mang-**gura'no** an Manila paper,*
ma NOT.BGN:AGT:HABIT-**how.much**TOP Manila paper
'Ma, **how much** (does) Manila paper (cost)?' [sew:1028]

(6) Lydia: *ma:-**ano** pa ako?*
FUT:AGT-**what** more 1s:TOP
'**What** else will I (do)?' [bday:955]

(7) Chona: *nag-**pira**-ng **aldaw** man su gatas na*
BGN:AGT-**how.many**-LNK **day** also TOP milk LNK
p{in}a-dara,
{BGN:PAT}-CAUSE-bring
'**How many days** (does) the milk that was sent (last)?' [sew:855]

Thus, Bikol speakers often make newsworthy expressions of manner, extent and duration stems of morphosyntactic verbs, satisfying Motivation A.

Type 2: Schematic

In Type 2 verbalizations, the verbalized constituent participates in a *schema* that is evoked in the immediate discourse (Fillmore 1977). Schematic verbalizations are motivated by Motivation B, the avoidance of low-content or predictable verbs. Once a schema has been evoked, explicitly coding only one element of the schema is usually sufficient indication that the schema still pertains, and unexpressed elements of the schema can usually be inferred. Thus, explicitly coding of more than one schema element is redundant in most contexts. Type 2 verbalizations allow speakers to code the event with just one schema element.

The schema may be evoked in various ways before the Type 2 verbalization. In the next example, the schema of building a pigpen is explicitly evoked in the discourse.

(8) Alex: *pwede baga tugduk-an iyan ki orig-an.*
able EMPH erect-LOC DEM.M.TOP NT pig-LOC
'A piggery could be built there.' [mama:103]

In the ensuing discussion, there are verbalizations with common design elements of pigpens serving as stems.

(9) Alex: ***salog**-an baga daa iyan,*
floor-LOC EMPH HEARSAY DEM.M.TOP
'(You would put a) **floor** (in) there' (lit. '**Floor** that.') [mama:144]

(10) Alex: ***islab**-on an,*
slab-PAT:NOT.BGN DEM.M.TOP
'(You would lay a) **slab** there' (lit. '**Slab** it.')

paril-on *iyan.*
concrete-NOT.BGN:PAT DEM.M.TOP
'**Concrete** it' [mama:152-3]

Sometimes, the schema is not evoked solely by the discourse, but the situation as well. The following is said in reference to an infant in the room after a long silence.

(11) Chona: *...ma:-ihi* *naman talaga iyan,*
FUT:AGT-urine again really DEM.M.TOP
'She's gonna pee again'

..ta *aki' pa.*
because child still
'because (she is) still young.'

Cory: *dai mo* *pig-ki-**Kimbies**,*
NEG 2s:AGT BGN:PAT-IMPF-**Kimbies**
'You don't (put her in) **Kimbies**?' (lit.: 'You don't **Kimbies** (her)')
[sew:831-2, 5]

Kimbies is a popular brand of disposable diapers in the Philippines. Diapering infants is only indirectly evoked in the discourse before Cory verbalizes *Kimbies*. Chona's talk evokes diapering only when considered in relation to the current situation: as the infant apparently has just urinated and is in their care, Chona's talk is hearable as a reason for waiting to put a new diaper on the infant.

Another aspect of Type 2 verbalizations is that nominally coded referents are available for further manipulation in the discourse, but stems of Type 2 verbalizations are not. Thus, in the first use of *resibo* 'receipt' below, the speaker has no plans for subsequent reference and thus uses a Type 2 verbalization, as the transaction schema has already been evoked. However, in the second case, the nominal form establishes a discourse referent for later tracking.

(12) Ching: 'She had me buy some achara. She said, "You didn't have (them make you) a **receipt** (lit.: 'You did not make (them) **receipt**') because when Father Jacob would have me (run) errands, I would sometimes have them **make** a **receipt**.

Cita: 'Oh, naturally'

Ching: 'So, I would leave (**it**) there for him so (he) would have nothing to talk about (i.e. 'he would have no grounds for making allegations of malfeasance.)'

Ching: *p{in}a-bakal* *baga ako* *ki* *atsara.*
{BGN:PAT}-CAUSE-buy EMPH 1s:TOP NT achara

dai na *ngaya pag-pa-**resiboh**-i.*
NEG already RPT:3 TEMP-CAUSE-**receipt**-LOC

takon ako pig-sugo',
because when 1s:TOP BGN:PAT-errand

..ni Father Jacob,
AGT Father Jacob

*nugad pig-pa-**gibuh**-an,*
sometimes BGN:PAT-CAUSE-**make**-LOC

*ki **resibo**,*
NT **receipt**

Cita: *[awnatural,]*
oh natural

Ching: *[ta i-kaag] ko duman,*
so BEN-put 1s:AGT DEM.D.LOC

tanganing sabi,
so say

dai-ng sabih-an.
NEG-LNKsay-LOC

[sroq:1478, 1481-9]

This contrast may be seen as reflecting *referentiality* in the sense of Du Bois (1980), or *tracking*, in the sense of Thompson (1997). It is also reminiscent of the discourse function characteristically associated with noun incorporation (Mithun 1984). This also follows from Hopper and Thompson's (1984) observation that constituents receiving nominal treatment are prototypically tracking, and constituents receiving something other than full nominal treatment are often non-tracking.

Thus, the stems of Type 2 verbalizations are non-tracking elements of schemas evoked in the discourse. This type of verbalization is a way of satisfying Motivation B by avoiding redundancy in the clause and avoiding the use of low-content verbs.

Type 3: Verbalization Constructions

The third type of verbalization is verbalized constructions (Fillmore *et al.* 1988): they are productive idioms in which constituents of a specified class are verbalized, and there is some meaning coded neither by the stem nor by the verbal morphology, but the combination of the two. There are three common constructions: Reported Speech, Inchoative and Locational. The meanings expressed non-compositionally by these constructions correspond to some low-content verbs; thereby, these constructions are an alternative to using such verbs and a means for satisfying Motivation B.

I will discuss the first two constructions only briefly, as they are much less common than the third. The Reported Speech verbalization construction means 'to say X,' where X is the stem. This construction is only used for one-word utterances in my data.

(13) Joy: *kan pig-ka'g-an ko ngaya iyan,*
NT BGN:PAT-put-LOC 1s:AGT RPT:3 DEM.M.TOP
'He said, "When I put that in (the agreement)'

*nag-**uho** man ngaya ako ta,*
BGN:AGT-**yes** too RPT:3 1s:TOP because
'He said, "I (said) **yes** because"' (lit.: 'I **yes**ed')

dai ako-ng antepara.
NEG 1s:TOP-LNK eye.glasses
'I didn't have (my) glasses' [sew:47-9]

The second construction involves inchoative meaning. The stem represents a state, and the verbalization construction expresses that this state comes about. There is no special inchoative morphology.

(14) Eliseo: *pag saro-ng semana,*
TEMP one-LNK week
'after one week'

dai mo pa na-ubos pag-deliver-a an sanggatos na
NEG 2s:AGT yet BGN:PAT-consume TEMP-deliver-PAT TOP 100 LNK
sako-ng bagas,
sack-LNK rice
'(if) you haven't finished delivering all 100 sacks of rice'

***m{umin}ahal** an presyo kan bagas.*
{AGT:CONSQ}-**expensive** TOP price NT rice
'the price of the rice (gets more) **expensive'** (lit.: 'the price of the rice **expensive**s') [sew:19-21]

The last construction, Locational, is by far the most frequent of the verbalized constructions in my data. The verbalized stem indicates a location, and the verbalization indicates that a verbal argument arrives at the location indicated by the stem. Therefore, verbalized locations indicate goals, never sources. The use of this construction satisfies Motivation B, as it is an alternative to using a low-content motion verb. In fact, there is no dedicated verb root in Bikol for general motion toward a goal, such as *go* in English.

(15) Karen: The chickens are not going to come **out**. (lit.: 'The chickens will not **outside**.')
Arnel: Yes, (they will).
Karen: They're not gonna come **out**. (lit.: '(They) will not **outside**.)
Arnel: Yes, (they will).

Karen: *dai man ma:-**luwas** su ano,*
NEG also FUT:AGT-**outside** TOP what

su manok,
TOP chicken

Arnel: *..iyo,*
yes

Karen: *da[i man ma:]-**luwas**.*
NEG also FUT:ACT-**outside**

Arnel: *[iyo,]*
yes [tind:245-49]

The chickens' potential movement is characterized by its goal, *luwas* 'outside'. Accordingly, *luwas* is verbalized twice.

Location verbalizations can also be used for caused motion. In the next example, Aaron comes to the house while Chicoy is frying lumpia. Below, Chicoy is offering Aaron some of the ones he has already fried.

(16) Chicoy: *kon gusto mo su ma-tagas,*
if want 2s:AGT TOP ADJ-hard
'If you want some tough ones'

Aaron: *a,*
'um'

Chicoy: *su ma-tagas,*
TOP ADJ-hard
'tough ones'

Aaron: *dai na-ng su ma-lumoy?*
NEG now-LNK TOP ADJ-soft
'There aren't any soft ones.'

***digdih**-an na su ma-tagas,*
DEM.PROX.LOC-LOC now TOP ADJ-hard
'(Bring) the tough ones **here**.' (lit. '**Here** the tough.') [bday:1013-17]

In the last line, Aaron verbalizes the proximal locative demonstrative *digdi(h)*. He uses it in a request to have something brought to him.

Unlike Type 2 verbalizations, the stem of Locational verbalizations can be tracking and even given (Chafe 1994). In the next set of examples, a group of women are discussing fiestas that will be held in various communities in the Bikol region. Below, they start discussing Peñafrancia, the most attended fiesta in the region.

(17) Thelma: *maka-Peñafrancia sana,*
NOT.BGN:ACT-Peñafrancia just
'Then, there will be Peñafrancia' (lit.: 'will Peñafrancia')

Ching: *uho,*
'yes'

iyo na.
yes now
'That's right'

Thelma: *a-baba-on ngunyan an Peñafrancia.*
ADJ-low-INTS now TOP Peñafrancia
'Peñafrancia (will be) early in the month this year.' (lit. Peñafrancia (will be) low now.)' [sroq:477-80]

The women discuss the date of the Peñafrancia festival for the following 43 intonation units. Then, they start discussing attending the festival. They verbalize the distal locative demonstrative *duman*, referring to Peñafrancia.

(18) Tita: *nag-du-**d{ur}uman** kamo?*
BGN:AGT-IMP-{DIST}-**DEM.D.LOC** 2p:TOP
'Do all of you usually (go) **there**?' (lit.: 'Do you (pl.) **there**?')

Ching: *kon may kwarta,*
if EXIST money
'If (we) have money' [sroq:524-5]

They continue to use *duman* 'there' to refer to the Peñafrancia festival. Below is one example of the verbalized tokens that follow.

(19) Ching: *ako pira pa pagka-gadan kaito-ng si May dai*
1s:TOP how.many more TEMP:PST-dead DEM.D.NT-LNK TOP mother NEG

*na ako naka-**duman**.*
already 1s:TOP BGN:AGT-**DEM.D.LOC**
'Me, how many (times have I gone?) I haven't (gone) **there** since my mother died.' (lit.: 'I haven't **thered**.') [sroq:534]

Thus, locational verbalizations can be used to track referents through discourse.

Type 3 verbalizations are constructions. Their use satisfies Motivation B by allow the avoidance of low content verbs.

Conclusion

In conclusion, this paper has discussed three types of verbalization: Adverbial, Schematic, and Verbalized Constructions. Their appearance is due to two discourse motivations.

A- Ensure that the stem of the morphosyntactic verb conveys newsworthy information.

B- Ensure that the stem of the morphosyntactic verb is semantically rich and is not predictable from other sentence constituents.

Adverbial verbalization is motivated by A. Schematic and Verbalization Constructions are motivated mainly by B, and sometimes also by A. Since a wide range of constituents function as verb stems with no explicit derivation, the phenomenon of verbalization heavily undermines the status of *verb* as an organizational category in the Bikol lexicon. In doing so, however, it allows morphosyntactic verbs to perform particular discourse functions more consistently, such as satisfying Motivations A and B.

In view of the potency of Motivation A and B demonstrated here for Bikol, we might expect them to have similar impact in the rest of the world's languages. However, this is not the case. In many languages, *verb* is a much more robust category for the organization of lexical types: a narrower range of constituents can receive verbal treatment without explicit derivation. To explain this, we must postulate another motivation, Motivation C, to compete with A and B and curb their effect.

C- Ensure that a stem that bears verbal morphology belongs to the lexical category verb.

The lexical category of verb has semantic as well as discourse-functional motivations (Hopper and Thompson 1984). Sometimes, not all three motivations can be satisfied. In Bikol, A and B win out, and the functional transparency of the verbal constituent is maintained. In many other languages, C wins more often. *Verb* is maintained as a category of lexical types, and motivations, such as A and B, promoting the functional transparency of the verbal constituent are more likely to be compromised.

References

Chafe, Wallace. 1994. Discourse, Consciousness, and Time: The Flow and Displacement of Conscious Experience in Speaking and Writing. University of Chicago Press.

Du Bois, John W. 1980. Beyond Definiteness: The Trace of Identity in Discourse. In, Wallace Chafe, ed. The Pear Stories: Cognitive, Cultural and Linguistic Aspects of Narrative Production. 203-274. Norwood, NP: Ablex.

Du Bois, John W, Susanna Cumming, Stephan Schuetze-Coburn, and Danae Paolino. 1993. Outline of Discourse Transcription. In Edwards, Jane A. and Martin D. Lampert, eds. Talking Data: Transcription and Coding in Discourse Research. Hillsdale, N.J.: Earlbaum.

Fillmore, Charles J. 1977. Topics in Lexical Semantics. In Roger W. Cole, ed. Current Issues in Linguistic Theory, 76-138. Bloomington: Indiana University Press.

Fillmore, Charles J., Paul Kay and Mary Catherine O'Connor. 1988. Regularity and Idiomaticity in Grammatical Constructions: The Case of *Let Alone*. Language 64: 501-538.

Hopper, Paul and Sandra Thompson. 1984. The Discourse Basis for Lexical Categories in Universal Grammar. Language 60: 703-52.

Mithun, Marianne. 1984. The Evolution of Noun Incorporation. Language 60: 847-93.

Mithun, Marianne. 1992. Is Basic Word Order Universal? In, Payne, Doris, ed. Pragmatics of Word Order Flexibility, 15-61. Amsterdam: John Benjamins.

Schachter, Paul. 1985. Parts of Speech Systems. In Shopen, Timothy, ed. Language Typology and Syntactic Description, I: 3-61. Cambridge: Cambridge University Press.

Thompson, Sandra. 1997. Discourse Motivations for the Core-Oblique as a Language Universal. In Kamio, Akio, ed. Directions in Functional Linguistics. Amsterdam: John Benjamins.

Transcripts Cited

Abbreviation	Name	Description
bday	Birthday	Family members preparing for a another family member's birthday celebration
mama	Mama	Neighbors talking on a roadside bench
sew	Sew	At the home of a seamstress
sraf	San Rafael	Baranggay ('barrio') council meeting for San Rafael
sroq	San Roque	Older women preparing food for a baranggay fiesta
tind	Tindahan	Family members and neighbors at a home with a small store and livestock
tambay	Tambay	Men sitting and talking by the side of the road

Glossing Abbreviations

ADJ	adjective
AGT	agt
BGN	begun
CAUSE	causative
CONSQ	consequential
D	distal
DEM	demonstrative
DIST	distributive
EMPH	emphatic
EXIST	existential
FUT	future
HABIT	habitual
INCEP	inceptive
IMPF	imperfective
INTS	intensive
LNK	linker
LOC	locative
M	medial
NEG	negative
NT	Non-Topic
PAT	patient
PL	plural
PROX	proximal
PST	past
RECIP	reciprocal
RPT:1	first person reported speech
RPT:3	third person reported speech
TOP	Topic
TEMP	temporal
1i	first person plural inclusive
1s	first person singular
2p	second person plural
2s	second person singular

Passive Constructions in American Sign Language

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1. INTRODUCTION[1] In this discussion, we identify the passive construction in American Sign Language (ASL), and discuss its function within ASL discourse. The existence of a passive construction in ASL has been alluded to in the literature, but discussion is infrequent, and the usual conclusion is that a passive does not, in fact, exist. We contend, however, that passives are more frequent in ASL discourse than may have been realized, and that a particular configuration of already understood grammatical features must be recognized as a fully passive construction.

ASL has traditionally been described as having only active voice. Stokoe, Casterline and Croneberg (1965) were among the first to propose that passive constructions were not found in ASL, although several authors (Wilbur 1987, Kegl 1990) do allude to the possibility that a passive form may exist. What Stokoe et al. suggest might be construed as passive they eventually determine is simply a "reversal of personal reference (p. 282)", in other words, a verb is inflected to agree with its subject and object, but does not have a truly passive form. Wilbur 1987 points out that Stokoe et al's conclusion is significant, not necessarily because they conclude that ASL does not have a passive, but because their conclusion is not based on a search for morphology similar to the English passive. Isenhath (1990), however, does not consider ASL on its own merit, exemplifying the point of view that suggests that because no English-type passive structure is found in ASL, it is just plain not there. "ASL verbs do not have voice," Isenhath (1990:39) concludes.

Kegl's (1990) account is entirely structural, and has to do primarily with detransitivizing the verb. It appears Kegl means that the passive form of the verb agrees with only one argument rather than two, whereas a regular transitive ASL verb agrees both with a subject and object by beginning and ending its movement at loci associated with agent and patient respectively.

With the exception of the above, ASL has traditionally been described as having only active sentence structure. Perhaps what is remarkable, though, is that active and passive voice is discussed so little, whether or not passive construction is believed to exist. It might be that it has been difficult in a signed language to know what to look for, and some features of ASL grammar may have complicated the exploration. Word order in ASL is considered to be flexible, although SVO is often argued to be the most basic. It is common to have topic-marked constituents, which are clause-initial, marked by raised eyebrows and a slight backward head tilt, and are often followed by a slight pause. We propose that active and passive constructions are distinguished in ASL, and that the passive is characterized by a particular arrangement of features in the predicate. In particular, three parameters of ASL grammar interact, and when these are

combined in a certain way, a prototypical passive results. Less prototypical passives may result, however, from alternate combinations.

1.1. SYNTACTIC AND FUNCTIONAL DIMENSIONS OF PASSIVES. Before further discussing the features of ASL that combine to form the passive, it is necessary to look at what a passive is. Voice is defined by Bybee (1985) as a grammatical category relevant to both the verb and its arguments. Voice signals changes in the roles of the NPs in a sentence and the perspective from which the situation described by the verb is viewed. Givón (1990:566) states that the "same semantically-transitive event, coded by the very same verb, agent and patient, may be rendered from several discourse-pragmatic **perspectives**" (emphasis his). Givón further suggests that the relative topicality of the agent and patient plays an important role in how the sentence will be constructed. Whereas the agent enjoys a prototypical topic position in the active voice, according to Givón, the passive results from the demotion of the agent from this position.

The demotion of the agent, however, leaves open a possible position (or function) for another NP to take over. An agent might be de-emphasized or even avoided because it is unknown, irrelevant or suppressed (Barber 1975), but if so "some strategy must be available to remove the agent subject and replace it with either a dummy or an NP having some other function in the sentence proposition" (Barber 1975:16). Shibatani (1985:30) outlines three functions of the passive, summarized here. First, passives prototypically involve no mention of an agent for contextual reasons, agent defocusing being the primary pragmatic function of the passive. Second, passives bring a topical NP other than an agent into subject position, although Shibatani suggests that the topicalization of a patient is not the main purpose of the passive. Third, the passive acts as a syntactic pivot, important for coreferential deletion processes. Critical for Shibatani is that active and passive constructions are not discrete, but rather, form a continuum. Hopper and Thompson (1980) also treat passives as being on a continuum, as can be seen in their discussion of passives and transitivity. "More uncontroversial passives, of the type found in English...in our terms, are low in Transitivity: they typically have, or must have, only one argument, and this argument generally exercises no control over the event denoted by the verb." (Hopper and Thompson 1980:293)

2. THE PASSIVE IN ASL

ASL clauses fall along an active/passive continuum, with prototypical active constructions at one end and prototypical passives at the other. The prototypical passive in ASL is characterized by the following.

1. Defocusing, or the demotion of, the agent, so that the agent is not mentioned. As Shibatani (1985:831) suggests, "passives are used when the singling out of an agent is either impossible or unimportant—because of its being unknown, obvious, or irrelevant." In our prototypical examples from ASL the agent is assumed or obvious. Less prototypical examples may have the agent

mentioned, but either not as the subject of the verb, or an NP that is much lower in transitivity, for example SOMEONE or WHO.

2. The event is viewed from the perspective of the patient rather than the agent. In the active construction, the point of view is clearly from the agent. That is, for many verbs in ASL, the beginning point of the articulation of the sign is located at a particular point in the space in front of the signer, while the endpoint is located at a second point in space. The spatial locus at the beginning point is associated with the agent of the action, and the endpoint, with the patient or recipient of the action. Point of view, however, is not typically discussed in ASL literature, perhaps because it is 'nonmanual,' that is it has to do with subtle shifts in the position of the shoulders and torso, and with eye gaze. In the active construction, the signer's shoulder leans slightly in the direction of the agent positioned in the signing space, and eye gaze is in the direction of the patient. The agent is more topical than the patient.

