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PROCEEDINGS OF THE EIGHTEENTH ANNUAL MEETING
OF THE
BERKELEY LINGUISTICS SOCIETY
February 14-17, 1992

GENERAL SESSION
and
PARASESSION
ON
THE PLACE
OF MORPHOLOGY
IN A GRAMMAR

Berkeley Linguistics Society
Berkeley, California, USA

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IN A
GRAMMAR

edited by
Laura A. Buszard-Welcher
Lionel Wee
and
William Weigel

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PREFACE

We hereby present the proceedings of the Eighteenth Annual Meeting. The conference, which took place in February of 1992, featured a Parasession on the Place of Morphology in a Grammar and a Special Session on the Typology of Tone Languages. The papers from the special session appear in our companion volume, BLS 18S.

We send our thanks to everyone who helped make this year's conference a success, and also to those who helped with the production of this volume: David Peterson and Yoon-Suk Chung, for helping proofread papers, and Laurel Sutton, for her patience, guidance and dedication.

1991-92 BLS Officers
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GENERAL SESSION

Ponapean Nasal Substitution: New Evidence for Rhinoglottophilia*

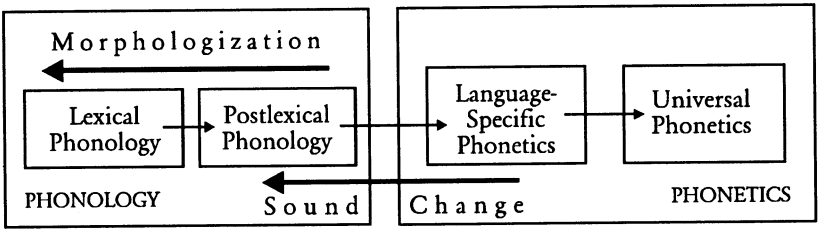
Juliette Blevins
University of Texas at Austin

Andrew Garrett
Stanford University &
University of Texas at Austin

1. Introduction

This paper addresses a particular diachronic problem which is of general interest for at least two reasons. First, on our analysis it adds to the evidence for the intriguing and relatively rare process identified in our subtitle.[1] Second, it bears on a long-standing debate over the characteristics of sound change — in particular, the well-known claim that sound change is conditioned only phonetically. Like the rest of the neogrammarian framework this has received its share of criticism, but in our view some of the criticism stems from an imprecise understanding of the notion 'sound change'. The notion may have been unproblematic within neogrammarian theory, but, in today's more elaborate frameworks, testing hypotheses about 'sound change' requires saying what that is. For concreteness' sake we use the model in (1), although nothing here depends either on the general assumption that morphophonological rules are of two distinct types or on the particular assumptions of the theory of Lexical Phonology.

(1) A Model of Morphophonological Synchrony & Diachrony



Within this model we understand the notion 'sound change' informally as follows:

(2) Sound change is the innovation of a phonological rule via the reanalysis of output previously determined by phonetic implementation rules.

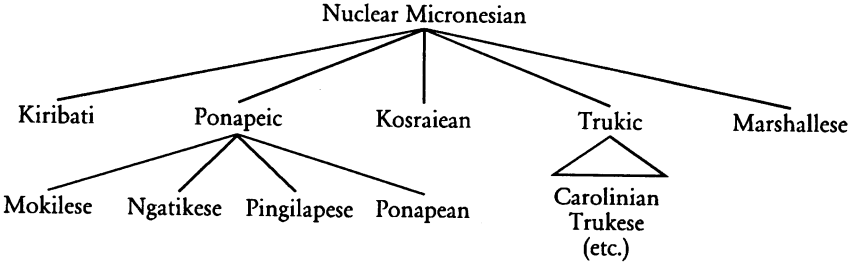
In a sense, then, sound change is the phonologization of phonetic implementation — for example, the reanalysis of vowel–vowel coarticulation as phonological umlaut. Within this framework the innovation of a phonological rule is distinguished (as 'sound change') from subsequent changes it undergoes; later changes involving the acquisition of morphological or morphosyntactic conditioning may, as indicated in (1), be subsumed under the rubric 'morphologization'. In our view precisely this approach to 'sound change' and 'morphologization' best captures the neogrammarian distinction between 'sound change' and 'analogy'.

A trivial consequence of the working definition in (2) is that sound change is conditioned only phonetically. A more interesting question, one which we believe usefully recasts the debate, is whether phonological processes have diachronic sources other than sound change and its morphologization. One relatively constrained view of morphophonological change is that they do not: sound change and morphologization together exhaust the possible system-internal sources of phonological rules.

This model of linguistic change is counterexemplified by any synchronic phonological process which cannot be plausibly explained as the reflex or reanalysis of a process which was once phonetically conditioned. Consequently, it focusses particular attention on rules which are phonologically natural but appear to be unnatural phonetically. While a detailed understanding of the development of any phonological process is certainly quite valuable, a particular desideratum is thus the diachronic analysis of those processes which seem phonetically implausible.

2. Ponapean Nasal Substitution

Nuclear Micronesian, a subbranch of the Oceanic branch of Austronesian, contains at least the following languages and dialect groups:



We omit possible internal subgrouping other than the well-established Ponapeic and Trukic groups. Among the Ponapeic languages, Mokilese and Ponapean are well-documented and a grammatical sketch of Pingilapese now exists.[1]

Each Ponapeic language has bilabials *p* and *m*, velarized bilabials p^w and m^w, velars *k* and *ŋ*, and a set of coronals reflecting Proto-Ponapeic **t*, **c*, **ç̆*, **n*, **l*, and **r*. A summary of the reflexes of these coronals is given in (3); note that while each Ponapeic language has a single fricative *s*, Proto-Ponapeic had none.

(3) Proto-Nuclear

Micronesian	Proto-Ponapeic	Mokilese	Pingilapese	Ponapean
**s*	**t*	*t*	*t* [t̪]	*t* [t̪]
**n*	**n*	*n*	*n* [n ~ n̪]	*n* [n̪]
**l*	**l*	*l*	*l* [l̪]	*l* [l̪]
**r*	**r*	*r*	*r*	*r*
**t*	**c*	*c*	*s*	*s* [s^y ~ c]
**t'*	**ç̆*	*s*	*s*	*ç̆*

All sonorants can occur long or short in Ponapean, but geminate obstruents do not occur morpheme-internally within the native vocabulary.[2] When identical obstruents come together as a result of reduplicative morphology, they surface as homorganic nasal–stop sequences, as in (4). Reduplication is the productive marker of durative aspect in Ponapean and was formerly used to derive intransitive verb stems from transitives.

(4) Ponapean Lexical Nasal Substitution — durative reduplication

a	/pap-pap/	*pampap*	'swimming'	(*pap* 'swim')
b	/p^{w}up^{w}-p^{w}up^{w}/	*p^{w}um^{w}p^{w}up^{w}*	'falling'	(*p^{w}up^{w}* 'fall')
c	/tit-tit/	*tintit*	'building a wall'	(*tit* 'build a wall')
d	/sas-sas/	*san^{y}sas*	'staggering'	(*sas* 'stagger')
e	/ʧaʧ-ʧaʧ/	*ʧanʧaʧ*	'writhing'	(*ʧaʧ* 'writhe')
f	/kak-kak/	*kaŋkak*	'(being) able'	(*kak* 'able')

Following Rehg 1981 and 1984, we refer to the process illustrated in (4) as 'nasal substitution'. Rehg proposes two Nasal Substitution rules in Ponapean. The first rule is based on forms like those in (4):

(5) Ponapean Nasal Substitution Rule I: 'When two identical voiceless consonants come together as a consequence of reduplication, the first will become a nasal that agrees in position of articulation with the second' (Rehg 1981: 58).

A second rule of Nasal Substitution, illustrated in (6), applies to identical labial and velar obstruent clusters in other derived environments. In (6a-b), for instance, the rule applies when directional suffixes are added to verb stems; in (6c) it is shown with the applicative suffix *-ki*; (6d-e) are cases of Nasal Substitution across a compound boundary, and (6f-g) show the same process over a word boundary.

(6) Ponapean Postlexical Nasal Substitution — labials and velars only

a	/lop-peseŋ/	*lompeseŋ*	'cut apart'
b	/sarep-pene/	*sarempene*	'scrape together'
c	/isik-ki/	*isiŋki*	'burn with'
d	/ep+p^{w}ɔʧol/	*em^{w}p^{w}ɔʧol*	'a game'
e	/sap^{w}+pai/	*sampai*	'world, earth'
f	/e kalap paːn soupisek/	*e kalam paːn soupisek*	'He'll always be busy'
g	/soulik kin soupisek/	*souliŋ kin soupisek*	'Soulik is (habitually) busy'

In parallel environments, as shown by the forms in (7), coronal obstruents do not undergo Nasal Substitution. In (7a-b), epenthesis eliminates sequences of identical coronal obstruents; in (7c-e), geminate coronal obstruents surface, either as a result of compounding or in sandhi.

(7) Ponapean Postlexical Nasal Substitution — does not apply to coronals

a	/m^{w}e-m^{w}eiʧ-ʧe/	*m^{w}em^{w}eiʧeʧe*	'just visiting'
b	/ait-to/	*aitoto*	'flow to here'
c	/mas+suwet/	*massuwet*	'ugly'

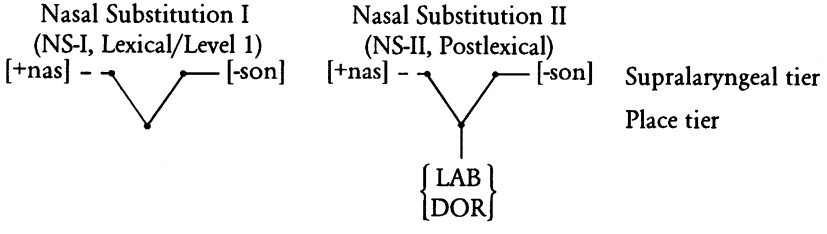
d	/e ekis suwet/	*e ekis suwet*	'It's kind of bad'
e	/ke meit taŋaːŋa/	*ke meit taŋaːŋa*	'Aren't you lazy!'

The process illustrated in (6) may be stated informally as follows:

(8) Ponapean Nasal Substitution Rule II: When identical bilabial or velar obstruents come together in the flow of speech, the first consonant will become a nasal that agrees in position of articulation with the second.[3]

Within autosegmental models, rules like (5) and (8) are stated as feature-insertion rules, and reference to geminates is handled by reference to multiply-associated nodes. (9) provides formal statements of these rules, assuming partial geminate structures for adjacent identical obstruents[4]:

(9)



Both NS-I and NS-II insert the feature [+nasal] in the first half of a geminate obstruent sequence, resulting in a nasal–obstruent sequence with shared place features. Two properties distinguish these rules: NS-I applies to all obstruents, while NS-II does not affect coronals; and NS-I is limited to the earliest level of the lexical phonology, whereas NS-II applies in all derived environments, including those in phrasal contexts.[5]

While the rules in (9) have several noteworthy properties, the one of interest here is the rarity of nasal substitution rules both synchronically and diachronically. We know no other clearly attested cases of voiceless geminate obstruents surfacing synchronically or diachronically as nasal–obstruent sequences.[6]

3. The Evolution of Ponapeic Nasal Substitution

Proto-Oceanic is usually assumed to have had only CV syllables and, with the possible exception of nasal–stop clusters, Proto-Nuclear-Micronesian also had no consonant clusters. The input clusters to Ponapean Nasal Substitution were therefore created by syncope, in most cases after Proto-Nuclear-Micronesian. Almost all the Nuclear Micronesian languages experienced parallel syncopes, whose elucidation is probably the most important task confronting Nuclear Micronesian historical phonology. The relevant syncopes were conditioned both by stress and morphology, with the particular result that, at least in some phonological contexts, CV and CVCV reduplication has yielded secondary consonant clusters in some languages; in some cases the resulting clusters underwent total regressive assimilation.[7] Thus in Trukese, for instance, word-initial gemination is a reflex of CV reduplication. Roughly the same set of developments can be assumed for the

prehistory of Ponapeic — first, syncope, conditioned in part by stress and morphology, and second, total regressive consonant assimilation. Since syncope typically applied in reduplicating syllables, Ponapean Nasal Substitution is most common across reduplication boundaries and its diachronic reflexes are found morpheme-internally across fossilized reduplication boundaries. Examples of Ponapean morpheme-internal nasal–stop clusters which result from Nasal Substitution appear in (10), where at least (10a-d) were originally formed by intransitivizing CV reduplication.

(10)	Ponapean	Diachronic Source	Comparanda
a	*mpeŋ* 'to be awakened'	**ppeŋ* < **pa-paŋi*	*paŋin* < **paŋi-ni* 'to awaken'
b	*mpek* 'to look for lice'	**ppek* < **pa-paki*	transitive *pakit*
c	*ŋkɔl* 'to make sennit'	**kkɔl* < **kɔ-kɔl-*	transitive *kɔle*
d	*ntil* 'to torch fish'	**ttil* < **ti-til-*	Saipan Carolinian *ttil*, Ponapean *til* 'torch'
e	*m^{w}p^{w}ul* 'flame'	**p^{w}p^{w}ul* < **p^{w}u-p^{w}ula*	Trukese *p^{w}p^{w}un*
f	*n^{y}sar* 'snare'	**ccar* < **ca-car*	Trukese *ssær*
g	*n̥č̥a* 'blood'	**č̥č̥a* < **č̥a-č̥a*	Trukese *č̥č̥a*, Kiribati *rara:*

Nasal Substitution is found nowhere else in Ponapeic as a living phonological process, but it has analogues in both Mokilese and Pingilapese. Mokilese evidence discussed by Harrison (1984: 386-95) shows unambiguously that Nasal Substitution did operate in the prehistory of that language. It has been lost there via levelling of the alternations it created, but its effects can still be seen morpheme-internally:

(11)	Mokilese	Diachronic Source	Comparanda
a	*iŋkɔŋ* 'sharp'	**kkaŋ* < **ka-kaŋi*	Trukese *kken*, Kiribati *kakaŋ*, Ponapean (unreduplicated) *keŋ*
b	*um^{w}p^{w}ul* 'flaming'	**p^{w}p^{w}ul* < **p^{w}u-p^{w}ula*	(10e) above
c	*insa* 'blood'	**č̥č̥a* < **č̥a-č̥a*	(10g) above

As these forms indicate, another difference between Mokilese and Ponapean is that word-initial Nasal Substitution reflexes — including geminate nasal sequences — are preceded by a prothetic vowel *i* or *u* in Mokilese but not in Ponapean. However, in the same context a prothetic vowel is 'optional' in Ponapean, as in *(i)n^{y}sar* 'snare' (Rehg 1981: 55). These prothetic vowels were Proto-Ponapeic and are now being lost in Ponapean, as shown by Rehg (1984: 329-30), rather than being an innovation of Mokilese spreading areally to Ponapean. In support of this claim Rehg notes that the prothetic vowel is 'optional' not only in Nasal Substitution contexts but also where a genuine etymological high vowel happens to fall word-initially before a nasal–stop cluster, as in *(u)m^{w}p^{w}el* 'earth oven filled with food', historically a compound derived from *um^{w}* 'earth oven' and *p^{w}el* 'earth'.

To show that Nasal Substitution indeed operated in the prehistory of Mokilese, it is also necessary to show that no Mokilese geminate obstruents must continue geminates which antedate the proposed Nasal Substitution rule of Proto-Ponapeic.

This argument is made by Harrison (1984: 387-92): he notes that the only surface geminate obstruents in Mokilese are word-medial — inherited initial geminate obstruents being reflected by nasal–obstruent clusters — and he shows that these all have secondary origins within Mokilese. One diachronic scenario suggested by his and Rehg's work on Mokilese and Ponapean respectively is therefore as follows:

(12) Diachronic Evolution of Nasal Substitution (version I)

a	Proto-Ponapeic (or earlier):	i	syncope and consonant assimilation
		ii	high vowel prothesis before initial geminates
		iii	Nasal Substitution
b	Mokilese:		Nasal Substitution eliminated via levelling
c	Ponapean:		'optional' prothetic vowel loss

The third and most recently documented member of the Ponapeic group is Pingilapese. This language has no traces of a Nasal Substitution process, but instead, in contexts where Ponapean has a nasal–obstruent cluster, it shows a single consonant with compensatory lengthening of the preceding vowel, as in (13-14)[8]:

(13) Identical obstruent clusters in Pingilapese

a	/tet-tetei/	*te:tetei*	'sewing'	(*tetei* 'to sew')
b	/pap-pap/	*pa:pap*	'swimming'	(*pap* 'to swim')
c	/tol-tol/	*to:tol*	'to pick with the hands' (intr.)[9]	

(14) Historical identical obstruent clusters in Pingilapese

a *i:til* 'to torch fish' (intransitive) < **ttil* < **ti-til*; cf. (10d) above

b *i:siŋ* 'to write' (intransitive) < **c̣c̣iŋ* < **c̣i-c̣iŋi*; cf. Mokilese *insiŋ*, Ponapean *n̥c̣iŋ*, Kosraien *s̥i-siŋ* 'to etch a tatoo' (intransitive)

c *sa:sal* 'to be shown, to be made clear' < **caccal*; cf. Mokilese *cancal* 'to be clear (of speech), open, obvious', Ponapean *sanʸsal* 'clear'

d *i:sa* 'blood' (Harrison 1984: 394)[10] < **c̣c̣a* < **c̣a-c̣a*; cf. (10g) and (11c) above

(13a-b) are examples of durative reduplication, and (13b) in particular is the exact cognate of the Ponapean form in (4a), with Nasal Substitution. (13c) is an instance of intransitivizing reduplication; compare the Pingilapese form with lengthening and its cognates, Ponapean *tontol* 'to pick' (transitive *tolu̥*) and Mokilese *tottol* 'to pick' (transitive *toli*), with and without Nasal Substitution respectively. The forms in (14) are synchronically opaque, although (14a-c) were originally reduplicated intransitives.

A final relevant context where Pingilapese single consonants appear arises in verbal derivation. To judge from the data available in Good & Welley 1989, directional suffixes like *-ta* 'up' and *-ti* 'down' cause stem-final consonant deletion:

(15) Suffixal consonant deletion in Pingilapese

a /mʷo:t-ti/ → *mʷo:ti* 'to sit down';
cf. Ponapean *mʷo:t* 'to sit', Trukese *mɔ:t* 'to sit', *mɔ:ttiw* 'to sit down'

b /paŋin-ta/ → *paŋi:ta* 'to wake up' (transitive);

cf. Mokilese *paŋin*, Ponapean *paŋin*, Trukese *fəŋini*

c /wɛn-ti/ → *wɛ:ti* 'to lie down'; cf. Ponapean *wen* 'to lie', *wenti* 'to lie down'

The stem-final vowel lengthening seen in (15) is not significant, since Pingilapese directional suffixes always lengthen preceding vowels, but the forms cited are nonetheless of great interest historically. They show a process otherwise apparently cognate to Ponapean Nasal Substitution operating in a context where Nasal Substitution fails to apply — between coronals across suffixal boundaries. This is important evidence that the Ponapean lexical Nasal Substitution rule (NS-I), synchronically restricted to reduplication, once had a wider domain; in fact probably the two Ponapean synchronic Nasal Substitution rules reflect a single process which originally applied postlexically to all consonant clusters. Rehg (1981: 63-64) has reached a similar conclusion on the basis of Ponapean *m^{w}o:nti* 'to sit down' < **m^{w}o:t-ti*. This isolated form is the exact cognate of the Pingilapese form in (15a) and, like (16a) and the fossilized compounds in (16b-c), it can only be explained if NS-I formerly operated across suffixal and compound boundaries.

(16) Ponapean evidence that NS-I formerly applied in nonreduplication contexts

a *pinti* 'to be stranded in shallow water' < **pit-ti* < **pil-ti*; cf. *pi:l* 'water' and Mokilese *pil* 'fresh water', *pil-ti* 'to be melted'

b *kamaṇčik* 'to move slowly, to cautiously persuade' < **kamaṭčik* < **ka-mal-čik*; cf. *ka-* (causative prefix), *malmal* 'to be slow', *tititik* 'small' (Mokilese *siksik*, causative *ka:siksik*)

c *piṇčaṭ* 'to convulse' < **piṭ-čaṭ* < **pir-čaṭ*; cf. *pir* 'to turn, spin', *čaṭ* 'to writhe'

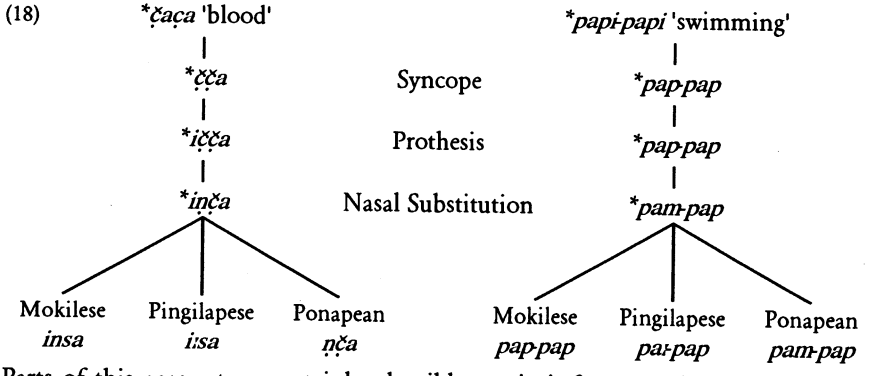
The originally unitary process of Nasal Substitution was split into two processes when, in the case of coronals, it was restricted to reduplication contexts; synchronically *m^{w}o:nti* and the forms in (16) are simply memorized.

Harrison (1984: 394) and Rehg (1984: 333) suggest that Pingilapese represents essentially a further development of the Ponapean state of affairs. On this view the historical background to Nasal Substitution may be revised as follows:

(17) Diachronic Evolution of Nasal Substitution (version II)

a	Proto-Ponapeic (or earlier):	i	syncope and consonant assimilation
		ii	high vowel prothesis before initial geminates
		iii	Nasal Substitution
b	Mokilese:		Nasal Substitution dies
c	Pingilapese:		nasals are lost with compensatory lengthening in vowel–nasal–obstruent sequences
d	Ponapean:		'optional' prothetic vowel loss; partial morphologization of Nasal Substitution

Two sample derivations are given in (18):



Parts of this account are certainly plausible a priori; for example, nasal loss with compensatory lengthening is attested in many languages. The model presents one serious problem, however: whatever its original conditioning, how could the process of Nasal Substitution possibly reflect the phonologization of any aspects of the phonetic implementation of geminate voiceless obstruents?

4. Previous Analyses of Nasal Substitution

Rehg 1984 was the first to suggest a possible phonological explanation for the origin of Nasal Substitution. He argues as follows (332):

> One obvious motivation for nasal substitution is the functional role it plays in limiting the number of optimal consonant cluster types in PNP ... [N]asal substitution rules interact with a complex series of other rules as part of a conspiracy to reduce 144 potential consonant cluster types to 12 optimal ones. Thus nasal substitution is motivated in part by the role it plays within the phonological system of PNP.