In the passive, the patient is more accessible, or given information, than is the agent. The patient is marked in the verbal agreement system as the final locus of the verb movement, but the event coded by the verb is viewed clearly from the perspective of the patient rather than of the agent. The identity of the patient is evident, whereas that of the agent is not. The signer may move his or her shoulders and torso slightly away from the spatially positioned agent, with eye gaze directed toward the agent of the action. The patient may, of course, be formally marked as the topic constituent in ASL. It is presumed, however, that the major function of topic marking is not to indicate the passive, as might be suggested by Givón's remarks. Whether or not an NP designating a patient is found in topic position may have no real bearing on the passive construction involving the verb and its arguments as we describe it. A patient may be a marked topic, and yet the arrangement of the verb and its argument(s) may satisfy the definition of an active clause.

3. For an agreement (or directional) verb, the prototypical defocusing of the agent means that rather than an agent being specified in the syntax by associating an agent NP with a particular locus, the locus is empty. The movement of the verb must still begin at some locus, however, and it is commonly understood that the semantic designation of the locus must be specified before the locus becomes operable. But in the passive, no agent is specified, with the result being that the movement of the agreement verb begins at a syntactic, but semantically empty locus. This differs from "null" arguments in which lexical items are not signed in the local construction, but the semantic material associated with the locus has been previously specified in the grammar in some accessible way. In the passive, the agent is typically not identified.

3. ACTIVE VERSUS PASSIVE CONSTRUCTIONS

The following examples (1) to (4) show the difference between a verb and its arguments arranged to give an active reading, and the arrangement that we understand to be passive. All of our data are taken from commercially available videotapes of ASL signers, most of which are in wide circulation.[2]

(1) (*An Introduction to American Deaf Culture*, © MJ Bienvenu and Betty Colonomos)

SIGN STUDENT, SECOND, INTERPRET INTEREST LEARN CONNECT INTERPRET, TEACH-agent, PRO.3p_a, DEAF WORLD$_b$, (PRO.3$_a$) $_a$**SEE**$_b$+++.
'Signed language students, interpreters interested in learning (about Deaf culture) for their work, and teachers observe aspects of Deaf culture.'

In (1), the active construction, the plural agent (i.e. the signed language students, interpreters and teachers) is at locus 'a', designated by subscript 'a'. The verb SEE agrees with its subject and object in that the direction of the movement of the verb is from locus 'a' toward 'b', the locus of the patient DEAF WORLD 'Deaf culture'. The signer moves her shoulder toward locus 'a' and looks in the direction of locus 'b', thus indicating that the situation is viewed from the perspective of the agent.

The perspective, however, is much different in (2) to (4).

(2) (*An Introduction to American Deaf Culture*, © MJ Bienvenu and Betty Colonomos)

_____t
POSS.1 NAME M-J B-I-E-N-V-E-N-U. $_a$**NAMED**$_1$ MJ*(sign name)*.
'My name is MJ Bienvenu. The name I have been given is "MJ".'

(3) (*An Introduction to American Deaf Culture*, © MJ Bienvenu and Betty Colonomos)

_____t
IF HAPPEN $_b$**LOOK.OVER.SHOULDER**$_1$, PRO.1 FEEL MORE STRESS.
_____t
POSS.1 TYPING FEEL MORE TYPE.STIFF.
'If my shoulder is being looked over, my typing feels more stilted/If someone is looking over my shoulder, my typing feels more stilted.'

(4) (*American Sign Language: A Student Text, Unit 1 - 9*, © Charlotte Baker and Dennis Cokely)

t

REMEMBER ONE.YEAR.PAST BASKETBALL TOURNAMENT,

q

EXCITE, WIN. $_{a}$**GIVE(2h)$_{1}$** TROPHY. REMEMBER.^{3}

Do you remember the basketball tournament last year, that we were excited to win? We were given the trophy, remember?'

In (2) the signer introduces herself and then tells us her ASL sign name. The situation described by the verb $_{a}$NAMED$_{1}$ is a prototypical passive. First, it is viewed from the perspective of the patient, the signer herself. Being named MJ is something that happened to her. She is in focus in this construction; the event is not about the agent. Second, the agent is not specified and is quite clearly not in focus. Of course, someone with the appropriate background could surmise that the two most obvious sources of the sign name would be either the signer's parents or the Deaf community itself, but in this case, the source has not been mentioned, and is perhaps irrelevant in this particular context (cf. Barber 1975, Shibatani 1985), and is left unindividuated. Third, the locus 'a' where the verb $_{a}$NAMED$_{1}$ begins is a locus in the signing space for which no NP has been associated in the signer's discourse. In other words, the verb agrees with an unfilled locus. The signer moves the verb toward herself, the endpoint locus '1', the recipient of the sign name already introduced in the discourse and highly topical, and the only identified argument of the verb.

As Givón (1990) suggests, it is possible to view this situation from another discourse-pragmatic perspective, that of the agent. In this case, the signer might have wished to communicate something about the act of bestowing a name sign, identified the agent, and through a shift in the shoulders and eye gaze as described above, taken the perspective of the agent. This is discussed in more detail in section 5, regarding the passive and reference shifting, below.

Examples (3) and (4) are further instances of the arrangement of characteristics in the verb phrase resulting in a passive reading. In (3) the locus 'b' in $_{b}$LOOK.OVER.SHOULDER$_{1}$, and the locus 'a' in $_{a}$GIVE(2h)$_{1}$ in (4) are similar to that described in (2). No agent is specified, the patient rather than the agent is in focus, and while the loci 'b' and 'a' are morphosyntactically required in the spatial agreement system of the verb, they are not filled with any semantic material. The identity of the agent is not relevant in these cases.

It was suggested above that when the event is viewed from the patient's perspective the signer's eye gaze is toward the locus of the agent, but this may not be a requirement if some aspect of the scene allows for the signer to direct his or her gaze elsewhere. In (3) the signer's message is that he is being intruded upon by someone looking over his shoulder as he is typing. While the eye gaze is not in the direction of the agent in this case, it very well could be, and in fact because the event is construed as being from the patient's point of view, the eye gaze

could not shift to take on the perspective of the agent. A more extreme example is given in (5).

(5) (*When the Mind Hears* (A synopsis in ASL), © Harlan Lane)

DOCTOR WILLING SEE, CAN $COME_a$++ TWICE EVERYDAY++++

FOR TWO.WEEK. MEDICINE $_b$**INJECT.IN.EAR$_l$**++ (gesture to ear) TWO.WEEK.
'The doctor was willing to see him, saying he could come twice each day for two weeks. He was given medicine for the two weeks.'

While $_b$INJECT.IN.EAR$_l$++ still qualifies as passive in (5), it may not be quite as prototypical as the examples above in that the agent has been identified in the previous sentence. This passage is a good example, however, of a shift in perspective, from that of the doctor expressed in the verb $COME_a$++ 'come to' with the doctor at locus 'a', to that of the boy receiving the ear medicine. The doctor is clearly the agent (at the new locus 'b'), but the situation $_b$INJECT.IN.EAR$_l$++ is not viewed from the doctor's perspective, but rather, the recipient's. The event is unpleasant, in any case, and the patient is looking away from the agent. In a sense, the perspective of the patient is made even stronger by the signer, whose narration is about someone other than himself, but who employs an ASL grammatical device in which the signer uses his own body as a locus (locus '1') for the third person referent.

4. TOPICALIZATION IS NOT PASSIVIZATION

Givón (1990) suggests that topicality plays an important role in passivization, but in a language like ASL, in which sentences are likely to include a grammatical topic, this marked topic and the passive structure have different functions. Topicalization in ASL is not passivization. The topic sets the framework for the information to follow. Li and Thompson (1976) claim that in topic-comment languages, passivization is not really needed—any NP (among other things) can go in topic position, and there is no need for any other construction to defocus a subject. Yet there are topic-comment languages where both topicalization and passive constructions occur, such as Mandarin (Li and Thompson 1981) and argued here, ASL, but these two constructions have different functions.

In example (2) above, the topic marking on the verb complex $_a$NAMED$_l$ might be thought to have something to do with passivization, considering their proximity, but their connection is slight, if at all. The topic marking in this case occurs because the verb expresses a clearly accessible pragmatic piece of information from a cultural 'insider' point of view. The phrase could receive topic marking whether or not the perspective is from the agent or the recipient.

A marked topic occurring with an active construction in ASL is shown in (6).

(6) (*When the Mind Hears* (A synopsis in ASL), © Harlan Lane)

_____t

MOTHER DO-DO, TAKE+ FEEL GO CHURCH, TRAVEL(*uphill*). IN

_____t

CHURCH PRAY++. CLERC PRO.3$_a$ (gesture) $_1$**LET**$_a$ DO-DO WHAT.

'His mother decided to take Clerc to church, which was up the hill. In the church she prayed, but she let Clerc do what he wanted.'

In the second sentence of this example, CLERC is the topic constituent, and this is followed by a pronoun positioning Clerc in locus 'a'. The verb $_1$LET$_a$ is signed from the mother's point of view, with the movement beginning near the signer's torso (again, the signer's body stands in for the third person referent) and moving toward locus 'a', thus it is an active construction. In (7) topicalization occurs with a passive construction, but they are not one and the same.

(7) (*American Sign Language: A Student Text, Unit 1 - 9*, © Charlotte Baker and Dennis Cokely)

_____+nod _____t

YESTERDAY FINISH, B-I-L-L $_a$**GIVE**$_1$ 800.

'Yesterday I was given a bill for eight hundred dollars.'

Here the signer has been discussing taking his car in to the shop for repairs. The situation, which includes the unspecified, but obvious, agent at locus 'a', is coded as a topic in its entirety. Receiving a bill after the car has been fixed is an expected result, and therefore is completely accessible to the addressee. The defocused agent, presumably a shop employee or owner, is at best lumped in with the pragmatic understanding of the whole scene, but cannot be said to be the topic itself.

5. Reference shifting and passivization

Reference shifting (also referred to as role shifting by some) is a discourse feature by which the signer relays the actions or conversation of different characters in a narrative (Lillo-Martin 1995). Similar to what has been described above, the signer shifts his or her shoulders and torso slightly in the direction of each character, and typically looks briefly in the direction of another character.

Why then is the passive not just an instance of such reference shifting? While these two processes do share features, reference shifting in narrative is from agent to agent, that is, each shift changes the perspective from one agent to another. The passive, conversely, may involve a shift from one character to another, but in the passive construction, the perspective additionally shifts to that of the patient. Alternatively, the focus may remain on one character, but a shift may take place from the perspective of the character as an agent to the perspective of the same character as a patient. Example (8) is particularly illustrative of this.

(8) (*When the Mind Hears* (A synopsis in ASL), © Harlan Lane)
t
FATHER SEEM EMBARRASS HAVE DEAF SON, (emphatic gesture).

MEAN $_{a}$(***multiple***)**STARE.AT**$_{1}$.
'His father seemed embarrassed about having a deaf son. It meant that he would be looked down upon.'

(*perspective shift*) PRO.3$_{b}$ FAMILY HAVE DEAF, SOMETHING WRONG.
'(People would say) his family has a deaf son; there must be something wrong with them.'

In this section of discourse, we find both the type of reference shifting discussed by Lillo-Martin and a passivizing perspective shift. In the first sentence, FATHER is in focus and is marked as the topic, but in the following sentence the verb $_{a}$(*multiple*)STARE.AT$_{1}$ indicates a perspective shift, still maintaining the father as the NP in focus, but with the action carried out by a plural, unspecified agent. Plurality is indicated in this verb by all the signer's fingers being extended rather than just the index and middle fingers, and the beginning of the movement is once again associated with an unfilled locus 'a'. The locus '1', where the movement of the passive verb ends, further indicates that once again the signer is using his own body to represent the third person 'father'. Here the perspective is clearly from the patient's point of view, and the signer's eye gaze is directed toward the unfilled locus 'a'.

In the final sentence, however, the reference shift is from the father as patient to the townspeople who are staring at him. While these people's identity is never overtly stated, we can make this assumption because earlier in the narrative the father has been identified as the mayor of a small town. As well, the perspective shifts from the father as a patient to the townspeople as agent. The signer's shoulder and torso shifts slightly toward locus 'a' and he points to a new locus 'b', understood to be the father's (new) locus. The signer, now having the perspective of the townspeople, addresses the father, the action being from the townspeople's point of view. This brief passage, therefore, is explicit in identifying both the role of each NP within the whole construction and the perspective marked in the verb complex.

6. A WEAKLY DEMOTED AGENT

It is sometimes the case that an agent is named in the passive construction, although the examples below show that the NP in this subject position is only weakly agentive. But even though it is generally thought that there is evidence of ASL having a basic SVO word order (e.g. Fischer 1975, Liddell 1980), for topic-comment languages the subject may not be a particularly important category (Li and Thompson 1976, also cf. Mithun 1991 for a discussion of languages thought not to have a subject category).

Example (9) is a continuation of the discourse introduced in (4).

(9) (*American Sign Language: A Student Text, Unit 1 - 9*, © Charlotte Baker and Dennis Cokely)

q

a. THAT.ONE PRO.3_a A-A-A-D HOUSTON PRO.3_a THAT.ONE.
'The one from the A.A.A.D. Houston game?'[4]

b. SOMEONE $_b$**STEAL**$_{(up)}$.
'It was stolen/someone stole it.'

In (9b), rather than being designated a spatial locus in the sense described for NPs above, SOMEONE is signed on a slightly higher piane. The verb $_b$STEAL$_{(up)}$ first agrees with locus 'b' associated with the location of the item being stolen, and the movement of the verb is upward and slightly away from the signer. The situation is viewed from the perspective of the owner of the trophy (and the narrator). In this case the agent, which is possibly the grammatical subject, has increased slightly in terms of focus, but the situation is not viewed from the agent's perspective.

The event could be construed from the agent's perspective, however, if the movement of the verb were articulated from a locus in the signing space toward the signer's body. This would not in and of itself identify the signer as the thief, because as we have already seen, the signer is at liberty to have his or her own body act as a third person referent. This construal would have the characteristic of reference shifting to the point of view of another agent, as discussed in section 5 above.

A similar situation is apparent in (10).

(10) (*When the Mind Hears* (A synopsis in ASL), © Harlan Lane)

t

CLERC HIDE$_a$. STAY$_a$+ $_a$THERE. WHO $_b$**MEET**$_1$, CLERC $_1$LOOK.AT$_b$, FIRST DEAF TEACH-*agent*.
'Clerc hid and stayed there. Then to his surprise, he was approached by the first Deaf teacher.'

Even though WHO occupies the subject position to the extent that SOMEONE does in (9b), the verb $_b$MEET$_1$ is construed from the perspective of the patient, the person being met. The identification of WHO is then given. While this instance may not be a prototypical passive, it is strongly marked by the appropriate passive perspective.

7. THE RELATION OF PASSIVES TO STATIVES

This notion is introduced here, but it is clear that further work is needed to explicate this relationship for ASL. Nonetheless, the kind of stative exemplified by (11) has features in common with the passive constructions discussed above.

(11) (*American Sign Language: A Student Text, Unit 1 - 9*, © Charlotte Baker and Dennis Cokely)

MORNING, $_{a}$**GONE**$_{(up)}$.
'In the morning it (the trophy) was gone.'

First, there is no agent mentioned in this sentence, and thus it would be impossible to describe the situation from an agent's perspective. The trophy, being inanimate, cannot have a perspective, but it is in focus, as designated by locus 'a', and by the eye gaze of the signer in the direction of locus 'a'. The stative is a result of some action, and similar to the movement of the verb $_{b}$STEAL$_{(up)}$ in (9b), the stative situation described by $_{a}$GONE$_{(up)}$ in (11) is characterized by an upward movement from a specific locus.

8. DISCUSSION

In this paper we have given evidence for a passive construction in ASL. Further, we have shown that if all the features we describe are clearly in place, the passive can be considered prototypical. A construction may not always display all of these features, however, in which case it may be considered less than prototypical, but still not active. As such, it is appropriate to suggest that active and passive constructions lie along a continuum in ASL in the following manner:

(12)

Prototypical <----------> Prototypical	
Active	Passive
-agent is subject	-defocused agent
-perspective of agent	-perspective of patient
-agent is given information	-patient is given information
-semantically filled, syntactically specified agent locus	-no semantically filled, syntactically specified agent locus

We show here that, in at least some ways, both spoken and signed languages behave similarly in some grammatical constructions and processes, but if signed languages are as much languages as are spoken languages, there is no reason to use spoken languages as the only model. In this light, how do signed languages construct the passive? Morphology is often held up as the identifying marker, but in ASL morphological units may look entirely different from those in spoken languages, and further, the combination of morphological units results in constructions for which many conventional, and by and large linear, descriptions

of morphology are inadequate. Perspective, as we have described, appears to be a significant part of ASL verb morphology.

It is expected that the function of language, no matter if the language is spoken or signed, is similar, and evidence of the speaker's or signer's cognitive framework as it contributes to the arrangement of morphology and syntax is of significant interest. This is clearly shown in the arrangement of features in constructions in ASL like the active and passive—what is immediately in focus in the mind of the signer is going to affect the construction of the linguistic expression.

The function of the passive in ASL is to either give or maintain a particular point of view, and this is accomplished in the verb complex by putting or keeping a patient in focus, and is accompanied by the defocusing of the agent. While this discussion has not attempted to describe every aspect of active/passive expression in ASL, it is a beginning. Further study should give greater understanding of the characteristics and distribution of the passive construction in ASL.

REFERENCES

BARBER, E. J. W. 1975. Voice—beyond the passive. BLS 1. 16-24.

BYBEE, JOAN L. 1985. Morphology: A study of the relation between meaning and form. Amsterdam: Benjamins.

FISCHER, SUSAN D. 1975. Influences on word-order change in American Sign Language. Word order and word order change, ed. by Charles Li, 1-25. Austin: University of Texas Press.

GIVÓN, T. 1990. Syntax: A functional-typological introduction, Volume 2. Amsterdam: Benjamins.

HOPPER, PAUL J., AND SANDRA A. THOMPSON. 1980. Transitivity in grammar and discourse. Language 56. 251-99.

ISENHATH, JOHN O. 1990. The linguistics of American Sign Language. Jefferson NC: MacFarland & Company.

KEGL, JUDY. 1990. Predicate argument structure and verb-class organization in the ASL lexicon. Sign language research: Theoretical issues, ed. by Ceil Lucas, 149-75. Washington, DC: Gallaudet University Press.

LI, CHARLES N., AND SANDRA A. THOMPSON. 1976. Subject and topic: A new typology of language. Subject and topic, ed. by Charles N. Li, 457-89. New York: Academic Press.

LI, CHARLES N., AND SANDRA A. THOMPSON. 1981. Mandarin Chinese: A functional reference grammar. Berkeley: University of California Press.

LIDDELL, SCOTT K. 1980. American Sign Language syntax. The Hague: Mouton.

LILLO-MARTIN, DIANE. 1995. The point of view predicate in American Sign Language. Language, gesture, and space, ed. by Karen Emmorey and Judy S. Reilly, 155-70. Hillsdale NJ: Lawrence Erlbaum.

MITHUN, MARIANNE. 1991. The role of motivation in the emergence of grammatical categories: The grammaticization of subjects. Approaches to grammaticalization, Vol. II, ed. by E. C. Traugott and B. Heine, 159-84. Amsterdam: Benjamins.

SHIBATANI, MASAYOSHI. 1985. Passives and related constructions: A prototype analysis. Language, 61, 821-48.

STOKOE, W. C., JR., D. CASTERLINE, AND C. CRONEBERG. 1965. A dictionary of American Sign Language on linguistic principles. Washington DC: Gallaudet College Press.

WILBUR, RONNIE. 1987. American Sign Language: Linguistic and applied dimensions. Boston: College-Hill Press.

Notes:

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[2] ASL signs are notated as upper case English words. Signs that require more than one English word are given as words separated by periods, as in ONE.YEAR.PAST 'last year', and signs understood to be compound in nature are given as words separated by hyphens. Signs that have repeated movements are written with '+', as in SEE+++. Subscripts (e.g. 'a', 'b', '1', etc.) represent loci in the signing space that correspond to NP arguments. Pronouns are notated as PRO.1, PRO.2 and PRO.3 for 1s, 2s and 3s respectively. Possessives are notated as POSS.1, POSS.2 and POSS.3. Marked topic constituents are designated by '_____t', and yes/no questions are designated by '_____q'. Fingerspelled words are given in upper case letters separated by hyphens.

[3] '2h' indicates that the sign is articulated with two hands rather than the usual one.

[4] A.A.A.D. is the American Athletic Association of the Deaf.

Shifters, grammatical categories and distinctive features

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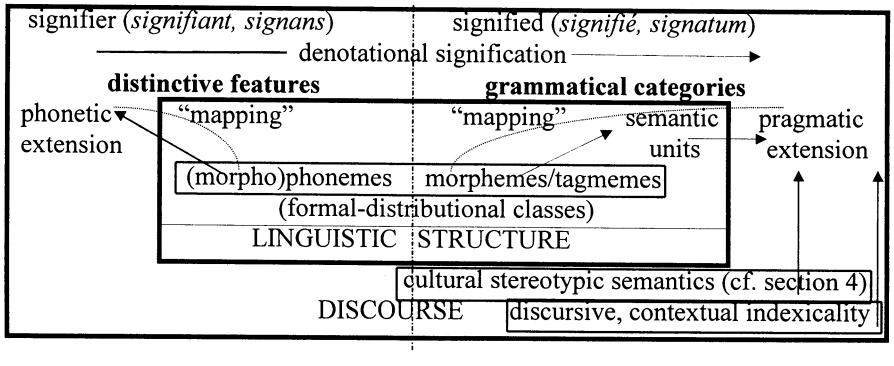
> *"Morphology will thus include those classes of words which we define, by analogy with phonology, as bundles of grammatical categories."* —E. Stankiewicz (1991:23)

1. Grammatical categories are distinct from formal-distributional classes.[1]

Drawing a right analogy from phonology—this has been a central problem in the domain of (morpho)syntax and semantics (cf. Jakobson 1971[1957], Aronson 1991, Silverstein 1993a), since the arguably inceptive phase of modern structural linguistics, when the "phoneme" idea was theoretically articulated by Baudouin de Courtenay, Kruszewski, Sweet, Saussure, Boas 1889, Sapir 1925, Bloomfield 1984[1933], *et al.*, all the way through the inter-war phase, when "the markedness hierarchy of distinctive features" was formulated by the Pragueans (and hinted at by Bloomfield 1984:79), up to, and, unfortunately, partially not including, today, when phonologists (or "phonotacticians") in some quarters have started to destroy phonology by drawing a wrong analogy from the "filter" idea in a syntactic theory which is, in the first place, based on a wrong analogy drawn from pre-"OT" phonology. That is, as I shall try to show, [1] the correct analogues of regular correspondences between phonemic *forms* and phonetic "*substances*" in the domain of (morpho)syntax and semantics are those between (morpho)syntactic *forms* and semantico-pragmatic "*substances*" (Lyons 1966, 1977); [2] the correct analogue of the *N*-dimensional space of distinctive features hierarchized on the basis of markedness asymmetry (cf. Cherry 1956, Silverstein 1985a, 1987) is "grammatical categories" in the classic sense, as in Bloomfield 1984:270[1933], Whorf 1945, Jakobson 1971[1957], to be strictly distinguished from (morpho) syntactic *form*-classes, discoverable through formal-distributional analyses, be they morphemic (most locally segmentable), morphological (focused on paradigmatic interrelations among morphemes and those syntagmatic units which are highly locally segmentable, coherent and thus "analogizable" with simplex morphemes, such as "words") or syntactic ("tagmemic"; focused on syntagmatic interrelations among morphological units *qua* sentential and phrasal constituents or bearers of so-called "grammatical relations" or "functions"); [3] the correct analogue of "phoneme" is "morpheme/tagmeme"; hence, *just as* a phoneme is a bundle of features, a morpheme/tagmeme is a bundle of grammatical categories, though, in the case of so-called "function (*vs.* "content") words," the number of categories might be a few or "ideally" single (i.e., *no* multiple or overlapping exponence in *any* syntagmatic position where such formal units have the privileges of occurrence); [4] *just as*, to derive an optimal set of distinctive features of the kind called "inherent" (Jakobson and Halle 1956: i.e., "local, segmental"; *vs.* "prosodic, global, supra-segmental"), it is not sufficient—though

necessary—to consider the privileges of occurrence of phonemes in formal syntagmatic positions, e.g., in syllabic structure (onset, nucleus, coda) *or* the articulatory, acoustic or perceptual correlates of phonemes, but *both* are required —that is, just as such "formal-functional double characterization" (*à la* Martinet) is required for getting a right set of distinctive features, a right set of grammatical categories cannot be obtained unless we take into consideration *both* (morpho) syntactic formal-distributions *and* semantico-pragmatic categories; [5] thus, *just as* the markedness hierarchy of distinctive features, partially characterized by *universal* phonetics (*humanly* perceivable and differentiable sounds, *inter alia* those which are saliently so), is needed to map one *L-specifically autonomous* phonological system onto another, a structured set of grammatical categories, partially characterized by universal semantico-pragmatics, is needed to map one L-specifically autonomous (morpho)syntactic system onto another (cf. Koyama 1999); [6] similarly, *just as* the markedness hierarchy of distinctive features may be used as a universal, cross-linguistically valid "metagrammar" (cf. "evaluation procedure") for measuring the "naturalness" of a "structural (re)statement" of a phonological system, which is otherwise purely "autonomous" and the grammatical description of which should proceed completely system-internally in terms of maximal pattern congruity, maximal regularity and "the genius of the language" (e.g., VH in Turkish, palatalization in Russian) *insofar as* it conforms to the universal matrix of "naturalness" (cf. Kisseberth 1969, Hyman 1970, Haiman 1972)—that is, just as the markedness hierarchy of features provides universal constraints ("a calculus of possibilities") on phonological "spaces" in which particular phonological systems construct unique, autonomous and regular formal patterns, a structured set of grammatical categories provides universal constraints on the freedom of particular (morpho)syntactic systems to build unique, autonomous and regular formalisms (cf. Silverstein 1995, Koyama 1999); and, finally, [7] *just as* "formal-functionally" characterized distinctive features "map" (in the sense specified thus far) phonemic forms onto phonetic "substances," grammatical categories map (morpho)syntactic forms onto semantico-pragmatic substances (cf. Silverstein 1993b, Koyama 1999). See the following schematization for a two-dimensional visual display of the arguments.



2. Linguistic structure is a formal *code* for *denotational* signification.
In view of the current popularity of, on the one hand, reductionist formalism—which infers from the well-argued-for *irreducibility* of linguistic structure to pragmatic factors (be they social, psychological, neuro-physical) the dubious conclusion that the latter are *irrelevant* to the former—and, on the other hand, reductionist functionalism—which infers from the well-argued-for necessary existence of pragmatic constraints on linguistic structure, the similarly dubious conclusion that the *specifics* of formal-structural regularities are *directly determined* by some *general* cognitive/neural factors (cf. Koyama 1997c)—in view of such reductionisms, it is important to recall the double implication of a "discovery" on which modern linguistic has been built: the phoneme idea. First, as is well recognized, the fruitfulness of this idea in attaining theoretical coherence and empirical findings has made it clear that, as most forcefully articulated by Saussure, Hjelmslev, Bloomfield, Chomsky, *et al.*, the domain of "phonemics" (or, more generally, linguistic structure) is irreducible to phonetics (or, more generally, "(per/il)locutionary" speech or *parole*, "what we do with words," or even "pragmatics" in a wide sense of *Praxis*, "what we do" *simpliciter*; cf. Koyama 1997a). Note that phonemes are *not* mere phonetic *regularities* (not to mention particular phonetic tokens), which allophonic "surface representations" are. Similarly, sentence-*types*, which belong to linguistic structure, are distinct from (though interrelated with), and irreducible to, the statistical regularities of sentence-*tokens*, which belong to the domain of phonetics and *pragmatics* (cf. Lyons 1977).[2] Notice, then, what (morpho)syntacticians ought to study, if we are to draw a correct analogy from phonology, which, of course, centrally studies regular correspondence patterns between (morpho)phonemes and allophones, is correspondence patterns between (morpho)syntactic formal-distributional structural types and the pragmatic "extensions" (cf. Lyons 1977, Koyama 1997c) which regularly correspond to them, such as reference and modalized predication—or more precisely, the (semantic-)denotational parts of these illocutionary types,[3] since not only the denotational extensions of linguistic semantics, but also discursive indexicality (cf. Halliday and Hasan 1976, Bolinger 1979), sociohistoric continuity of usage (cf. Kripke 1972) and "cultural stereotypes" (Putnam 1975) *regularly* contribute to reference and predication in discourse (cf. Silverstein 1981, 1987; Koyama 1997a, b, c, 1999). Thus, it is an error to find analogues of phoneme-to-allophone correspondences in "DS"-to-"SS" interrelationships (or their more "surface-y" equivalents), while marginalizing what deserves to be a central focus of structural analysis—that is, correspondence patterns between (morpho)syntactic forms and semantico-pragmatics—in an awfully powerful "filter"-like "module" of "semantic interpretation" ("LF"), with its radically reconstructive logico-*semantic* devices yielding, moreover, (*not* purely semantico-denotational, but *pragmatico-referential*) *propositions* associable with the *pragmatic* regularities of sentence-*tokens*.

This is, in fact, what the other half of the "double implication" teaches us. The fertile consequences of the "phoneme" idea have decisively shown us that what matters is not mere physical (articulatory, acoustic or perceptual) sounds, but their capacity to signal *denotational signification qua signifiants* (cf. "minimal pair"). Thus, though structural forms—be they phonemic, morphemic or tagmemic (syntactic)—have "autonomy" of their own insofar as they have *sui generis* characteristics (cf. categorical perception; structure sensitivity of, say, movement "rules" and binding conditions; endocentric and exocentric "projections"; *valeur « purement » oppositive, relative et négative*; etc.) and are irreducible to, and only *indirectly* and *interactingly* interrelated with, phonetico-pragmatic externalities as a systemic totality (*"un système où tout se tient,"* as Meillet taught us)—despite such formal autonomy, linguistic structure has denotational signification as its teleological, pragmatico-functional *raison d'être* (cf. "means-ends" model of Jakobson 1960). In fact, the most deeply entrenched, if not necessary, conditions for us to call something "a (natural) language" are: [1] its regularities are maximally (relative to those of other semiotic phenomena) *ir*reducible to pragmatic, behavioral regularities ("arbitrary," "symbolic"; *faculté de langue*) and [2] it functions *denotationally* (cf. Benveniste's papers in his *PLG I, II*). From this, it follows that both reductionist formalism and reductionist functionalism are, *in principle*, *wrong*.

Thus, pragmatics is important for (morpho)syntax at least as much as phonetics is important for phonology. In fact, this is a correct lesson we should draw from Jakobson's 1971[1957] seminal paper "Shifters, verbal categories, and the Russian verb" (cf. Aronson 1991). To understand this, recall that, earlier, Jakobson formulated a theory of "markedness hierarchy of distinctive features" on the basis of formal-functional *double* characterization, the one phonological (formal) and the other phonetic (extensional, non-structural, "functional"). First, distinctive features are the logical consequences of the idea of phonemes as distinctively signifying forms; just as phonemes distinguish morphemes one from another, distinctive features distinguish phonemes one from another. What is important to note here, however, is that the inverse relationship also holds, though this may be obvious only in some transparent cases. That is, as clearly seen in minimal pairs, phonemic distinctions are *also* based on morphemic/tagmemic (and ultimately semantico-denotational) differences. Now, morphosyntactic forms, of course, distinguish semantico-denotational units. Inversely, morphemic and syntactic differences are based on semantico-denotational (*as well as*, of course, phonemic) differences. This is clear in some transparent cases where phonemically identical morphemes are distinguished on the basis of their semantico-denotational differences (homonyms). Thus, if we want analogues of distinctive features *within* (morpho)syntax/semantics/denotation, we should use semantico-denotational units (as well as formal ones). But, of course, we need something as universal (cross-linguistically applicable) and widely recurring across languages as distinctive features. Clearly, then, we should not start from

what distinguishes, say, *bank-*$_1$ from *bank-*$_2$, but *from the top down*, from general and from simple, that is, from universally manifested illocutionary types (reference, predication, deictic types, etc.) and their semantico-grammatical correlates, as Jakobson indeed did in "Shifters," by characterizing grammatical categories by general features based on cross-linguistically valid pragmatics, such as "P(articipant)," "E(vent)," "S(peech)," "N(arrated)."

Second, formal-distributionally, the privileges of occurrence of various phonemes in asymmetric positions in the formal structure of syllable, as investigated cross-linguistically, lead to empirical generalizations about the sonority hierarchy, which may be formulated in terms of the hierarchy of privatively asymmetric, marked-*vs*.-unmarked features and the neutralization of (un)markedness. For instance, a set of phonemes which have maximal privileges to occur in the syllable peak position, i.e., vocalic phonemes, has a characteristic which distinguishes this set from the rest, [+syll]. Moreover, they also have characteristics shared by the less privileged phonemes that are, however, more privileged than other phonemes: e.g., [+son], [+voi], etc. Hence, [+syll] $\supset$ [+son] $\supset$ [+voi], but not the inverse, so that vocalic phonemes are *un*specified for the features [son] and [voi] (whose markedness values are thus *intensionally* neutralized) and the sonorant-ness and voicedness of their phones are automatically implicated at the level of phonetic discourse, though, such implicatures (*vs*. entailment: cf. Levinson 1983) are contextually defeasible, as in Japanese, where vocalic phonemes have devoiced allophones in some interconsonantal environments. Inversely, those phonemes which have much less privileges to occur in the syllable peak position, e.g., oral plosive phonemes, must be *specified* for the privatively (not equipollently) oppositional values of "+" or "-" for [voi], where "+" signals the specific information about voicedness which "-" fails to signal (i.e., "~(signaling voicedness)," *but not* "signaling(~voicedness)" (cf. Waugh 1982, Silverstein 1986)). At the level of phonetic discourse, of course, [-voi] implicates unvoicedness, in an effectively equipollent opposition to [+voi], without which, note, such a mere implicature *disappears*, as in the classic Trubetzkoian (*extensional*) neutralization, where the *unmarked* value appears, not signaling voicedness (*vs*. signaling *un*voicedness).

Observe, now, as pointed out by H. P. Grice, Horn 1984 and Silverstein 1985c, 1986, an exact parallel obtains in the interrelationships between formal (morpho)syntax, grammatico-semantics and pragmatics. As Silverstein 1976, 1981, 1985a, 1987 has articulated in a series of papers, a set of morphosyntactic forms which have maximal privileges to occur in the formal positions that (not necessarily uniquely) correspond to the grammatical category "first person" (a subordinate, specific, complex grammatical category derived from interactions among superordinate, general, simple ones such as "nominal," "nominative/ergative/'agentive' case," "argument of true transitive predicate," "indexical-denotational," etc., as is widely known after Silverstein 1976)—i.e., "first person" forms—has a characteristic which distinguishes this set from the rest, [+ego].

Moreover, they also have characteristics shared by the less privileged forms that are, however, more privileged than other formal units: e.g., [+human], [+animate], etc. Thus, at the level of NP grammatical categories (analogous with that of distinctive features), [+ego] ⊃ [+human] ⊃ [+animate] obtains, but not the inverse; hence, the formal unit which corresponds (not necessarily uniquely) to the grammatical category of "first person" is *un*specified for the features [human] and [animate] (whose markedness values are thus *intensionally* neutralized) and the humanness and animacy of its denotatum are automatically implicated at the level of discourse, though, such implicatures are contextually defeasible, as in syntactically well-formed, yet semantically contradictory/referentially infelicitous or metaphorically effective sentence-types/tokens, such as *I am a book*, etc. (cf. the "colorless green ideas" sentence-type). Inversely, those (morpho)syntactic forms which have less privileges to occur in the syntactic positions corresponding to the superordinate grammatical categories noted above, e.g., (non-speech participant) "animate" nouns (such as *dog-s*, *govern-or-s*) must be *specified* for the privatively (not equipollently) oppositional values of "+" or "-" for [human], where "+" signals the specific information about 'humanness' which "-" fails to signal (i.e., "~(signaling 'humanness')," *but not* "signaling(~'humanness')"). At the level of pragmatic discourse, of course, [-human] implicates un-humanness, in an effectively equipollent opposition to [+human], without which such a mere implicature disappears, as in (*extensionally*) neutralized uses of *animal-*, whose denotational extensions in a universe of discourse include humans, when its contexts of use make the opposition pragmatically insignificant. Note that, again, it is the unmarked value that appears, not signaling humanness (*vs.* signaling *un*humanness). The parallelism stands.

Third, the hierarchical stratification of distinctive features is constrained/ reflected by cross-linguistically manifested formal patterns of phonemic inventories. For example, a cursory look at typological comparisons of phonemes across languages makes clear the "basic-ness," generality, superordination, prototypicality of the distinction between vocalic and consonantal phonemes, in relation to more specific, subordinate distinctions between, say, [acute/grave] (i/u, t/p), between [voiced/unvoiced] (p/b, t/d, k/g), etc. (cf. Jakobson and Halle 1956), as can be formulated in implicational hierarchy. To be sure, such *inductively* derived cross-linguistic generalizations allow exceptions: e.g., despite the overwhelmingly manifested prototypicality of voiceless oral plosive phonemes (p/t/k) in the consonantal set, some Australian languages have only *voiced* oral plosives. This sort of exceptionality clearly indicates the futility of any reductionistically functionalist enterprise which mistakenly locates—essentializingly hypostatizes—typological universals (cross-linguistic generalizations, many of which are extensionally, structure-externally motivated) *within* particular languages *by piecemeal*, thereby destroying their systemic integratedness (e.g., "OT"). Typological universals, being *cross*-linguistic generalizations, do not belong to the same epistemico-ontic order as particular

languages ("grammars"); they are to be seen as indicating the organization of a "*meta*grammar" which we construct as the markedness hierarchy of distinctive features or the hierarchy of grammatical categories, which we use to *predict* the organizations of particular languages on the basis of cross-linguistically valid implicational relationships, measure the "*naturalness*" of structural (re)statements of languages in view of their conformity to cross-linguistic generalizations, and *explain* the existence or the lack thereof of some phonemic or (morpho)syntactic form-classes on the basis of "functional unity." For instance, Heath 1975 shows that if a language has a maximally elaborately "grammaticalized" (formalized) system of gender and number, it has a minimally elaborately formalized system of switch-function (e.g., formally calculable anaphoric coreference) and switch-reference (coded by, e.g., "same/different" formal markers), and inversely (cf. Foley and Van Valin 1984:321-74). Only by understanding the *distinct* morphosyntactic form-classes not only as structurally different, but also in relation to these grammatical categories, and the latter in relation to the superordinate grammatical category of *reference maintenance*, can we satisfactorily *explain* the organizations of particular languages (cf. Koyama 1999). Formal-distributional generalizations yielding hypotheses to be "tested" ("explanations" in some theories), albeit necessary, are not enough.

Similarly, note, different phonological systems use *distinct* formal means ("rules") to achieve similar ends ("functions") which conform to typological generalizations obtaining across languages. For instance, Haiman 1972 shows that *structurally varied* VH rules in Turkish, palatalization in Russian, etc., function ("conspire") to achieve the vocalic triad of /a, i, u/, the prototypicality of which is universally manifested (cf. Jakobson and Halle 1956, Lass 1984). Note, then, that universal generalizations/constraints, which we formulate in terms of the hierarchical organizations of distinctive features and grammatical categories, are satisfied by particular languages in *distinct* formal-distributional means ("rules"), which are *fully integrated* in the particular and "autonomous" *systèmes où tout se tient* ("interactions of rules"). That is, *interactions* of structurally, formally distinct elements correspond to "significant generalizations" and "functional unity," which are usually phonetically and pragmatically motivated. From this, it follows not only that writing a grammar (e.g., constraints ordered in ranks) that purports to "collapse" (Kisseberth 1970) phonetically/functionally identical, yet structurally distinct rules and *directly* inscribe (essentialize) phonetic/functional characteristics *in* "rules" (a.k.a. "constraints," "correspondence patterns") is *wrong*, but also that there are no one-to-one correspondences between specific forms (be they phonemic or (morpho)syntactic) and "functions" (be they distinctive featural, phonetic, grammatical categorial, semantic or pragmatic), but only many-to-many, "bi-*non*-unique," "prototypic" *correspondences* (which, alas, many confuse with the non-discreteness of formal classes or featural, grammatical and semantic categorial "functions" *within their own respective domains*, thereby making inexplicable the empirically attested phenomena of "categorical

perceptions," where, e.g., glottalized or aspirated *peripheral* phones and *prototypic* phones of a voiceless oral stop are phonemically *no different*; and Donnellan's (1966, 1978) "attributive" or "*semantic*" (*vs.* "*referential*" or "speaker") use of definite NPs: e.g., *the animals lions eat* [*whatever they are*], where zebras and penguins are semantico-denotationally *no different*; prototypic correspondences are not the same as non-discrete categorizations).

In so comparing formal systems and deriving typological generalizations from them, we have already made an implicit appeal to phonetic correlates of phonemes (just as formalists make an implicit appeal to semantico-pragmatics in substantively labeling nodes in (morpho)syntactic configurations, setting up *ad hoc* "features" and selection restrictions, etc., in *un*principled ways), since cross-linguistic comparison is, strictly speaking, antithetical to the formalist doctrine of the purely "negative" (contrastive, system-internal) definitions of the *valeurs* of structural units (cf. *CLG*). Now, what is so significant about the theory of distinctive features is that generalizations about perceptual characteristics of phonetic units turn out to relatively transparently map onto cross-linguistic generalizations derivable from phonemic inventories of particular languages, and such "mapping" is *principled*, in that the most basic, prototypical distinctions observable across linguistic structures (e.g., [vocalic/consonantal]) are the ones which differentiate those which are perceptually maximally distinctive "polar opposites" (e.g., low vowels *vs.* unvoiced oral plosives) (cf. Jakobson and Halle 1956, Silverstein 1993a). In other words, the hierarchization of features "evolves"—proceeds—from maximal to minimal contrastiveness: i.e., from general to specific, from more to less salient, and from simplex to complex, a pattern which is also seen in the linguistic coding of "basic color terms" (cf. Sahlins 1976, Silverstein 1993a). Then, we expect to find that superordinate, basic, general and simplex grammatical categories differentiate the most general, simplex illocutionary types such as referring, predicating, deictic indexing, etc., as Jakobson 1971[1957] saw clearly.