For any phonological rule, of course, the same could be said: the rule is motivated by the fact that its output is grammatical, while its input is not. We are no closer to understanding why geminate obstruents COULD have been reanalyzed as nasal-obstruent clusters, that is, in what sense this sound change might be phonetically explicable.[11] Rehg also offers a perceptually-based explanation: 'Voiceless geminate obstruents are difficult to perceive, especially when they are in initial or final position. By lowering the velum and adding voicing to the first obstruent — the changes involved in nasal substitution — this perceptual problem is alleviated' (332). Finally, Rehg suggests (333-34) that Nasal Substitution is an instance of syllable-final weakening:

> The motivation for the weakening of consonants in syllable-final position, and thus a motivation for nasal substitution, is almost certainly related to the fact that the single universal syllable is the open syllable — CV ... Substituting a nasal for a syllable-final obstruent would appear to be one way of opening up the syllable, as evidenced in the many languages in the world that permit only open syllables, or syllables ending in a nasal. Thus nasal substitution may represent an attempt to restore the optimal pattern

of syllables in [Ponapean], sequences of open syllables, that was violated by earlier vowel deletion rules.

Whether or not these observations are correct, as explanations they all have the same disadvantage: the development of nasal–obstruent sequences from geminate consonants is not phonetically grounded. In addition, other factors argue against the weakening analysis.[12] Most importantly, while the sound change underlying Nasal Substitution only applied to geminates, rules of coda weakening typically do not apply to geminate consonants. Three rules of coda weakening are presented in (19) with examples illustrating their failure to apply to geminates:

(19) Geminate inalterability in coda weakening (Hayes 1986)

a Persian $v \rightarrow w$ in the syllable coda

i. non-geminate coda			ii. geminate coda	
/nov-ruːz/	*nowruːz*	'new-day'	*ævvæl*	'first'
/bo-ræv/	*borow*	'go!'	*qolovv*	'exaggeration'

b Klingenheben's Law in Hausa: syllable-final obstruents become sonorants

i. non-geminate coda			ii. geminate coda	
/sabroo/	*sawroo*	'mosquito'	*babba*	'big'

c Toba Batak debuccalization: stop $\rightarrow$? / __ C

i. non-geminate coda			ii. geminate coda	
/halak batak/	*hala?batak*	'Batak person'	*nakka*	'jackfruit'

Harrison 1984 proposes a phonetic account of the apparent spontaneous nasalization occurring in Nasal Substitution. He suggests that Nasal Substitution can be viewed as 'a response to the heightened pressure inherent in geminate obstruents. This pressure can be reduced by lowering the velum to allow some air to escape through the nasal cavity, thereby destroying the obstruent articulation' (393). There are several problems with this account. First, there is no need to reduce intra-oral air pressure in voiceless obstruents: reaching peak intra-oral air pressure levels does indeed result in cessation of voicing, due to the reduction in the transglottal pressure drop, but since the segments in question are voiceless, not voiced, there is no incompatibility involved.[13] Second, this account is inconsistent with observed effects of intra-oral air pressure in voiceless obstruents, which in fact serves to secure velic closure and, as a result, inhibits nasalization. Ohala (1975: 300) makes the following related comment:

> Nasalization would be least compatible with oral obstruents, especially stops, since the noise of fricatives and affricates and the burst at the release of stops requires a build up of air pressure in the oral cavity. This would require that no air leak out of the oral cavity into the nasal cavity.

In addition, the instability of voiceless geminate obstruents suggested by Harrison is not reflected in their phonological behavior, e.g. with respect to the otherwise regular rules of weakening illustrated in (19). The same generalization is evidenced elsewhere. For example, Lass notes in a survey of Uralic weakening processes that

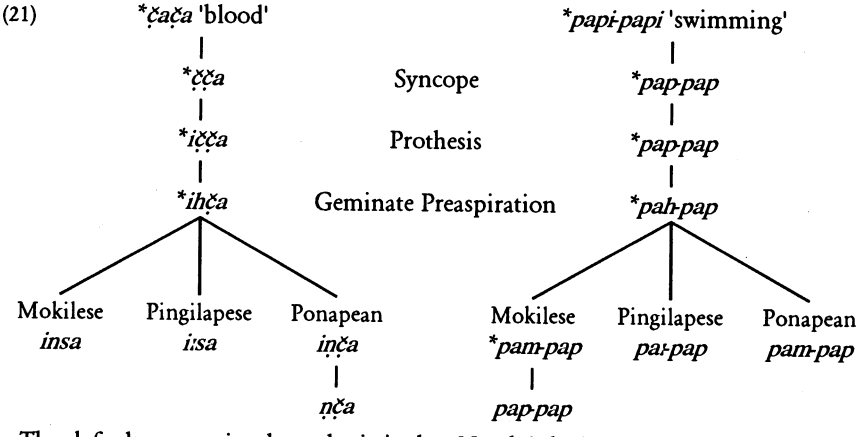
'the double stops never undergo either sonorization or opening, though they may shorten ... Consonants are not so prone to lenition if protected by another consonant as they are standing alone' (1984: 182). For these reasons, we consider Harrison's phonetic explanation inadequate, and we offer a new analysis.

5. A New Analysis of Nasal Substitution

We propose that Nasal Substitution is historically the result of the two sound changes in (20), where T_i is an obstruent and N_i is a homorganic nasal:

(20) a Geminate Preaspiration: $T_iT_i > hT_i$
b Aspirate Nasalization: $hT_i > N_iT_i$

The change in (20a) was Proto-Ponapeic, and was followed in the Ponapeic daughter languages by (20b), restricted to Mokilese and Ponapean, and by *h* loss with compensatory vowel lengthening in Pingilapese. The sample developments in (18) may be revised as follows:



The default competing hypothesis is that Nasal Substitution occurred as a single process. In our view, however, Nasal Substitution alone would be a phonetically unnatural sound change: to our knowledge, geminate voiceless stops have no articulatory or acoustic property which would explain either their evolution into or their reanalysis as nasal–stop clusters. On the other hand, as we will show, the developments proposed in (20) are phonetically natural and attested elsewhere.[14]

5.1. Geminate Aspiration

The first sound change proposed in our analysis of Nasal Substitution is Geminate Preaspiration in (20a). This seems to be a particular case of a more general phenomenon whereby spontaneous aspiration arises from plain voiceless geminate obstruents. In (22), we list languages known to us where aspiration has or may have developed from voiceless unaspirated geminate obstruents:

(22) Cases of Geminate Aspiration

a Saipan Carolinian (Jackson 1984)

b Polynesian Outliers (Oceanic): Kapingamarangi (Elbert 1948; Lieber & Dihepa 1974); Nukuoro (Carroll 1965; Carroll & Soulik 1973); Pileni (Elbert 1965); West Futuna (Dougherty 1983)

c New Caledonian (Oceanic) languages: Fwâi, Jawe, Nemi, Pije (Haudricourt 1968, Ozanne-Rivierre 1982)

d Scandinavian: Icelandic (Pétursson 1972, 1976; Garnes 1976; Thráinsson 1978); Faroese (Werner 1963); Norwegian dialects (Wolter 1965)

e Scots Gaelic dialects (Borgstrøm 1937, 1940, 1941; Oftedal 1956; Ternes 1973; Shuken 1979)

f Sami, northern dialect (Engstrand 1987)

The case of Saipan Carolinian in (22a) is of interest because it belongs to the Trukic branch of Nuclear Micronesian and is therefore closely related to Ponapeic. This language has both short and geminate voiceless stops. As elsewhere in Trukic — and in our view Proto-Ponapeic — geminates in Saipan Carolinian result from vowel syncope followed by assimilation. Jackson (1984: 244) describes the contrast between short and geminate stops as follows: 'For the most part, the geminate variety of each consonant is simply longer and tenser than the single segment ... All consonants are unaspirated, although when geminate the stops often seem aspirated.' The Polynesian Outliers and New Caledonian languages in (22b-c) have undergone similar developments, as illustrated in (23) for two of the former:

(23) Proto-Polynesian	Nukuoro (Carroll & Soulik 1973)	Kapingamarangi (Lieber & Dikepa 1974)	gloss
**'tuki*	*tuki*	*tuki*	'kick'
**tu'tuki*	*t^huki*	*t^huki*	'kick' (emphatic)
**'taŋi*	*taŋi*	*taŋi*	'weep' (sg.)
**ta'taŋi*	*t^haŋi*	*t^haŋi*	'weep' (pl.)

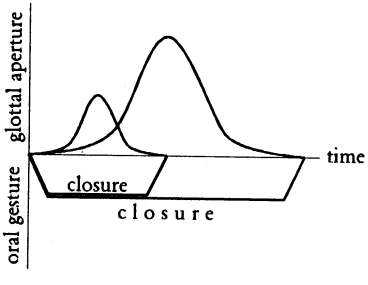
The developments from Proto-Polynesian to these languages parallel in some detail those which we propose for Proto-Ponapeic. Finally, the languages in (22d-f) are of interest because they have preaspirated (not just postaspirated) stops and because the preaspirates in at least some of them probably continue geminates.[15]

We now turn to the question of what phonetic factors might explain the appearance of aspiration on voiceless geminate obstruents.[16] First, following several researchers (e.g. Lisker & Abramson 1964, 1971, Rothenberg 1968, Löfqvist 1980), we assume that the most important factor in the control of aspiration is the timing of the laryngeal gesture in relation to supraglottal articulations: if glottal abduction begins at implosion and peak glottal opening is aligned with the early portion of the stop closure, a voiceless unaspirated stop results, whereas if peak glottal opening occurs late during closure, or following release, postaspirated segments result. A

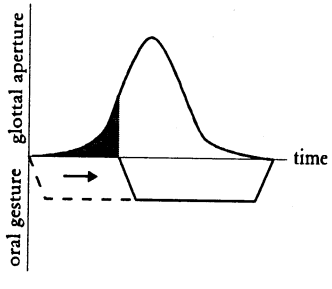
secondary factor in the control of aspiration appears to be the degree of glottal opening: in at least some languages, glottal aperture is larger for aspirated or heavily aspirated stops than for unaspirated or lightly aspirated stops (Kagaya 1971, Hirose, Lisker & Abramson 1972, Hirose, Lee & Ushijima 1973, Dixit 1975). For preaspiration to arise from a voiceless unaspirated stop, then, the laryngeal gesture must occur earlier relative to oral stop closure, and the peak glottal opening should be increased.

Both an increase in the magnitude of glottal aperture and the mistiming of oral and laryngeal gestures can naturally arise in the production of plain voiceless geminate stops. As demonstrated by Sawashima & Miyazaki 1973 for Japanese, the production of geminate as opposed to short voiceless unaspirated stops already involves glottal gestures of greater magnitude.[17] This is depicted schematically in (24a):

(24) a

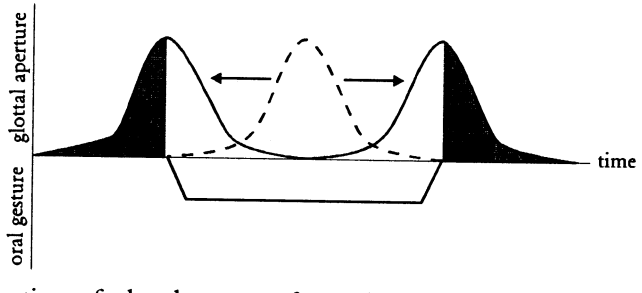


b



In plain voiceless stops, these glottal gestures of greater magnitude are aligned with oral implosion. However, as shown in (24b-c), there are two ways in which aspiration (indicated by shading) can arise spontaneously from such articulations. First, as in (24b), simple shortening of the oral gesture, a common fast speech phenomenon, can result in audible noise before closure which may eventually be reinterpreted as preaspiration. Second, as in (24c), slight temporal misalignment of oral and glottal gestures — i.e. anticipatory or perseveratory coarticulation — can also result in spontaneous aspiration[18]:

(24c)



Anticipation of glottal gestures for aspirated obstruents has been reported for English and Swedish by ní Chasaide & Goble 1988, who observe vocal fold abduction before stop closure in VT^{h}V contexts. Although the most perceptually

salient cases of preaspiration involve long segments, these studies suggest that preaspiration in short stops might also result from simple anticipation of the laryngeal gesture.

Subsequent to phonetic developments like those shown in (24b-c), which result in lightly aspirated segments, enhancement of both preaspiration and postaspiration can also be understood phonetically. Oral closure gestures in preaspirated segments will be further delayed or inhibited, due to the greater volume and velocity of airflow in the supralaryngeal cavity: that is, oral closure gestures encounter higher resistance in slightly preaspirated segments, resistance which could further shorten the closure phase of the stop.[19] In slightly postaspirated segments, on the other hand, increased aspiration can be viewed as acoustically enhancing the already noisy character of the stop burst.[20]

In sum, laryngeal gestures of greater magnitude appear necessary in long as opposed to short voiceless stops in order to produce voicelessness for the greater part of the stop closure. Shortening of stop closure or slight mistiming of such laryngeal gestures may result in lightly preaspirated or postaspirated segments; subsequent enhancements of this aspiration can also be explained in aerodynamic and acoustic terms. Spontaneous aspiration is therefore a phonetically natural development from plain geminate voiceless obstruents.

5.2. Aspirate Nasalization

The second sound change which on our analysis underlies Nasal Substitution is Aspirate Nasalization in (20b). This change manifests what Matisoff, in a classic paper, has called 'rhinoglottophilia — an affinity between the feature of nasality and the articulatory involvement of the glottis' (1975: 265). Insofar as Nasal Substitution has no other plausible historical explanation, it is important evidence for this unusual phenomenon.

At least two aspects of the Ponapeic development distinguish it from other cases of spontaneous nasalization noted in the literature: it involves nasalization induced by *h* and no other consonant, and the quality of adjacent vowels is irrelevant. We will refer to nasalization processes with these two properties as 'simple' rhinoglottophilia for the reason that they have a single phonetic basis, summarized succinctly by Ohala (1975: 303)[21]:

> ... [h] may produce an effect on vowels that 'mocks' that of nasalization. Because of the open glottis during phonation accompanying an [h] (or breathy voice), the spectrum of the vowel will be changed in the following ways: there will be upward shifting of the formants, especially F_1 ..., increased bandwidth of the formants, presence of anti-resonances in the spectrum and an overall lowering of the amplitude of the vowel ... This is identical to the effect of nasalization on vowels. Articulatory re-interpretation may occur, i.e., actual nasalization may be produced on the vowel.

Before identifying what we believe to be other cases of simple rhinoglottophilia, it may be useful to summarize the varieties of spontaneous nasalization known to us

and to comment briefly on the nature of the evidence discussed in earlier rhinoglottophiliological literature. In some cases the evidence may illustrate processes other than simple rhinoglottophilia, processes whose diachronic basis cannot be explained by reference to the acoustic effects of *h* noted by Ohala.

Several types of spontaneous nasalization are identified in (25):

(25) Types of Spontaneous Nasalization

a Simple rhinoglottophilia — nasalization induced by *h* (and breathy voice)

b Rhinochthamalophilia — nasalization induced by pharyngeal consonants or low vowels (Ohala 1971, Henderson 1984, Whalen & Beddor 1989)

c Rhinosyrigmatophilia — nasalization induced by sibilants (Lintz & Sherman 1961, Ohala & Amador 1981)

Matisoff's 1975 treatment discusses facts from Thai, Lao, Lahu, Lisu, East Gurage, and English. None of these cases involves the development of nasalization from *h* alone. In East Gurage, nasalization develops adjacent to pharyngeal and glottal consonants and may, in the case of pharyngeals, be caused by the lowering of the uvula involved in these sounds, which creates a velic opening (Hetzron 1969). In the other languages, nasalization is found after *h* and *ʔ*, or after *h* and in vowels with no consonantal onset at all, and appears to be restricted to low vowels. Spontaneous nasalization of low vowels is common cross-linguistically, and receives a possible explanation in the fact that low vowels are produced with the velum lowered relative to its position for other vowels. Low vowel and pharyngeal nasalization, called 'rhinochthamalophilia' in (25b), has an articulatory basis rather than the acoustic explanation associated with simple rhinoglottophilia.

As indicated in (25c), spontaneous nasalization has also been reported in vowels adjacent to sibilants. Such cases of 'rhinosyrigmatophilia' might actually have the same explanation as simple rhinoglottophilia if sibilants are produced with the same glottal configuration as *h*, and if this laryngeal configuration perseveres into the following vowel. However, since evidence regarding the timing of glottal gestures in these cases is unavailable to us, we tentatively distinguish rhinoglottophilia and rhinosyrigmatophilia.

There are also processes which manifest some connection between nasalization and certain laryngeal consonants or features but which should not be mistaken for the phenomenon under discussion. For example, it is well known that laryngeal consonants in some languages are transparent to nasalization and so can be nasalized allophonically by adjacent nasals or nasalized vowels (Cohn 1990). Such laryngeal transparency may well have the same phonetic basis as simple rhinoglottophilia, but the actual source of nasalization in such cases is not the transparent segment itself. This is clear enough in well-known cases like Sundanese, but can be harder to identify retrospectively. In the prehistory of Avestan, for instance, Proto-Iranian **h* became a voiceless velar nasal (spelled *ŋh*) between low vowels; e.g. **wahauš* > *vaŋhəuš* 'of good' (Vedic *vásoḥ*) and **asat* > *aŋhaṯ* 's/he would be' (Vedic *ásat*), but **ahura-* > *ahura-* 'lord' (Vedic *ásura-*). In this case it is

impossible to determine whether the change was in part caused by the acoustic properties of *h*, or whether nasalization was induced by low vowels and has only surfaced diachronically on *h*.

Rhinoglottophilia as described above could equally well result in reanalysis of nasalization as aspiration, leading to what might be called 'spontaneous aspiration'. An Owerri dialect of Igbo illustrates this process.[22] In this dialect aspiration is contrastive for the following segments:

(26) plain voiceless	*p*	*p^{y}*	*t*	*s*	*c*	*k*	*k^{w}*	*h*			
plain voiced	*b*	*b^{y}*	*d*	*z*	*j*	*g*	*g^{w}*		*r*	*w*	*y*
voiceless aspirated	*p^{h}*	*p^{yh}*	*t^{h}*	*s^{h}*	*c^{h}*	*k^{h}*	*k^{wh}*	*h^{h}*			
voiced aspirated	*b^{fi}*	*b^{yfi}*	*d^{fi}*	*z^{fi}*	*j^{fi}*	*g^{fi}*	*g^{wfi}*		*r^{fi}*	*w^{fi}*	*y^{fi}*

Vowels are not contrastively nasalized, but they are allophonically nasalized after the aspirated sonorants, the aspirated fricatives, and the aspirated palatalized and labialized stops; e.g. /ènùg^{wfi}ù/ → *enug^{wfi}ũ*. The natural class of segments triggering aspiration appears to be those with aspirated [+continuant] release; palatalized and labialized segments fall into this class as a consequence of their aspirated off-glides. Despite appearances, however, this case does not parallel Ponapeic: Hyman 1972 and Williamson 1973 have argued that the diachronic source of both aspiration and nasalization in Owerri is a lost nasal consonant: *CVNV > *CNV > C^{N}Ṽ > C^{h}Ṽ, as Ladefoged et al. 1976 schematize the development.[23]

Another case of rhinoglottophilia is found in the Northwest Caucasian languages Bzhedukh and Shapsegh. Both of these languages contrast aspirated and unaspirated spirants. Vowels following aspirated spirants are nasalized. Colarusso (1988: 42) notes:

> The velum appears to be lowered slightly, not enough to cut down the air flow through the oral occlusion, but enough to cause secondary turbulence in the nose. This enhances the aspirated quality of these segments, and must also enhance the formant-like concentrations of energy by introducing nasal-like formants into the spirant noise in such a way that they reinforce the formant-like bands of energy that are already there due to aspiration alone.

For example, Bzhedukh /ʂ̣^{h}aš^{h}/ 'horse's milk' surfaces as [ʂ̣^{hn}ɪʂ̣^{hn}] or [ʂ̣^{hn}ɪʂ̣^{hn}]. Further development of the aspirated spirants in Shapsegh parallels the Ponapeic developments suggested above. In the Israeli dialect of Shapsegh there is no longer a contrast between aspirated and unaspirated spirants: instead, distinctive vowel nasalization has arisen. Colarusso (1988: 43) concludes:

> This nasalization ... appears to be the etymological reflex of the aspiration of an earlier aspirated spirant ... It appears that at some stage in the history of this dialect the secondary phonetic effect of partial nasalization must have been reinterpreted as the basis for a phonemic contrast, the aspiration of the spirant being reevaluated as a mere secondary acoustic effect. The aspiration was lost, leaving behind a distinctive nasalization where no nasal had previously existed.

Continuancy alone is an insufficient trigger of vowel nasalization, since vowels are not nasalized after plain voiceless spirants. Hence vowel nasalization here can be viewed as a case of simple rhinoglottophilia enhanced by rhinosyrigmatophilia.

6. Conclusion

Any attempt to take the Neogrammarian view of sound change seriously from a modern point of view naturally focusses special attention on the diachrony of phonetically implausible but clearly documented phonological innovations. To the extent that these can be decomposed into phonetically sensible intermediate developments, as in the case of Ponapeic Nasal Substitution, a constrained and natural model of phonological change is supported.

Notes

* We are very grateful to Henry Churchyard, Mark Hale, Bob Harms, Shelly Harrison, Jay Jasanoff, John Kingston, Björn Lindblom, and especially Ian Maddieson for discussion and references.

[1] Ngatikese is undocumented. See Bender 1971 for a survey of the Nuclear Micronesian family and other languages spoken in Micronesia; among them, Nauruan may be Nuclear Micronesian. We cite Mokilese data from Harrison 1976, 1984 and Harrison & Albert 1977, Pingilapese data from Good & Welley 1989, and Ponapean data from Rehg 1981, 1984, 1986 and Rehg & Sohl 1979; outside Ponapeic, we cite Kiribati data from Sabatier 1971, Kosraiean data from Lee 1976, and Trukese data from Goodenough & Sugita 1980. Since the standard Nuclear Micronesian orthographies are incommensurate, we use IPA symbols with standard American modifications (e.g. underdots for retroflex consonants). Note also that, although *e* and *ɛ* contrast in Ponapean, Rehg 1981 and Rehg & Sohl 1979 follow the standard orthography and do not distinguish them; we too write *e* here for both vowels.

[2] They are found in loan words and exclamations, however. Examples include *nappa* 'Chinese cabbage' (vs. *n̪ɕape* 'girt'), *ketta* 'Japanese clogs' (vs. *ketei* 'palm sp.'), *akka* 'an exlamation of surprise' (vs. *aka* 'these by me'), *kakko* 'to put on airs' (vs. *kaːka* 'desiring peace and quiet while under the influence of kava'), *kassouku* 'to train for an athletic event' (vs. *kasokamai* 'to build a fish trap of coral on a reef'), and *esse* 'an exclamation of pain' (vs. *ese* 'to know, to understand'). Near-minimal pairs illustrating the contrast between short and long sonorants include the following: *kemmat* 'to change into dry clothing', *keme* 'to spank'; *lamʷmʷin* 'majestic', *limʷaː* 'next to'; *kɔsɔnnet* 'rule', *sɔnop* 'ball of sennit'; *mall* 'clearing in a forest', *malau* 'far apart'; *kaŋŋeɕ* 'to cause to pant', *kaŋit* 'to pound or press into a mass'; and *rerrer* 'to be trembling', *rere* 'to skin, peel'.