3. Grammatical categories, from the top down.

Thus, in the spirit of "Shifters," we try to identify maximally basic, prototypical illocutionary types. By the "functional definition" of linguistic structure made explicit above, it is clear that (1) *reference* and (2) (tensed-and-modalized) *predication* must be one of such prototypic dimensions which "functionally" constrain the organization of grammatical categories (cf. Dixon 1982:1-62). It is easy to see that this dimension is orthogonally cross-cut by that of (a) *paradigmatic* selection and (b) *syntagmatic* sequence.[4] Consequently, they generate a space of four pragmatically characterized "modules": 1a) *referential paradigm*, 2a) *predicational paradigm*, 1b) *referential syntagm* and 2b) *predicational syntagm*. Note that 1a) corresponds to *nominal* (NP) grammatical categories (e.g., roughly, person deictic, anaphor, demonstrative, proper name, human term, animate term, etc.[5]; further cross-cut by noun class/nominal

classifier, number, etc.; cf. Silverstein 1976, 1986, 1987); 2a) corresponds to *predicate* grammatical categories (e.g., denotational verb class, valence, case *vis-à-vis* arguments, topical ordering of arguments: cf. *give- vs. receive-*, aspectual *Aktionsart*); 1b) corresponds to the categories of *reference maintenance* (cf. Heath 1975, Silverstein 1985a, Koyama 1999); and 2b) corresponds to the categories of *interclausal linkage* (cf. Foley and Van Valin 1984, Van Valin 1993). These "modules" seem to comprise a pragmatically correlated general matrix of grammatical categories which maps (morpho)syntax to semantico-pragmatics. See below for a 2-D visual representation of the arguments.

	(1) referential	(2) predicational
paradigm (a)	nominal categories (1a)	predicate categories (2a)
syntagm (b)	reference maintenance (1b)	interclausal linkage (2b)

Recall, here, Heath 1975, which shows that the morphosyntactic form-classes corresponding to the grammatical categories of gender and number in the *paradigmatic* module of nominal categories (1a) "function" as important part of the grammatical category of reference maintenance (1b), which, being a *syntagmatic* phenomenon, is "prototypically" marked by *syntactic* formal-distributional mechanisms of switch-function/switch-reference. This illustrates *interactions* of grammatical categories where paradigmatic grammatical categories are "projected" onto syntagmatic ones (1a→1b), thereby generating the "functional unity" of distinct formal classes. And it is these interactional behaviors of grammatical categories (*independent* variables) that serve as *explicata* for the *dependent* phenomena of prototypic-to-peripheral, *differential gradience* and *gradation* of "grammaticality" of syntactic formal-distributional patterns, such as Rossian "squishes" (cf. Silverstein 1993b, Koyama 1999): e.g., (*syntactic*) (anti)passivizability of sentence-types, a *dependent* variable, is differentially affected by the differences among *independent* variables such as the (*paradigmatic*) categories of NPs as well as the (*paradigmatic*) categories of predicates that figure in such *syntactic* sentence-types, as well as, to be sure, such pragmatic variables as referential thematicity and social indexical deference (as in Malagasy and, metaphorically, Japanese.)[6]

As Jakobson 1971[1957] pointed out, this "matrix" of grammatical categories is orthogonally cross-cut by another "prototypical" opposition, non-indexical types *vs.* denotational-indexicals ("deictics" and "shifters"; cf. Jespersen 1922): e.g., this dimension of (non)indexicality intersects 1a), 1b), 2a) and 2b), as pervasively manifested in such diverse phenomena as noun compounds ("semantic" *vs.* "deictic" in Downing 1977), attributively modifying adjectives ("reference-" *vs.* "referent-modification" in Bolinger 1967), sense *vs.* referent anaphora, nonspecific *vs.* specific indefinite NPs, Donnellan's (1966) "attributive" *vs.* "referential" uses of definite NPs, etc.[7] Moreover, once we understand this opposition in terms of the *degrees* of pragmatic (deictic, indexical)

presupposability of referents in felicitous reference, it becomes immediately clear that the very same principle generates, in the domains of 1a) and 1b), the *gradiently* organized "agency" hierarchy of NPs (cf. Silverstein 1976, 1981) and the *gradiently* organized order of co-referential NPs from *less* presupposing (e.g., full NP-*cum*-embedded S) to *more* presupposing ones (e.g., zero anaphora) (cf. Halliday and Hasan 1976, Bolinger 1979, Silverstein 1985a), respectively. With an even finer distinction between two kinds of "presupposability," i.e., Searle's (1969) distinction between the pragmatic presupposability of existence and other *quantifiability* of referents, on one hand, and the presupposability of their *characterizability* ("descriptive backing" in Searle 1969), on the other, we can reticulate, in the domains of 1a), 1b), 2a) and 2b), nominal categories in terms of number *vs.* noun class (cf. Jakobson 1971), predicate categories in terms of aspect *vs.* verb class (cf. *Ibid.*), nominal classifiers in terms of mensural *vs.* sortal (cf. Lyons 1977:463), verbal classifiers in terms of aspectual *vs.* predicate structural (cf. Silverstein 1986), the tightest interclausal linkages in terms of aspectual *vs.* causative, the tightest non-complement interclausal linkages in terms of temporal adverbial clause *vs.* conditional, etc., respectively. Thus, *just as* distinctive features reticulate a phonetico-phonological universe, grammatical categories reticulate a universe of denotational-semantics and (morpho)syntax. The parallelism stands.

4. A plea for *grammatical* semantics (*vs.* lexical, pre-structural(ist) semantics). Semantics, then, should be construed in such grammatical categorial terms from the top down. This is, indeed, what Putnam 1975 has taught us: e.g., the *grammatically* encodable, linguistic semantics of *water-*, e.g., 'substantive,' 'inanimate,' 'mass,' is to be distinguished from its cultural stereotypic semantics, e.g., 'colorless,' 'transparent,' 'tasteless,' 'thirst-quenching,' 'H_2O,' etc., which varies across speech communities *within* a single linguistic community (cf. Gumperz 1972, Koyama 1997a.)[8] That is, like (morpho)syntax (cf. Bloomfield 1984:274) and grammatical categorial structure (cf. Whorf 1945), we deal with (linguistic structural) semantics *from the top down*: i.e., those which correspond to superordinate grammatical categories. For example, the *structurally* semantic "content" of the (formally) simplex morpheme *I* is *indirectly*, *interactingly* and *complexly* determined by its privileges of occurrence in various (morpho)syntactic configurations (e.g., NP slots, case-markings, etc.), which have more direct, more transparent and simpler correspondences with superordinate, basic grammatical categories (e.g., nominal, nominative case, etc.), semantics (e.g., 'substantive,' 'Agent-of,' etc.) and pragmatics (entity, agent-of-speech, etc.), which generate the more specific and subordinate correlates of the morpheme *I* (e.g., the grammatical category of "first person singular"), by multiply intersecting, and interacting with, one another. Lexicon is, let us recall, a *fully interlocked part* of grammar, as Saussure and Boas taught us in the earliest phase of the first century of structural linguistics.

5. Interlockedness of *langue* and *parole*, or "formalism" and "functionalism." And with remembrance we end off this *explication de texte* (*jakobsonien*). As this century of structural linguistics comes to its *dénouement* (or anticlimax, possibly), let us recall a truth on which our discipline is founded: "*There is no langue without parole and no parole without langue; these two aspects of language 'presuppose each other,' as Saussure put it*" (Jakobson 1990:109). *Linguista sum; linguistici nihil a me alienum puto. Langue* and *parole*: autonomous, yet interlocked. A science of *langage*, a totality.

Notes

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[1] This paper is an extensively revised and, hopefully, improved version of Koyama (1997c).

[2] Similarly, moods and modalities (in structure) are distinct from, though interrelated with, pragmatic regularities of "speech acts" (in the sense of Austin and his followers), as is known by anyone familiar with the vast literature on "indirect speech act" (cf. Koyama 1997a). Similarly, *mutatis mutandis*, for any other "denotational-indexical" types (cf. Jakobson 1971[1957]) and, though more opaquely, for any other linguistic types, the semantico-denotational correlates of which should not be equated with the regularity of reference and modalized predication associable with their occurrences.

[3] They are major parts of what is called "attributive use" or "semantic reference" in the literature of pragmatics, after Donnellan 1966, 1978 and Kripke 1979.

[4] Recall that Saussure postulated paradigmatic ("associative") and syntagmatic axes in structure *on the basis of* the pragmatic "reality" of such axes in discourse. Note that, in referential pragmatics, as articulated by Firbas, Daneš, and other Pragueans, a theme-to-rheme *sequence* obtains on syntagmatic axis, and a *first* rheme (R1) becomes a theme (T1) in relation to a *second* rheme (R2; note the ordinal *sequence*), where the principle of (referential) equivalence obtains between R1 and T1 along paradigmatic axis (cf. Jakobson 1960 on "the principle of equivalence"). Similarly, in non-referential, social indexical pragmatics (cf. Koyama 1997a, b), as articulated by Ervin-Tripp 1986[1969] under the rubric of "alternative" *vs.* "(horizontal) co-occurrence" rules, a request-to-reply *sequence* obtains on syntagmatic axis, and the subcategories of reply such as reject and comply are distributed on paradigmatic axis and are (non-referentially) equivalent to the extent that they are replies. Similarly, again, deference (defeasibly) indexed by the use of a token of an honorific "register" may be *followed*, on syntagmatic axis, by another deference similarly indexed, or (paradigmatically) *alternatively*, by the lack thereof indexed by the use of a token of a "plain" or "derogatory register." Among these (tokens of) alternative registers, the principle of equivalence obtains not only non-referentially (to the extent that they signal degrees of "honorificity," positive or negative), but also referentially (but not exactly semantico-denotationally, to be precise) (cf. Koyama 1997a, b).

[5] The stipulation of these grammatical categories is constrained morphosyntactically by behaviors of accusative/ergative case-markings ("split case-marking"), and pragmatically by the degrees of presupposability of denotata in speech events (cf. Silverstein 1976, 1981, 1985a, 1987).

[6] *Pace* reductionistic formalists, such pragmatic variables must be *identified* and *controlled* if we try to describe the linguistic structural, non-pragmatic characteristics of (anti)passives. Also, *pace* reductionistic functionalists, to conflate them under the all-encompassing rubric of some putative, ill-defined and ill-understood "prototype" (e.g., "de-agentivization") does us no good and is circular as explanation, however intuitively appealing it might be (cf. Agha 1993).

[7] The Donnellanean distinction, in fact, seems to be reducible to the combination of (1) indexical (= pragmatic) *vs.* "symbolic" (= syntactico-semantic), understood in terms of (2) the Jakobsonian

subtaxonomization of "metalanguage" (*métalangage*) to "metasemantics" (*métalangue*) and "metapragmatics" (*métaparole*); and (3) the Searlean distinction between the presupposability of existence and quantifiability (e.g., uniqueness) *vs.* that of descriptive characterizability (cf. Silverstein 1985b).

[8] This does not mean, of course, there is no *interaction* between the two *distinct* kinds of semantics. Structural-discursive processes of encoding of such cultural stereotypes into noun classes and nominal classifiers in structure are analyzed in Silverstein 1985c, 1986, 1993b (e.g., *vis-à-vis* Dyirbal); Compound nouns, as analyzed by Downing 1977, show more "micro-level," discursively centered processes.

References

Agha, Asif. 1993. *Structural Form and Utterance Context in Llasa Tibetan.* New York: Peter Lang.

Aronson, Howard I. 1991. "Towards a typology of verbal categories." In L. R. Waugh & S. Rudy eds., *New Vistas in Grammar.* Amsterdam: John Benjamins. pp.111-31.

Bloomfield, Leonard. 1984[1933]. *Language.* Chicago: University of Chicago Press.

Boas, Franz. 1889. "On alternating sounds." *American Anthropologist* 2:47-53.

Bolinger, Dwight. 1967. "Adjectives in English." *Lingua* 18:1-34.

_____. 1979. "Pronouns in discourse." In T. Givón ed., *Syntax and Semantics, vol. 12: Discourse and Syntax.* New York: Academic Press. pp.289-309.

Cherry, E. Colin. 1956. "Roman Jakobson's 'distinctive features' as the normal co-ordinates of a language." In M. Halle, *et al.* eds., *For Roman Jakobson.* The Hague: Mouton. pp.60-4.

Dixon, R. M. W. 1982. *Where Have All the Adjectives Gone?* Berlin: Mouton.

Donnellan, Keith S. 1966. "Reference and definite description." *Philosophical Review* 75:281-304.

_____. 1978. "Speaker reference, descriptions and anaphora." In P. Cole ed., *Syntax and Semantics, vol. 9: Pragmatics.* New York: Academic Press. pp.47-68.

Downing, Pamela. 1977. "On the creation and use of English compound nouns." *Lg.* 53:810-42.

Ervin-Tripp, Susan. 1986[1969]. "On sociological rules." In J. J. Gumperz & D. Hymes eds., *Directions in Sociolinguistics.* Oxford: Basil Blackwell. pp.213-50.

Foley, William A., and Robert D. Van Valin, Jr. 1984. *Functional Syntax and Universal Grammar.* Cambridge: Cambridge UP.

Gumperz, John J. 1972[1968]. "The speech community." In P. P. Giglioli ed., *Language and Social Context.* London: Penguin. pp.219-31.

Haiman, John. 1972. "Phonological targets and unmarked structures." *Lg.* 48(2):365-77.

Halliday, M. A. K. and Ruqaiya Hasan. 1976. *Cohesion in English.* London and New York: Longman.

Heath, Jeffrey. 1975. "Some functional relationships in grammar." *Lg.* 51:89-104.

Horn, Laurence R. 1984. "Toward a new taxonomy of pragmatic inference: Q-based and R-based implicature." In D. Shiffrin ed., *GURT 1984.* Washington, D.C.: Georgetown UP. pp.11-42.

Hyman, Larry M. 1970. "How concrete is phonology?" *Lg.* 46(1):58-76.

Jakobson, Roman. 1960. "Concluding statement." In T. Sebeok ed., *Style in Language.* Cambridge: MIT Press. pp.350-77.

_____. 1971[1957]. "Shifters, verbal categories, and the Russian verb." In *Selected Writings, vol. 2.* The Hague: Mouton de Gruyter. pp.130-47.

_____. 1990[1942]. "Langue and parole." In L. R. Waugh & M. Monville-Burston eds., *On Language.* Cambridge: Harvard UP. pp.80-109.

_____. and Morris Halle. 1956. *Fundamentals of Language.* The Hague: Mouton.

Jespersen, Otto. 1922. *Language.* London: Allen and Unwin.

Kisseberth, Charles L. 1969. "On the abstractness of phonology." *Papers in Linguistics* 1(2):248-79.

_____. 1970. "On the functional unity of phonological rules." *Linguistic Inquiry* 1:291-306.

Koyama, Wataru. 1997a. "Desemanticizing pragmatics." *Journal of Pragmatics* 28:1-28
___. 1997b. "Dishonorable honorifics." *CLS* 33, *vol. 2: The Panels*:45-57.
___. 1997c. "'Phonologizing' syntax and semantics." Paper presented at the 23rd BLS.
___. 1999. "Reference entailment and maintenance mechanisms in universal grammar of Japanese." *Studies in Language* 23(1):105-47.
Kripke, Saul A. 1972. *Naming and Necessity*. Cambridge: Harvard UP.
___. 1979. "Speaker's reference and semantic reference." In P. A. French *et al.* ed., *Contemporary Perspectives in the Philosophy of Language*. Minneapolis: University of Minnesota Press. pp.6-27.
Lass, Roger. 1984. *Phonology*. Cambridge: Cambridge UP.
Levinson, Stephen C. 1983. *Pragmatics*. Cambridge: Cambridge UP.
Lyons, John. 1966. "Towards a 'notional' theory of the 'parts of speech.'" *Journal of Linguistics* 2:209-36.
_____. 1977. *Semantics*. (2 volumes.) Cambridge: Cambridge UP.
Putnam, Hilary. 1975. "The meaning of 'meaning.'" In *Philosophical Papers, vol. 2*. London: Cambridge UP. pp.215-71.
Sahlins, Marshall. 1976. "Colors and cultures." *Semiotica* 16:1-22.
Sapir, Edward. 1925. "Sound patterns in language." *Lg.* 1:37-51.
Searle, John R. 1969. *Speech Acts*. Cambridge: Cambridge UP.
Silverstein, Michael. 1976. "Hierarchy of features and ergativity." In R. M. W. Dixon ed., *Grammatical Categories in Australian Languages*. Camberra: Australian Institute of Aboriginal Studies. pp.112-71.
___. 1981. "Case marking and the nature of language." *Australian Journal of Linguistics* 1:227-44.
_____. 1985a. "Noun phrase categorial markedness and syntactic parametricization." *ESCOL* 2:337-61.
___. 1985b. "The functional stratification of language and ontogenesis." In J. V. Wertsch ed., *Culture, Communication and Cognition*. Cambridge: Cambridge UP. pp.205-35.
_____. 1985c. "Language and the culture of gender." In E. Mertz and R. J. Parmentier eds., *Semiotic Mediation*. Orlando: Academic Press. pp.219-59.
_____. 1986. "Classifiers, verb classifiers, and verbal categories." *BLS* 12:497-514.
_____. 1987. "Cognitive implications of a referential hierarchy." In M. Hickmann ed., *Social and Functional Approaches to Cognition and Thought*. Orlando: Academic Press. pp.125-64.
_____. 1993a[1980]. "On nominatives and datives." In R. D. Van Valin, Jr. ed., *Advances in Role and Reference Grammar*. Amsterdam: John Benjamins. pp.465-98.
_____. 1993b. "Of dynamo and doorbells." *CLS* 29, *vol. 2: The Parasession*:319-45.
_____. 1995. "Kiksht 'impersonals' as anaphors and the predictiveness of grammatical-categorial universals." *BLS* 21:262-86.
Stankiewicz, Edward. 1991. "The concept of structure in contemporary linguistics." In L. R. Waugh & S. Rudy eds., *New Vistas in Grammar*. Amsterdam: John Benjamins. pp.11-32.
Van Valin, Jr., Robert D. 1993. "A synopsis of Role and Reference Grammar." In R. D. Van Valin, Jr. ed., *Advances in Role and Reference Grammar*. Amsterdam: John Benjamins. pp.1-164.
Waugh, Linda R. 1982. "Marked and unmarked." *Semiotica* 38:299-318.
Whorf, Benjamin L. 1945. "Grammatical categories." *Lg.* 21:1-11.

Other People's Stories: Person and Evidentiality in Individual and Group Memory

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This paper surveys the use of grammatical person in oral narrative and shows that second and third person narratives bear a complex relation to individual and group identity and memory. In particular, the paper demonstrates the existence of a class of narratives of events not witnessed by the speaker, non-participant narratives, and shows how these are shaped by the speaker's claim of membership or non-membership in the groups and events involved, as well as by the role that narrative plays within an institution. Non-participant narratives use resources of person, evidentiality and marked or unmarked quotation from written or traditional sources to construct large scale issues of memory and membership.[1]

Why Look at Person?

The investigation of the person of narrative, while apparently a small question, opens a door into a number of very important issues. Some obvious issues include the pragmatics of evidentials and point of view markers, as well as the overall structure of differing types of narratives. There are wider issues concerning the relation between the narrative of personal experience to other genres, including myth and folklore.

Beginning with Labov and Waletzky (1966) and Labov (1972), discourse analysis has focused on the narrative of personal experience. Labov and Waletzky (1966) defines the narrative of personal experience as a form distinguished from "complex long-standing literary or oral traditions," such as myths, folk tales, legends, histories, epics, toasts and sagas. The narratives analyzed in this work are defined as not "the products of expert storytellers that have been re-told many times, but the original productions of a representative sample of the population." There has been an emphasis on originality and on the creativity of the ordinary person in the ordinary flow of everyday conversation. This contrasts with earlier emphases, particularly within anthropological linguistics, on the collection of traditional texts, partly because these are thought to embody older and purer forms of disappearing languages.

Within both linguistics and folklore itself, there has been an assumption that non-personal forms of oral narrative — myth, legend and folktale — are dying traditions locating in dying forms of social organization like the village or the tribe (Dégh 1989). While there have been collections of urban folklore, they have not studied how these tales and artifacts are situated within social organizations, or what work people use them to do (Brunvand 1981, Dundes 1975). In this paper

I will show that the study of narratives within a variety of flourishing institutions reveals a continuum between what we would call narratives of personal experience and what we would call myth and folklore. (Linde (to appear) offers a fuller discussion of this point.) The study of narrative benefits enormously from examining how stories are told within institutions, what work they do, who has rights to tell them and what material and social resources support them.

PERSON IN NARRATIVE

Typically, any narrative is described as having a person, which corresponds to a grammatical person: first person, third person, etc. However, the relation is more complex than a simple person marking. Almost any first person narrative has more characters than the narrator alone, and hence will contain third person characters and verbs. Some third person narratives will include the narrator as a subsidiary character, or observer and will thus contain first person verbs. What determines the person of a narrative is not the simple presence or even numerical preponderance of a given grammatical person. Nor is it necessarily the person of the main character or protagonist. Rather, the deciding factor is the point of view from which the narrative is told. The point of view character determines the person of the narrative.

Discourse analysis has traditionally focused on the first person narrative of personal experience, that is, the narrative in which the point of view character and the protagonist are identical to the speaker. In fact, that is how oral narrative has been defined, beginning with Labov's classic work on narrative which locates the definition of oral narrative in the narrative of personal experience, which must necessarily be a first person narrative, since it requires personal experience (Labov 1972: 359, Linde to appear). Obviously, there are other persons possible for oral narrative, although they have not been studied in the detail that the first person narrative has received. Studying narratives told in second or third person raises complex issues of constraints on reportability and on storytelling rights, as well as some rather complex issues of elicitation and context of telling.