[3] This formulation differs slightly from that of Rehg 1981 and 1984, who collapses the rule with one of nasal assimilation: $C_iN_i \rightarrow N_iN_i$, where i indexes place features and C_i is labial or velar. We will have nothing further to say about such regressive nasal assimilation.

[4] In particular, we assume that adjacent consonants with like place nodes undergo place-node merger; this is supported by the fact that in forms like (6d-e), the first labial assumes the backness value of the second, i.e., the two consonants share all place features.

[5] We assume the following model of the Ponapean lexicon:

	Morphology	Phonology
Lexical	1. Reduplication	NS-I, NS-II
	2. Suffixation	NS-II (NS-I bled by epenthesis)
	3. Compounding	NS-II (NS-I does not apply)
Postlexical	Syntax	NS-II (NS-I does not apply)

[6] An adequate treatment of the sporadic process of 'nasal dissimilation' in Aramaic (Spitaler 1954, Kutscher 1977, Macuch 1989) or of Middle Indic dialectal 'spontaneous nasalization' (Grierson 1922) requires considerable linguistic and philological detail. For some discussion see Blevins & Garrett 1992.

[7] Syncope was no doubt originally conditioned by stress, but already in the early prehistory of the attested languages considerable morphologization seems to have occurred.

[8] Apparent counterexamples are Ponapean loan-words in Pingilapese; see Blevins & Garrett 1992.

[9] The obstruent cluster in this word is derived (by assimilation), not underlying.

[10] Good & Welley (1989: 13) cite this form as '*isaɹ*'.

[11] The implication of Rehg's suggestion is that Nasal Substitution occurs because it is a structure-preserving process (in the sense of Kiparsky 1982): since homorganic nasal-obstruent sequences are found underlyingly, there is no cost in producing them. We are seeking to explain a regular sound change in Ponapeic, however, and the principle of structure preservation is irrelevant if, as proposed above, sound changes yield late postlexical rules in the first instance, since the latter are not subject to structure preservation.

[12] Rehg's second argument is also only applicable to initial and/or final geminates: intervocalic length contrasts are easily perceived and are relatively stable cross-linguistically. As illustrated above and argued at some length by Rehg himself (1984: 328-31), medial geminate obstruents also underwent Nasal Substitution.

[13] This contrasts with the production of geminate voiced stops, where reduction in the transglottal pressure drop results in cessation of voicing, and where nasalization, lowering of the larynx, or passive expansion of the intra-oral cavity could be viewed as attempts to maintain voicing.

[14] There is also concrete counterevidence to the view, explicit in (17), that all Proto-Ponapeic coda nasals were lost with compensatory vowel lengthening in Pingilapese; hence if this loss is related to Nasal Substitution, the latter cannot have occurred in Proto-Ponapeic. See Blevins & Garrett 1992.

[15] The diachrony is debated: for example, although Scots Gaelic preaspirates do descend from geminates, Borgstrøm 1974 has argued that preaspiration in that language actually reflects Scandinavian contact, much as dialectal Scots English preaspiration is certainly due to Gaelic interference; for Icelandic, where not all synchronic preaspirates continue inherited geminates, there are several competing analyses (for an overview see Liberman 1982: 260-72).

[16] Proto-Ponapeic had no fricatives, but note in general that the glottal aperture for *s* is already wide enough to result in aspiration. As shown by Hirose & Gay 1972, Hirose, Lisker & Abramson 1972, and Collier, Lisker, Hirose & Ushijima 1979, voiceless fricatives are produced with the widest glottal aperture of any consonants. In a sense, then, fricatives in most languages are aspirated in terms of the spread position of the vocal folds, though aspiration is normally simultaneous with oral constriction and therefore not perceived as a characteristic release feature.

[17] This is probably due to the relatively symmetric curve associated with vocal fold abduction: to maintain voicelessness for longer durations, greater vocal fold abduction is necessary.

[18] Cf. Löfqvist (1980: 486): '... it is possible to give a hypothetical but phonetically plausible account of the emergence of pre-aspiration in stop consonants and why it never seems to co-occur with post-aspiration. In order to avoid post-aspiration, an early timing of peak glottal opening can be used. In this process, the coordination of glottal opening and oral implosion will be more or less synchronous; if glottal opening precedes oral closure, an audible noise will occur that might eventually develop into a regular phonologic pattern.'

[19] If stressed syllables are produced with even greater air mass and velocity, then stop closure in stressed syllables could be inhibited further. We thank I. Maddieson for calling such aerodynamic factors to our attention.

[20] Stop closure duration appears to be inversely proportional to noise duration in preaspirated and postaspirated stops (Hutters 1985). Hence closure should be shortened as preaspiration is 'enhanced', resulting in an even more radical misalignment of oral and laryngeal gestures than that shown in (24c), where stop closure duration remains constant.

[21] Cf. Ohala 1980, 1987 and Klatt & Klatt 1990.

[22] We are grateful to J. Jasanoff for the data. These facts are also reported in Colarusso 1988.

[23] The same development has occurred in several New Caledonian (Oceanic) languages; cf. e.g. Nemi (postnasalized) *ᵗᵒot* 'wealth' as opposed to Cèmuhî *hĭūūt* and Pije *ᵗʰōōt*. See Haudricourt 1972 and Ozanne-Rivierre 1982.

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THE AZTEC TRIANGLE: THREE-WAY LANGUAGE CONTACT IN NEW SPAIN

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0. Introduction. The recent celebration of the Columbian quincentennial has focused attention on the history of contact between Spanish and Native American cultures. From the linguistic viewpoint, vocabulary items borrowed from American Indian languages into Spanish are often labeled as 'Americanisms'; of course many such words have also entered other languages of the world, as witness English words like *tobacco* and *potato*.[1] Referring to the hundreds of words borrowed in Mexico from the Aztec (or Nahuatl) language, Hispanic scholars have spoken of 'aztequismos' (or 'nahuatlismos'); again many such words have entered English, e.g. *tomato* and *chocolate*.[2] In referring to borrowings in the opposite direction, from Spanish into American Indian languages - again mostly vocabulary, although features of phonology and grammar may sometimes be involved - the word 'hispanismos' has been used. This latter term can be easily Englished as 'Hispanisms'; however, it is hard to know whether to adapt 'aztequismos' to English as 'Aztequisms, Aztekisms,' or 'Aztecisms'; to avoid this dilemma, I prefer to simply borrow the terms 'hispanismos' and 'aztequismos' as loanwords into English.

The literature on hispanismos in the Aztec language is fairly substantial; landmark works on borrowings from Spanish into Aztec, from the colonial period to the present, include González Casanova 1933, Law 1961, Karttunen & Lockhart 1976, Karttunen 1985, and Hill 1990. Studies of hispanismos in Meso-American Indian languages other than Aztec include Bartholomew 1955 (for Otomí) and Clark 1977 (on Sayula Popoluca). In northwestern Mexico, marginally outside the cultural sphere of Meso-America, especially interesting studies of hispanismos have been provided by Johnson 1943 (for Yaqui), by Grimes 1960 (for Huichol), by Miller 1985 (for a broad range of languages), and by Casad 1988 (for Cora). Still farther north, in Arizona and New Mexico, we can cite the work of Miller 1959-60 (for Acoma) and of Crawford 1979 (for Cocopa). Finally, for California, we have an extensive body of works by linguists in the Berkeley tradition, initiated with the particular encouragement of Prof. Yakov Malkiel. These include cross-language surveys in Northern California by Shipley 1962, and in Southern California by Bright 1979b.

An assumption in much of the literature on hispanismos is that borrowing of vocabulary normally took place directly from Spanish to the individual Indian languages. This is undoubtedly a correct assumption for certain times and places, e.g. in the earliest borrowings into the Colonial Aztec spoken in the Valley of Mexico in the 16th century, and into languages spoken in coastal California during the 18th century. Consider the following example:

(1) Spanish: Colonial *aguja* [aɣúža, aɣúša] 'needle', Modern [aɣúχa]

Aztec: Colonial *akóoša* (González Casanova 1933)

Modern (Tetzcoco) *akoša* (Lastra de Suárez 1980) (Isthmus) *akoošah* (Law 1961:556)[3]

It appears that the Col. Sp. form was borrowed directly into Col. Az., and that the pronunciation with the sibilant [š] was perpetuated in most dialects of Modern Aztec.[4] In Native California, the same word shows a different pattern:

(2) Mod. Sp. *aguja* [aɣúχa], non-standard *abúja* [aβúχa]
Bodega Miwok *abúuha* (Callaghan 1970)

Here the Spanish form not only shows replacement of [š] by [χ], but also a non-standard variant pronunciation widespread in California.

Elsewhere, however, it is likely that hispanismos may have spread between Indian languages, from Language A to Language B, often before Language B had entered into direct contact with Spanish. In Meso-America, especially during the Colonial period, Aztec functioned as a widespread lingua franca (Dakin 1981). Thus, in southernmost Mexico, the Tzotzil word for 'needle', *akuša* (Laughlin 1975), may be a borrowing either directly from colonial Spanish, or through Aztec as an intermediate language. (It is of course possible that additional Indian languages were also involved as intermediates.) In the inland languages of native California, a variety of forms occur:

(3) Lake Miwok *áwha* 'needle' (Callaghan 1965)
Patwin *awha*, *awho*, *awuuha* (Bright & Bright 1959)

In Lake Miwok, the word was probably acquired through one or more intermediate Indian languages; in Patwin, the first two forms were probably borrowed through native intermediates, while the third form is likely to be a later re-borrowing directly from Spanish.

In recent years, several students of hispanismos have suggested that, in Meso-America and perhaps also in northwestern Mexico, a common route of borrowing was not directly from Spanish into individual Indian languages, but rather from Spanish into the Aztec lingua franca, and from there into the individual languages (Bright 1979a, Nordell 1985). Some especially interesting cases seem to come from the northwestern area (Miller 1985, Casad 1988), suggesting that Aztec may have been used as a lingua franca even on those remote frontiers. In this paper, I wish to clarify and expand evidence for the crucial role of Aztec—to show that, from the viewpoint of a language like Tzotzil or Cora, many so-called 'hispanismos' are better regarded as 'aztequismos' on the more immediate historical level, and as 'hispanismos' only on a more remote level. By contrast, in the languages of the southwestern U.S. and of California, hispanismos show little evidence of having passed through Aztec as an intermediate language.

An additional purpose of this paper is to point to parallels: the relationship among Spanish, Aztec, and some third language of Mexico is comparable to that between other triads of languages in a variety of times and places. A case that comes to mind is that of Latin, French, and English, in which learned words passed from Latin into French, and through French into English, as well as directly from Latin into English. Another case, perhaps less familiar to most linguists, is that involving Japanese, to be discussed in more detail at the end of this paper. The very numerous European loanwords in modern Japanese are occasionally from German or French, but mostly from English. However, some of the English words were themselves borrowed by English from French. A question then arises as to whether we can reliably distinguish French words borrowed directly into Japanese from those borrowed through the intermediacy of English.

1. Origins: Spanish or native? In examining the linguistic history of Mexico (and Guatemala), our data involve lexical similarities from which we can

infer some historical relationship involving Spanish and various American Indian languages. However, as stated above, it is not always clear what the route of transmission may have been for a given word. In some cases, there may even be doubt as to whether the starting point is in Spanish or in a native language. A striking example is that of words designating FELINES in several modern languages, which involve the syllable *mis*:

(4) Col. Az. *mis-tli* 'mountain lion' (with absolute *-tli*)
Mod. Az. (Teotihuacán) *mis-tli* (González Casanova 1922); (Isthmus) *mis-ton* (with diminutive *-ton*, Law 1961:558)
Mazatec *miši* (Stewart and Stewart 1954)
Huichol *misu* (Grimes 1981)

The element *mis*, meaning 'domestic cat', occurs alone in a few languages, such as Mazatec and Huichol. In Aztec, however, the same element occurs either with an absolutive suffix or a diminutive marker. One possibility is that all these are derived from Col. Az. *mis-tli* 'mountain lion'. However, it is also possible that all these terms, whether meaning 'mountain lion' or 'domestic cat', are derived from a Spanish element *mis*, attested from pre-Conquest times as a syllable used for calling cats (often with repetition; Kiddle 1964). That is, two hypotheses can be considered: (a) the similarity between the Aztec and Spanish elements *mis*, both connected with felines, may be accidental, so that native words for 'cat' in Meso-America may be derived from either source, or both; or (b) Col. Az. *mis-tli* may reflect early borrowing from Spanish, with atypical (but not unprecedented) addition of absolutive *-tli* to a loanword.[5] However, cases like this, in which it is hard to distinguish Spanish vs. native sources, are rare.

Apart from such unusual cases, there are hundreds of less problematic vocabulary items which show resemblances in Spanish, Aztec, and the non-Aztec native languages, which I will for convenience label simply as 'Indigenous'.[6] But distinctions can be made among such words: in the following sections, they will be classified in terms of (a) their starting-points within Mexico, and (b) their paths of transmission from one language to another.

3. Indigenous origin. Words of native but non-Aztec origin have, in a relatively small number of cases, been borrowed into Spanish, but usually only for local use. Thus a Mayan word for a type of resin used as incense, *pom*, has been borrowed into Spanish in the areas of principal Mayan contact, namely southern Mexico and Guatemala. But elsewhere the corresponding Aztec term, *kopalli*, has been borrowed as Sp. *copal*, and has entered into widespread use (it can even be found in dictionaries of English). I only know of one non-Aztec Indian word which was borrowed into Spanish and became universally known in Mexico (and again, even entered English). The Spanish word is *huarache* 'a type of sandal', apparently from Tarascan *kuaɽ̈ači* 'an old sandal', derived from a verb *kua ɽ̈i-* 'to break' (Santamaría 1959, Velásquez Gallardo 1978).

4. Aztec origin. Some aztequismos widely used in Spanish, such as *chocolate*, have been mentioned above. However, there are differences among the paths of borrowing followed by such words.

4.1. Az. > Sp. Certain words were borrowed from Aztec into Spanish, but are seldom found in the Indigenous languages - presumably because they designate features of native American life which already had well-established names among native peoples. An example is Aztec *koyootl*, borrowed into Spanish as *coyote*, and subsequently into English.[7] By contrast, most Indigenous languages have totally unrelated terms, such as Tzeltal *ok'il* (Laughlin 1975) or Huichol *yuavi*

(Grimes 1981). But even words like this have occasionally been borrowed by Indigenous languages from Spanish, probably in recent times: thus we find that the Popoluca (Sayula) term is, in fact, *koyote* (Clark 1961). The phonology of this item clearly reflects borrowing through Spanish, rather than directly from Aztec.

4.2. Az. > Ind. A somewhat larger number of words seem to have been borrowed from Aztec directly into Indian languages, and never to have entered Spanish. Some of these may well have been part of patterns of linguistic borrowing which existed in Mexico even before the Conquest; e.g.,

(5) Cl. Az. *koolootl* 'scorpion'
Totonac (Xicotepec) *kuluutl* (Reid & Bishop 1974)

(6) Cl. Az. *šiwitl* 'year'
Popoluca (Sayula) *šiwit* (Clark and Davis de Clark 1960)

But others are found not only in Meso-America proper, but also in northwestern Mexico, where contacts with Aztec are likely to reflect the post-Conquest period in which Aztec came increasingly to function as a lingua franca. Consider the word for 'adobe':

(7) Cl. Az. *šaamitl* 'adobe'
Zoque *sámit* (Harrison, Harrison and García 1961)
Tzotzil *šámit* (Laughlin 1975)
Kekchi *šan* (Haeserijn 1979)
Yaqui *sami* (Buelna 1890)
O'odham (Pima-Papago) *ṣaamt* (Saxton and Saxton 1983)

Here the Az. word seems to have been borrowed not only in languages of southern Meso-America (such as Zoque and Tzotzil in Mexico, and Kekchi in Guatemala), but also in northwestern languages like Yaqui, and even in O'odham of Arizona.

One of the terms for 'cat' mentioned above was undoubtedly spread in post-Conquest times:

(8) Mod. Az. (Isthmus) *miston* (Law 1961).
Popoluca (Sayula) *míštoon* (Clark & Clark 1960).
Cora *mistun* (Casad 1988:80).

A number of other borrowings from Aztec turn up MAINLY in the state of Sonora and in adjacent areas of the northwest (cf. Miller 1985):

(9) Cl. Az. *tootolin* 'female turkey'
Yaqui *totoli* 'chicken' (Buelna 1890)

(10) Cl. Az. *tlahtoaani* 'ruler, governor'
Cora *tahtuwan* (Casad 1988:96)

(11) Az. *teookwitlatl* 'god's excrement, i.e. silver, gold'
Yaqui *teokwita* 'silver' (Buelna 1890)

Again, some such loans extend all the way to the O'odham of Arizona:

(12) Az. *teoopan(-tli)* 'temple, church'
Yaqui *teopo* 'church' (Buelna 1890)
O'odham *čʔopi* (Saxton and Saxton 1983)

(13) Az. *teki-panoa* 'to perform a duty, to work'
Yaqui *tekipanoa* 'work' (Buelna 1890)
O'odham *čʔkpan* 'to work' (Saxton and Saxton 1983)[8]

4.3. Az. > Sp. > Ind. When we look at Indigenous languages spoken in an area like California, far distant from the area where Aztec was ever used, we can be

satisfied that apparent aztequismos are in fact borrowings through Spanish. The numerous examples in a language like Cahuilla (Bright 1979b) include the following:

(14) Cl. Az. *kamohtli* 'sweet potato'
Sp. *camote*
Cah. *kamóoti*

(15) Cl. Az. *wehšoolootl* 'male turkey'
Sp. *guajolote*
Cah. *waxolóoti*

4.4. Az. > Ind., or Az. > Sp. > Ind.? There remain cases where words of Aztec origin appear both in Spanish and in Indigenous languages - and it is not clear whether the latter borrowed the items directly from Aztec, or whether they entered via Spanish. Examples are the following:

(16) Cl. Az. *sakatl* 'grass'
Sp. *zacate* 'hay'
Totonac (Papantla) *šákat* (Aschmann 1973)
Popoluca (Sayula) *šógot* (Clark & Clark 1960)

(17) Cl. Az. *šikalli* 'gourd cup'
Sp. *jícara*
Huichol *šukúuri.* (Grimes 1981)

Of course it is possible that some of the Indian words represent BLENDS between forms borrowed directly from Aztec and those borrowed from Spanish as intermediary.

5. Spanish origin. Words of this type, i.e. hispanismos in the narrower sense, constitute a very large number of examples. When such words are found in Indigenous languages, it is often hard to determine whether they have first passed through Aztec as intermediary. Nevertheless, the following categories may be distinguished.

5.1. Sp. > Az. A hypothetically possible category is that of Spanish words which appear in Aztec, but not in other native languages of Mexico. In the available data, a few words appear to fall into this category; however, this may be only because of accidental gaps in the corpus. For instance, Sp. *aliñar* 'to align' is attested as borrowed in Col. Az. *alinyaroa* (González Casanova 1933), but is not reported in any Mod. Az. dialect or Indigenous language. Similarly, Sp. *alfiler* 'pin' is reported as Mod. Az. (Isthmus) *aalpinel* (Law 1961:556), but not elsewhere in Meso-America. It is likely that these terms could in fact be found elsewhere in the area.[9]

5.2. Sp. > Ind. Another possible category is that of Spanish words which are reported from Indigenous languages, but not from Aztec. Such examples are rarely attested in Meso-America, though this may result in part from gaps in the data. However, they are common in California and the Southwest, outside the reach of the Aztec lingua franca. An example is the word for 'bee', which is reported in Mexico only from one variety of Zapotec, but is found in several languages of California and the southwest U.S.:

(18) Col. Sp. *abeja* [aβéža, aβéša] 'bee', Mod. Sp. [aβéχa]
Zapotec (Coatlán) *bèe's* (Robinson 1963:34)
Cahuilla *evéexa'* (Bright 1979b)
Cocopa *avix* (Crawford 1979).

5.3. Sp. > Ind., or Sp. > Az. > Ind.? In a large number of Spanish words, found both in Aztec and in Indigenous languages, it is difficult to say whether the Indigenous languages borrowed the forms from Aztec or directly from Spanish. An example is the following:

(19) Sp. *tomín* 'coin, money' (now obsolete, originally from Arabic *θumn* 'an eighth')
Col. Az. *tomin*
Mod. Az. (Tlaxcala) *tomih* (Bright & Thiel 1965)
Kekchi *tumin* (Haeserijn 1979)
Yaqui *tomi* (Johnson 1962)

In such an item, the Spanish phonetic model could be copied with little change by any of the native languages, so we have few phonological clues as to the path of transmission. Another example is:

(20) Sp. *aceite* [aséyte] 'oil'
Col. Az. *aseyte*
Mod. Az. (Milpa Alta) *haaseyte* (Whorf 1944:372)
Tzotzil *asete* (Laughlin 1975)
Seri *hasáiti* (Moser and Moser 1961)

Here the unusual initial *h* in Mod. Az., with its re-appearance in Seri, is suggestive; however, any attempt to trace the exact paths of borrowing would have to be based on detailed knowledge of the phonologies of the native languages concerned—descriptive, dialectological, and historical - and such knowledge is, in general, not available.

5.4. Sp. > Az. > Ind. In a fair number of Spanish words, found both in Aztec and in other native languages, phonological clues are more strongly indicative that borrowing occurred first from Spanish into Aztec, and secondarily into at least some Indigenous languages. These are, specifically, words which reflect certain phonetic features of Colonial Spanish which have been altered in more recent Mexican Spanish, but are attested in Aztec from both the Colonial and Modern periods (e.g., Col. Sp. apico-alveolar [ṣ] becomes Mod. Sp. [s], but Col. and Mod. Az. [š]). Specifically, we find the following phonological correspondences:[10]

(21)	Col. Sp. *s* [ṣ, ẓ]	Az. [š]	Mod. Sp. *s* [s]
	Col. Sp. *x* [š], *j* [ž]	Az. [š]	Mod. Sp. *j* [X]
	Col. Sp. *ll* [lʸ]	Az. [l]	Mod. Sp. *ll* [y]

When we study hispanismos which contain any of these sounds, certain inferences may be possible concerning the transmission of loanwords. Consider the following typical example:

(22) Col. Sp. *xabon* [šaβón] 'soap', Mod. Sp. *jabón* [Xaβón]
Col. Az. *šapo*
Mod. Az. (Tetelcingo) *šapo* (Brewer and Brewer 1962)
Tarascan *šapú* (Velásquez Gallardo 1978)
Popoluca (Sayula) *šápuun* (Clark and Davis de Clark 1960)
Yaqui *sabum* (Buelna 1890)

These and many other languages show an initial sibilant, reflecting the sound of Colonial Spanish. (In languages like Yaqui which lack [š], an *s* occurs instead.) In the case of central Mexican languages like Tarascan, it is of course possible that the

sibilant pronunciation was borrowed directly from Colonial Spanish, instead of through Aztec. But in a language of the northwest like Yaqui, where contact with Spanish came at a somewhat later date, there is considerable likelihood that borrowing was from Aztec.

Sometimes a hispanismo reflects the pronunciation of Colonial Spanish (or of Aztec) in some languages, and that of Modern Spanish in others:

(23) Col. Sp. *ajo(s)* [ážo(ş), ášo(ş)] 'garlic', Mod. Sp. [áχo(s)]

Col. Az. *ášuš*

Mod. Az. (Huasteca) *ášoš* (Kimball 1980)

Popoluca (Sayula) *ášušš* (Clark and Davis de Clark 1960)
Tequistlatec *gal-'áhus* (Turner and Turner 1971)
Cora *hàahu* (Casad 1988:82)

Here the last two languages listed have clearly borrowed their forms from the Modern Spanish pronunciation.

Sometimes doublets occur in different dialects of a single language, as shown by the two Mod. Az. forms below, or even in a single dialect, as in Kekchi:

(24) Col. Sp. *silla* [şílʸa] 'chair, saddle', Mod. Sp. [síya]

Col. Az. *šila*

Mod. Az. (Isthmus) *šilah* (Law 1961:556); but (Tetelcingo) *siya* (Brewer and Brewer 1962)

Huichol *šira* (Grimes 1981)

Kekchi *šiil*, *siiy* (Haeserijn 1979)

In the Kekchi case, the first form may have been borrowed either directly from Colonial Spanish, or from Nahuatl (possibly through some other Indigenous language); but the form *siiy* is clearly a borrowing from Modern Spanish. We thus find here a type of lexical stratification, in which the form *siiy* is apparently the newer form in Kekchi.

The likelihood that an Indigenous language borrowed a word from (or through) Aztec, rather than directly from Colonial Spanish, increases when we look at languages of northwestern Mexico, where Spanish arrived at a relatively late date. An interesting case is the following:

(25) Col. Sp. *Castilla* [kaştílʸa] 'Castile' (Mod. Sp. [kastíya])

Col. Az. *kaštil-lan* 'Spain' (by re-analysis, with the locational suffix *-lan*); *kaštil-* 'Spain, Spanish, foreign'; *kaštil(an)-totolin* 'Spanish turkey, i.e. hen, chicken'

Subsequently, variants of the Aztec words spread all over Meso-America, and as far north as Arizona and the Rio Grande pueblos of New Mexico, but with further changes of form and meaning: The element *kaštil-* has acquired the added meanings mestizo, Mexican' (as opposed to Indian), and the combination meaning 'chicken' has been reduced to *kaštil* or *kaštilan*, which is then reduced in turn to the types *kašlan*, *štilan*, or *tilan*. Here are some sample forms:

(26) Mod. Az. (Tetzcoco) *kaštil* 'Spanish' (Lastra de Suárez 1980); (Tlaxcala) *kašti* 'hen' (Bright & Thiel 1965); (Huasteca) *kaštelan* 'Spanish' (Kimball 1980)

Cuitlatec *kaštili* 'Spanish' (Escalante Hernández 1962)

Totonac (Papantla)*kaštil* 'foreign', *štiilaan* 'hen' (Aschmann 1973)

Tzotzil *kašlan* 'foreign; hen' (Laughlin 1975)

Kekchi *kašlan, čiilan, tiilan* 'hen' (Haeserijn 1979)

Cora *kastiran* 'Spanish' (McMahon and McMahon 1959)
Hopi *kastíila* 'Mexican' (Voegelin and Voegelin 1957)
Keresan (Santa Ana) *kasdíira* 'Mexican' (Davis 1964)

The liquid consonants in the forms of Cora, Hopi, and Keresan give an especially clear reflection of the pronunciation used in Colonial Spanish and of Aztec, as opposed to the [y] of Modern Mexican Spanish.

The likelihood of borrowing through Aztec (with or without other native-language intermediaries), as opposed to the unlikelihood of borrowing directly from Spanish of any period, is especially great in words which were common in Spanish of the colonial period, but subsequently became obsolete. A good example is the following:

(27) Col. Sp. *zaragüelles* [saraɣʷélʸeʂ] 'loose breeches' (the Mod. Sp. pronunciation would be [saraɣʷéyes])

Col. Az. *sarawelas*
Mod. Az. (Pipil, El Salvador) *sala* (Campbell 1985)
Zoque *sanawénes* (Harrison & García 1961)
Yaqui *sarawera* (Buelna 1890)
Névome *salvel* (Pennington 1979)

Here the occurrence in the northwestern languages Yaqui and Névome, as well as the liquids preserved in those languages, both argue for borrowing from Nahuatl or some intermediate native language, rather than directly from Spanish.

6. Blends. I have made the argument that, of the numerous 'hispanismos' in the Indigenous languages of Mexico, many may indeed have been borrowed directly from Spanish—but that a significant number were probably borrowed through the intermediacy of Aztec. I have also suggested some phonological criteria which may be used to identify words borrowed in that way. However, as mentioned above, the possibility remains that some terms show BLENDING of phonological elements from both Spanish and Aztec. This is illustrated in the following:

(28) Col. Sp. *naranja(s)* [naránža(ʂ), naránša(ʂ)] 'orange(s)', Mod. Sp. [narán͡ʝa(s)]

Col. Az. *nalanša, nanša*

Mod. Az. (Tlaxcala) *nanšah* (Bright & Thiel 1965); (Tetelcingo) *alɔšɔš* ([ɔ] < *aa* ; Brewer 1962)

Tzeltal (Bachajón) *alašaš* (Slocum & Gerdel 1965); (Oxchuc) *narash* (Slocum 1953)

It is apparent that the Col. Sp. word entered Aztec in at least three forms - approximately (a) *nalanša*, (b) *nanša*, and (c) *alan šas*. In Tzeltal (a Mayan language of Chiapas), the Bachajón dialect clearly contains form (c), but the Oxchuc dialect apparently has form (a). The loss of the final vowel in the Oxchuc dialect is common when Spanish and Aztec loanwords enter Mayan languages. Beyond this, however, Oxchuc uses *r*, a sound not native to Tzeltal, instead of the expected *l*. The most likely explanation is contamination from Spanish *naranja* — or perhaps a more general tendency to replace *l* by *r*, by hypercorrection, in words which speakers regard as borrowings.

7. French, English, and Japanese. Modern Japanese is of course famous for its hospitality to loan words, especially from English. In effect, English loans in Japanese constitute an open-ended list, since writers feel at liberty to use, in a Japanese text, virtually anything they find in a bilingual dictionary. Thus, in 1988, a Tokyo department store advertised men's clothing under this heading:

(29) *riizunaburu kara yangu purestiji made, waido na puraisu renji*
'From "reasonable" to "young prestige", a wide price range.'

However, Japanese also borrows words from other European languages, especially French. But since English also borrows many of the same words from French, we have a situation somewhat comparable to that in Mexico: just as a language like Tzotzil seems to have borrowed some Spanish words directly, and others through Aztec, so also Japanese seems to borrow some French words directly, and others through English.[11] One very large class of resemblances between French, English, and Japanese consists, of course, of words which English borrowed from French (or from Latin, on a French model), during the period from the Norman Conquest through the Renaissance—and which Japanese has subsequently borrowed from English. An example is the following:

(30) Old French *mansion* 'abode' (Mod. Fr. *maison* 'house')
Eng. *mansion*
Ja. *manshon* 'upscale apartment'

Such cases, although numerous, are of relatively little interest in the present context: the phonological difference between the Mod. Fr. and the Mod. Eng. forms is great enough to make it clear that Japanese has borrowed the term from English, not from French.

Of greater interest, however, is the more recent chronological stratum of French words— referring especially to clothing, food, and the arts - which have gained international currency from the 17th century onward, entering English and Japanese as well as other languages. In examining this more recent layer of words in Japanese, we may distinguish three categories: those clearly borrowed directly from French, those clearly borrowed through English, and (the largest class) those for which the path of transmission is unclear.

7.1. Fr. > Ja. Words which we can identify as probable direct borrowings from French into Japanese fall into two classes. First, there are terms which have simply never become current in English:

(31) Fr. *manteau*, Ja. *manto* 'cloak'
Fr. *concours*, Ja. *konkuuru* 'contest'
Fr. *petit*, Ja. *puchi* 'small' (esp. in trade names)
Fr. *prêt-à-porter*, Ja. *puretaporute* 'ready-to-wear'

Other words occur in both English and French, but phonological criteria make it clear that Japanese has borrowed them directly from French. That is, their pronunciation reflects the phonetics of French (as pronounced in Japan) more closely than the phonetics of English (again, as pronounced in Japan). Thus

syllable-final *r* of French is normally *ru* in Japanese, whereas Eng. syllable-final [ur] would be rendered as *ua(a)*, as in Ja. *tsuaa* 'package tour' < Eng. *tour*.

(32) Fr. *mètre*, Ja. *meetoru* 'meter' (unit of measure)[12]

(33) Fr. *mannequin*, Ja. *manukan* 'mannequin' (The medial *u* is the regular reflection of Fr. '*e* muet' [ə], as in *petit* > *puchi*.[13])

(34) Fr. *reportage*, Ja. *ruporutaaju*, abbreviated to *rupo* 'news report' (Cf. Ja. *repooto* from Eng. *report*.)

(35) Fr. *gourmet*, Ja. *gurume* (Ja. final short *e* is normal in direct loans from French, as compared to long *ee* in words borrowed through English, e.g. Ja. *baree* from Eng. *ballet*.)

7.2. Fr. > Eng. > Ja. Words which can be clearly identified as having been transmitted through English, en route from French to Japanese, are characterized by distinctive phonology; the examples mentioned above have been Fr. *tour*, Eng. *tour*, Ja. *tsuaa*, and Fr. *ballet*, Eng. *ballet*, Ja. *baree*. Other instances are the following:

(36) Fr. *dessert*, Eng. *dessert*, Ja. *dezaato* (As seen above, the syllable-final *r* of English, but not that of French, is realized as Ja. *a* or *aa*. Note also Fr. [s], Eng. [z], Ja. [z], as well as final Fr. zero, Eng. *t*, Ja. *to*.)

(37) Fr. *brassière* 'bodice', Eng. *brassiere*, Ja. *burajaa* 'bra' (The phonology of Ja. *jaa* < **jiyaa* < Eng. [ziə], as well as the semantics, indicates borrowing through English.)

(38) Fr. *pension* 'accommodation with meals', Eng. *pension*, Ja. *penshon* 'small hotel'.[14]

7.3. Fr. > Ja., or Fr. > Eng. > Ja.? The largest category of all, as might be expected, is that of words whose path of borrowing is uncertain. These items are current in both French and English, as well as Japanese, and lack crucial phonological features which would confirm transmission through English. Examples are:

(39) Fr. *madame*, Eng. *madam* 'proprietress of a brothel', Ja. *madamu*
Fr. *ensemble* 'musical group', Eng. *ensemble*, Ja. *ansamburu*
Fr. *cognac*, Eng. *cognac*, Ja. *konnyakku*

7.4. Blends. Finally, as might be expected, there are words that show a mixture of French-type and English-type phonological features. Thus the word *ruporutaaju* 'news report', cited above (34) as a loan from Fr. *reportage*, has an alternant *reporutaaju* : this is probably a blend of the French form with Ja. *repooto* < Eng. *report*. Another possible blend is the following:

(40) Fr. *chou à la crème* 'cream puff', Ja. *shuukuriimu* (with apparent contamination from Ja. *kuriimu* < Eng. *cream*)[15]

8. Conclusion. The moral to be drawn is that the historical linguist should be alert to situations of sociolinguistically motivated three-way borrowing such as those discussed: Language A, of high prestige (at least in certain cultural fields), provides loanwords both to Language B and Language C; but Language B, also characterized by prestige, transmits some of those same loans to Language C. Within Language C, the assignment of loans to Language A vs. Languge B may be sometimes clear, sometimes ambiguous, and sometimes complicated by blending. Situations like this must have arisen frequently in the history of the world: for example, although I am mostly ignorant of African linguistics, I would expect to find that words of Arabic origin, in certain languages of Nigeria or of Kenya, might be traced directly to local varieties of Arabic—or, alternatively, to Hausa and to

Swahili, respectively, as vehicles of transmission. In general, it seems likely that borrowing of vocabulary can not be understood in terms of single 'languages of culture' as sources for loanwords, but must rather been seen in terms of a more complex model which allows for stratified transmission through intermediary languages. In the context of the Columbian quincentennial, we are reminded again that the history of contact between cultures and languages in the Americas was not a unilateral matter, but rather a multilateral process of what Spanish Americans prefer to call an *encuentro*: not a 'discovery', but an 'encounter'.

NOTES

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1. An authoritative reference is Friederici 1947.

2. A relevant study is Macazaga Ordoño 1987; see also the review by Bright 1990.

3. Col. Az. hispanismos cited below are, in general, from González Casanova 1933; native words can be found in Siméon 1885.

4. Data from Indian languages are transcribed as they appear in sources, but with adaptation of symbols to a common phonetic standard. Thus the Aztec word for 'needle' is often transcribed *acoxa*, following the orthographic conventions of Spanish, but it is converted here into symbols more generally recognized by linguists. —Regarding the phonology of Colonial Spanish, see the recent discussions of Ariza Viguera (1989:159-69) and of Campbell 1989.

5. An argument for hypothesis (a) is the fact that *mis-tli* 'mountain lion' is attested in several native compounds, e.g. *masa-mistli* 'deer-lion, a feline species', and metaphors, e.g. *wei mistli ipan kistok* 'He resembles a great lion, i.e. is very brave' (Siméon 1885). However, an argument for hypothesis (b) is provided by the borrowings with added absolutive *-tl*, *-tli* which are attested in some modern dialects, e.g. Tlaxcala *akošah-tl* 'needle' (Bright & Thiel 1965).

6. This term is intended to acknowledge the fact that Aztec was itself an intruder in Meso-America, only a few centuries before Spanish.

7. Cl. Az. forms of native origin, as transcribed here, include indication of vowel length and of the 'saltillo' or glottal stop, written as *h*; for these features, often omitted in the usual Spanish-based orthography, I rely on the determinations made by Karttunen 1983.

8. Relevant here is the report of Kroeber (1934:1-2) that Aztec was still spoken in the early 20th century by a few people in Sonora - the descendants of settlers moved there from central Mexico by the Spanish.

9. In fact, borrowings of Sp. *alfiler* are reported from several languages of California, e.g. Cahuilla *enfiléer* (Bright 1979b).

10. For a recent discussion of these, see Hill 1990.

11. Many publications, both in Japanese and in English, deal with European loans in Japanese; see, for instance, Arakawa 1984, Webb 1990.

12. Distinguished in Japanese from *meetaa* 'meter' (instrument for measuring), which is borrowed from German *Meter*. Japanese has borrowed many words from German in the areas of science, medicine, winter sports, and hiking.

13. But Ja. *manekin*, from Eng., also occurs, perhaps assisted by native Ja. *maneku* 'to welcome in' (Roy Andrew Miller, p.c.)

14. Since the Eng. pronunciation of this word is usually modeled on Fr. [pāsiõ], the Ja. form is probably based on a spelling pronunciation of the English, like that used in English sense for the meaning 'retirement pay'. Such spelling pronunciations are common in Ja. borrowings, e.g. *nyuusu* 'news'.

15. A possible blend involving German, rather than French, is a term which has recently become familiar in Japan: *kapuseru hoteru* 'capsule hotel' (i.e., one where the guest rents not a room, but a sleeping space something like a glorified coffin). This is only superficially modeled on English. The word *hoteru* may indeed be originally borrowed from English, French, or German. But *kapuseru* can only be from German *Kapsel*; the English word *capsule* would be rendered as Ja. **kyapushuru*.

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Abbreviations:
IJAL = International Journal of American Linguistics
ILV = Instituto Lingüístico de Verano
INAH = Instituto Nacional de Antropología e Historia
JCGBA-PL = Journal of California and Great Basin Anthropology, Papers in Linguistics
RPh. = Romance Philology
UCPL = University of California Publications in Linguistics
UNAM = Universidad Nacional Autónoma de México

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English Comparatives and an Indexed Phrase Structure Grammar

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I. Introduction

In this paper[1], I propose a new analysis of English comparative constructions, based on a few observations including a new classification of "Comparative Deletion (CD) and Comparative Ellipsis (CE)" and other related issues. The theoretical framework used is an "Indexed Phrase Structure Grammar (IPSG)", which introduces stacked indices into a GPSG framework. The basic idea behind this approach is that comparative elements (*-er, more, as* etc.) themselves have the property of licensing the compared phrases (*than/as*-phrases).

II.1. Comparative Deletion and Subdeletion

A variety of ellipses are involved in comparatives. First, we have such independently motivated ones as VP Ellipsis, Null Complement Anaphora, Gapping, Pseudo-gapping, and Right Node Raising (cf. Napoli 1983, sec. 1). Second, there are (obligatory) comparative-particular deletions:

(1) a. Mary is taller than Joan is (*x tall*).
    b. John eats more apples than Mary eats (*x-many apples*).
(2) a. Mary is taller than Joan is (*x*) thin.
    b. John has more books than Mary has (*x-many*) records.

The deletion of the elements in the parentheses has been the center of study in comparatives, which are handled by the so-called CD rules. Third, there is another group of ellipses which are dealt under the name of CE rules:

(3) a. John is taller than Mary. b. Mary was fatter at 15 than at 21.
    c. John eats more apples than oranges. d. John is more tall than thin.

The ellipses in this group seem to be motivated neither by independently motivated ellipses nor by comparative-particular ones.

The ellipsis phenomena in the first and third groups can be characterized as "omission under identity of a non-contrastive phrase". In this paper, we will focus on the analyses of the comparatives containing the second and third group ellipses. For the second group, we will explore the idea that CD is responsible for the omission of only *x(-many)* in (1-2). For the third group, we will pursue the idea of "base generation" in line with most GPSG approaches, which implies that our account would have far fewer ellipses than in traditional approaches.

As for the second group of comparative-particular deletions, it has been assumed in the literature that there are two different kinds of obligatory deletion rules involved

(Bresnan 1973, Chomsky 1977, etc.): a CD rule for the data in (1) and a Comparative Subdeletion (CSubD) rule for (2). Even though Bresnan (1977) posits a single rule for these two cases by using a variable, the deletion of A (and N) is still a part of the CD rule. However, I will argue that CD is responsible only for the omission of a Degree Phrase (DP) (*x* in (1-2a)) or a Quantity Phrase (QP)(*x-many* in (1-2b)). In addition, I posit that the deletion of Adj *tall* in (1a) is motivated by its distributional characteristics and hence the resulting gap is not due to CD itself. By factoring out this independently existing deletion, we can provide a unified account of CD phenomena, without positing separate CD rules for (1) and (2).

To begin with, we see a contrast in the acceptability of the following sentences:

(4) a. *Mary is taller than Joan is tall.
b. ?John eats more apples than Mary eats apples.

First of all, both of these sentences violate a general (semantic, cf. Gazdar 1980: 166) constraint against repetition of non-contrastive phrases. But sentence (b) is not so bad, especially with a contrastive stress on *John* and *Mary*, while sentence (a) is still bad. To see the difference here, notice that Adj *tall* has a "neutral meaning" rather than the normal "polar meaning" and that the neutral meaning arises only when an Adj (or Adv) occurs as the head of comparative elements and other degree expressions such as *this/that* and *how* (cf. Bresnan 1973: 323).

It is true that both *tall*'s in (4a) occur with degree elements, *-er* in the former and empty DP *x* in the latter. This empty DP gives a neutral meaning to Adj *thin* in (2a). However, the effect of empty DP is not as strong as that of explicit comparative elements in providing neutral meaning to its head. Its effect can be nullified in special contexts (Chomsky 1977: 122, Gazdar 1980):

(5) What is more, this desk is higher than that one is HIGH.

Here the height of the desk in the compared phrase is 'high' in its polar sense. With a special intonation we can cancel out the effect of the omitted degree word.

Then we can see why the repetition of *tall* in (4a) is worse than that of *apples* in (4b). What is required in the compared phrase is 'tall' in its neutral sense. But the empty DP is not strong enough to keep this neutral meaning salient. Hence, the Adj is likely to be associated with the regular polar meaning. This conflict can be easily resolved by avoiding repetition in the compared phrase when Adj (or Adv) is the head of empty DP/QP. Notice that there is no polar vs. neutral distinction when the head of a comparative word is a N as in (4b). In sentence (6),

(6) Henry is taller than 6 feet (tall). (Rusiecki 1985: 48)

the repetition of *tall* is natural. The reason here is that we have an explicit QP *6 feet*, which gives the neutral meaning of the Adj without any interference from the polar meaning, unlike the case where there is an implicit QP. This constitutes an independent motivation for the distributional deletion of As (Adjs and Advs) in

comparatives. This distributional fact leads to a natural account of the almost-obligatory deletion of Adj in (1a), and of the difference between (1a) and (5). It also means that we cannot account for the deletion of A as a part of CD itself.

One potential problem of the present approach is that the omission of Adj in the compared phrase seems to be obligatory when the Adj is used attributively as in (7) (Carl Pollard, p.c.):

(7) a. John has smarter friends than Bill has [x (*smart/*stupid)] enemies.
b. We have more intelligent consultants than they have [x (*intelligent/*competent)] engineers.
(8) John doesn't have such a kind brother as Mary has a *(nice) sister.

However, not all attributive Adjs are omitted. On the contrary, the construction in (8) requires one. We can account for the phenomena in (7) with reference to the distributional difference between *-er/more* and DP/QP gaps (i.e. *x* and *x-many/much*):

(9) a. i) a smarter boy, *smarter a boy.
ii) a very/more pleasant boy, *very/??more pleasant a boy.
b. i) *a this/so/such big boy, this/so/as big a boy.
ii) *a such kind friend, such a kind friend.

The data in (a) show that *-er*, *more*, and *very* have the same pattern of distribution (i.e. [Det - [[DP-Adj] - N']]). But *this/so/as* and *such* have different patterns (i.e. [[DP-Adj] - [Det - N']] and [DP - Det - Adj - N'], respectively) as we can see from the data in (b)[2]. Based on this difference, we can assume that the DP/QP gap belongs to the second group in its distribution. Then the sentences in (7) are ungrammatical with Adjs because the order required by the head of comparison (i.e. the first pattern) is different from that which is required by the DP gap (i.e. one of the second patterns). We have independent evidence for our approach:

(10) a. John has as kind a friend as Mary has x vicious an enemy.
b. *Paul has a longer table than Sue has a wide desk.

In sentence (a) the order that is imposed by DP *as* is the same as that imposed by the DP gap in the compared phrase. But there is an order conflict in sentence (b) (*a x wide* vs. *x wide a*).

II.2. The Status of the Compared (*than*-) Phrase

Now focusing on comparatives involving the third group of ellipses (cf. (3)), I will argue that *than* has three different functions in comparatives, contrary to traditional two-way distinctions (Hankamer (1973), Napoli (1983) and Ryan (1986)): P(reposition), Comp(lementizer) and (Coordinating) Conj(unction). The three-way distinction here is similar to Pinkham's (1982) classification: "clausal" and "base-generated" comparatives", the latter of which is further classified into "parallel" and

prepositional comparatives.

The compared phrase is a PP when only an NP follows *than*, regardless of this NP's interpretation as subject or object. There are several pieces of evidence for the PP analysis. First, we have expressions like *different from/than NP, superior/inferior to NP* and *taller than me/*I*. Here *than* alternates with a P, words which have comparative meaning have PP complements, and the accusative form of a pronoun occurs after *than* for many speakers of English, respectively. Second, the NP can be fronted as in (11) (Hankamer 1973):

(11) a. Mary is taller *than Joan.* b. (?)*Who* is Mary taller *than*?
(12) John thinks [Mary$_i$ is taller than herself$_i$/*her$_i$].