Second person narratives

The first question about second person narratives is why they should exist at all. The constraints on storytelling rights would suggest that people have the most authority about their own life, and therefore other speakers can not tell narratives about those lives (Shuman 1986). However, there are circumstances where a person is **not** in command of all the facts, or all the meanings, and therefore can be told a second person narrative. There are a number of reasons why this may be the case.[2]

The protagonist was drunk, or otherwise insensible. This can lead to the classic request: "Tell me, what did I do last night?" This question is reasonable because someone else may have a better memory of the events than the protagonist does.

The protagonist may not remember the details of some event she was involved in and may ask another participant to tell her the story again.

The protagonist did not understand the consequences of what happened, or had a very different view of them. For example, I was once told a narrative about myself by a friend about a situation in which I, as editor of the college newspaper, bravely confronted a complaint from the wrestling team about lack of coverage of their events by inviting them to write for the paper. I was astonished at hearing this narrated as a brave confrontation on my part. My friend, who was present but silent during the exchange, was a judo champion: he perceived a physical threat in the complaint from which he might have to defend me. I perceived only a correct complaint about a shortage of sports writers, which I tried to remedy. When my friend praised me years later by telling me this narrative, I was astonished at his agonistic and highly dramatic version of an event I barely remembered.

The protagonist's actions had consequences unknown to her at the time. For example, I have had narratives told to me about how some purported action of mine as a graduate student was taken as an example by later generations of graduate students.

The protagonist was too young to remember the events. One regular subtype of this class of narratives are the narratives that are told to children about their actions as babies. The narratives of this type that persist form a particularly important kind of personal myth. Such narratives point to central events, or to examples of typical character traits. These childhood narratives thus form one important way that parents convey to their children their characters, their position in their families, and their similarity to or difference from other family members.[3] [See Miller et. al. 1989, Miller et. al. 1990, Stone 1988.]

The protagonist does not know what is happening to or being said about her behind her back. These have been extensively described in Goodwin's work on he-said-she-said sequences. These are complex sequences in which A tells B what C is saying that B did (Goodwin 1988). These accounts can have serious social consequences for the future relations of all the parties involved.

The protagonist must be reminded of something she did that she does not see as currently salient. One important type of examples like this are the disputes which can be very frequent between couples. Here the narrative may be indexed rather than told: "But there was the time when you told your boss he didn't exist."

However, if the offender does not even remember what the offending action was, or why it was and still is offensive, then the entire narrative may be told.

Third person narratives

Although third person narratives are more frequent than second person narratives, they still do raise a question about the circumstances under which they can be told.

First, there are specific constraints on the reportability of third person narratives. These are more reportable of all interlocutors know the protagonist. A third person narrative with a protagonist unknown to the addressees must have events which are extremely reportable, because of their drama, or because they are extremely relevant to some topic already discussed in the conversation.

Finally, there is a serious issue of evidentiality in describing third person narratives. There is an important difference, as I shall show, between a third person narrative in which the speaker was a minor participant or silent witness of the events and one in which the speaker did not witness the events, but rather heard about them in some other way. We will return to this issue of participation and the nature of evidence.

Grammatical Person and Membership

Thus far, the discussion has assumed that the person of the narrative is the correct dimension of identification. Certainly, it appears that person is a dimension of evidentiality: One knows the events of a first person narrative in a very different way than one knows the events of second or third person narratives. However, this paper attempts to show that claimed identity and group membership is also extremely relevant in shaping what narratives get told and with what point of view.

The key point in this analysis is the demonstration of the existence of the non-participant narrative (NPN): A narrative told by someone who was not a participant in the events narrated. The point of view of these narratives can be that of either We or They, regardless of the grammatical person of narrative.

This study uses data from two different institutions, since it is within institutions that NPNs are most easily collected. The first source is interview data tracing the history of work teams, specifically product development teams in a Silicon Valley computer firm. Of these 6 interviews, 3 speakers produced NPNs. The product development teams studied in this paper form a valuable site for issues of language, group memory and group identity because the teams and the speakers' memberships are nested in larger and larger circles of membership. They also have relations with other groups which may be known and viewed as allies or enemies or which may be newly formed and almost entirely unknown.

The second data source is an ethnographic study of work practice in a major American insurance company, which I shall here call Mid West Insurance. This company is of great interest since it has a long history, and furthermore, works its past very intensely, using oral and written stories as well as photographs and physical artifacts to induct members and to interpret future actions as coherent with the valued past.

NON-PARTICIPANT NARRATIVES

For the NPNs the most important distinction is not evidentiality, that is, the way that the speaker learned of the events, but rather the speaker's claimed membership, as well as the degree of institutionalization of the narrative. That is, there is a difference between the way a speaker tells a narrative of what she considers to be her group and the way she tells a narrative of a group she considers to be other (the Enemy, the Rival, the Nuisance, or the Management), even though both kinds of narratives have been heard second-hand. There is also a difference between narratives that are relatively ephemeral, that is, narratives of a group or institution that is relatively short-lived and narratives that have become fixed within a long-lived and highly reified institution.

Some examples of NPNs

Let us begin with two examples of two non-participant narratives taken from Linde 1996 to illustrate the differences in style caused by differences in membership.

The first narrative was told by a speaker about activities of her own development team that took place before she joined. In fact, it is the narrative of how she came to join the team; it is thus her own origin myth.

1. Sp: And it's, uh, really frustrating work. These guys___this group started—I'll do a little bit of history, we'll do more later but —

   Int: Okay, yeah.

   Sp: --when this group started a couple of years—three years ago, the f—the five or six engineers who were already here **felt** that they wanted an interface person. They **wanted** somebody to take all those decisions off their hands. They didn't want to have to make them, they didn't feel qualified to make them, whatever. And so **they** actually pushed **their** manager who pushed **his** manager who was unwilling to spend the money on an interface designer and they actually made this huge pitch to him that they wanted to have somebody there. And so that was when I was hired. And so they themselves made the decision that they wanted me to come here.

The second narrative is the history of how the project as a whole was first brought into being by upper management, a group to which the speaker does not belong. It is distant in time from the time of speaking and some of the people involved have since left the project or the company.

2. Sp: Okay(hh). A long, long time ago, a galaxy far, far away ((spoken very fast)), Roy Bergen

   Int: Last couple of years or--?

   Sp: Yes, about three years ago. Roy Bergen, Robert Trout, and, uh, shhh, what's his name? Mike McFenerty

   Int: Yeah, I know him.

   Sp: Okay, Mike (???) was the head of [the hardware division] at that time, doing stuff(?). Uh, Bergen was head of [the labs] where [the overall project] was at the time.

   Int: Right.

   Sp: Okay, and Trout was still head of this. Uh, they said, let's do a [specific type of] product. Um, Robert said, **we'll** productize it. Bergen said, **we'll** provide the initial software, which was [Product Name] And Pendleton said, we're going to come out with a [product] which is (now just) known as [Name].

These two narratives are clearly very different and the ways in which they differ are systematic. They divide along the lines of the speaker's perception or claim to membership or identity. The first speaker is describing the actions that her own group took to get her hired. The dramatic point here is that a group of engineers was willing to argue with their management to get an engineering position filled by a user interface designer, someone who was perceived as not a person who would write code. This is a surprising action within this work culture. As she later describes their second level manager's reaction:

3: Then they had to make a huge pitch to Walter, uh, to—to spend—from Walter's point of view to spend a—a req for an engineer on a person who wouldn't write any code. [Laughs] You know, what—what good was that?

The narrative includes their actions and their motives, told extensively and dramatically. The point of view of the narrative is that of someone who was present, or at least who has full knowledge of the events, their background and their meaning. It is thus a We narrative, even though "we" is never used in the telling.

In contrast, the second speaker is telling the origin myth of an entire product development project. He describes how upper management brought this project into being. Although he later worked on this project, he was not present or involved in these events, and he is not a member of the group whose actions are described. This narrative is not told like a personal narrative. No motivation is provided, and the telling is formulaic, almost like a fairy tale. The opening marker is a quasi-formulaic quote from *Star Wars: A long, long time ago, a galaxy far, far away*. Indeed, this has become formulaic in the lore of Silicon Valley: Steve Jobs is said to have used it as the opening for his speech as he left Apple Computers. There is also a characteristically fairy-tale like use of the Rule of Three, in this case, three entirely parallel and non-realistic clauses:

> Um, Robert said, we'll productize it. Bergen said, we'll provide the initial software, which was [Product Name] And Pendleton said, we're going to come out with a [product] known as [Name].

This is certainly told like a fairy tale, rather than a realistic narrative: In my experience of business meetings, no one has ever announced a decision in one sentence. And the point of view is not that of a participant: There is no full account of the events, their background and their meaning, nor of the participants' motives. It is this a They narrative.

FUNCTION OF NPNS WITHIN THEIR INSTITUTIONS

Let us now turn to the function which NPNs serve within institutions. Non-participant narratives can form an important part of the memory and self-presentation of an entire group or institution, not only the memory and self-presentation of an individual.

In every institution, whether it be a corporation, a family, a gang or a regular Tuesday night poker game, there is a body of stories that everyone in the group tells or at least has heard. These are important carriers of the company's identity, values and history, and are used to help induct new members, explain the group to outsiders, and negotiate the legitimacy of new activities or changes in policy, direction, etc. Thus, the function of the narratives and the varying rights which members have to tell them, is crucially involved with the nature of the institution.

Most or all groups have examples of this class of narratives which are regularly and appropriately told by speakers who were not present at the events narrated. The most common NPN, for any institution, is an origin story for the institution. For example, many people can tell the story of how their parents met. These narratives are crucial for understanding the formation and negotiation of group identity, group memory, the stance speakers take towards the institutions they are involved with and the negotiations between groups in a larger institution. When a

person tells a narrative about a group event at which she was not present, she may be telling the narrative of the We, either directly through the use of the first person plural or as a third person narrative about members of the We. Or she may be telling it remotely as the story of some group of They that she does not belong to. Such manipulation of point of view can provide very strong evidence about how identity is perceived and negotiated.

Mid West Insurance has a very extensive and highly institutionalized origin story, which is organized around its charismatic founder, a figure whose memory is still frequently and respectfully invoked. This story exists in many forms, since, as previously mentioned, this company works its past very extensively. It exists as an authorized history and biography of the founder, a book published in the late 1950s, which is still in print and which is prominently displayed by many managers and executives. The story also has been told in installments in the company magazine. It is represented in a museum exhibit of historical memorabilia with extensive labels commenting on them in the lobby of the main building and in traveling historical exhibits at sales conventions. The origin story is told often by managers to agents and to newer managers at various levels.

The example below is a narrative about the founder. The oral version was told to an ethnographer as part of an unstructured interview. The speaker is a manager who has been with the company for over 45 years. He knows a great deal about the history of Mid West, and of the insurance industry, and appears to enjoy discussions of history. The ethnographer did not specifically elicit this or the many other narratives about the founder and the history of the company which he told. As we have observed, telling these stories is clearly part of his ordinary discourse practice. The written version of this narrative was published in the company magazine in 1992.

I have no external evidence for whether the oral version is derived from the written version or if this is an oral story extant in the company which the written version records. The fuller form of the confrontational conversation in the oral version of the narrative does not prove that this is the original form, since this is the kind of detail which skilled narrators frequently invent.

Oral Version	Written Version **Silencing the Guns**
	In addition to the Depression, other challenges had to be met during the '30s. Mid West had become big enough for people to begin taking "pot shots" at the organization.
And then, um, oh, one story about McBee was some editor because the newspaper was getting a lot of advertising from one of (the brokerage firms) and, uh, so the editor, the broker guy (???) Mid West and so forth and started really giving him a bad time (to pay for it). So the broker got the editor to write this about Don't put your money into Mid West, Don't buy insurance from them, They'll cancel you. So the agent was really getting uh, taking the heat. He called, uh, finally called McBee and said, Well. it's this guy on this newspaper is killing me and I don't know how to—I don't know how to get around him. McBee got on the train in (?) and the story goes that, uh, he walked into the editor's office and said, uh I understand that you've been giving the Mid West agent out here a bad time. And the guy said Yeah, so what? He said, My name's McBee, I'm the uh president of this company.	Anonymous letters and pamphlets were sent to policy holders by competitors. Rumors and stories were circulated to discourage interest in Mid West. One of the blasts was handled by T. D. McBee personally. Stopping in a small western city, he went to the editor of the paper and said, "My name's McBee. I'm president of Mid West Insurance."
	"Oh, you are, eh?" answered the editor.
	"Yes sir," said Mr. McBee, "and I'm looking for the fellow who has been rawhiding my agents out here every week in this paper."
And he said, Well, yeah, what do you expect **me** to do about it?	"Well, I'm him. What are you going to do about it?" snapped the editor.
He said, not a **thing**. He reached over, he had a cigar in his pocket and put it in **his** pocket and he said, Keep it **up**. He said, uh, uh, "He's written more business just from that than you can imagine" And walked out the door.	"Nothing," Mr. McBee said with a grin. "I just want to shake your hand. Here, have a cigar. You're a fellow after my own heart. You know, you've got these agents so mad they're writing more insurance than I ever dreamed they could. Keep up the good work. Don't say I talked with you, but just keep on riding them."
So the editor's guns fell silenced. [LAUGHTER] So He was that kinda guy He would do that kinda stuff.	The newspaper's guns fell silenced.

There are obviously a number of salient differences between the oral and the written versions of this narrative. One is the use of evidentials in the oral version: *One story about McBee.*, as well as *and the story goes*. These are an indication of a narrative which has become institutionalized. Not only was the speaker not a participant (he was not born at the time of these events), but he is telling a story which is familiar within his work world in both oral and written forms and which has a canonical shape, including key incidents and key phrases. It is interesting to compare this usage to quotatives like: *As the old saying goes*. It appears that there is a wide class of institutionalized language which must be marked as such. In particular, this speaker uses evidentials of this sort when he tells personal third person narratives about key characters in the history of the company. He does not use them for more chronicle-like accounts of the march of large-scale events.

Additionally, the oral version contains an explicit quotation of the slanders the editor was writing, organized in the familiar folktale pattern of three escalating statements: *Don't put your money into Mid West, Don't buy insurance from them, They'll cancel you.*. In contrast, the written version contains a more explicit explanation of why Mr. McBee wanted the editor to keep slandering his agents: *You've got these agents so mad they're writing more insurance than I ever dreamed they could. Keep up the good work. Don't say I talked to you, but just keep on riding them.*

However, for the purposes of this paper, the most crucial difference is the point of view of each of the stories. The written version is framed as a story of Mid West Insurance and Mr. McBee. It is thus relevant to all members of Mid West Insurance: both sales agents, as well as those working in claims, operations, etc. In contrast, the oral version is framed as a story particularly relevant to agents, telling their history, since it demonstrates the valued qualities that agents share with the founder. It was preceded by a story about how Mid West Insurance faced serious business difficulties just after the end of World War II and was saved by the actions of the agents, who showed the same determination and dedication as the founder. The narrator concluded this story about the attitude of agents at this time: *And if someone ran down Mid West Insurance, them's fighting words. I'm the same way. I still am.* He then moved immediately to the story given above, which shows how the founder dealt with someone running down the company. By its placement and framing, this story demonstrates how agents and the founder continue to share the same qualities of determination and loyalty to the company. Indeed, in this version, it is an agent who calls on the founder to defend the company, while in the written version, there is no specification of how the founder became involved with the offending editor.

While the story was told to a fieldworker, we have reason to believe that it is one that the speaker in his role as manager has often told to agents. We have certainly heard many stories of this type, in particular stories about the founder, told at

conventions, at meetings and in casual conversation between agents and managers of all levels. These stories form a way of inducting new members and reminding old members of the values of the company and the kinds of identities and actions that are supported and valued.

CONCLUSION

This paper has shown that the study of person and point of view in NPNs opens out onto large issues of the organization of institutions and groups and the ways in which memory can be preserved, contested and changed. Certain narratives have a very long life, longer and broader than the life of a single speaker. Other people's stories thus become a key way of inducting us into who we are and where we belong.

Notes

[1] This paper on other people's stories necessarily relies on other people's contributions. I would like to thank first those anonymous speakers who so kindly shared their stories with us. I am grateful to the members of the ethnographic team with whom I studied the insurance firm: Christopher Darrouzet, Joe Harding, Nancy Lawrence and Charline Poirier, as well as to all the members of the insurance company studied, who were incredibly generous and hospitable to us. I would also like to thank my colleagues at IRL and Stanford: Penny Eckert, Ray McDermott, Norma Mendoza-Denton, Loyda Olson, Elizabeth Traugott and Helga Wild, who contributed substantially to this research, as well as very helpful suggestions from Laine Berman, Alessandro Duranti, and Livia Polanyi. And I must again express my gratitude to all my colleagues who often wonder if I am listening to what they are saying or the way they are saying it.

[2] Most of the examples of second person narratives used here come from my own history. This is a necessary consequence of the fact that it is nearly impossible to elicit second person narratives about oneself. One can, of course, elicit first person accounts of second person narratives told to the narrator, but this introduces an added complexity of person, and eliminates the context of the narration.

[3] While I have not done a formal study of this type of second person narrative, informal questioning suggests that at least half of the people I asked remember at least one story told to them as children about their actions as babies or younger children.

References

BRUNVAND, JAN HAROLD. 1981. *The Vanishing Hitchhiker*. Norton.

DÉGH, L. 1989. *Folktales and Society: Story-telling*. Bloomington, Indiana: Indiana University Press.

DUNDES, ALAN. 1975. *Urban Folklore from the Paperwork Empire*. Austin, Texas: American Folklore Society.

GOODWIN, MARGORIE HARNESS. 1990. *He-Said-She-Said: Talk as Social Organization among Black Children*. University of Indiana Press.

LABOV, WILLIAM and JOSHUA WALETZKY. 1966. Narrative Analysis: Oral Representations of Personal Experience. In Helm, June (ed.). *Essays on the Verbal and Visual Arts: Proceedings of the 1966 Annual Spring Meeting of the American Ethnological Society*. University of Washington Press.

LABOV, WILLIAM. 1972. The transformation of experience in narrative syntax. *Language in the Inner City*, 354-396. Philadelphia: University of Pennsylvania Press.

LINDE, CHARLOTTE. nd. In Bamberg, Michael (ed.). Narrative: Experience, Memory, Folklore. Special issue of *Journal of Narrative and Life History.*

LINDE, CHARLOTTE. 1996. Whose story is this?: Point of view variation and group identity in oral narrative. In Arnold, Jennifer, Renee Blake, Brad Davidson, Scott Schwenter and Julie Solomon (eds). *Sociolinguistic Variation: Data, Theory and Analysis. Selected Papers from NWAV 23 at Stanford.* CSLI Publications.

LINDE, CHARLOTTE. 1993. *Life Stories: The Creation of Coherence.* Oxford University Press.

MILLER, PEGGY, RANDOLPH POTTS, HEIDI FUNG, LISA HOOGSTRA, and JUDY MINTZ. 1990. Narrative practices and the social construction of self. *American Ethnologist* 17,2: 292-311.

MILLER, PEGGY and BARBARA BYHOUWER MOORE. 1989. Narrative conjunctions of caregiver and child: A comparative perspective on socialization through stories. *Ethos* 17,2:428-449.

SHUMAN, AMY. 1986. *Storytelling Rights: The Uses of Oral and Written Texts by Urban Adolescents.* Cambridge University Press.

STONE, ELIZABETH. 1988. *Black Sheep and Kissing Cousins: How Our Family Stories Shape Us.* Times Books, Random House.

Framing Effects in Japanese Non-final Clauses: Toward an Optimal Grammar-Pragmatics Interface*

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1. Introduction

In Japanese, as in other verb-final languages (including Korean, Tamil, and some Papuan languages, e.g. Tauya), non-final clauses can stand by themselves in discourse, without being followed by the main clause. Some examples are (TE=participial, NODE=reason, NONI=concessive): [1]

(1) *kocchi-mo saikin* ***isogashikute***
this.side-also lately be.busy.TE
'I've been busy lately too-TE [and]'

(2) *ocha-ga* ***hairimashita-node***
tea-NOM be.ready.POL.PAST-NODE
'The tea is ready-NODE [so]'

(3) *koe-o kaketekurereba* ***itta-noni***
call-ACC give.BEN.COND go.PAST-NONI
'(I)'d have gone together if (you) had given (me) a call-NONI [but]'

In these examples, the clause linkage markers *te*, *node* and *noni* are attached to verbs, and they are all syntactically incomplete (thus when (1)-(3) occur as simple independent clauses, the verb forms would be *isogashii*, *hairimashita*, and *itta*, respectively). However, examination of conversational data shows that they are not mere elliptical utterances and that they have interactionally significant characteristics. These considerations lead us to assume that they form an independent class of grammatical constructions.

These constructions, which I would call *suspended clause constructions* (hence SCCs; cf. Itani 1992; Iguchi 1995; Shirakawa 1995; Ohori 1995), raise an intriguing issue for the theory of clause linkage in that we need to characterize under what pragmatic conditions they occur and what kind of inferential mechanism is at work. Further, in answering these questions, it is expected that we may obtain some insight into the problem of the grammar-pragmatics interface.