Third, the NP in the compared phrase behaves like an element in the same clause as the head of comparison as in (12) (Napoli 1983: 164-5). Lastly, there are comparatives where the NP in the compared phrase is an explicit DP or QP ("measure phrase NPs"):

(13) a. The car was travelling faster than 90 mph.
b. Mary bought more records than ten.
c. Max is older than the forty years they reported him to be.

The underlined DP/QPs here can combine with Ps (e.g. *at ten, over 90 mph*, etc.) but never with Comp or Conj. And we cannot assume that any DP/QP element is omitted from the compared phrase. This is different from those cases where the compared phrase is introduced by Comp or Conj *than*.

Than is a Comp when a clause (which has at least a subject and a predicate) follows, as in the examples in (1-2). There is evidence for this assumption:

(14) a. *Who is Mary taller than t is? b. Mary is [taller than Joan is].

From (a) we can see that *than* is not a P. In (b) *taller than Joan is* forms a constituent. Hence *Mary is taller* cannot be a constituent, which means that *than* is not a Conj either. Consider the following data:

(15) a. Did you buy more apples than John bought oranges?
cf. *Did you buy some apples and John bought some oranges?
b. *Did you buy more apples than did John buy oranges?
cf. Did you buy some apples and did John buy some oranges?

As we can see, *than* here shows different properties from those of Conj *and*. It shows exactly the same set of properties as other Comps. The compared phrase is not affected by "operations" on the higher clause.

Thus far, we have observed that comparative *than* functions as a P when an NP follows and as a Comp when a clause follows. But there are many other comparative sentences which do not fit into these two categories. I will now argue that it

functions as a Conj in these sentences. Typical examples of Conj *than* are those in which the focus of comparison itself is the head of comparison:

(16) a. The company needs [more trucks] than [(*x-many*) cars].
b. John bakes [better cakes] than [(*x-good*) pies].
(17) a. John is more tall than thin. b. This car runs more fast than smoothly.

(More) apples in (16a) is the focus and, at the same time, head of comparison. The examples in (17), which are called "meta-comparatives", have the same characteristics as those in (16) in the sense that these also induce a coordinate structure. But they have different characteristics in other respects and will be discussed in section III.

Comparatives with Conj *than* show a strong parallelism between the two conjuncts. Napoli (1983, sec. 2.1.) lists some pieces of evidence for Conj-hood of *than*. First of all, this construction obeys the "Coordinate Structure Constraint"[3]:

(18) a. Nancy Reagan, I've seen [more pictures of] than [books about].
b. *Who did you see more pictures of than books about Ronald?
c. *Who did you see more pictures of Nancy than books about?

Second, *than* can introduce elements of any major syntactic category. This will become evident when we discuss other examples, especially meta-comparatives. Third, items which have limited distribution can appear in the compared phrase when the conditioning context is present in the sentence:

(19) The team made/*liked [more noise] than [(*x-much*) headway].

Notice that *headway* is a part of the idiom chunk *make headway*. But *like headway* is not a possible expression.

Apart from those cases where the focus of comparison is the same as the head of comparison, there are other cases for which we should assume that *than* is Conj:

(20) a. I bought [a bigger car today] than [e yesterday].
b. Mary was [fatter at 15] than [e at 21]. (Ryan 1986)
c. John listens [to folk music more often] than [to jazz e].
d. John gave [more books to Shirley] than [e to Fred].

If we assume that only constituents can be conjoined, the first conjunct would be the smallest constituent which contains both the head and focus of comparison. For example, in (20a) the first conjunct would be *bought a bigger car today*. But if we assume that non-constituents can also be conjoined (cf. Dowty 1988), the first conjunct would be a string which contains only the head and the focus of comparison. For example, that of (20a) would be *a bigger car today*. I favor this second analysis because we would need to posit sentence (21) as the source of (20a), which is ungrammatical, under the first analysis:

(21) *I bought a bigger car today than bought e yesterday.

Whichever of these two possible analyses we choose, we need a Conj *than* rather than a Comp *than* because Comp can introduce only clausal units. We will see further evidence for the Conj analysis when we deal with meta-comparatives.

Incorporating what we have observed thus far, we can summarize comparative constructions schematically as follows:

(22) L). A + *-er*; $more_1$ + A
M). $more_2$ (+ N^1)
} { P). $than_P$ + NP
Q). $than_{COMP}$ + clause
R). $than_{CONJ}$ + X

The parentheses in (M) indicate that $more_2$ can also be used as an NP or as an Adv. The symbol X in (R) represents the assumption that it might not be a constituent.

Schema (22), first, shows that there are six interrelated constructions:

(23) LP: John is taller than Mary.
LQ: John is taller than [Mary is (*x tall*)].
LR: John has [smarter friends] than [(*x smart*) enemies].
Mary was [fatter at 15] than [(*x fat*) at 21].
MP: John eats more apples than Mary.
MQ: Mary eats more apples than [Mary eats (*x-many apples*)].
MR: John eats [more apples] than [(*x-many*) oranges].
John gave [more books to Shirley] than [(*x-many books*) to Fred].

Notice that the italicized elements in the parentheses are not explicit expressions. Second, the schema shows that there are 2 *more*'s (observed thus far). The one in (22L), $more_1$, which is a morpho-phonologically conditioned variant of *-er*, is a DP and induces degree comparatives (the same with the *as...as* construction). The *more* in (23M) is a QP and induces quantity comparatives.

I can show that the DP vs. QP distinction is responsible for the contrast among the following expressions (cf. Bresnan 1973: 322-7):

(24) a. *John is taller than thin. *John is as tall as thin.
b. John has more apples than oranges.
(25) a. John is taller than he is thin. John is as tall as he is thin.
b. John is as much tall as (he is) thin.
(26) John is more tall than (he is) thin.

In a "single-scale comparative" as in, for example, *John is taller than Mary*, we are comparing the heights of John and Mary on a single scale of 'tallness'. When there is only one scale involved, we can compare what is represented by two points of degree because the comparison is done within the same scale. We can see the relative positions of these points by just looking at them on the given scale. But when there are two different scales involved as in (24a), the comparison of two degrees would

be logically impossible because we cannot compare 'tallness' and 'thinness' directly without referring to the quantities of them. In (24b), however, we are comparing two quantities rather than two degrees. Notice that *more* here is a QP rather than a DP.

The sentences in (25a) do not have quantity expressions even though two scales are involved. But they are grammatical unlike those sentences in (24a). But there is a difference between these two groups of sentences, which is related to the issue of providing quantities. In (25a) we can get the quantity of 'thinness' by referring to a specific entity 'he', which is in the scope of comparison (the constituent containing both the head and the compared phrase). In this case we know how much 'thinness' we are talking about. The 'tallness' and 'thinness' are compared on the scale of 'tallness' by referring to the quantity of 'thinness' indirectly provided. In (25b), we can get the quantities of both 'tallness' and 'thinness' directly because we have an explicit quantity expression *much*. The expressions in (26) have nothing to do with degree or quantity. These meta-comparatives will be handled in the following section.

III. Meta-comparatives

It has been pointed out that the comparatives in (17) and (26) have different characteristics from the others we have observed thus far (Pinkham 1982, Napoli 1983 and Ryan 1986 among others). But the focus of study has been on semantic differences. In this section, I will show similarities and differences between the two groups from a syntactic point of view. These properties will be described with reference to the properties of *more* and *than*.

First of all, any (phrasal) categories of the same type can be connected by *(more)...than...* in meta-comparatives (AdjP, AdvP, NP, VP and PP):

(27) a. Mary is [more very tall than very thin].
b. It was a [more social than intellectual] affair. (Pinkham 1982: 152).
(28) a. This car runs more very fast than very smoothly.
b. He played more passably than extremely well. (Ryan 86: 91)
(29) a. Mary is more a linguist than a sociologist.
b. She more than he understands how to proceed. (Napoli 83: 681)
(30) John is more trying to win acceptance than (he is) trying to get rich.
(31) The airport is located more to the east than to the north.

This is a characteristic of a coordinate structure. Actually this construction shows the same characteristics as those of the construction in (16) and (18) as far as the behavior of *than* is concerned (cf. the MR construction in (22)).

A real difference between the MR construction and the meta-comparative construction lies in the behavior of *more* rather than *than*. We argued above that there are two *more*'s: DP and QP. But *more* in a meta-comparative is neither DP nor QP because it has nothing to do with degree or quantity. I will argue that it is a Conj. Strictly speaking, it is the first part of a split Conj *more ... than*. We can say that it has the same function as *neither ... nor, either ... or*, etc.

There are some other pieces of evidence for this assumption besides the semantic

fact that the (first) Adjs in a meta-comparative have polar meanings. First, as was pointed out by Pinkham (1982: 150-1), meta-comparative *more* cannot be modified:

(32) a. Mary was even more angry than she was sad.
b. Mary was three times more angry than she was sad.

These sentences have only the literal meaning, i.e. only the DP/QP reading of *more*. She used [+metacomparative] and [+numerical] to account for this fact in (32). But meta-comparative *more* cannot be modified for the simple reason that it is a Conj in the present analysis. No stipulation is necessary.

Second, the compared phrase in meta-comparatives does not have any DP/QP gap, not only from a semantic point of view but also from a syntactic point of view:

(33) a. Mary is more very tall than very thin.
b. *John is more tall than I think he is thin.

If we assume that *more* in meta-comparatives is a Deg word, we cannot account for the fact that two Deg words occur in (33a). Notice that a DP has the characteristic of closing an AP (cf. Gazdar et al. 1985). As meta-comparatives do not have any gaps, there would be no unbounded examples of meta-comparatives. This is apparent as we can see from sentence (33b). But regular comparatives with sentential compared phrases can be unbounded.

To account for the observations in this section we can revise the schema in (22) as follows:

(34) L). A + *-er*; $more_1$ + A
M). $more_2$ (+ N^1)
} { P). $than_P$ + NP
Q). $than_{COMP}$ + clause
R). $than_{CONJ}$ + X

N). $more_{CONJ}$ + XP ——— R'). $than_{CONJ}$ + XP

There are seven interrelated comparative constructions. We can divide these into two groups: N-R' vs. the others. The major difference between these two groups of constructions is due to the functional difference of *more*: Conj vs. DP/QP. This difference is responsible for the syntactic and semantic differences between regular comparatives and meta-comparatives.

IV. An IPSG Approach

Thus far we have observed that the comparative word *more* has three different functions: DP, QP and Conj. And *than* also has three functions: P, Comp and Conj. We have noticed that DP and QP *more* induce gaps in those compared phrases which are introduced by Comp and Conj *than*. But we have not looked at the nature of the gaps induced by DPs and QPs. There is enough evidence which shows that these gaps are different from NP (and other) gaps, which are usually represented by SLASH (/) or other similar notations in the literature. The force of DP or QP gaps seems to

be far weaker than that of other gaps in the sense that their existence is not so significant as others either syntactically or semantically. We have already seen one case where the effect of a DP gap is canceled out in (5).

First, DP/QP gaps do not obey the Generalized Left Branch Constraint as in (35) (Carl Pollard, p.c.):

(35) a. John is taller than Mary is [x thin].
b. *How is John [x tall]? cf. [How tall] is John e?
(36) a. ?More caviar was eaten at the party than I thought that [(*x-much*) smoked salmon] would be.
b. *More caviar was eaten at the party than I thought that [e] would be[4].

In wh-questions, which involve SLASHes, the whole constituent should be extracted when the left-most element of the constituent is a wh-word. Second, the empty DP/QP has no ECP effect as is shown in (36) (Gueron & May 1984: 20). We can see the ECP effect only when other elements are deleted together with the DP as in (36b). Third, Gazdar (1980: 177) points out that in some dialects there is a contrast between (37) and (38):

(37) a. Fido is more cowardly than Rover is e nowadays.
b. *Fido is more cowardly than Rover's e nowadays.
(38) a. Fido is more cowardly than Rover is x careful nowadays.
b. Fido is more cowardly than Rover's x careful nowadays.

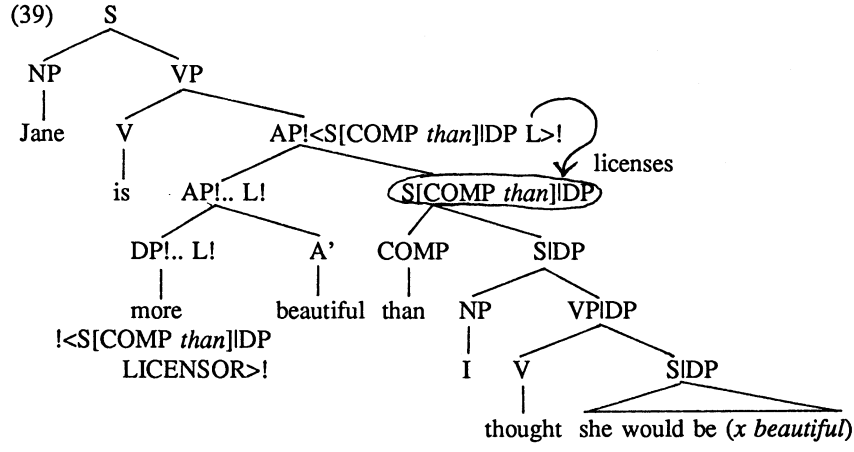
It is well-known that contraction of the tensed auxiliary is not allowed when a (real) gap follows. But (38b) indicates that the DP gap does not obey this constraint. From these observations, we can argue that DP/QP gaps are different from other gaps. We can also see that DP/QP gaps show different characteristics when they are alone from those cases when they are combined with other gaps. Only in the latter case, the (string of) gaps involved behave like normal gaps (cf. Pinkham 1982: 2).

Now we can give a formal account of the relationship between the comparative element and the compared phrase. The basic idea is that the former has the (lexical) property of licensing the latter. I have been exploring a theoretical framework which employs a FOOT feature LICENSOR to capture the relationship between particular lexical items and what is licensed by these items (Chae 1990, 1991, and in prep). This framework, which I will call an "Indexed Phrase Structure Grammar (IPSG)", introduces stacked indices into a GPSG framework. This work is inspired by Gazdar (1988), which explores applicability of Indexed Grammars to the analysis of some English discontinuity phenomena[5].

We will use USLASH (Upright SLASH: |) rather than SLASH to represent the DP/QP gaps. We have seen before that this gap is different from other gaps. Then, under the present framework, we can say that *-er* and $more_1$ have the property of licensing PP[PFORM *than*], S[COMP *than*]|DP or X[CONJ *than*]|DP. $More_2$ licenses PP[PFORM *than*], S[COMP *than*]|QP or X[CONJ *than*]|QP. And Conj *more* licenses XP[CONJ *than*]. The idea here can be easily formalized by using a LICENSOR

feature, which is a stacked FOOT feature. For example, *-er* has <PP[PFORM *than*] LICENSOR> in the lexicon as a part of its syntactic information. This feature propagates through the tree by way of a stack and pops out of the stack when it licenses PP[PFORM *than*].

Let us see how the present system accounts for the following example:



I am using !...! to represent a stack. The LICENSOR feature on the node of the higher AP pops out of the stack and licenses the S[COMP *than*]|DP node under the principle that the LICENSOR feature of a node licenses one of its daughters when its value specification is the same as that of this daughter node. The upward propagation of the LICENSOR feature stops at the moment when it pops out of the stack because it propagates only through a stack. The |DP on the node of S[COMP *than*] cannot propagate upward because it is licensed by the LICENSOR feature. Licensed features are different from freely instantiated features. Notice that USLASH in |DP is responsible only for the omission of *x* in the lowest clause. Adj *beautiful* is omitted due to other factors as noted above. And the USLASH is a mechanism for the account of unbounded dependencies in comparatives.

We need some more constraints, which are not necessarily syntactic, to account for other aspects of comparatives. First, there is a strong parallelism between the head of comparison and the corresponding syntactic and/or semantic unit in the compared phrase. The standards based on which we can measure the parallelism is the site of DP/QP in the head and that of omitted DP/QP (if there is one) in the compared phrase. Notice that the information about these two sites is provided by comparative elements and what is licensed by them, which are connected by way of LICENSOR features in our framework.

A corollary of the parallelism requirement is that the head of comparison should be a part of the compared phrase (at least in its interpretation) when the corresponding unit is not present in the compared phrase:

(40) a. I've never seen a man [[taller] than my mother].
b. *I've never seen [[a taller man] than my mother].

In (40) a semantic unit that should be provided in the compared phrase is 'x tall' in (a) and 'x tall a man' in (b). But this latter meaning is incompatible with *my mother*, which is a female.

Second, we need a constraint on the relative linear order of contrastive phrases, i.e. the focus of comparison and the corresponding contrastive phrase in the compared phrase. I will argue that the latter should be to the right-hand side of the former when the compared phrase is introduced by Conj *than*. This is an absolute grammatical constraint when the contrastive phrases are complements:

(41) a. John stored bigger boxes in the basement than in the attic.
b. *John stored bigger boxes than in the attic in the basement.

The PP *in the basement* is an argument of V *store*. In (a) the contrastive phrase in the compared phrase (i.e. *in the attic*) comes to the right of this PP. But it is not the case in (b). The situation is a little more complex when the contrastive phrases are adjuncts. In these cases, sentences are not ungrammatical even though they violate the above-posited constraint. The reversed order just adds difficulties in processing.

V. Conclusion

In this paper we have seen that new observations about the deletion of A (Adj and Adv), and about *more* and *than* lead to a reanalysis of a messy group of comparatives into separate (but closely related) well-defined constructions. First, we have shown that the deletion of A is distributionally motivated rather than an integral part of CD itself. Second, comparative word *more* has three different functions. This distinction is shown to be related to the contrast among **taller than thin*, *taller than he is thin* and *more tall than (he is) thin*. Third, *than* has also three functions. These three-way distinctions led to a good analysis of the whole range of comparatives including meta-comparatives. We were able to capture the similarities and differences between regular comparatives and meta-comparatives within the same set of mechanisms. Then, we have provided a framework to formally represent the relationship between a comparative element and what is licensed by it (i.e. the compared phrase).

<Endnotes>

1. This paper is a condensed version of sec. 6.1, Chae (in prep). I express my sincere gratitude to Jason Frank, Carl Pollard and Arnold Zwicky for their comments on its earlier versions. I also acknowledge the benefit I got from Carl Pollard's manuscripts on comparatives: "Notes on the Syntax and Semantics of Comparatives" and "A Survey of Comparatives in HPNL". His and my approaches share the basic idea that comparative elements license the compared phrases. But there are significant differences in the classification of comparatives and specific mechanisms of analyses.

2. The [[DP-Adj] - [Det - N']] order is also possible for *more*:
(i) Dan is [more competent a manager] than Derek.
If this order is in effect in (7b), the sentence with an Adj in the compared phrase would be OK under our analysis. However, we can maintain our approach because the [Det - [[DP-Adj] - N']] order is far more natural.

3. Carl Pollard (p.c.) told me that the data in (18) do not show that *than* is a Conj. They show only that whatever factors are at work in coordinate constructions that give rise to the so-called Coordinate Structure Constraints are also at work in that construction. But I think we need Conj *than* to account for other data to be discussed shortly.

4. We can see a difference in the behavior of Comp *than* and Comp *that*:
(i) More students ate apples than e ate oranges.
Here Comp *than* is not subject to ECP even though a full NP is omitted.

5. The tradition of adopting stack-valued features into a GPSG-like framework goes back to Maling and Zaenen (1982), Pollard (1984), and early versions of HPSG.

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Argument Structure and Absolute Prominence Theory*

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1. Introduction

The purpose of this study is to argue for an absolute prominence theory (hereafter, APT) of argument structure. I will show that relative prominence theory (hereafter, RPT), which has been assumed in the literature, is invalid.

RPT has been assumed in Grimshaw &Mester (1988) and Grimshaw (1990), and is used by Li (1990) in predicting the argument structures of Chinese compound verbs. This study shows that RPT is not appropriate; (i) it cannot make distinction between unergatives and unaccusatives, and (ii) it makes wrong predictions for argument structure of Korean compound verbs. It will be shown that APT as proposed here will do the two jobs above which RPT cannot, as well as those which RPT can.

2. Argument Structure and RPT

In this section, I will briefly introduce Grimshaw's (1990) argument structure theory and RPT, and discuss Li (1990), which shows how we can predict the argument structure of Chinese compound verbs. I will focus on Li (1990), where RPT plays a crucial role. Some problems with the theories and assumptions taken by Li (1990) will be pointed out.

2.1. Grimshaw (1990) and Grimshaw & Mester (1988) show that argument structure is structured as in (1):[1]

(1) <Agent <Experiencer <Goal/Source/Location <Theme>>>>

The hierarchical argument structure in (1) represents the prominence relation. That is, Agent is more prominent than Experiencer, Experiencer is more prominent than Goal, and so on. Here Grimshaw (1990) and Grimshaw & Mester (1988) assume that the prominence relation is relative.[2] So each argument has a relative prominence status, which is measured only by comparing with the others. This prominence theory is called RPT (Relative Prominence Theory) here.

2.2. Li (1990)

Li (1990) shows how the argument structure of Chinese compound verbs can be predicted. To do the job, Li (1990) takes several theories and assumptions: (i) Theta-role Prominency (termed by Li) which follows from the hierarchical prominence relation in (1), (ii) the Theta-role identification of Higginbotham (1985), (iii) Head-feature Percolation (Lieber 1983), and (iv) RPT.

First, Theta-role Prominency is a property of theta-grid; the less prominent theta-role is assigned earlier than the more prominent one. If a verb has a theta-grid, <1, 2, 3>, then the lowest one <3> must be assigned prior to all the others, and <2> must be assigned before <1>. Second, Li adopts the idea of Theta-role

identification of Higginbotham (1985). That is, when two verbs, V1 and V2, form a compound verb V3, a theta-role of V1 may be identified with that of V2 in V3. This identification operation is optional and not restricted by the hierarchical theta-grid of a verb.[3] Third, Li adopts Head-feature Percolation as proposed in Lieber (1983); relevant features of a head are maintained throughout its projections. Li assumes that the theta-role prominency of a head verb is a head feature[4] and thus is maintained in the theta-grid of the compound. Fourth, Li adopts RPT. Specifically, he adopts the Left-Right version of RPT.[5] So the leftmost theta-role is counted as the most prominent one, the next one is the second, and so on. One important claim in Li (1990) is that he does not make any new rule or assumption, but he just resorts to the given theories and assumptions which are independently motivated.

Now I will illustrate how Li (1990) predicts the argument structure of Chinese compound verbs by using the theories and assumptions above. Chinese has the type of resultative compound verbs illustrated in (2).

(2) Baoyu qi - lei - le neipi ma.
ride tired Asp that horse
'Baoyu rode that horse (and as a result it/he) got tired.' (Li 1990: (2))

From the theta-grids of the two verbs, V1 and V2, in (3), we may have argument combinations for the theta-grid of the compound verb V3 in (4).

(3) a. V1: *qi-* 'ride' <1, 2> b.V2: *-lei-* 'tired' <x>

(4) V3: a. <1, 2=x> b. <1=x, 2> c.<2=x, 1> d. <2, 1=x> e. <1, 2, x> ...