2. Discussion

2.1 Some characteristics of SCCs

As mentioned earlier, SCCs are typically marked for sub-ordination, so they are not directly comparable to English connectives such as *and*, *so*, and *but*. The colloquial use of *though*, however, is somewhat similar to SCCs:

(4) *I don't care about politics,* ***though.***

Of course this similarity is only marginal, and there is much to be explored in Japanese SCCs, as we shall see below. To start, let us see that SCCs are neither echo utterances nor co-constructions uttered by two speakers. Here's a discourse fragment (from my archive): [2]

(5) (A and B are talking about job-hunting in the senior year; C is B's mother)

A: *daijoobujanai, Y-kun-nara/ nanigeni*
alright.PRED.PRT.NEG Y-TL-TOP incidentally
'(he) may be alright, Y./ incidentally (I)'m in the same
zemi-mo isshoda-shi/ chokochoko kiteru yo/
seminar-also together.PRED-and very.often come PRT
'seminar, and/ (he) comes to the campus very often/
kare-ga shuushoku-shitai-no-wa nee, are mitai,
he-NOM job-get.VOL-NZ-TOP PRT that MOD
'the job (he) wants to get is, it seems,
supootsu-kankee, shinbun toka=
sports-related press etc.
'a sports-related (job), like press'

B: *=aa=*
ah-huh
'ah-huh'

A: *=JRA toka, sore-wa keebadesho/*
JRA etc. that-TOP horserace.PRED.MOD
'and say, JRA, that's (the organization for) horserace/
sooyuuno yaritaindatte
like.that do.VOL.PRED.COMP
'(he says he) wants to do that kind of job'

B: *hai*
INT
'here you are'
C: *hai, arigato/ shuushoku nee/ shuushoku kiboo deshoo*
INT thank.you job PRT job want PRED.MOD
'oh, thanks/ job-hunting, hmm/ will (you) go job-hunting?'
A: *tabun/ demo ima-tte* ***kibishiidesu-kara*** *nee*
maybe but now-TOP tough.PRED-KARA PRT
'maybe/ but now (it) is really tough-KARA [so]'
C: *soo nee*
yes PRT
'yes, that's right'

Interestingly, SCCs occur most frequently on TRPs as in the above example, marking the transition of a turn. In (5), A and B are talking about their classmate's job preference, and then C (=B's mother) comes in and asks if A will go job-hunting too (whose intention is indeed what kind of job she wants). A answers by saying 'maybe, but now it is really tough, so...', but there is no statement in the discourse for which the *kara*-marked clause provides a reason. Here the conversational routine is short-circuited, in the sense that a main clause which would follow the suspended reason clause simply doesn't occur. If it did, it would be a direct answer to C's intended question: A cannot be very picky (unlike her classmate). But C gets what A means without the main clause, so she says, 'yes, that's right' showing sympathy. Thus the *kara*-marked clause uttered by A is not really 'suspended' but is smoothly integrated into the flow of discourse.

Another interesting pragmatic property of SCCs is that they are not mere declarative utterances, but carry directive and expressive functions, for example calling for sympathy, giving direction, or expressing emotion. Thus (1) can be used as an excuse, (2) as a direction, and (3) as a soft reproach. This non-declarative property of SCCs may account for their frequent occurrence at TRPs: utterances with interpersonal functions tend to trigger the switch of the speaker. Example (5) clearly illustrates this point. Here what matters is A's concern about the toughness of the job market. Note that both A's and C's utterances in question both have *nee* at the end, which is known to be among the commonly used utterance-final particles in Japanese. As Cook (e.g. 1989) suggests, one discourse function of *ne(e)* is a request for agreement, and this is what is happening in (5).

In the following example (from my archive), the reason marker *kara* has a strong connotation of urge for sympathy, whose inferential mechanism is roughly schematized in (6') (for details, cf. Ohori 1995; also notice the suspended use of KEDO which is a marker of counter-expectation):

(6) (A and B, both graduate students, are talking about TA jobs)

A: *nani kore?*
this what
'what is this?'

B: *ringu faibu yarette*
ling 5 do.COMP
'(they told me) to do Ling. 5'

A: *nn soo/saisho-wa soo iwareru-no yo*
hmm so first-TOP so tell.PASS-PRT PRT
'hmm yea/ first, (everybody) is told so'

B: *faibu-dake-wa iya-da tsuttanda-kedo na=*
5-only-TOP no-PRED say.PAST.PRED-KEDO PRT
'I said I didn't want to do 5-KEDO [but]'

A: *=watashi-datte konaida soo ittara orijinarii-ni*
I-TOP[?] earlier so say.TARA originally-DAT
'I also said so earlier-TARA [then] originally (I) was
faibu ni ***nattanda-kara***
5-DAT become.PAST.PRED-KARA
'assigned to 5-KARA [so]'

(6') P-KARA, Q ('because P, Q') => P-KARA, ø ('because P, you know what' => 'because P, I'm concerned')

In this example, *kara* does not give any reason for any particular event. Rather, *kara* indicates that the content of the clause has a strong concern for the speaker. Hence a more natural translation of A's utterance would be 'Hey look, even I was originally assigned to Ling 5, so it's my concern too'.

What is the motivation behind this extension of interpretation? Discourse-pragmatically, when people give a reason for an event, they consider that doing so is important to make sense of the situation being talked about. More technically, reason clauses point to a certain set of assumptions against which the relevance of the main assertion is enhanced (cf. Blakemore 1987, 1988). In (5), saying that the job market is tough indicates that it has much to do with the current discourse topic, i.e. the speaker (=A)'s job search. From this background, the hearer (=C) easily infers that A cannot be picky about her job, and that she sees the toughness of job market as her primary concern. But in examples like (6), the main assertion is often unspecifiable, and the hearer is required to interpret the *kara*-marked clause as giving justification to the speaker's emotional commitment to whatever s/he is facing. Schematically, the consequent part of (6'), which originally is a proposition (=Q), becomes vacuous at this point, or it is at best a tautological

assertion, e.g. 'things are as they are'. Here *kara* is not really a connective in the ordinary sense, but indeed seems to be acquiring some of the functions of clause-final discourse particles.

2.2 Framing effects in SCCs

One important generalization about SCCs is that linkage markers which allow suspension are those typically expressing (pseudo-)logical semantic relations (e.g. reason). In contrast, the marker *to*, which is typically used to encode temporal or habitual sequence, does not seem to occur in SCCs:[3]

(7) ??*shigoto-ga* ***isogashii-to***
job-NOM be.busy-TO
('(I) am so busy with my job-TO [and then]')

To generalize, SCCs involve *inference-intensive* clause linkage markers. Moreover, I would argue that this property is embodied in the construction itself, making the SCC a frame within which the interpretation of a linguistic form is constrained. Let us look at some examples closely.

In Japanese, the marker *shi* is usually used for juxtaposition or weak contrast. Linkage by *shi* also allows a reason reading as well as a temporal reading, depending on the context (in this regard, *shi* is fairly close to English *and* in terms of the possible range of interpretations). The suspended version of *shi*-linkage is given below:

(8) *watashi-mo ii toshi* ***desu-shi***
I-also good age PRED-SHI
'I have become very old-SHI [and]'

What is important is that (8) only has a reason reading, and hence interactionally the hearer is solicited to show sympathy for what the speaker would assert in the given context. Thus, for example, (8) can be used as an excuse for not accepting a request. Now, crucially, example (8) can be interpreted as a reduction of (9), but not of (10):

(9) *watashi-mo ii toshi* ***desu-shi****, kono shigoto-wa dekimasen*
I-also good age PRED-SHI this job-TOP make.POL.NEG
'I have become very old, and I can't do this job'

(10) *watashi-mo ii toshi* ***desu-shi****, otto-wa mamonaku teenen desu*
I-also good age PRED-SHI husband-TOP soon retire PRED
'I have become very old, and my husband is retiring soon'

Example (9) involves certain degree of causality, as indicated in the gloss. In contrast, (10) is a mere juxtaposition of two distinct states of affairs. The speaker's being old cannot be a reason for her husband's retirement. In this way, given the suspended frame, a linkage marker which can potentially have more than one interpretation will have a limited range of readings within that frame. In other words, when a non-final clause stands by itself (i.e. is used as a SCC), a *framing effect* arises, enforcing some particular interpretation which would otherwise be only optional.

Likewise, *te*, which is a widely used non-final verb form with a variety of readings (Makino and Tsutsui 1986, for example, list sequentiality, two states of something, reason, means, contrast, and unexpectedness), mainly has a reason reading in the suspended frame, as shown in example (1). In addition, *te* in the following example is used as an emphatic marker, whose English translation would require supplementing the gloss '...which makes me so impressed'.

(11) *kon'nani rippa-ni* ***natte***
this.much respectable-DAT become.TE
'(you)'ve become such a respectable figure-TE [and]'

Here too, we can clearly observe the framing effect of SCCs, i.e. the superimposition of inference-intensive readings and the endowment of interpersonal functions (there are other instances of utterance-final *te*, but in this paper I will not deal with them, since they form separate constructions from SCCs). The foregoing examples show that while non-final clauses are typically associated with background information, they express important discourse material when they occur in a suspended frame.

From these considerations, it could be safely established that SCCs form a grammatical construction in their own right. The generalization obtained from the above discussion can be summarized as follows:[4]

(12) When non-final clauses occur in SCCs, they tend to have inference-intensive readings. That is, put into the SCC frame, the possible range of interpretations of the clause-linking form is constrained by the constructional frame.

Let us turn to broader implications of this generalization for the grammar-pragmatics interface.

2.3 Grammatical constructions in pragmatic theory

The case of SCCs suggests that, in order to account for their occurrence systematically, we need some way to represent linguistic knowledge as formulated in (12), whose more schematic representation is given in (12'). If a linkage marker is neutral as to whether it is inference-intensive or not, as in the case of *shi*, LINK inherits the information <Inference intensive> from the constructional template of the SCC.

(12') CONST: Suspended Clause

SynCat	<Cl + dependent	
	:	
	- embedded>	
SemRel	<Inference-intensive>	
PragEff	<Interpersonal>	
[	[. . . CLAUSE . . .]	– LINK] #

The conventional wisdom in linguistic theory says that our linguistic knowledge consists of highly abstract (and presumably universal) principles coupled with a set of lexical items. But this view is untenable in view of the fact that there are linguistic generalizations such as (12) that can be only made with reference to the notion of grammatical construction as a structured pairing of form and meaning. Construction-based knowledge includes instructions for utterance interpretation associated with a particular morpho-syntactic constellation. In this respect, SCCs offer a strong case for the construction-centered theory of grammar (e.g. Fillmore, Kay, O'Connor 1988; Zwicky and Pullum 1991; Goldberg 1995), as long as one holds that the goal of grammar is to model optimal pairing of form and meaning.

At the same time, pragmatics also seems to benefit from the employment of grammatical constructions as a theoretical construct, since it eases the division of labor in the treatment of non-truth conditional meanings. Admittedly, this is not a new idea. Ever since Grice (1975), non-truth conditional aspects of meaning associated with particular linguistic forms have been treated under the heading of conventional implicatures, although the main concern of pragmatic theory has been the characterization of over-arching principles of communication. The present study gives support to the postulation of constructional templates as bearers of such meaning, providing a way to link grammar and pragmatics seamlessly.

3. Concluding remarks

The general implication of this study is summarized as follows. Japanese SCCs embody particular procedures for interpretation, namely preference for inference-intensive readings and reinforcement of inter-personal functions. The Relevance-theoretic account of connectives as procedures for interpretation may be right, but to deal with the *conditioned variation* of interpretation as given in (12), pragmatics needs an elaborate body of knowledge consisting of grammatical constructions besides logical form and higher-order principles.

In addition, two points may be mentioned here which I have deliberately kept aside in this paper but deserve a few words from a typological interest. First, SCCs provide yet another piece of evidence for the untenability of the coordination-subordination dichotomy, which has been amply demonstrated in recent functional-typological studies. Second, SCCs exemplify the importance of clause-final position as a locus of grammaticalization in Japanese (and possibly other verb-final and clause-chaining languages).[5] It appears that forms of various origins drift toward pragmatic particles (i.e. tend to bear interpersonal and/or textual functions) clause-finally. Here two examples are given, both from complement constructions (also cf. Okamoto 1995 for the pragmaticization of clause-final nominal elements):

(13) *dare-mo tasuke-ya* ***shinai-toyuu***
anyone-PRT help-PRT do.NEG-COMP
'nobody would help (me)-COMP'

(14) *sono chotto-ga* ***nagainda mon***
that a.little-NOM long.PRED thing [?]
'that little step was quite tiresome-THING [?]'

In (13), *toyuu* (< *to* as COMP proper and *yuu* 'say', which originally modified a content noun such as *hanashi* and *wake*, both meaning 'story', making up a complex NP) is yet another type of suspended clause, and here a part of complement structure is used to express the speaker's detachment. In the above example, the speaker is reporting her own experience, but by adding *toyuu*, she is conveying that information as if it were hearsay. I am inclined to call this use of *toyuu anti-evidential* as it purposefully obscures the source of information. In (14), the abstract noun *mono* (reduced to *mon*) has almost become a pragmatic particle, strengthening the speaker's assertion. The study of the exact mechanism of this drift will shed light on the process of pragmatically-motivated emergence of grammatical categories. The closer examination of SCCs from this perspective,

together with the clearer elucidation of inferential processes, will be among our future tasks.

Notes

* The author gratefully acknowledges valuable feedback from the floor and elsewhere, including Senko Meynard and Ryoko Suzuki. All the remaining faults are my own.

[1] Glossing abbreviations are as follows: ACC(usative), BEN(efactive), COMP(lementizer), DAT(itve), INT(erjection), MOD(ality), NEG(ative), NOM(inative), NZ(=nominalizer), PASS(ive), POL(ite), PRED(ication), PRT(= particle), TL(=title), TOP(ic), VOL(itional). Linkage markers are left unglossed. Detailed morphological boundaries are not given, and when a Japanese expression coresponds to more than one word in English, dots are used instead of spaces. Elements which are not expressed in Japanese (e.g. subject NPs) are in parentheses in the English translation. Romanization is broadly phonetic.

[2] In this example, the marker *shi* is simply glossed 'and', but the matter becomes more complicated in some contexts, as we see below.

[3] Seiko Fujii (p.c.) suggested that *to*-marked clauses can be suspended if the predicate is in the negative form:

(i) *hayaku* ***ikanai-to***
soon go.NEG-TO
'(I) have to go soon'

But in fact, this case exemplifies another type of suspended construction, which may be considered a conventionalized idiom fragment. Thus (i) is a reduced form of (ii), where the expression following the *to*-marked clause is not really a full clause involving independent participants and actions:

(ii) *hayaku* ***ikanai-to*** *ikenai*
soon go.NEG-TO be.alright.NEG
lit. 'if (I) don't go soon, (it) won't be alright'

In contemporary Japanese, *V-nai-to-ikenai* forms an idiomatic expression for modality (more specifically, that of necessity), alongside *V-nakereba [-naranai]* (V-NEG.COND[-become.NEG]) and *V-nakute-wa[-naranai]* (V-NEG.TE-PRT[-become.NEG]). In colloquial speech, *V-nakereba* is reduced to *V-nakerya* and further to *V-nakya*, and *V-nakute-wa* is reduced to *V-nakucha*. Unlike these examples, the SCCs under consideration in this study do not derive from idiomatic expressions.

[4] The "inconsequential" construction in Papuan languages seems to share some of the features given in (12). Macdonald (1989) gives examples from Tauya, where "inconsequential clauses...can occur alone as grammatical sentences, despite their status as subordinate clauses and their status as dislocations" (pp. 242-243). However, what sort of framing effect is associated with inconsequentials is yet to be ascertained.

[5] An interesting point, which came up from the floor at the time of presentation, was that the clause-initial position can also be a locus of pragmaticization, as exemplified by Romance *si*. Hence it may be speculated that clause edges tend to be loci of pragmaticization, especially the exteriors of the verb.

References

Blakemore, Diane. 1987 *Semantic Constraints on Relevance*. Oxford: Blackwell.

_____. 1988. "'So' as a constraint on relevance", in Kempson, Ruth (ed.) *Mental Representations: The Interface between Language and Reality*. Cambridge: Cambridge University Press. 183-195.

Cook, Haruko Minegishi. 1989. "The sentence-final particle ne as a tool for cooperation in Japanese conversation", in Hoji, Hajime (ed.) *Japanese/Korean Linguistics*. Stanford: CSLI. 29-44.

Fillmore, Charles J., Paul Kay, and Mary Catherine O'Connor. 1988. "Regularity and idiomaticity in grammatical constructions: the case of *let alone*", *Language* 64. 501-538.

Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure*. Chicago: University of Chicago Press.

Grice, H. Paul. 1975. "Logic and conversation", in Cole, Peter and Jerry L. Morgan (eds.) *Syntax and Semantics 3: Speech Acts*. New York: Academic Press. 45-58.

Iguchi, Yuko. 1995. "The role of inferencing in functional shift: a case of *kara*". manuscript. Dokkyo University.

Itani, Reiko. 1992. "Japanese conjunction *kedo* ('but') in utterance-final use: a relevance-based analysis", *English Linguistics* 9. 265-283.

Macdonald, Lorna. 1988. "Subordination in Tauya", in Haiman, John and Sandra A. Thompson (eds.) *Clause Combining in Grammar and Discourse*. Amsterdam: John Benjamins. 227-246.

Makino, Seiichi and Michio Tsutsui. 1986. *A Dictionary of Basic Japanese Grammar*. Tokyo: The Japan Times.

Ohori, Toshio. 1995. "Remarks on suspended clauses: a contribution to Japanese phraseology", in Shibatani and Thompson (eds.). 201-218.

Okamoto, Shigeko. 1995. "Pragmaticization of meaning in some sentence-final particles in Japanese", in Shibatani and Thompson (eds.). 219-246.

Shibatani, Masayoshi and Sandra A. Thompson (eds.). 1995. *Essays on Semantics and Pragmatics*. Amsterdam: John Benjamins.

Shirakawa, Hiroyuki. 1995. "Riyuu-o arawasanai *kara*" (*Kara*'s that don't express reason), in Nitta, Yoshio (ed.) *Fukubun-no Kenkyuu*. (*Studies in Complex Sentences*). Tokyo: Kurosio. Vol. 1. 189-219.

Pullum, Geoffrey K. and Arnold M. Zwicky. 1991. "Condition duplication, paradigm homonymy, and transconstructional constraints", *BLS* 17. 252-266.

Deconstructing "Zero Anaphora" in Japanese[1]

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The notion of "zero anaphora" has played a prominent role in most approaches to Japanese grammar for at least the last three decades (Kuroda 1965; Clancy 1980; Hinds 1982). It's easy to see why: Japanese can be demonstrated to have far fewer explicit mentions of referents than some European languages. Thus where English, for example, must express what appears to be an obligatory "argument" of a verb, Japanese often does not.

(1) nihon no koto toka kiki -tai -shi sa
Japan of thing or hear-want-and FP
(I) want to hear about what's going on in Japan

The idea of "zero anaphora", "zero pronouns", or "ellipsis" arose naturally from this observation, and it has proven to be a productive approach to the description of Japanese clause structure. Two carefully argued and justifiably highly influential works are Clancy 1980 and Hinds 1982. Clancy 1980 is an especially insightful treatment of reference forms in Japanese Pear Stories from this perspective. In fact, for the kind of event structure found in narratives, an account which postulates "zero" and our account may not be very different, as we will see below.

When we began to look at ordinary Japanese conversation, however, the idea of "zero anaphora" proved to be problematic. In addition, some Japanese scholars have expressed reservations about the idea of "zero anaphora" (see especially Matsumoto 1981 and Okamoto 1985). Interestingly, parallel questions have been raised for Mandarin by Li in press and Tao 1996 and for Brazilian Portuguese by Dutra, p.c. In particular, most native speaker linguists seem to be uncomfortable with the idea that anything is "missing" in utterances for which "zero" has been postulated, even in examples like (1), where it is crystal-clear who wants to hear what's going on in Japan.

So we decided to try to figure out why a "zero" analysis evokes this discomfort. And the first thing we found out was that a zero analysis seems to be based on a standard assumption about argument structure, or "valency", which can be summarized as in (2):

(2) predicates HAVE one or more fixed "argument structures" based on their meanings, that is, on the nature of the "event" that is named by that predicate.

So, to take an example of Hinds 1982, the Japanese verb *taberu* 'eat' is said to evoke a scene in which there must be an eater and something which is eaten. Thus, if the eater, let's say, is REFERRED TO, but not MENTIONED, we can justifiably posit a "zero" in the "slot" which the verb *taberu* evokes. (3) is an example from our database.[2] The transcription system we are using is adapted from Du Bois et al. 1993; each line corresponds roughly to a prosodic unit, with a comma indicating continuing prosody, a period "final" prosody, and a question mark "appeal" prosody. Two hyphens means the prosodic unit was broken off. The equals sign means lengthening, and the brackets mean overlap.

(3) Talking about the party which M just came back from

M: oiishii mono atta -shi [sa=],
delicious thing existed-and FP
there were delicious things

K: [honto=] ippai tabeta no=?
really a.lot ate FP
really, did (you) eat a lot?

-> M: tabe **tabete** nai.
eat eat not
(I) haven't eaten (implying as well that she didn't eat much at the party)

For now, we'll put aside the issue of exactly what wasn't eaten. So, just focussing on the "eater", many scholars would say that when speakers can easily agree on what "obligatory" arguments a verb takes, and can easily identify who the "intended referent" is who is doing the eating, then positing a "zero" there, that is, saying that there is an unexpressed argument in that agent "slot", is unproblematic.