In (4), the sign '=' indicates theta-role identification. Now the question is which one in (4) is the correct theta-grid for the compound verb, *qi-lei-*. According to Li, the correct theta-grid is predicted by the theories and assumptions we introduced just before. One important assumption of Li is that the Chinese resultative compound is headed by V1.[6] Now let's apply each theory to each case in (4). Theta-role Prominency will require that the orders of theta-roles of V1 and V2 are maintained in V3. Then, this theory rules in (4a), (4b), and (4e), whereas it rules out (4c) and (4d) because the theta-role <2> must be assigned prior to <1> but this is not the case in (4c) and (4d). The theta-role identification is optional and thus it will allow for all the cases in (4). Head-feature Percolation requires that the theta-role prominency of a head must be maintained in the compound. So, the theta-role prominency of the head V1, <1, 2>, must be maintained in V3 (Here the Left-Right version of RPT is assumed). Thus, it will rule in (4a), (4b), and (4e), but rule out (4c) and (4d).[7] That is, in (4c) and (4d) the theta-roles, <1> and <2>, have different prominence from those in (3a). For example, <1> is the most prominent one in (3a), but it is not in (4c). So, this change of prominence violates Head-feature Percolation. Thus, the theories rule in (4a), (4b), and (4e). Here Li is required to note one more thing, Case Theory. He assumes that a Chinese sentence allows for only two structural cases, accusative and nominative, unless it is a special construction like BA-construction.[8] Then Case Theory rules out (4e) because it has three theta-roles and thus it requires three Cases; an overt argument must have Case in order to get a theta-role. Now, we have two cases, (4a) and

(4b), and they are attested in (2), which is ambiguous. That is, we get the interpretations (4a) and (4b) in (2).

This is a nice result because we get the correct interpretation(s) by using independently motivated theories and assumptions only. In the following section, I will point out some problems in Li (1990).

2.3 Problems

2.3.1. Head-feature Percolation

Li (1990) assumes that the theta-role prominency is a head feature. But we need to ask whether theta-role prominency is a head feature.[9] More basically, we need to ask what a head feature is. It seems that the basic idea for a head feature comes from the head-to-head relationship.[10] When a lexical head takes an argument or subcategorizes a category, the argument or the subcategorized category is required to have some specific features like categorial features, [+N] and [-V]. If a head feature is defined this way, theta-role prominency is not a head feature because it is not required by an external lexical head. So, we cannot use Head-feature Percolation for the theta-role prominency of a head.

But we need to keep the theta-role prominency of a head verb in the compound. Otherwise, we cannot predict the correct theta-grid of a compound verb from those of its component verbs. Suppose that a head verb has a theta-role, Agent. Then, we do not want the theta-role to be Theme in the compound. To keep the theta-role prominency of a head, I propose the following:

(5) Head Prominence Preservation (HPP)[11,12]
Each argument of a head has its prominence preserved in a compound.

2.3.2 Relative Prominence Theory (RPT)

We have seen that Li (1990) follows Grimshaw (1990) and Grimshaw & Mester (1988) for RPT. In this section, I will point out the problems of RPT in general.

There are three problems for RPT. First, it cannot distinguish between unergatives and unaccusatives. Unergatives and unaccusatives have single arguments, so RPT will represent them as follows:

(6) a. unergative: <x> b. unaccusative: <x>

As we see in (6), we cannot distinguish between unergatives and unaccusatives. But we know that they should be distinguished cross-linguistically (Cf. Perlmutter 1978 and Burzio 1986). For this reason, Grimshaw (1990) tries to distinguish them as in (7).[13]

(7) a. unergative: <x> b. unaccusative: <<x>>

The distinction in (7) is just a notational difference and it does not explain the fundamental difference; That is, the argument of unergatives is Agent and that of unaccusatives Theme.

Second, RPT cannot make correct predictions for the argument structure (or theta-grid) of some compound verbs. The compound verbs in question can be found in Korean. Suppose that V1 takes the argument structure, <1, 2>, and V2 <x, y, z>, and the compound verb V3 (=V1+V2) is double-headed. Theta-role

Prominency, Head Prominence Preservation, and the Left-Right version of RPT allow for <1=x, 2=y, z> only. This is not attested, but <1=x, y, 2=z> is. I will discuss this problem in detail in the next section, comparing RPT with APT.

Third, each version of RPT makes a different prediction for the argument structure of compound verbs. As noted in endnote 5, there are three versions of RPT. Furthermore, no version of RPT makes a correct prediction. This problem will also be discussed in detail in the next section.

Because of these problems of RPT, I propose an absolute prominence theory (APT).

3. Absolute Prominence Theory (APT)

3.1 The main thesis of APT is that each argument has its own absolute value. Thus, the absolute value is not affected by the presence or absence of other arguments. Suppose that there is a definitely given number of arguments, and thus we may represent the argument structure as in (9) which roughly corresponds to (1) which is repeated here.

(1) <Agent <Experiencer <Goal/Source/Location<Theme>>>>

(9) <1<2<3<4>>>>

(9) is interpreted as follows: <1> corresponds to the most prominent argument with the absolute value 1, and <4> corresponds to the least prominent with the absolute value 4, and so on. But <1> is not interpreted as Agent and <4> as Theme because APT does not use theta-role labels, following Rappaport & Levin (1986) and Grimshaw (1990). Rather, I assume that each predicate has its argument structure with these values. For example, the English verb *hit* will have the argument structure, <1, 4>, and the verb *hate* <2, 4>. These values are determined in Lexical Conceptual Structure (for Lexical Conceptual Structure, see Rappaport & Levin 1986 and Grimshaw 1990). So, the semantics of each predicate will determine the absolute values of its arguments.

APT differs from the thematic hierarchy theory where thematic roles are employed. First, as mentioned earlier, APT does not use the thematic role labels. As noted in the literature, it is very difficult to define each thematic role. Second, an absolute value may have more than one thematic role. As indicated in (9), the argument <3> may correspond to the thematic roles, Goal, Source, and Location. Korean has an example to show that Goal and Source have the same value. This example will be shown in section 4. And Experiencer may have the value <1> as Agent does. Korean has two types of Experiencer: agentive ones and non-agentive ones.[14] So, an agentive experiencer verb will have the argument with the value <1> as the English agentive verb *hit* does.

3.2. Analysis

3.2.1. Unergatives and Unaccusatives

Now we can distinguish unergatives from unaccusatives easily. The difference between them is that an unergative verb has an argument with the value <1>, and an unaccusative one has an argument with the value <4>. They are represented in (10):

(10) a. unergative : <1> b. unaccusative : <4>

3.2.2 Argument Structure of Compound Verbs

In this section, I will show how APT makes correct predictions on argument structure of compound verbs in Chinese and Korean, and it will be shown that RPT makes wrong predictions.

Like Li (1990), I adopt hierarchical argument structure, more specifically, Li's Theta-role Prominency, and Theta-role Identification of Higginbotham (1985) or argument merger of Rosen (1989). Unlike Li (1990), I adopt APT and Head Prominence Preservation (HPP); Li uses RPT and Head-feature Percolation.

Crucial data to distinguish APT from RPT come from Korean compound verbs.[15] Let's look at example (11) and the argument structure of each verb in (12).

(11) Mary-ka John-eykey moca-lul mantul-e-cwu-ess-ta.
Nom Dat hat Acc make give Past Dec
'Mary made/gave a hat to John.' ('Mary made a hat and gave it to John.')

(12) a. V1: *mantul-* 'make' <1, 4> b. V2: *cwu-* 'give' <1', 3', 4'>[16]

Here we are interested in the argument structure of the compound verb V3 (=V1+V2) 'make/give' in (11). By applying Theta-role identification or argument merger, we may have many possible argument combinations from the argument structures of V1 and V2, as shown in (13).

(13) a. <1=1', 3', 4=4'> b. <1=1', 4=3', 4'> c. <1', 1=3', 4=4'>
d. <4=1', 3', 1=4'> e. <1=3', 1', 4=4'> ...

Now it is time to consider which one, APT or RPT, makes correct predictions. The two cases (13a) and (13b) are enough to see the result. The table (14) shows how APT and each version of RPT make predictions concerning (13a) and (13b).

(14)

		(13a)	(13b)
APT		^	*
RPT	LR	*	^
	RL	*	*
	ND	^	^

(^ : grammatical, *: ungrammatical)

From the table (14), we can see that each theory and each version makes a different prediction.

One important note here is that this type of Korean compound verbs is double-headed. Both components of the compound are clearly verbs and the compound is also a verb. If it is possible pragmatically, V1 and V2 may change their positions. For example, for the compound verb, *tolli-e-chi-* 'turn/hit,' we may have the compound *chi-e-tolli-* 'hit/turn.'[17]

First, (13a) and (13b), which are potential argument structures of V3, do not violate the hierarchical argument structure or Theta-role Prominency. That is,

the argument orders of V1 and V2 do not change in V3. Thus, this does not distinguish between (13a) and (13b).

Now, considering APT and HPP, take a look at (13a). The verb V1 in (12) has two arguments whose values are <1> and <4> and their status does not change in (13a). The argument, <1>, of the verb V1 maintains its status, the absolutely highest one in (13a), because it is identified with an argument of the same value and there is no other argument higher than <1>. This is also the case for the argument <4> of the verb V1. The same story holds for the arguments <1'> and <4'> of the verb V2: They do not change their absolute values. Only the argument <3'> remains alone. This means that (13a) is subject to HPP and thus APT predicts that (13a) is a correct argument structure for the compound verb V3 as shown in the table (14).

What about RPT for (13a)? Each version makes a different prediction. Let's consider first the Left-Right version of RPT, which Li (1990) adopts. The Left-Right version says that in the argument structure of V1, the argument <1> is the most prominent one, and <4> is the second most prominent. This relative prominence of each argument is not maintained in V3, i.e., in (13a); the argument <4> is the second most prominent in V1, but the third in V3. So, the Left-Right version of RPT predicts that (13a) is an incorrect argument structure for V3, as shown in (14), violating HPP (or Head-feature Percolation).[18]

The Right-Left version of RPT makes the same prediction as the Left-Right version, but in a different way. The argument <1> of the verb V1 is the second to the last in V1, but it is the third to the last in V3, i.e., in (13a). So, it violates HPP, predicting that (13a) is incorrect as shown in (14).

The Non-directional version of RPT makes a different prediction from the other versions of RPT. In (12), the argument relation that <1> is more prominent than <4> is maintained in (13a), and the argument relation that the argument <1'> is more prominent than the argument <3'> which is more prominent than <4'> is maintained in (13a). So, the Non-directional version of RPT predicts that (13a) is a correct argument structure for the compound verb V3. This is also shown in (14).

Now let's go to (13b). APT and HPP predict that (13b) is an incorrect argument structure because the argument <4> of the verb V1 does not maintain its status in (13b); in (13b) the argument <4> is not the absolutely lowest one because the argument <4'> is the lowest one. So, (13b) violates HPP.

The Left-Right version of RPT predicts that (13b) is correct because the relative prominencies of left-right order of arguments in V1 and V2 are maintained in V3, i.e., in (13b). The Right-Left version predicts that (13b) is incorrect because the argument <1> of V1 is the second to the last in V1, but the third to the last in (13b), so it violates HPP. The Non-directional version predicts that (13b) is correct. All these predictions are shown in (14).

So far, we have seen that each one makes a different prediction for the argument structure of the compound verb V3. Then, which one is correct? As we see in (11), only (13a) is attested. So, APT makes the correction prediction. No version of RPT makes a correct prediction for the Korean compound verb.

Now we can predict the correct argument structures of the Korean compound verbs (15) - (20) by applying the theories taken here, especially, APT. Some example sentences are given in (21).

(15) V1's valency = 1, V2's valency =1
a. *kel-e-ka-* 'walk/go' b. *talli-e-ka-* 'run/go' c. *kulm-e-cwuk-* 'starve/die'

(16) V1's valency = 2, V2's valency = 1
a. *cap-e-ka-* 'catch/go b. *kkul-e-ka-* 'drag/go' c. *mul-e-ka-* 'bite/go'

(17) V1's valency = 2, V2's valency = 2
a. *cap-e-mek-* 'catch/eat' b. *kkul-e-tangki-*'drag/pull' c.*cap-e-tangki-* 'hold/pull'

(18) V1's valency = 2, V2's valency = 3
a. *sa-e-cwu-*'buy/give' b. *mantul-e-cwu-* 'make/give' c. *ssa-e-cwu-* 'wrap/give'

(19) V1's valency = 3, V2's valency = 3
a. *ponay-e-cwu-* 'send/give' b. *kenney-e-cwu-* 'hand/give'

(20) Multiple compound verbs
a.*cap-e-tangki-e-olli-* 'hold/pull/raise' b.*cip-e-tenci-e-cwu-* 'pick-up/throw/give'
c. *cap-e-kkul-e-tangki-e-olli-* 'hold/drag/pull/raise'

(21) a. John-i hakkyo-ey kel-e-ka-ess-ta. (<=15a)
Nom school to walk go Past Dec
'John walked to school.' or 'John went to school on foot.'

b. kyungchal-i ku memin-ul cap-e-ka-ess-ta. (<=16a)
police Nom the criminal Acc catch go Past Dec
'The police caught and took away the criminal.

c. saca-ka thokki-lul cap-e-mek-ess-ta (<=17a)
lion Nom rabbit Acc catch eat Past Dec
'The lion caught the rabbit and then ate it.'

d. John-i Mary-eykey chayk-ul sa-e-cwu-ess-ta. (<=18a)
Nom Dat book Acc buy give Past Dec
'John bought Mary a book. (involved the event of giving)'

e.John-i Mary-eykey chayk-ul ponay-e-cwu-ess-ta. (<=19a)
Nom Dat book Acc send give Past Dec
'John sent Mary a book.'

f. John-i kabang-ul cap-e-tangki-e-olli-ess-ta. (<=20a)
Nom bag Acc hold pull lift Past dec
'John held and pulled and lifted the bag.'

We can apply APT to Chinese resultative compound verbs. The only difference between Korean compound verbs and Chinese resultative compound verbs are the headship; Korean ones are double-headed and Chinese ones single-headed (headed by V1).[19] The headship difference results in more restricted interpretations in Korean than in Chinese because both heads are subject to HPP.

4. An Alternative - Role Matching

Some may suggest that the argument structures of compound verbs are determined just by matching of the same thematic roles (hereafter, Role Matching). That is, Agent is identified with Agent and Theme with Theme (This is suggested by P. Sells). But this is wrong.

The first problem arises in the following Korean compound verb:[20]

(22) kutul-un panci-lul selo cwu-ko-pat-ess-ta.
they Top ring Acc each other give take Past Dec
'They gave and took rings.' or They exchanged rings.'

(23) a. V1: *cwu-* 'give' <Agent$_1$<Goal$_1$<Theme$_1$>>>
b. V2: *pat-* 'take' <Agent$_2$<Source$_2$<Theme$_2$>>>
c. V3: *cwu-ko-pat-* 'give/take' <A_1=A_2<G_1=S_2<T_1=T_2>>>

As we can see in (23c), different roles, Goal and Source, are identified, violating Role Matching.

The second problem is in the difficulty of defining each role: How is Agent or Theme defined?

On the other hand, these are not problems for APT. First, APT allows that two thematic roles may belong to the same value. That is, Goal and Source in APT have the same absolute value <3>. Second, APT does not use thematic role labels so that we do not have the difficulty of defining the thematic roles.

5. Apparent Problems

One problem with APT is that an NP may have more than one value as in the example below. This problem was pointed out by S. Wechsler.

(24) John purchased a book from Bill for $5.

In (24), 'John' can be Agent (that is, purchaser), Goal (receiver of the book), and Source (of the money). This means that 'John' may have the two absolute values, <1> and <3>. To this problem, I may suggest that the most prominent theta-role is Agent, i.e., <1>. The predominant meaning of the predicate 'purchase' is in the action of purchasing rather than in receiving the book or in paying the money. The nominalization of the sentence, *purchase of a book by John/*Bill,* shows that 'John' is Agent because it can occur with the agentive *by*-phrase. So, I don't think that this is a serious problem with APT.

Another problem arises in a Korean compound verb where two different values are identified as shown below.

(25) John-i ku khal-ul ttang-ey pha-mut-ess-ta.
Nom the knife Acc ground at dig bury Past Dec
'John dug (the ground) and buried the knife in the ground.'

Each verb of the compound verb *pha-mut-* will have the argument structures as in (26), and (27) show example sentences:

(26) a. *pha-* 'dig' : <1, 4> b. *mut-* 'bury' : <1', 3', 4'>

(27) a. John-i ttang-ul pha-ess-ta.
Nom ground Acc dig Past Dec
'John dug the ground.'
b. John-i ku khal-ul ttang-ey mut-ess-ta.
Nom the knife Acc ground at bury Past Dec
'John buried the knife in the ground.'

The predicted correct argument structure of the compound verb in (25) by APT and HPP is (28).

(28) <1=1, 3', 4=4'>

But sentence (25) has a different interpretation from (28); in (25), <4> of V1 and <3'> of V2 are identified. So, APT and HPP do not make correct prediction for the compound verb in (25).

To this apparent counterexample, I suggest that we need to distinguish between synthetic compounds and root compounds, as suggested in Grimshaw (1990). The argument structure of a synthetic compound verb is predictable from its component verbs, whereas that of a root compound is not. So, I would say that the compound verb *pha-mut-* 'dig/bury' in (25) is a root compound verb. Some Korean compound verbs are lexicalized and they have some figurative meanings as in (29).

(29) a.tol-e-ka-shi-
turn go Hon 'die'
b. al -e- tut-
know listen 'understand'

In (29a), the compound verb contains even the honorific marker (inflectional morpheme) and thus this expression is used only for some honorific person. In (29b), two verbs make a new meaning. These compound verbs as well as that in (25) may belong to the class of root compounds.

The peculiar behavior of the compound verb *pha-mut-* 'dig/bury' is not found in other compounds where the verb *pha-* 'dig' is employed.

(30) a. John-i ttang-ul pha-heychi-ess-ta.
Nom ground Acc dig scatter Past Dec
'John dug/scattered the ground.'
b. John-i swupak-lul pha-mek-ess-ta.
Nom watermelon Acc dig eat Past Dec
'John dug/ate the watermelon.'

The argument structures of the compound verbs in (30a) and(30b) are predicted correctly. So, the pecularity of the compound *pha-mut-* may be accredited to the property of its being root compound.[21]

Finally, it is pointed out by H. Pan that the theories taken here are too powerful; in that sense, they are too weak. This problem arises in Chinese resultative compound verbs which are single-headed. Let's look at the Chinese example in (31).

(31) John chui - mie - le deng.
blow die-out Asp light
'John blew out the light.' (From Pan 1991)

The theories predict that the sentence (31) may have more than one interpretation, but it has only one in (31). For the sentence (31), why do we not have another interpretation, 'John blew the light and as a result John died out.' The reason is that it is not possible (or plausible) pragmatically, although the theories do not themselves disallow it.

6.Concluding Remarks

In this study, I have proposed an absolute prominence theory (APT) of argument structure. We have seen that the APT makes correct predictions in determining the argument structures of compound verbs in Korean and Chinese, whereas the relative prominence theory (RPT) makes wrong predictions. APT is also necessary to distinguish unergatives from unaccusatives. I also proposed Head Prominence Preservation (HPP) because we have seen a problem in Li (1990) who assumes that a theta-role prominence is a head feature.

This study implies that any operation on argument structure should be aware of the status of arguments, i.e., absolute values.[22]

Endnotes

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1 See Baker (1989) and Bresnan & Kanerva (1989) for somewhat different argument structures.

2 Grimshaw (1990:10) says that " The argument structure contains ... only information about the relative prominence for the arguments."

3 According to Li (1990:181), theta-roles are identified before the theta-roles are assigned. Thus, the identification is not restricted by the hierarchical theta-grid.

4 It will be pointed out shortly that this assumption is not correct.

5 There can be three versions of RPT: the Left-Right (LR) version, the Right-Left (RL) version, and the Non-directional (ND) version. The following example shows how each version measures the prominence status of each theta-role. Suppose that a verb takes a theta-grid, <1, 2, 3>.

	< 1, 2, 3 >
LR	1st 2nd 3rd
RL	3rd 2nd 1st
ND	1 > 2 > 3

LR and RL measure the relative position of each theta-role from the left end and from the right, respectively. ND just indicates the relative prominence relation of

theta-roles. In fact, Li (1990) does not explain why he takes LR, not the other versions.

6 According to Li (1990: 182), the reason that V1 is the head of the compound is that V1 is a verb and V2 is 'adjective-like', but the whole compound is 'verb-like.' So, Li assumes that V1 is the head of the compound. I will follow Li's assumption for the Chinese compound verbs here, although clear evidence is required for the assumption.

7 Here Theta-role Prominency and Head-feature Percolation bring about the same result; they both rule in (4a), (4b), and (4e), but rule out (4c) and (4d). But they have different functions in the following case. Suppose that V1 has <1> and V2 <x, y>, and V1 is the head. For the theta-grid <x, 1=y> of V3, Theta-role Prominency rules it in, but Head-feature Percolation rules it out because the theta-role prominency of the head V1 is not maintained; <1> is the most prominent theta-role (by the Left-Right version of RPT) but it is not the most prominent in V3.

8 Li follows the assumption that BA can assign Case to its complement.

9 This question was raised by P. Sells and C.L. Baker.

10 This is suggested by C. L. Baker.

11 I thank C. L. Baker for his help to clearly express the constraint, HPP.

12 Head Prominence Preservation plays the same function as that of Head-feature Percolation in Li (1990).

13 Grimshaw (1990:39) suggests that we need some measure of absolute prominence.

14 For the distinction between these two types of experiencer verbs, see Kim (1990) and Hong (1991). Many tests are given there to tell one from the other. For example, the agentive experiencer verbs may take imperative forms as follows:

Agentive Experiencer verb: Mary-lul coh-e-ha-ela.
Acc like Imperative
Lit. (as an imperative) 'Like Mary.'

Non-agentive Experiencer verb: *Mary-lul coh-ela.
Acc like Imperative
* 'Like Mary.'

15 Here the compound verbs in Korean are limited to the type, V1+*e*+V2, where *-e-* is an affix which itself does not have any semantic content, and it does not change the categorial status. Note also that V2 in the compound verb is not a clausal-taking verb. Korean has the latter type verb like *mek-e-po-* 'attempt to eat,' where V2 takes a clausal complement. For the argument structure of this type of complex verb, see Sells (1991).

16 The prime notation indicates the arguments of a different predicate. But it still shows the absolute values; That is, the arguments <1> and <1'> have the same absolute value.

17 The same type of compound verbs are *olli-e-chi-* 'raise/hit' and *chi-e-olli-* 'hit/raise,' and *mil-e-chi-* 'push/hit' and *chi-e-mil-* 'hit/push.'

18 As mentioned earlier, HPP plays the same function as that of Head-feature Percolation in Li (1990).

19 Chinese also has double-headed compound verbs as follows:

jian-zhu 'build/construct,' *jian-cha* 'examine/check'
lai-wang 'come/go' *jian-nan* 'hard/difficult' (From Li 1990:190)

This type of compound verb has only one interpretation, as the theories predict.