But we have two problems with this line of reasoning:

(4) a. For most of the predicates in our conversational database, there is no clear argument structure such that obligatory arguments can reliably be identified. That is, not only is it often not clear just what referents are being "intended", but it is not clear what "arguments" that predicate should be said to "take".
b. Even for action verbs like 'eat' and 'read', we think there is another way of looking at "argument structure", that raises questions about what is "obligatory".

So what we want to do here is suggest a different direction for thinking about argument structure, and see if it sheds new light on the "zero" question. We

propose replacing the notion of "argument structure" with a much looser and broader picture of the "meanings" of Japanese predicates. Instead of talking of predicates "requiring" certain types of "arguments", we want to follow Fillmore 1986, Goldberg 1995, and others, and suggest that predicate "meanings" be described as including a huge range of semantic and pragmatic associations regarding the sorts of activities, states, and participants that might be invoked when a given predicate is actually used. As pointed out by many researchers recently (including Bybee 1985, Bybee and Slobin 1982, Bybee and Moder 1983, Clancy forthcoming, Langacker 1987, Ono & Thompson 1995), these "meanings" are actually generalizations from many repetitions of hearing predicates used in association with certain types of human events and situations over the course of a person's lifetime. We wish to suggest that only some of these associations are captured by what linguists have talked about under the heading of "argument structure". Most importantly, we suggest that what people have been thinking of as "obligatory arguments" may be a matter of the predicate itself and the context. In other words, as in (5) on the handout,

(5) In many conversational contexts, there may be NO clear "obligatory" arguments.
That is, among the associations which are evoked by a given predicate it may be very difficult to separate the "obligatory" from the "non-obligatory".

Consider example (3) again, for instance. As we said before, the meaning of the predicate *taberu* 'eat' APPEARS to be describable in terms of someone who eats and something that is eaten. But it seems to us that the extent to which these associations are evoked in a given Japanese utterance depends entirely on the context. It is reasonable to assume that among the uses to which this verb is put, many of them involve specifying "eaters" and perhaps also "eatees", and relatively few of them involve specifying instruments; yet in some contexts, Japanese speakers will find it important to associate say, *hashi* 'chopsticks' with the predicate taberu. This means that *hashi* could also be part of *taberu*'s "argument structure", such that if it is not mentioned, it could be considered as a "zero". But few linguists would suggest such an analysis.

It is very important here to notice what we've just done. We've suggested that "argument structure" may be much more a matter of pragmatics than of "structure". Even for predicates like *taberu* 'eat' there are a number of possible associations regarding the participants in the eating event being reported; why, then, do we feel that the agent, the "eater", should be priviledged with an "obligatory" argument structure "slot" while the instrument, the 'chopsticks', say, should not?

The answer to this question clearly lies in the area of FREQUENCY. As we suggested above, it is reasonable to assume that among all the uses of *taberu* 'eat' in Japanese, the great majority of them will involve conversationalists being concerned about who the "eater" is, and very few of them will involve being concerned about what instrument is used. This is because, as quantified studies amply demonstrate (Givón 1979, 1983, 1984), people tend to talk most about people and the things that people do.

What this means is that, WITH FREQUENT REPEATED USE, for certain verbs, certain associations in fact DO get reified by grammars - the grammars of languages often do pick out certain associations - these are what we call "core" roles, or part of the "case frame". As shown by Bybee 1985, Clancy forthcoming, Du Bois 1987, Hopper 1987, 1988, and others, frequent repetition often leads to grammaticization. This is an important fact about languages. But we want to stress that it's not merely a structural fact, it's primarily a pragmatic fact because it is a direct result of frequency in USE.

So what does this all mean for argument structure and "zero"? Three things, as shown in (6):

(6)

a. We are proposing that argument structure in Japanese is primarily semantic and pragmatic, rather than structural. We suggest that even when grammars appear to make a clear "core" / "non-core" distinction, this distinction is only loosely grammaticized. In Japanese, for instance, it does not seem to be at all well grammaticized (cf Okamoto 1990).
b. If our sense of what argument structure is is on the right track, then there are no "obligatory" arguments, and the idea of an obligatory "slot" which can either be filled with a mentioned referent or a "zero" may not be appropriate.
c. The sense we have of an "intended referent", that we know perfectly well who it is who hasn't eaten in (3), can be accounted for by well-known inferential processes.
   That is, as has been discussed at length by Hinds 1982 for Japanese, and by Li in press and Tao 1993 for Mandarin, it is easy to infer in (3) who has not eaten from information in the verb and in the context. But this INFERRABILITY doesn't need to be accounted for by postulating "zero". Inferences like this are part and parcel of our use and comprehension of language. So we don't need to invoke "zero" to do that work. We are saying that there is no a priori reason to consider that the "eater" should have a priviledged status among the associations that go with *taberu*, except for the fact that they have a priviledged PRAGMATIC status based on the verb's meaning which leads to frequent use with concern for who the

> "eater" is. And, we suggest, it is this same pragmatic fact that leads linguists to postulate "zeros" for just those "core argument" associations.

So how does our view differ from the "zero" view? For verbs with relatively clear action scenes like *taberu* 'eat', it differs in the following way: the "zero" analysis postulates an agent "slot" for *taberu*, which can be either filled or not filled. When it is not filled, the "zero" analysis would postulate a "zero" in that slot. Our analysis suggests that there are no "slots" - there only SEEM to be such "slots" because with some kinds of verbs some associations are frequently of concern and come to be regularly associated with those verbs through repeated use. And verbs can to some extent be classified, by speakers and by analysts, according to the most frequent associations. As Hopper 1987 puts it,

> The linguistic system [can be seen] ... as a growing together of disparate forms. This convergence takes place through lateral association of real utterances.

Thus for verbs like *taberu*, there may not be a big difference between our analysis and the "zero" analysis. However, it is evident that our analysis opens up a more pragmatic view of argument structure that has interesting implications for other areas of grammar.

But we have another important point to make in this paper, and that is that MOST OF THE PREDICATES IN OUR CONVERSATIONAL DATA ARE NOT LIKE *TABERU* 'EAT'. That is, they are even less clear in what arguments they should be said to take. We would like to concentrate on these for the rest of this paper.

Our claim is that a close study of actual talk-in-interaction reveals several facts which conspire to reduce the appeal of a "zero" approach to Japanese clause structure:

(7) For a great majority of the predicates in our data, it is either counter-intuititve, difficult, or impossible to identify a particular referent when no argument occurs. Many of these predicates are part of fixed expressions with different degrees of lexicalization. These findings lead to our current proposal that when predicates appear with no overt arguments "zero" should not be postulated. We will now discuss these facts with examples.

First, it is often difficult to asign "missing" arguments to predicate nominals. Look at (8):

(8) O and T are trying to decide the time to meet

-> O: kayoobi dat -tara ne=,
Tuesday COP-if FP
if (it) is Tuesday/if (we meet on) Tuesday

T: [hai].
yes

O: [aa] san-ji han ga ii wa.
uh 3 -o'clock half SUB good FP
uh, three-thirty is good

-> T: san-ji han [desu ka]?
3 -o'clock half COP Q
three-thirty?

-> O: [onnaji] onnaji ne kyoo to.
same same FP today with
just like today

T: hai.
yes

In the utterances pointed to by the arrows, it seems difficult to settle on particular referents for the "missing" arguments.

Predicate adjectives are similar:

(9) T starts getting ready to leave, saying she should get going:

T: ano jaa,
well then

O: itte [itte],
go go
(you) go, (you) go

T: [raishuu=],
next.week
next week

-> O: un= itte **warui** kara.
mhm go bad because
mhm, (you) go because (by keeping you here I feel) bad

It is difficult to identify a particular referent which would be the "missing" argument of *warui* 'bad'. The translation reflects this difficulty.

Similarly:

(10) koko ni kure -ba **ii** n desu ka?
here at come-if good NOM COP Q
Is (it) good if (I) come here?/Is coming here good?

Again, it is difficult to come up with the referent for the "missing" argument for the adjectival predicate *ii* 'good'. One could say the "missing" subject is something like 'coming here', but of course that is already expressed in the form of the conditional clause (see Clancy et al. in press for a discussion of the grammaticization of conditionals as expressions of deontic modality). One could suggest that the entire expression in (10) is a lexicalized expression, of the type that Fillmore, Kay, and O'Connor (1988:505) call a "lexically open idiom", which consists of a conditional clause and the adjective ii. In that case, there is no point talking about its argumenthood. We tend to agree with that analysis. However, we should also emphasize that our conversational database is filled with lexicalized expressions like (10), which seem to be grammaticized without any "argument structure".

And, though we will not point this out for each case, many of the examples discussed in this paper seem to be associated with various degrees of lexicalization.

Let's consider another example:

(11) (T and O are talking about whether it matters how soon they get together again to make another recording

-> 1 T: ano hayaku i ano are **shi**-na -kya ikenai n desu ka?
uh quickly uh that do -not-if bad NOM COP Q
is (it) bad if (we) don't do that quickly?/
is not doing that quickly bad?

2 kore wa i --
this TOP
this

->3 O: **deki**-tara,
can -if
if (you) can/if (it's) possible

4 iya betsuni sonna koto nai sonna koto nai.
no particularly such thing not such thing not
No, we don't have to, we don't have to

The first line includes a predicate adjective *ikenai* 'bad' and the fourth line includes a predicate nominal *koto* 'thing', which are similar to the types we have seen already for which it is difficult to come up with a referent for the "missing" argument. However, in this example, we would like to focus on the verb *suru* 'do' in the first line. As the translation suggests, it is possible to think that here the subject 'we' is not expressed. However, it is equally possible to think that the subject of the verb in question is a generic referent like 'one' or 'you'. Further, the utterance can even mean 'is not doing that quickly bad?'

We can make a similar observation for the verb *dekiru* 'be possible' in the third line. As indicated in the translation, this clause could be seen as "missing" a subject argument 'you', but it could equally be seen as meaning that something is possible.

Some linguists would want to posit two (or even more) different "argument structures" for many of the predicates in our database, like *dekiru* 'be possible'. We do not favor that approach for the large number of similar predicates in our database, for the simple reason that there does not seem to be more than one "meaning" corresponding to these different "argument structures". Furthermore, for such predicates, native speakers often cannot specify which of the various argument structures is "intended". In fact, as Dutra, p.c., has suggested, we may want our model of language to reflect the fact that there are many contexts in which the "referent" is intended to be left "open". Thus, rather than say that *dekiru* 'be possible' has two different argument structures, we would want to say that its meaning allows a range of interpretations as to what might or might not be 'possible' in a given context.

The following example is even more instructive:

(12) Talking about how long the next recording session might take

-> O: **owatta** tokoro de **yame**-tara ee kara.
ended place at stop -if good because
(it's) good if (we) stop when (we)'re done/
stopping when (we)'re done is good

ni-jikan gurai shabet-temo.
2 -hour about talk -even
even if (we) talk about two hours/even talking two hours

betsuni antata ga ee n yat -tara,
particularly you SUB good NOM COP-if
if (it) is good with you

This segment has many of the features which we have already discussed. However, let us focus on the first line. Again it is difficult to come up with a specific referent for the "missing" argument for the verb *owaru* 'end/be done': it's something like 'our talking'. Similarly, the verb *yameru* 'stop' can be assigned the referent 'we', but as the second translation suggests, it does not have to be.

And again, we are not saying that the "difficulty" of finding an appropriate referent is causing us to reject an argument structure analysis according to which required "arguments" that are missing should be seen as "zeros". What we are saying is that MOST of the verbs in our conversations are of this type, which makes us question the assumptions underlying the "argument structure" and "zero" approach to Japanese clause structure.

Most functional and cognitive scholars of Japanese and other languages for which "zero" has been postulated would agree that examples like (8)-(12) do indeed raise major questions about the idea of "zero". Some have proposed that there seem to be "different kinds of zeros" (see Tao 1996 and Clancy forthcoming for important analysis of "different zeros"). But we are going two steps farther in our analysis, as shown in (13):

(13) Ono-Thompson:

1. we are saying that the cases in our conversational data where a "zero" analysis seems inappropriate may be the MAJORITY of cases in ordinary conversation;
2. we are saying that there is no PRINCIPLED difference between these cases and the one illustrated with *taberu* 'eat' in (3) above. If "zero" is not appropriate for (8)-(12), then it is not appropriate for (3) either.

We conclude that, while "zero anaphora" may have appeared to be a useful metaphor for describing aspects of Japanese clause structure, it may actually be a misleading one. Our examination of conversations suggests a need to supplant this idea with a more realistic model in which semantics and pragmatics play a primary role, in which what has been known as "argument structure" is seen as essentially a pragmatic matter, with the "meanings" of predicates evolving from repeated occurrences in actual language USE. In such a model, the notion of "zero" would play no role. Referents, like much else in linguistic communication, would be inferred from the entire range of semantic and pragmatic factors which are present in the actual interactions in which speakers engage in everyday life.

NOTES

[1] We wish to thank the following people for their valuable help in discussing the issues raised in this paper, even though they may not necessarily agree with all of our proposals: Patricia Clancy, Susanna Cumming, Pamela Downing, Rosalia Dutra, Kumiko Ichihashi-Nakayama, Kim Jones, Toshihide Nakayama, Shoichi Iwasaki, Yoshiko Matsumoto, Shigeko Okamoto, Danae Paolino, Ryoko Suzuki, and Tomoyo Takagi.

[2] Our database consists of three very spontaneous and informal conversations among family members and friends, totalling approximately 6 minutes, about 500 intonation units.

REFERENCES

Bybee, Joan. 1985. Morphology: a study of the relation between meaning and form. Amsterdam: Benjamins.

Bybee, Joan and Carol L. Moder. 1983. Morphological classes as natural categories. Language 59: 251-270.

Bybee, Joan and Dan I. Slobin. 1982. Rules and schemas in the development and use of the English past tense. Language 58: 265-289.

Clancy, Patricia. 1980. Referential choice in English and Japanese narrative discourse. In Chafe, Wallace, ed., The pear stories, 127-202. Norwood: Ablex.

Clancy, Patricia. Forthcoming. A discourse-functional approach to argument structure: a developmental study of Korean.

Clancy, Patricia M., Noriko Akatsaka, and Susan Strauss. In press. A study of deontic modality in Japanese, Korean and English: Form and function in adult-child discourse. In Akio Kamio, ed., Directions in functional linguistics. Amsterdam: Benjamins.

Du Bois, John W. 1987. The discourse basis of ergativity. Language 63: 805-855.

Du Bois, John, Stephan Schuetze-Coburn, Danae Paolino, and Susanna Cumming. 1993. Outline of discourse transcription. In Jane A. Edwards and Martin D. Lampert, eds., Talking data: Transcription and coding methods for language research, 45-89. Hillsdale, NJ: Lawrence Erlbaum.

Fillmore, Charles J. 1986. Pragmatically controlled zero anaphora. BLS 12: 95-107.

Fillmore, Charles J., Paul Kay, and Mary C. O'Connor. 1988. Regularity and idiomaticity in grammatical constructions. Language 64:501-538.

Givón, Talmy. 1979. On understanding grammar. New York: Academic Press.

Givón, T. 1983. Topic continuity in discourse. Amsterdam: Benjamins.

Givón, T. 1984. Syntax: A functional-typological introduction, vol. 1. Amsterdam and Philadelphia: John Benjamins.

Goldberg, Adele. 1995. Constructions: a construction grammar approach to argument structure. Chicago: University of Chicago Press.

Hinds, John. 1982. Ellipsis in Japanese. Edmonton: Linguistic Research, Inc

Hopper, Paul J. 1987. Emergent grammar. Berkeley Linguistics Society 13, 139-157.

Hopper, Paul J. 1988. Emergent grammar and the *a priori* grammar principle. Linguistics in context: Connecting observation and understanding, ed. by Deborah Tannen. Norwood, NJ: Ablex.

Kuroda, S-Y. 1965. Generative grammatical studies in the Japanese language. PhD dissertation, MIT.

Langacker, Ronald. 1987. Foundations of cognitive grammar. Stanford: Stanford University Press.

Li, Charles N. In press. On zero anaphora. In a secret festschrift.

Matsumoto, Yoshiko. 1981. Noun phrase ellipsis in Japanese discourse. Unpublished Manuscript.

Okamoto, Shigeko. 1985. Ellipsis in Japanese discourse. PhD dissertation, UC Berkeley.

Okamoto, Shigeko. 1990. Potential complements and complementation: the case of Japanese. Unpublished ms., California State University, Fresno.

Ono, Tsuyoshi and Sandra A. Thompson. 1995. What can conversation tell us about syntax? In Philip W. Davis, ed., Alternative Linguistics: Descriptive and Theoretical Modes, 213-271. Amsterdam: Benjamins.

Tao, Hongyin. 1996: Units in Mandarin conversation: Prosody, discourse , and grammar. Amsterdam: John Benjamins.

Tao, Liang. 1993. Zero anaphora in Chinese: Cognitive strategies in discourse processing. PhD dissertation, University of Colorado.

Discourse Structure and Discourse Interpretation

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1 Introduction

In this paper, I present an informal account of discourse syntax and semantics under the *Linguistic Discourse Model* (*LDM*). (Polanyi 1985, 1987, 1988, 1996; Polanyi and Scha 1984; Polanyi and van den Berg 1996; Scha and Polanyi 1988; Prust, Scha and van den Berg, 1991; van den Berg and Polanyi, 1999). The goal of analyzing discourse under the LDM is to assign a correct semantic interpretation to each semiotic gesture in a discourse – be it a word or phrase, a deictic gesture or significant head nod. A correct semantic interpretation allows us to characterize how speakers are able to recover personal, temporal and spatial references even in apparently disorderly discourse as well as to provide appropriate next utterances even while the conversation may seem to have wandered off course[1]. To ground the discussion, we will consider Prince's 1988 account of Yiddish Expletive, *ES + Subject Postposing*. I will argue that Prince's analysis provides an excellent point of departure for exploring the nature of language use above the sentence. After presenting an overview of the LDM, we will consider a re-analysis of Prince's Yiddish data in the LDM framework. It will be shown how apparent counter examples to her account of Yiddish *es + Subject Postposing* fall out of our analysis.

2 Prince's treatment of Yiddish Expletive *ES* + Subject Postposing

Prince (1988: 176) presents an analysis of 1804 clauses from a corpus of Yiddish anecdotes, *Royte pomenantsen* (I Olavanger ed. 1947) "in which the subject is Postposed with a concomitant use of expletive ES". We use Prince's examples, shown in 1-3 below, to illustrate the phenomenon:

1. *es* is geshtorbn *a raykher goy.*
   It is died a rich gentile
   A rich gentile died.

2. *es* veln oyfahteyn *groyse khakhomin* *fun daytshland ...*
   it will upstand big sages from Germany.
   Great sages from Germany will stand up.

3. *es* geyt epes in vald *a yid*
   it goes something in wood a Jew
   Some Jew seems to be walking in the woods.

Prince argues that "Postposed subjects of ES-sentences indicate that they do not represent entities which have already been evoked in the discourse." (184) Her conclusion is well supported by the data given: out of 1804 examples of ES+Subject postposing, there are only 2 putative counterexamples to this generalization which both occur in the same story. These counterexamples bring into question the apparently unremarkable idea of what it means to be evoked in the discourse. Arriving at a general, independently motivated theory of what evoked in the discourse entails is the task of this paper.

2.1 Non-discourse initial Postposed subjects of ES sentences

In her 1988 article, Prince explains that the full NP *the horse and the wagon* occurs six times in the text of a single anecdote, *What my Father Did*[2]. In two cases, the postposed subject in an ES sentence is not "discourse initial in the story" (Prince 1988:184).

Prince explains these apparent anomalies as follows:

> *The second occurrence*[3] *[of the phrase in the text] is Postposed [and] is in an interior monologue of the hero – and since, as far as we know, he has not spoken about the horse and wagon* ***recently*** *it is discourse-initial in his private discussion with himself.*
>
> *The fourth occurrence*[4] *[of the phrase in the text] is [also] Postposed, but this time it is in his public announcement back in the inn, addressed to the guests, and in that speech-event it is discourse initial.*
>
> *Thus it seems that the generalization is maintained that Postposed subjects of ES-sentences may not represent entitities already evoked in the discourse, with the unsurprising caveat that* ***discourses have internal structure and may themselves include sub-discourses in each of which some discourse entity may be new.***[5]

Prince's analysis of how these cases differ from the norm is compelling. However, as stated, the explanation of the key data is ad hoc and unrelated to any more systematic linguistic theory. No explanation of what it means for a discourse to have internal structure is given. In the following section, I will present an overview of the Linguistic Discourse Model (LDM) and then will show how the LDM can account for Prince's data within a comprehensive theory of discourse structure.

3 An Overview of the *Linguistic Discourse Model*

The LDM is modeled as a discourse parser which operates on a discourse from left to right accepting elementary discourse structures as input and returning as output a structural description of the discourse and a (set of) discourse semantic representations.

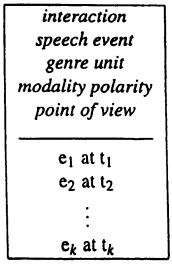
3.1 Basic Discourse Units

The elementary unit of discourse formation is the *Basic Discourse Unit (BDU)*. There are two types of BDU: the *elementary discourse constituent unit* or *e-dcu*, a semantically motivated semiotic structure that expresses propositional meaning, and the *discourse operator* that does not express content but structural and semantic relations among meaning units as well as pragmatic information linking the discourse to its utterance situation including greetings, vocatives and the speakers' attitude towards propositional information.