20 This compound is different from the compounds dealt with so far in their affixes: the first one takes the affix *-e-* and the second *-ko-* (not a conjunctive form). Both share the same property, according to which an adverb cannot be inserted between the two verbs. But the *-ko-* type compounds are much more limited than the *-e-* type one: in fact, there are less than ten compound verbs of the *-ko-* type, as far as I know. I think that this type of compounds can be dealt with without any problems within the system that we propose here.
21 The pecularity of the compound verb *pha-mut-* is also noted in Kang (1991).
22 The absolute values of arguments may be reflected in the syntax. Note that argument structure is projected to D-structure (See Grimshaw 1990). M. Baker (1989) shows that two verbs in the serial verb construction should share a D-structure object, that is, a Theme. This object sharing property of serial verb constructions follows from APT.

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TWO METATEXTUAL OPERATORS: NEGATION AND CONDITIONALITY IN ENGLISH AND POLISH

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In his recent work on negation Horn (1985, 1989) argues that logical operators can be seen as pragmatically (not semantically) ambiguous between a descriptive and metalinguistic use. In the unmarked descriptive use, which is found in all standard cases of sentential negation, *not* operates on propositions and focuses on their truth or falsity. In the metalinguistic use, which is a marked extension of the descriptive one, the focus is on the assertability of the utterance. In Horn's definition, metalinguistic negation expresses the speaker's "unwillingness to assert, or accept another's assertion of, a given proposition in a given way"; it is "a device for objecting to a previous utterance on any grounds whatever, including conventional or conversational implicata it potentially induces, its morphology, its style or register, or its phonetic realization" (Horn 1989:363). In what follows I will argue that Horn's pragmatic interpretations are better described as metatextual, rather than specifically metalinguistic; Polish data particularly support this viewpoint. Metatextual uses of another operator - conditionality - will also be displayed, together with examples where metalinguistic uses of negation and conditionality co-occur in the same utterance.

I. Metatextual negation in Polish

The most interesting cases among Horn's examples are those where *not* is used in its sentential negation position, and yet is interpreted metalinguistically. Many, though not all such examples have parallel Polish translations. An equivalent translation can, for instance, be provided for the sentences in which pronunciation, morphology, or appropriateness of a given constituent are commented upon (all English examples are taken from Horn 1989):

(1a) He didn't call the [pólis], he called the [polís].

(1b) Nie wezwał pol[i]cji, tylko pol[i:]cję.

(2a) I didn't manage to trap two mongeese - I managed to trap two mongooses.

(2b) Nie złapałem dwu głuszeców, tylko dwa głuszce.

(3a) Grandma isn't feeling lousy, Johnny, she's just a tad indisposed.

(3b) Babcia nie korkuje, Jasiu, tylko troszkę źle się czuje.

Example (1b) contrasts the substandard pronunciation of *policja* with the correct one, while (2b) rejects morphologically deviant forms *głuszece*(ACC), *głuszeców*(GEN), in favour of *głuszce*(ACC), *głuszców*(GEN). In (3b), the item objected to is the slang verb *korkować*.

Like the English (a) versions, all of the (b) Polish examples have the form of full negative sentences. This is marked in three ways:

— the negative particle *nie* precedes the verb,

— pronominal subjects could occur in (1) and (2) only in the position before *nie* (*On nie wezwał..., Ja nie złapałem...*),

— the direct objects of (1) and (2) are marked with the genitive case, which is obligatory for negative sentences in Polish. In affirmative sentences direct objects are in the accusative case. Thus, the noun phrases *policja* and *dwa głuszce* appear in the genitive form in the first clauses of (b) sentences, and in the accusative form in their second clauses.

Not all of the (b) forms are as unmarked as the English versions. In the case of (3), the Polish translation offered in (3b) would probably be the standard way of objecting to the term previously used by Johnny. In (1) and (2), on the other hand, alternatives such as (c) and (d) would be used more readily than (b):

(1c) Wezwał nie pol[i]cję, a pol[i:]cję.

(1d) Nie "wezwał pol[i]cję", tylko "wezwał pol[i:]cję".

(2c) Złapałem nie dwa głuszece, a dwa głuszce.

(2d) Nie "złapałeś dwa głuszece", tylko "złapałeś dwa głuszce".

Unlike the (b) sentences above, (1c) and (2c) do not contain sentential negation. In the (c) sentences, any pronominal subject would have to occur directly before the verb - *On wezwał..., Ja złapałem....* Further, they differ from sentential negation in that *nie* does not precede the verb and the case of direct objects is accusative. In these examples, then, the metalinguistic negation takes the form of constituent or focus negation, with the negative particle *nie* preceding the phrase being objected to. Such constructions in English (e.g. *He called not the [pólis], but the [polís]*) are apparently less common: English normally uses sentential-level negation marking for metalinguistic uses of negation.

The (d) examples contain direct quotations from the utterances just heard, which is marked in pronunciation by a pause between *nie* and the material quoted. The particle *nie* directly precedes the quote and the expression under scrutiny is marked by a fall-rise intonation, within the quotation. Furthermore, the deleted subjects can be recovered only within the quotes: *Nie "on wezwał...", Nie "ty złapałeś...".* Most crucially of all, the objects in these examples are accusative, not genitive.

In spite of the fact that in Polish constituent negation prevails as an expression of metalinguistic objection to the form of an expression, sentential-level metalinguistic negation in such cases is acceptable both in English and in Polish. Copula sentences constitute another group of examples where sentential negation can be interpreted metalinguistically in both languages, apparently regardless of the nature of the objection:

(4a) Ben Ward is not a black Police Commissioner but a Police Commissioner who is black (quoted after Horn 1989).

(4b) Ben Ward nie jest czarnym komisarzem policji, lecz komisarzem policji, który jest czarny.

Again, the negation in (4b) is sentential negation: the particle *nie* precedes the verb (as in the (b) sentences of (1) through (3) above). The sentence can, however, be rephrased as constituent negation, with *nie* preceding the predicate noun phrase.

Sententially positioned negation in (4b) can be interpreted metalinguistically, because, first, the predicate phrase is rhematic in standard intonation contour and is thus in focus without further marking, and, secondly, negating the copula does not trigger special case marking in the predicate phrase, as is the case in SVO sentences. Consequently, there is no formal difference between descriptive and metalinguistic use.

Sentences like (4a) are used to reject their predicate NP's as appropriate descriptions of their referents. Similar constructions can be used to object to appropriateness of forms of address - Horn's example *She is not Lizzy, if you please - she's Her Imperial Majesty* seems to be ambiguous between these two functions. In Polish the two uses would be marked by case. Ordinary predicate noun phrases of copula sentences in Polish are marked with the instrumental case, in affirmative and negative variants alike. In the "form of address" metalinguistic instances, however, the case is nominative in both clauses, as in: *Nie jestem Ela, tylko pani Kowalska (I'm not Lizzy(NOM) - I'm Mrs. Kowalska(NOM))*.

Presumably, then, it is possible to interpret Polish *nie* metalinguistically in its sentential negation position, largely due to the overall echo-repair format of the construction in which it appears.

However, in some sentences in Polish the format of the construction alone does not ensure acceptability. For instance, a metalinguistic reading will not be possible for a sentence in which negation focuses on the content verb in an SVO structure:

(5a) Chris didn't **manage** to solve the problem - he solved it easily.

(5b) *Krzysztof nie **zdołał** rozwiązać problemu(GEN) - rozwiązał go(ACC) z łatwością.

Sentence (5b) is a contradiction - it first asserts that Chris didn't solve the problem, and then that he did. Similarly in a scalar example:

(6a) Around here, we don't **like** coffee, we **love** it (from Horn 1989).

(6b) *My tu nie **lubimy** kawy(GEN), my ją(ACC) **kochamy**.

Examples (5b) and (6b) are unacceptable as wholes, because the echo-repair format and the fall-rise focus on the verb do not suffice to prevent the reading of negation in the first conjuncts as descriptive. The standard preverbal position of the negative particle and the genitive case marking on the object override the intonational contour. Let us recall that in the Polish equivalents of (1) and (2) above, which are very similar syntactically to (5b/6b), the rejected expressions

could be identified as inappropriate without any reference to their meaning: the objection was directed exclusively at the form of the utterance - pronunciation, morphological form, or style. In (5) and (6), on the other hand, which, according to Horn, object to conventional and conversational implicatures respectively, the expressions in question are rejected with respect to their contribution to interpretation, not form.

Interestingly enough, at least (6b), though not (5b), can be saved if we formally mark the echoic character of the first clause by changing the case of the object from the genitive, characteristic of negation, to the accusative, which must have been used in the previous utterance referred to. The change to an accusative object makes it clear that (6c) is a negative comment on positive content, rather than an expression of a negative proposition:

(5c) *Krzysztof nie **zdołał** rozwiązać problem(ACC) - rozwiązał go(ACC) z łatwością.

(6c) My tu nie **lubimy** kawę(ACC), my ją(ACC) **kochamy**.

The only plausible explanation of the difference in acceptability of (5c) and (6c) is that the former has fewer surface signals of the metalinguistic reading intended, because it does not offer repair of the phrase objected to - instead, it explains the reason for the rejection. The repair - *Chris solved the problem* - is implicit in a sentence like (5), but it is not given explicitly, as in (6). In fact, if an explicit repair is offered instead of an explanation, (5c) becomes acceptable:

(5d) Krzysztof nie **zdołał** rozwiązać problem(ACC) - po prostu go(ACC) rozwiązał (Chris didn't **manage** to solve the problem - he simply solved it).

Further, with an explicit repair a constituent negation variant is also acceptable, such as *Nie "zdołał rozwiązać", a "rozwiązał" (? Not "managed to solve", but "solved")*. With an explanation instead of a repair, however, the only acceptable translation of (5a) is with the phrase *To nieprawda, że...* (*It's not true that...*), as in (5e):

(5e) To nieprawda, że Krzysztof **zdołał** rozwiązać problem(ACC) - rozwiązał go(ACC) z łatwością.

This might be taken to suggest that in the case of an objection to conventional implicature the difference between the descriptive and metalinguistic reading is blurred. Horn rejects the phrase *It's not true that* as a proof of descriptive use, for, as he claims, it can also be ambiguous between a descriptive and metalinguistic reading. Nevertheless, clearly *It's not true that* is not an acceptable paraphrase of all examples of metalinguistic negation. For instance, it is rather unlikely that the phrase would be used to reject the pronunciation or morphological form of an expression, as in *?? It's not true that I caught two mongeese - I caught two mongooses*. Apparently, then, *It's not true that*, even if not unambiguously descriptive, is much more likely to be used as a comment on meaning-related phenomena than on pure form.

The examples above seem to point to some kind of difference between metalinguistic comments on form and those objecting to aspects of interpretation. These differences, however, disappear in the constituent negation format. A possible explanation is that a metalinguistic comment has to first of all make it clear which part of the previous utterance is being objected to. If the expression echoed is inappropriate in form (pronunciation, morphology, style) or rhematic (as in the case of copula sentences), it is easily identifiable. In the case of comments on aspects of interpretation, such as implicature, sentential negation fails to be understood metalinguistically because nothing singles out a particular implicature as the subject of the comment. Constituent negation format, which puts the expression in question directly in the scope of *nie*, helps to single out the part of the sentence responsible for the relevant implicature.

Thus, the asterisked examples above are found unacceptable for just one reason - that it is not clear whether *nie* negates the whole sentence or only part of it. This seems to suggest that metalinguistic negation is first of all an objection to a localizable part of the text of the previous utterance; what the speaker of a metalinguistically negative sentence has to achieve first is to make clear which fragment of the utterance she[1] objects to. And, as we have seen, all of the formal devices used in the examples above (echo-repair format, intonation, change of case, constituent negation) are meant to highlight the part of the utterance being questioned and have nothing to do with the nature of the objection raised. It thus seems that the uses of negation exemplified above can more appropriately be described as **metatextual**, rather than as specifically metalinguistic comments on linguistic form.

As for the specific reason why the fragment is considered inappropriate, it is clearly marked only in the cases pertaining to form (pronunciation, morphology, style), while in other instances the aspect of the interpretation being rejected can only be understood in contrast with the interpretation offered in the repair.

The revision of Horn's terminology suggested above admits various understandings of what the "text" is. In the majority of cases, exemplified above, the fragment in question is a word or a phrase. But it is also possible to make a metatextual comment on the whole utterance, if the aspect of the utterance which is questioned can only be derived on the basis of its text as a whole. A good example is quoted by Horn (1989) after Wilson (1975:152):

(7) I'm not his daughter - he's my father.

The echo and the repair are semantically synonymous in this case and there are no formal signals of focus on any of the expressions. The only aspect that can be calculated as being objected to is an overall framing of the clause's content.

In Polish, which uses double negation, it is also possible to express an objection to two fragments of the text. One token of negation in such instances is the particle *nie*, which then appears in the sentential negation position and focuses on the verb, the other is *żaden (no)*, which can only precede nominals. Such a use of double negation, sometimes possible also in English, will predominantly express

an objection to formal aspects of the previous utterance - pronunciation, morphology, and style, as in:

(8) Nie walnąłeś się do żadnego wyra, tylko poszedłeś do łóżka (You did not hit no sack, you went to bed).

The same construction with *nie* preceding the verb and *żadnego* preceding the noun phrase can also be used to unambiguously mark the focus of metatextual negation if it does not fall within the immediate scope of *nie*. We can thus have a sentence similar to (8) with only the noun *wyro* being objected to:

(9) Nie poszedłeś do żadnego wyra(GEN), tylko do łóżka.

With this additional marking the case of the object remains genitive without causing confusion, for the text in question is identified unambiguously.

We have thus seen that the negative particle *nie* has a metatextual use in Polish, similar, with surface differences, to what Horn defines as metalinguistic negation. Polish examples also test positively for Horn's three diagnostics for metalinguistic negation. The first diagnostic concerns the inability of metalinguistic negation to incorporate prefixally. Horn's English example (10) has an equivalent in Polish:

(10) The queen of England is {not happy/*unhappy} - she's ecstatic.

(10a) Królowa {nie jest szczęśliwa/*jest nieszczęśliwa} - jest w ekstazie.

Horn also notes that metalinguistic negation does not trigger negative polarity items. Thus in *Chris didn't manage to solve some of the problems - he managed to solve all of them* there is no possibility of using *any* instead of *some*. Similar restrictions seem to hold for analogous expressions (*niektóre/żadne*) in Polish.

The third diagnostic has cross-linguistic validity and concerns the use of a conjunction like *but* in the repair part following a statement containing metalinguistic negation. Languages like German, Swedish, Spanish, and Finnish use two conjunctions in the contexts in which *but* is used in English, and, as Horn argues, only one of them appears in the context of metalinguistic objection to previous utterance. Thus, one type of *but* is used in a concessive sense, and then the first conjunct does not have to be negative, but obligatorily relates to a point having a higher position on an implied pragmatic scale than what the second conjunct relates to. If the first conjunct is negative, the negation is interpreted descriptively. Also, the syntactic form of the second conjunct cannot be reduced:

(11) Max doesn't have three children, but he has/does have two.

The second *but*, expressing contrastive rather than concessive meaning, appears in different contexts. The preceding clause is necessarily negative, and the negation is interpreted metalinguistically. The syntax of the second conjunct is reduced, as in (12):

(12) Max doesn't have three children, but four.

In Polish, a similar opposition is marked and similar restrictions hold for the two constructions. Also, as in German and Spanish, two different conjunctions

are required. Thus, the equivalent of *but* in (11a) is *ale*, while in (12a), which requires intonation focus on *trojga*, conjunction *a* has to be used.

(11a) Max nie ma trojga dzieci(GEN), ale ma dwoje.

(12a) Max nie ma trojga dzieci(GEN), a czworo.

Presumably, two constructions with *but* are distinguished similarly in English and in Polish. However, formal differences disappear in a constituent negation format, which is acceptable for both cases:

(11b) Max ma nie troje dzieci(ACC), a dwoje (Max has not three children, but two).

(12b) Max ma nie troje dzieci(ACC), a czworo (Max has not three children, but four).

This can be seen as due to the form of the construction, for as Horn notes himself, post-auxiliary constituent negation can only be taken metalinguistically. However, the observation does not seem to answer all the relevant questions. If (11b) is a metatextual comment, then what aspect of the utterance does it object to? Whichever form it takes, a sentence like (11) goes down the implied scale, not up, as was claimed characteristic for descriptive uses of *but*. Regardless of the form, the sentence claims that it is not the case that Max has three children, and such a reading is not metalinguistic in the sense proposed by Horn. Apparently, then, a metatextual objection can be made also with respect to an aspect of propositional content.

There is still an important difference between (11a) and (11b), marked, among others, by case and the position of *nie*, in that the former is concerned with falsity, the latter with unassertability. In (11b) part of the propositional content is rejected, but the repair offered assumes some common ground with the previous utterance. The same holds for (12b). Both interlocutors in the speech exchanges concluded with (11b) and (12b) believe that Max has children, but they seem to disagree on how many he has, and the direction of the scale in which the correction is to be made does not seem to matter in a constituent negation format in Polish.

There seem to be more examples of metalinguistic/metatextual comments objecting to aspects of propositional content. Horn classifies these as metalinguistic on the grounds of their form:

(13a) John was born, not in Boston, but in Philadelphia.

(13b) John wasn't born in Boston, but in Philadelphia.

(13c) John wasn't born in Boston, he was born in Philadelphia.

All of these have exact equivalents in Polish. In all versions it is clear from the sentences that it is not true that John was born in Boston. The repair, on the other hand, states that he was born in Philadelphia. These are, surely, statements concerning propositional content, and not implicature, form, or style. What makes them metatextual, then?

First, they are objections to the previous utterance directed at one of its aspects. Also, they have the form of a metatextual construction, that is, they contain the echo part and the repair part, whether in sentential or constituent format. But they do not comment on the language used in one of its pragmatic or formal aspects, they reject a part of the text of the previous utterance on the basis of its contribution to the propositional content. Like our previous examples, they focus on a part of the text of the previous utterance.

What all the examples considered above share is the attempt to reject only a **part** or **aspect** of the previous utterance which the speaker finds unassertable. In the examples concerned with form only, the speaker agrees with the whole of the content, but rejects part of the wording. In those directed at implicatures, the essential part of the message remains untouched (e.g. he did solve the problem, we are indeed fond of coffee, etc.). In the case like (13), there is also a part of the message which is accepted, perhaps something like: "John was indeed born in an East Coast city with historic tradition, but the city was not Boston - it was Philadelphia". The cases described by Horn, which comment on the choice of expression, can be referred to as metalinguistic, but they seem to be a part of a larger class of utterances, which I proposed above to call **metatextual**.

The view that seems to emerge from the above considerations is that we are dealing with something more than an ambiguity of negation, even if it is a pragmatic ambiguity. The ambiguity arises in a specialized construction, whose pragmatic function is to find the most effective expression of the thought one of the interlocutors - let us continue envisaging him as the hearer - purports to communicate. The context for using such a construction is the situation where the hearer communicated an assumption in the way he considered to ensure its appropriate understanding by the speaker. The utterance produced is thus meant to communicate a thought and the form is believed to give the thought the best expression.

The other interlocutor - the speaker - receives the utterance and assumes she understood the message - the thought. But she believes that the utterance does not give an optimal expression to the thought. She thus offers an improvement on the formulation of what she assumes to be the intended message. The speaker does not reject the whole of the utterance, but one of its aspects, and the comment offered has to make it clear which aspect it is. It does so by echoing and revising the fragment of the text the speaker rejects. With the objections to formal aspects of the utterance, such as pronunciation, morphological form or style, the corrective effect is ensured by the very juxtaposition of the form rejected and the form meant to substitute for it. Hence, as we saw above, such cases require only minimal marking of the echo and the repair parts of the construction.

In the cases in which some part of the meaning is under scrutiny, more surface signals may be required for the hearer to understand the objection (as we saw in the examples from Polish, the range of available means of focusing on the right part of the text may be quite broad). In some cases, as in (13) above, the rejected part of the text may be objected to with respect to its content. However, this does

not mean that the utterance is rejected as false, but that it is not a fully adequate expression of the hearer's thought. In the example like (13) the speaker does not concentrate on the falsity of the statement about John being born in Boston, but on getting right the purported message about John's place of birth. The sentence is still concerned with unassertability, not falsehood, as in Horn's definition, but we can say that the speaker considers the previous utterance unassertable with respect to an aspect of propositional content. The fact that in semantic terms the unassertability renders the sentence false does not concern the speaker of a metatextual utterance, because her point is to get the message right, whether with respect to form or intended interpretation. She does not even have to assume that the hearer holds a false belief in such a case, she may treat the inaccuracy as a lapse of memory or even a slip of the tongue.

In the examples related to interpretation, not form, we are thus dealing with a cline of comments on meaning, ranging from conversational implicature, through conventional implicature, to propositional content. None of these can really be qualified as a comment on the choice of language, that is a metalinguistic comment, because what the repair concerns first of all is **what** the hearer has said (or implicated), and not **how** he has said it. Regardless of whether the aspect of meaning in question is described as pragmatic or semantic, it remains an aspect of the overall interpretation, and may thus be evaluated as being more or less adequate as a description of the state of affairs in question.

II. Metatextual conditionals

Horn (1985, 1989) notes that pragmatic ambiguity between descriptive and metalinguistic uses is characteristic not only of negation, but also of other operators, such as disjunction and conditionality, and of some constructions, such as questions.

Horn's chief examples of metalinguistic conditionals, such as (14) and (15), are constructions he calls "Austin conditionals", after Austin's (1961) famous sentence *If you are hungry, there are biscuits on the sideboard.* Such conditionals, as Horn claims, are metalinguistic in that they are concerned with specifying conditions for the appropriateness of asserting the antecedent, and not for its truth.

(14) If you haven't already heard, Punxsutawny Phil saw his shadow this morning.

(15) If I may say so, you're looking particularly lovely tonight.

In some works on conditionals, however, (Van der Auwera 1986, Sweetser 1990), such examples are described as **speech act conditionals**, and their antecedents are thus seen as conditions on the appropriateness of a speech act purportedly performed in the consequents. In the Austin example above, then, the *if*-clause does not qualify the appropriateness of **asserting** that there are biscuits on the sideboard, but gives a justification for **offering** biscuits to the hearer. Similarly, the antecedents of (14) and (15) justify acts of informing and

complimenting, respectively.

It can further be noted that Horn's sentences in fact show little similarity to his examples of metalinguistic negation. They are not contextualized in the same way, as they do not refer to the previous utterance, and they do not contain parts identifiable as "echo" and "repair", or as "echo" and "explanation". Even more importantly, they do not seem to distinguish among individual aspects of the utterance, such as pronunciation, morphological form, style, implicature, etc.

On the other hand, examples displaying exactly these features can be found:

(16a) He trapped two mongeese, if that's how you make a plural of "mongoose".

(16b) He trapped two mongeese, if "mongeese" is the right form.

(17a) Grandma is feeling lousy, if I may put it that way.

(17b) Grandma is feeling lousy, if that's an appropriate expression.

(18a) Chris managed to solve the problem, if solving it was in any way difficult for him.

(18b) Chris managed to solve the problem, if "manage" is the right word.

(19) The Queen of England is happy, if not ecstatic.

(20) John was born in Philadelphia, if that's where they keep the Liberty Bell.