3.1.1 Elementary Discourse Constituent Units

Any semiotic gesture (a shrug of the shoulders in response to a question, deictic point, or shaking the head "yes" or "no") communicating an atomic predication is an encoding of an e-dcu. The e-dcu, when linguistically encoded, will have a syntactic and phonological realization. The e-dcu expresses an atomic predication: a single event or state of affairs in some semantic *world of discourse* (*WOD*). The WOD is an intermediate representation between natural language expressions and model structures as in (DRT) and are no more mentally real than variables or generalized quantifiers. (It is important to point out that the elementary dcu is **not simply** a *sentence, clause, phrase, prosodic unit, discourse paragraph* [Longacre 1976], *discourse segment, turn at talk, or rhetorical/coherence relation.* [Hobbs 1976, Reichmann 1985, Mann and Thompson 1987]).

E-dcus are always indexed for situation of utterance (real or modeled interaction and speech event) and modal context: modality, specificity, evidentiality, point of view, etc. (Contexts may be underspecified.) These contexts identify the WOD in which the predication obtains. We depict a simple discourse world as shown in (4):



3.1.2 Complex DCUs

Complex discourse is formed by the recursive sequencing and embedding of dcus to dcus. There are three processes of discourse formation, *Coordination*, *Embedding* and *Binary Attachment*. These general processes as well as more specific discourse structure sub-types can be represented by rules of discourse grammar.[6]

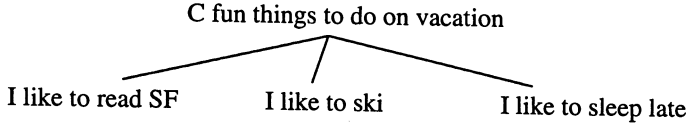
Coordination (creating lists of various types)

Adding a next item to a list, giving a next episode of a story, beginning a new topic in a conversation when discussion of a previous topic has been concluded, or going on to a next expected activity in a speech event such as a church service can all be analyzed as continuing the development of an ongoing discourse activity. In the DPT such continuing activities are depicted as a sequence of coordinated constituents, i.e. as nonterminal *C* node immediately dominating arbitrarily many constituents that share a single type. LISTS, TOPIC CHAINS, and NARRATIVES are common sequential structures. To calculate the extension of the primary node label, all information held in common by daughter nodes is inherited up to the dominating node. (See Polanyi 1985, Prust, Scha and van den Berg 1994 for a discussion of these calculations.) Semantically, a new item on a list updates a representation of the listed structure with the information expressed.

(5) *I like to read Sci-Fi. I like to ski and I like to sleep late.*

The structure of (5) can be characterized by the tree given in (6):

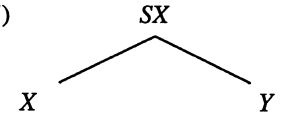
(6)



Embedding (Integrating elaborating and "interrupting" elements)

Discourse activities which interrupt the completion of other ongoing activities are treated in a structurally uniform manner. ELABORATIONS on a point just made, DIGRESSIONS to discuss something else, ASIDES, APPOSITIVES, sections of DIRECT DISCOURSE, or true INTERRUPTIONS are all treated as subordinated to activities which continue the development of an ongoing unit, be it a story, a proposal for a course of action, a lecture, or a move in speech event as well as SENTENTIAL SUBORDINATION (Matthiesson 1988, Thompson 1983), appositives, and parenthetical elements. In the general case, the subordinated constituent will be encoded as the right daughter *Y*. The subordinated (left) daughter is inherited up to the mother node[7] in an elementary tree such as (7):

(7)



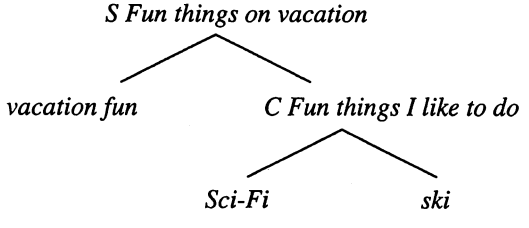
Perhaps less intuitively, the same structural description is appropriate for elaborations, where the right daughter gives more information about some aspect of the predication or entity encoded in the left daughter, as in the following example (8):

(8) a. *I like to do fun things on vacation.*
b. *I like to read Sci-Fi.*

Semantically, a representation of an elaboration is embedded within the representation of the units elaborated upon. A representation of an interruption, however, will not be incorporated within the representation of the structurally dominating constituent.

Should the discourse continue, (c.) *I like to ski*, this new dcu would be coordinated to Y *I like to read Sci-Fi* under a newly created *C* node interpreted as **Fun things I like to do** as in (9):

(9)



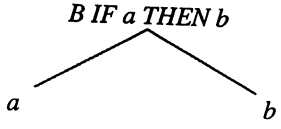
Binary attachment (Adjacency pairs, logical relations, rhetorical structures, sentential adjuncts)

Binary structures constuct a dcu out of two dcus related logically (e.g. IF/THEN, THEN/IF, OR, THEREFORE), rhetorically, (e.g. SUM UP), or interactionally (e.g. QUESTION/ANSWER, WARRANT/RESPONSE, ERROR/REPAIR). Sentential adjuncts are related to the dominating sentential constituent in a MOD-Binary relationship.

(10) a. *If John goes to the store*
b. *he'll buy tomatoes*

In representing binary relations structurally an intrasentential binary node dominating both dcus in the first sentence is annotated with the complete binary structure as shown in (11):

(11)



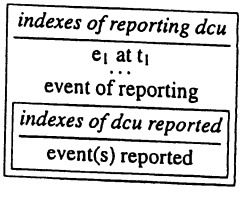
3.2 Discourse Parsing

Discourse segmentation is determined by semantic criteria and guided by syntax and intonation. A new dcu is started whenever phonological (i.e., pausal or prosodic) criteria indicate a break, whenever sentential syntactic criteria indicate a clause break (except for a lexically limited set of matrix verbs governing infinitival clauses), and whenever sentential semantics requires a change in any of the contexts (spatial, temporal, modal, etc.) that index the discourse worlds where the events (and, in general, states of affairs) are interpreted.

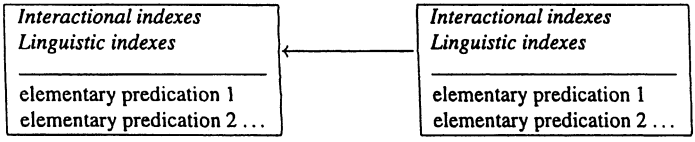
The structural description of any discourse is an Open Right Discourse Parse Tree (DPT). During discourse parsing a structural description is assigned to a discourse incrementally. Each incoming elementary dcu is attached to the developing DPT as the right daughter of an appropriate existing, or newly created, node along the Right Edge of the Tree. Once a node is no longer on the Tree's right edge it is no longer a candidate for new dcu attachment.

3.3 Discourse Semantic Representation

The attachment of the elementary dcu to the DPT's Right Edge is taken as an instruction to discourse semantics to create a new discourse representational structure to accommodate the propositional information asserted by the dcu or to increment or otherwise modify existing representations with the new information. We treat discourse worlds as purely technical devices of semantics, no more mentally real than variables or generalized quantifiers. For our purposes, discourse worlds are simply intermediate representations between natural language expressions and model structures, much as in DRT.[8] Since discourse worlds are constructed by the discourse, truth relative to discourse worlds is automatic. Discourse worlds can be embedded in one another, as in the case of reported speech depicted in (12):



Elaboration and logical relations are indicated by arrows connecting representations or elements within representations.



Syntactic subordination of unrelated material, as in interruptions and digressions, does not give rise to semantic subordination, but rather to parallel (coordinated) discourse worlds as shown in (13):

Interactional indexes *Linguistic indexes*	*Interactional indexes* *Linguistic indexes*
elementary predication 1 elementary predication 2 ...	elementary predication 1 elementary predication 2

The DPT is a record of the unfolding of the encoding event itself while the semantic representation encodes the states of affairs asserted to obtain in the WODs of the discourse interpretation. Thus, under the LDM, discourse syntactic and semantic structures need not be isomorphic: Discourse *syntax* is monotonic while Discourse *semantics* is non-monotonic. Some classes of Repair, for example, are instructions to remove information from a semantic representation under construction. In the DPT representing the syntactic representation of the discourse, there will be a record of the original dcus encoding the information to be repaired, the dcus encoding the Repair instruction and any subsequent dcus containing information to be substituted for the removed constituent. In the semantic representation, neither the original information nor the Repair instruction may appear.

4 Reanalysis of Prince (1988, 1993)

Let us begin to see how Prince's data is treated under the LDM by considering a shortened version of the Yiddish anecdote with glosses removed. The text given below has already been segmented according to LDM criteria.

What my father did.

(a) A guy once went by an inn. (b) He left his horse and wagon outside (c) and went alone into the inn. (d) Inside the inn, (e) he ordered a couple of eggs (f) or some chicken (g) and ate it. (h) Then he got up (i) to travel further. (j) He goes outside the inn. (k) He looks around. (l) There's no horse and no wagon. (m) He thought, (n) there was probably a thief among the people in the inn (o) that had stolen the horse and wagon. (p) He goes back into the inn (q) and shouts (r) "The horse and wagon should be returned". (s) The thief got scared. (t) He quickly went out (u) and brought back the horse and wagon.

This discourse consists of constituents of various types including: the List, Elaboration, SUM UP, Subordinate Clause, Operator/Sentence, Interruption, Direct Discourse, Reported Thought, IF/THEN, BECAUSE, ANTECEDENT / CONSEQUENT, and YIDDISH ANECDOTE and WRITTEN YIDDISH ANECDOTE. The WRITTEN YIDDISH ANECDOTE is a coordinate structure consisting of several coordinated constituents (as a first analysis and based on this one example).

YIDDISH ANECDOTE → (Opening), Orientation, Action, Question, Answer

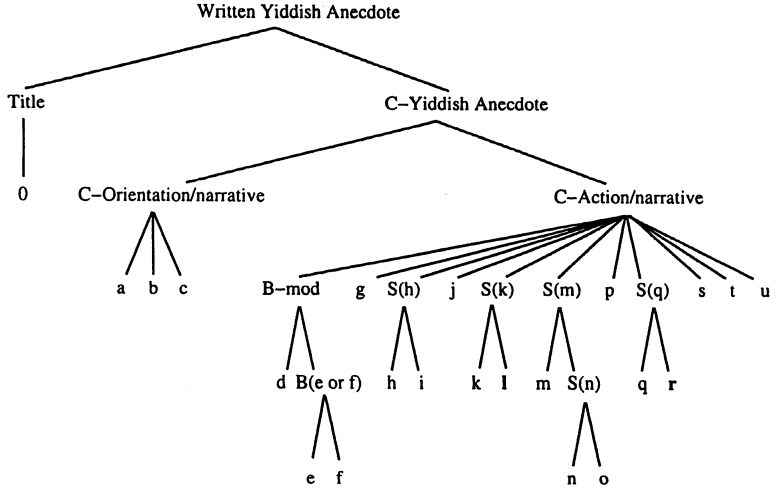
A WRITTEN ANECDOTE involves an Interaction between a Reader and a Modeled Writer in which an Interaction between a Modeled Narrator and Modeled Story Recipient takes place. The rule for WRITTEN YIDDISH ANECDOTE consists of the constituents of YIDDISH ANECDOTE plus an initial Title constituent:

WRITTEN YIDDISH ANECDOTE → Title, YIDDISH ANECDOTE.

4.1 LDM representations of *What my father did*

Following the rules of discourse segmentation and discourse syntax given above results in the Discourse Parse Tree for *What my Father Did* given in figure 1.[9]

An examination of the DPT for *What my Father Did* reveals its hierarchical structure. The events of the narrative mainline are represented as daughters of one coordinate ACTION node, while reported speech, thought and perception are shown as embedded constituents under **S** nodes. From this purely structural representation, however, it is not clear why the subjects in (l) and ® are not postposed. For an explanation of this phenomena we must look further to the semantic representation. In figure 2 below, we have prepared an informal representation of the semantics of this text.[10]



DPT for *What my father did.*

4.2 *Evoked in which discourse?*

As you will recall, LDM analysis of discourse requires that each BDU be tagged for a number of context variables. If we now examine the semantic representation for this text constructed following the LDM, it is clear that a *horse and wagon* is evoked within the scope of three separate interactional contexts: Interaction 1 involving a Modeled Narrator and a Modeled Story Recipient, Interaction 2 in which the participant is set is the Guy who acts as both enunciator of perception and receiver of enunciation, and Interaction 3 in which the Guy interacts with the crowd at the Inn. These three dcus correspond to dcus marked (b), (l) and (r). These are the first mention of *horse and wagon* in the Yiddish anecdote we have been examining and the two putative counterexamples to Prince's generalization.

Since the LDM requires tagging of each dcu for Interactional Context as well as for a host of other context types, our analysis provides the machinery to re-phrase Prince's theory of Yiddish expletive *es* + Subject Postposing without extending the model at all. The analysis of this under the LDM specifies that any entity mentioned initially in any Interaction Context will be marked in Yiddish as a first mention.

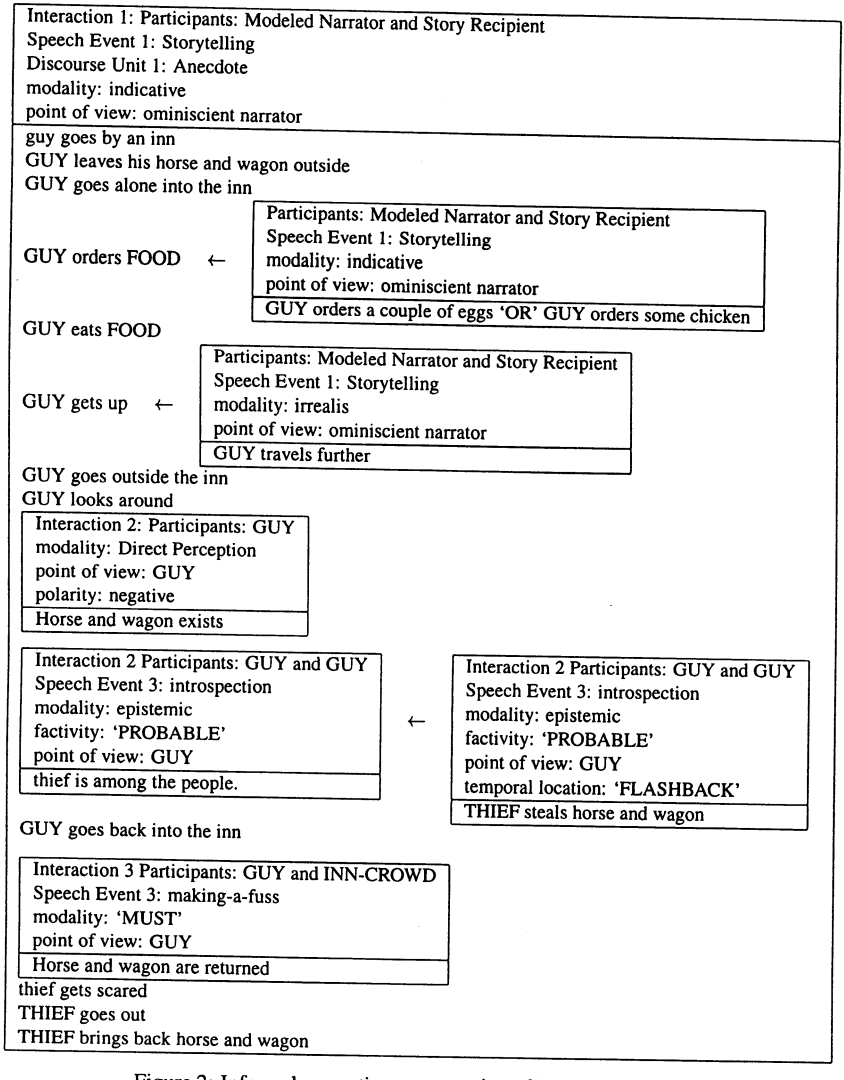


Figure 2: Informal semantic representation of *What my father did*

5 Conclusion

There are a number of important issues in discourse understanding which requre an understanding of discourse structure, most importantly issues of anaphora resolution and reference tracking. In other published work, there have been accounts given of how the LDM framework described briefly here contributes to our developing understanding of these phenomena. (See Polanyi 1987; Prüst, Scha and van den Berg 1991; Polanyi and van den Berg 1996; van den Berg 1996, 1999.)

Notes

[1] How a discourse presents as "coherent" falls out of our semantic account but does not motivate the analysis.

[2] The translated shortened form of the anecdote is in Section 4 below.

[3] ***es iz nito*** *der vogn* ***un nit*** *dos ferdl*
It is not here the wagon and not the horse
There's no **horse and no wagon**

[4] ***es zol*** ***teykef*** ***Vern*** *der vogn mith ferdl*
It shall immediately become the wagon with the horse.
The horse and wagon must come back immediately

[5] Emphasis added.

[6] See Polanyi and Scha 1984, Scha and Polanyi 1988, and Prüst, Scha and van den Berg 1994 for discussions and examples of discourse grammar rules.

[7] This constraint is relaxed in sentential subordination, where the normal order of embedding can be reversed.

[8] In this informal account, none of the complex logics needed to express discourse semantic relations are discussed. See Prust, Scha and van den Berg 1994; van den Berg and Polanyi 1995, 1999; van den Berg 1995 for more formal discussions.

[9] For the sake of simplicity the terminal nodes are labeled only with the letter corresponding to the e-dcu in the segmented text; non-terminals are labeled only with **C**, **S**, or **B** and the simplest indication of semantic extension. Full node labels are much more extensive and allow for the computation on the non-terminal nodes necessary to express recursive dcu formation.

[10] In order to make the diagram a bit more easily understood, only particularly relevant contexts are identified and after dcu l the contexts which hold for the entire are not repeated.

References

van den Berg, Martin. 1996. Discourse Grammar and Dynamic Logic. In *Proceedings of the Tenth Amsterdam Colloquium*. Amsterdam: ILLC.

van den Berg, Martin. 1996. Discourse Structure and Discourse Interpretation. In *Proceedings of the Tenth Amsterdam Colloquium*. Amsterdam: ILLC.

van den Berg, Martin and Livia Polanyi. 1999. Logical Structure and Discourse Anaphora Resolution. In *The Proceedings of the ACL Workshop on Discourse Structure*.

Chafe, Wallace. 1988. Linking Intonation Units in Spoken English. In J. Haiman and S. Thompson, eds. *Clause Combining in Grammar and Discourse*. 1-28.

Givon, T. (ed.) 1983. *Topic Continuity in Discourse: A Quantitative Cross-Language Study*. Amsterdam: John Benjamins.

Goldstone, N. 1995. *Mommy and the Murder*. New York: Harper Collins. 1-2.

Hobbs, J. 1979. Coherence and Conreference. *Cognitive Science* 3,1:67-82.

Longacre, R. 1976. *An Anatomy of Speech Notions*. Lisse, The Netherlands: Peter de Ridder Press.

Mann, W. and S. Thompson. 1987. Relational Propositions in Discourse. *Discourse Processes* 9,1:57-90.

Matthiesson, C. and S. Thompson. 1988. The Structure of Discourse and 'Subordination'. In J. Haiman and S. Thompson, eds. *Clause Combining in Grammar and Discourse*. Amsterdam: John Benjamins. 275-330.

Polanyi, L. 1985. A Theory of Discourse Structure and Discourse Coherence. In *Proceedings of the 21st Annual Meeting of the Chicago Linguistics Society*. Chicago: University of Chicago Department of Linguistics.

Polanyi, L. 1987. Keeping it all Straight: Interpreting Narrative Time in Real Discourse. WCCFL 6:229-245.

Polanyi, L. 1988. A Formal Model of Discourse Structure. *Journal of Pragmatics* 12:601-638.

Polanyi, L. 1996. *The Linguistic Structure of Discourse*. Stanford, CA: CSLI Technical Report.

Polanyi, L. and R. Scha. 1984. A Syntactic Approach to Discourse Semantics. In *Proceedings of the 6th International Conference on Computational Linguistics*. Stanford, CA.

Prince, E. 1988. The Discourse Functions of Yiddish Expletive ES + Subject-Postposing. In *Papers in Pragmatics* 2, 1-2:176-194.

Prince, E. 1993. On the Discourse Functions of Syntactic Form in Yiddish: Expletive es and Subject-Postposing. In Goldberg, D.; Herzog, M.; Kirshenblatt-Gimblett, B.; and Miron, D. (eds). *The Field of Yiddish, 5th collection: Studies in Yiddish Language, Folklore, and Literature*. Northwestern University Press / YIVO. 59-86.

Prüst, H., R. Scha and M. H. van den Berg. 1994. Discourse Grammar and Verb Phrase Anaphora. *Linguistics and Philosophy* 17:261-327.

Reichman, R. 1985. *Getting Computers to Talk Like Me and You*. Cambridge: MIT Press.

Sag, I. and C. Pollard. 1991. An Integrated Theory of Complement Control. *Language* 67,1:63-113.

Scha, R. and L. Polanyi. 1988. An Augmented Context Free Grammar for Discourse. In *Proceedings of CLING 88*. Budapest.

Thompson, S. 1983. Grammar and Discourse: The English detached participial clause in Flora-Klein Andreu, ed. *Discourse Perspectives on Syntax*. New York: Academic Press. 43065.

Woodbury, A. 1987. Rhetorical Structure in a Central Yupik Eskimo Traditional Narrative. In J. Sherzer and A. Woodbury, eds. *Native American Discourse: Poetics and Rhetoric*. Cambridge: Cambridge University Press.

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