Sentences (16)-(20) have much in common with examples of metatextual negation considered in the previous section. The utterance in the "antecedent"[2] presents a given thought in a given way. The speaker, however, is not sure if she chose the right expression to render an aspect of the utterance - whether pertaining to form or interpretation. To mark the lack of certainty, she appends to the utterance an *if*-clause expressing her doubt about a part of the text. The *if*-clause may highlight the fragment in question by echoing it (as in (16b) and (18b)), or refering to it anaphorically (note the use of *that* in (17b)). It may also offer a repair, as in (19), or explain the reasons why the speaker is not sure about the expression being an appropriate one - this is the case in (16a)-(18a) and in (20). The comments offered can concern any aspect of the utterance - its form (see (16)), its style (as in (17), its implicata ((18) and (19)), or an aspect of its propositional content (as in (20)).

The similarities between metatextual conditionals like (16)-(20) and metatextual negative constructions are striking: the comments in both cases are comments on assertability, they object to a part of the previous utterance, and they pertain to the same range of phenomena. The difference lies mainly in the fact that in metatextual conditionals the speaker comments on her own utterance, and the comment follows the utterance in the same construction. In cases of metatextual negation the speaker usually objects to an interlocutor's utterance (although, as Horn shows, it is possible for the speaker to create a special rhetorical affect by rejecting what she has just communicated), and the metatextual utterance is formally independent of the one it comments upon. Also, the objection expressed in

a metatextual conditional is understood as doubt, or uncertainty, not as outright rejection of the previous utterance as unassertable. This seems to follow from two factors: first, the use of *if* dictates a weaker interpretation of the objection than in the case of *not*, and, secondly, if the speaker were sure that the utterance is not assertable in a given way, she would initially choose a different means of expression.

To account for these data, we need to postulate a class of metatextual conditionals, which is independent of speech act conditionals (such as Austin's famous example) and bears a striking resemblance to Horn's cases of metatextual negation.

Speech act conditionals and metatextual conditionals are still similar in many respects. First of all, both types express conditions on appropriateness, and thus do not involve any real-world dependence between their antecedents and consequents. Neither of the classes admits the use of conditional verb forms, i.e., speech act or metatextual interpretation is excluded from subjunctive and counterfactual conditionals. Also, *then* is not used to introduce the "consequents" in either class.

The similarities are not incidental. Both speech act and metatextual clauses are comments on utterances presented in their "consequents", and are thus markedly different from standard conditionals, which express a content relation between the clauses (in the sense introduced by Sweetser 1990). Their parenthetical role can be seen also in the fact that they can be used as comments on content conditionals, as in (21) and (22), presenting a metatextual and speech act condition respectively:

(21) I would go with pleasure if I didn't feel so lousy, if that's an appropriate expression.

(22) If I know my daughter, she'll go mad if you tell her.

It seems possible, then, to refer to speech-act and metatextual examples jointly as **conversational** conditionals.

But there are significant differences between the classes, too. We can note, for instance, that speech act conditionals are often specific to a given force or sentence type, and may explicitly refer to its preconditions. Thus, *if*-clauses such as *if I haven't already asked..., if it's not rude to ask...* can only function with questions as "consequents", while *if I may say so* typically accompanies a declarative. There are no such restrictions in the case of metatextual comments, since they focus on a fragment of the text regardless of the utterance's force or sentence type. Another argument for treating the two classes independently is that an utterance can be qualified by **both** types of comments simultaneously. In (23), for instance, the initial *if*-clause justifies the appropriateness of asking a question, while the final one focuses on the phrase *my husband*.

(23) If I haven't already asked, when did you last see my husband, if I can still call him that.

Let us also note that it is rather unlikely that the same speech act would be hedged twice, by means of two independent *if*-clauses, while two metatextual comments on two formal aspects of an utterance would be acceptable.

Speech act and metatextual conditionals also differ with respect to their preferred clause order. The former are most often used with their *if*-clause in the sentence-initial position, but a reversed clause order is equally acceptable (as in a paraphrase of (14) above: *Punxsutawny Phil saw his shadow this morning, if you haven't already heard*). The metatextual ones, on the other hand, are almost exclusively sentence-final, apparently due to the fact that a metatextual comment must echo the text in question or refer to it anaphorically, and thus has to follow it. Further, as in the case of negative metatextual constructions, it has to be clear which part of the text is being focused upon. The sentence-final position of a metatextual "antecedent" ensures the text-metatext proximity only if the "text" appears in the predicate phrase, or otherwise in the rheme of the preceding "consequent". If it is a sentence-initial part, the link may be lost, as in (24):

(24) *My husband hates onion soup, if I can still call him that.

In such cases, due to the required transparency of the text-metatext relation, the speaker has the unique possibility of putting an *if*-clause **inside** the "consequent", as in *My husband, if I can still call him that, hates onion soup.*

Metatextual conditional sentences have been shown to be strikingly parallel to the negative constructions discussed by Horn. Also, the two types of metatextual operators seem to co-occur in some contexts. In a sentence like *The Queen of England is happy, if not ecstatic* (example (19) above) we are dealing with a conditional metatextual comment on the scalar implicature triggered by *happy*. The *if*-clause is obligatorily negative and can be interpreted as suggesting that *ecstatic* is perhaps a better term than *happy*. Under this interpretation the negation, interestingly enough, is also interpreted metatextually, for the speaker is not saying that the Queen is not ecstatic.

The difference between a negative metatextual utterance like (10) (*The Queen of England is not happy, she is ecstatic*) and the conditional one like (19) is that in the former negation focuses on the term related to a lower position on the scale (*happy*), and in the latter on the one having a higher position (*ecstatic*). In the metatextual conditional the weaker term has actually been used, and is questioned, rather than rejected, while the stronger term (e.g., *ecstatic*) is only considered as an alternative. A possible gloss to clarify the actual scope of negation here is: "It is appropriate to use the word 'happy' to describe the Queen's emotional state, if it is not more appropriate to use the word 'ecstatic'". The affinity between the scalar uses of metatextual and negative constructions can also be seen in the fact that the conditional examples involving scalar implicature are the only ones involving a potential repair.

Scalar metatextual conditionals are also interesting in that they are elliptical in form:

(25) He spoke ungraciously, if not rudely.

(26) She ate many of the cakes, if not all.

With respect to this many analyses (Kjellmer 1975, König 1986, Haiman 1986) treat examples like (19), (25) and (26) on a par with sentences like (27), and qualify them jointly as concessive:

(27) The salary was good, if not up to her expectations.

Sentence (27) has a straightforward concessive interpretation, and its negation is understood descriptively, as we can see in the paraphrase: *The salary was good, even if it was not up to her expectations.* As for (19), (25) and (26), they have two interpretations. One is indeed parallel to that of (27), and can be paraphrased in the same way: *He spoke ungraciously, even if he didn't speak rudely.* The second, metatextual interpretation is best rendered quite differently, with a different expression in the scope of *even*, and no negation: *He spoke ungraciously, perhaps even rudely.* Presumably, then, the scalar conditional/negative metatextual constructions should be seen as independent of the concessive elliptical constructions as exemplified in (27), even though they are formally similar. Elliptical *if*-clauses can be ambiguous between the two uses, and the choice of one interpretation or the other crucially relies on the metatextual or descriptive interpretation of negation.

As a final point, we should consider a group of conditional constructions which are metatextual in character, but do not involve echoic use and are not concerned with explanation or repair. Instead, a linguistic expression used in one of the clauses functions itself as a justification for a parallel or contrasting expression used in the other clause. The first examples of such use were noted by Ducrot (1972) (and quoted by Horn 1985, 1989):

(28) If the Cité is the heart of Paris, the Latin quarter is its soul.

Ducrot sees the *if*-clauses of such examples as offering justification for the metaphor used in the "consequent". It can perhaps be added that both clauses of (28) are metaphorical, and justify each other against a background of a broader metaphor in which Paris is envisaged as a human being. The reciprocity of the justification can be seen in the possibility of reversing the order of the clauses: *If the Latin Quarter is the soul of Paris, the Cité is its heart.* Such sentences can thus be called symmetric metatextual conditionals.

The symmetric metatextual sentences can also express contrast, as in *If Velazquez soothes, Goya terrifies.* The clauses can again be reversed without affecting the stylistic effect. They cannot be reversed, though, if the rhetorical device used is intensification, not symmetry or contrast: *If Mary is just pleasantly pretty, her sister is a real beauty.*

As I suggested in the earlier version of this paper (Dancygier 1986), a metatextual analysis in terms of intensification can be postulated for a sentence first discussed by Jespersen (1940), then commented upon by Haiman (1978) and Sweetser (1990):

(29) If I was a bad carpenter, I was a worse tailor.

The example seems to be best interpreted as "If **bad** is the right expression to describe my carpentry, **worse** has to be used to describe my tailoring".

III. Conclusion

In the analysis above two main points have been made. Firstly, it was argued that Horn's idea of metalinguistic use is better captured in terms of a comment on a part of the text of the previous utterance, objecting to it in any of its aspects, including its contribution to propositional content. In the second part, it was shown how metatextual use is realized with respect to another operator - conditionality, and how two metatextual operators can function in one sentence, complementing each other. The data presented suggest that it does not suffice to treat metatextual use solely in terms of pragmatic ambiguity of operators, but that we also have to be concerned with a variety of formal devices languages may employ to mark this use as distinct from the descriptive one. In the data analyzed above we saw devices such as intonation, double negation, or case, and also some specialized constructions. For instance, the echo-repair format prevails in the cases of sentential-level negation, constituent negation is the basic expression of metatextual negation in Polish; also, metatextual *if*-clauses appear sentence-finally, and are syntactically reduced if they also contain metatextual negation. Finally, metatextual comments, which qualify the assertability of an utterance, can focus on its **content**, not only **form**. Interestingly, they do so without implying that the utterance objected to is false.

I hope to have shown, then, that surface exponents of metatextual use may vary across languages, and that the pragmatics of metatextual interpretations is more complex than has originally been suggested by Horn.

FOOTNOTES

[1] I will follow the convention whereby the speaker is referred to as *she*, while the hearer as *he*.

[2] The quotes signal that the terms *antecedent* and *consequent* can be used solely with respect to formal features of a conditional construction.

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Semantic Relations vs. Abstract Syntactic Relations: Evidence from Halkomelem

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1. THE THEORETICAL ISSUE

Relationally oriented theories of grammar make available essentially two approaches to paraphrases such as those in (1).

(1) a. Fred handed the towel to Wilma
b. Fred handed Wilma the towel

According to the REVALUATION approach, which characterizes RELATIONAL GRAMMAR (RG) (Perlmutter 1980, Perlmutter and Postal 1983), both sentences show the same grammatical relations at an initial level of structure. *Fred* is subject (or 1), *Wilma* indirect object (or 3), and *the towel* direct object (or 2). In (1b), however, *Wilma* and *the towel* bear different relations at the final level of structure. The initial 3 is said to advance to 2, causing the initial 2 to revalue to chomeur, as shown in Figure 1.

(1a)	**Fred**	**Wilma**	**the towel**	
Syntactic Relations:	|	|	|	
Initial & Final:	1	3	2	
(1b)	**Fred**	**Wilma**	**the towel**	
Syntactic Relations:	|	|	|	
Initial:	1	3	2	
Final:	1	2	Cho	⇐ *Revaluation*

REVALUATION (Classical Relational Grammar)

Figure 1

Theories that do not make use of revaluations and multistratal representations characterize the relationship between sentences like (1a) and (1b), in one way or another, as involving an ALTERNATIVE LINKING of the semantic arguments of a predicate with grammatical relations, as schematized in Figure 2.

Semantic Relations:	Agent	Recipient	Theme	
(1a)	**Fred**	**Wilma**	**the towel**	
Syntactic Relations:	1	Obl	2	⇐ *Default Linking*
Semantic Relations:	Agent	Recipient	Theme	
(1b)	**Fred**	**Wilma**	**the towel**	
Syntactic Relations:	1	2	Obl	⇐ *Alternative Linking*

ALTERNATIVE LINKING ("Monostratal" Relational Theories)

Figure 2

Which of these two devices is made available in a theory has important consequences for the question of what kinds of relations will play a role in accounting

for grammatical phenomena. Consider, for example, the phenomenon illustrated in (2).

(2) a. Fred handed **the towel** to Wilma *soaking wet*
b. Fred handed Wilma **the towel** *soaking wet*
c. * Fred handed the towel to **Wilma** *soaking wet*
d. * Fred handed **Wilma** the towel *soaking wet*

A predicate adjective can be construed with *the towel* in both versions of the dative shift construction; but can be construed with *Wilma* in neither. If an alternative linking analysis is given, the condition must be formulated in terms of semantic relations (as in (3b)), since there is no syntactic relation shared by *the towel* in (1a) and (1b).

(3) a. An object oriented predicate adjective is construed with an INITIAL 2.
b. An object oriented predicate adjective is construed with a THEME.

If a revaluation analysis is given, on the other hand, *the towel* is an initial 2 in both sentences and *Wilma* is not an initial 2 in either. The condition can be formulated without reference to notions such as THEME, as shown in (3a). A question arises as to whether there is any need to recognize semantic relations, given the possibility of multistratal representations of syntactic relations.

Taking classical RG as a starting point, in Farrell (1991) I develop and motivate a kind of relational theory in which semantic relations such as THEME and AGENT are explicitly incorporated into representations of clause structure and revaluation and alternative linking are *both* allowed.[1] I claim that alternative linking is actually quite common and the range of revaluation constructions is considerably smaller than generally thought. By way of illustration, the kind of analysis of (1a) and (1b) that I propose is shown in Figure 3.[2]

Semantic Relations:	Agent	Recipient	Theme	
(1a)	**Fred**	**Wilma**	**the towel**	
Syntactic Relations:	|	|	|	
Initial & Final:	1	Obl	2	⇐ *Default Linking*
Semantic Relations:	Agent	Recipient	Theme	
(1b)	**Fred**	**Wilma**	**the towel**	
Syntactic Relations:	|	|	|	
Initial:	1	3	2	⇐ *Alternative Linking*
Final:	1	2	Cho	⇐ *Revaluation*

Figure 3

Based on a partial reanalysis of a corpus of data from Halkomelem (Salish) analyzed from the perspective of classical RG in a series of works by Donna Gerdts, I want to argue for this latter kind of relational theory in general and, in particular, for the claim that a set of semantic relations distinct from abstract (i.e. non-final) syntactic relations must be recognized. The argumentation proceeds as follows. First, I look at four kinds of constructions for which Gerdts appeals to revaluation analyses: passive, causative, antipassive, and applicative. I argue that a subset of these — namely the latter three — are better analyzed otherwise. Based on these results, I examine certain grammatical phenomena which might have been understood in terms of initial syntactic relations, if multistratal analyses of the con-

structions in question were available. Since they are not, however, it is necessary to formulate the relevant conditions in terms of semantic relations.

2. FOUR CONSTRUCTIONS IN HALKOMELEM

The Passive Construction

Passive clauses such as (4b) differ from their active paraphrases in several ways.

(4) a. ni q̓ʷól-ət-əs θə sɬéni? tᵘə scé:ɬtən ACTIVE
aux bake-tr-3erg det woman det salmon
'The woman baked the salmon.'

b. ni q̓ʷól-ət-əm ?ə θə sɬéni? tᵘə scé:ɬtən PASSIVE
aux bake-tr-intr obl det woman det salmon
'The salmon was baked by the woman.' (G's 2a-b, p. 195)

First, the logical subject is marked with the general oblique case marker used for clausal dependents that are not final 1s or 2s. Second, the ergative agreement marker found in finally transitive clauses is not present, indicating final intransitivity. Third, the general intransitive marker *-əm* is suffixed to the verb. Fourth, as Gerdts (1988, Ch. 5) shows, the logical subject does not, in general, have the syntactic properties of a final subject, being unable, for example, to be "extracted" using the ordinary final 1 strategy in (pseudo)cleft, relative clause, and question constructions. All of these facts could be accounted for equally well under either of the analyses shown in Figure 4.

(4a)				(4b)		
'bake'	'woman'	'salmon'	⇒	'be baked'	'woman'	'salmon'
	1	2			Obl	1

Alternative Linking: NO

		'woman'	'salmon'
(4b)	*Initial:*	1	2
	Final:	Cho	1

Revaluation: YES

Figure 4

There is, however, at least one kind of compelling evidence for a revaluation analysis. Gerdts shows that *either* the logical subject *or* the logical object of a passive clause can "raise to object" — something which otherwise only final 1s can do.[3] The sentences in (5) illustrate the phenomenon of raising to object.

(5) a. ?i cən x̌éc-t [?u ?i?-əs cəlkʷstá?mət tᵘə xʷələnítəm]
aux 1subj wonder-tr lnk aux-3Ssubj do det white men
'I wonder what the white men will do.'

b. ?i cən x̌éc-t **tᵘə xʷələnítəm** [?u ?i?-əs cəlkʷstá?mət]
aux 1subj wonder-tr det white men lnk aux-3Ssubj do
'I wonder what the white men will do.'(G's 34a-b, p. 207)

In (5b) the final 1 of the clause embedded under the verb *x̌éc-* is a constituent of the main clause, in which it functions as the final 2.[4] (6) shows that the final 2 of the embedded clause cannot be a raisee. The sentences in (7) show the logical object and the logical subject of a passive embedded clause as raisees.

(6) * ʔi cən xeʔxcí-t **kʷθu níɬ** [ʔu ni:n *FINAL 2
aux 1subj wonder-tr det 3emph lnk aux-1Ssubj
cəʔ ƛ'əwəɬ lə́m-nəxʷ]
fut again see-l.c.tr
'I wonder if I will see that one again.' (G's 38b, p. 209)

(7) a. ni cən xéc-t **kʷθu níɬ** [ʔu ʔiʔ-əs LOGICAL
aux 1subj wonder-tr det 3emph lnk aux-3Ssubj OBJECT
c'éw-ət-əm ʔə-ƛ' John]
help-tr-intr obl-det John (G's 41b, p. 210)
'I figured out that that one was helped by John.'

b. ni cən xéc-t **kʷθə John** [ʔu ʔiʔ-əs LOGICAL
aux 1subj wonder-tr det John lnk aux-3Ssubj SUBJECT
c'éw-ət-əm kʷθu níɬ]
help-tr-intr det 3emph (G's 45b, p. 211)
'I figured out that that one was helped by John.'

There is no feature — whether syntactic or semantic — that would unite the raisees into a class under an alternative linking analysis of passive. Under the revaluation analysis, on the other hand, the class of possible raisees consists of nominals that are a subject *in some stratum*. The condition on raising to object can be formulated as in (8).[5]

(8) A raisee to object must be a 1.

The Causative Construction

Affixally mediated causativization in Halkomelem is illustrated by the following examples, which show that the causative suffix can be added to an intransitive base to create a transitive clause in which the argument that would otherwise be realized as the subject is realized as the direct object and an agent/causer argument is realized as the subject.[6]

(9) a. ni ʔiməš ɬə sɬéniʔ INTRANSITIVE
aux walk det woman
'The woman walked.'

b. ni cən ʔiməš-stəxʷ ɬə sɬéniʔ CAUSATIVE
aux 1subj walk-caus det woman
'I made/had/let the woman walk.' (G's 36a-b, p. 158)

In classical RG, such causative constructions are analyzed as CLAUSE UNIONS of initially biclausal structures. As illustrated in Figure 5, the final 1 of the inner clause (equivalent to the structure of (9a)) revalues to an object relation in the main clause, which is headed by the causative morpheme and has an agent/causer argument as initial 1; all other dependents of the inner clause — if there are any — also bear a relation, determined by general principles, in a non-initial stratum of the main clause (Aissen and Perlmutter 1983, Gibson and Raposo 1986). The alternative analysis that I propose is one according to which causativization is an operation on argument structure: an agent/causer argument is added and the argument of the base that would otherwise be the initial 1 bears the relation theme (in addition to whatever other semantic relation it may bear). By the default linking principles, the agent of the resulting argument structure is the initial 1, the theme is the initial 2.[7]

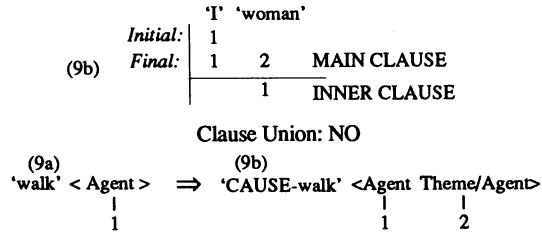


Figure 5

The motivation for the proposed analysis is that it explains two otherwise mysterious restrictions on causativization. If there were an inner clause in the causative construction, one might expect that it could be transitive or passive. However, (10a) shows that, regardless of the case marking of the nominals, a transitive base cannot be causativized; (10b) shows that a passivized base cannot be causativized either.

(10) a. * ni cən q"ə́l-ət-stəx" (ʔə) ɬə sɬéniʔ (ʔə) k"θə səplíl
aux 1subj bake-tr-caus obl det woman obl det bread
'I had the woman bake the bread.' (based on G's 95, p. 174)

b. * ni q"ə́l-ət-əm-stəx"-əs k"θə səplíl ʔə ɬə sɬéniʔ
aux bake-tr-intr-caus-3erg det bread obl det woman
'He had the bread baked by the woman.' (G's 152, p. 247)

An analysis according to which there is no inner clause obviates the need for the stipulations in (11), which are required on a Clause Union analysis (see Gerdts 1991).

(11) a. The inner clause must be finally intransitive.
b. The inner clause initial 1, if there is one, must also be the inner clause final 1.

Since passive involves an advancement to 1, as established above, it is clearly a clause-level syntactic phenomenon. If causativization is characterized as an operation on argument structure, it follows that it cannot be preceded by passive. Causativization of a transitive base on the proposed analysis would involve an operation such as that shown in (12).

(12) 'bake' <Agent Theme> ⇒ 'CAUSE-bake' <Agent Theme/Agent Theme>
1 2 1 2 2

The resulting structure would give rise to a syntactic representation with two initial 2s, in violation of the STRATAL UNIQUENESS LAW (Perlmutter and Postal 1983), paraphrased in (13).

(13) *Stratal Uniqueness Law*
There can be at most one TERM relation (1, 2, or 3) per stratum.

Under the proposed analysis, then, the very nature of the causative affixation rule precludes transitive and passive bases as input.[8]

The Antipassive Construction

Under the right circumstances, transitive clauses in Halkomelem can be paraphrased with an intransitive structure in which the theme is realized as an oblique rather than as a direct object and a form of intransitive marking is used *instead of* transitivity marking, as illustrated in (14).[9]

(14) a. ni cən q̓ʷə́l-ət tᵘə səplíl — TRANSITIVE
aux 1subj bake-tr det bread
'I baked the bread.'

b. ni cən q̓ʷə́l-**əm** **ʔə** tᵘə səplíl — ANTIPASSIVE
aux 1subj bake-intr obl det bread
'I baked the bread.' (G's 3a-b, p. 148)

Two arguments can be constructed for analyzing the antipassive construction as involving an alternative linking of the theme with the oblique relation, as shown in Figure 6.

(14b)

	'woman'	'bread'
Initial:	1	2
Final:	Cho	1

Revaluation: NO

(14a) 'woman' 'bread' ⇒ (14b) 'woman' 'bread'
1 2 1 Obl

Alternative Linking: YES

Figure 6

The first is based on the fact that antipassive feeds causativization:

(15) ni cən q̓ʷəl-ə́m-stəxʷ ɬə sɬéniʔ ʔə kʷθə səplíl
aux 1subj bake-intr-caus det woman obl det bread
'I had the woman bake the bread.' (G's 76, p. 170)

If the output of the antipassive rule were a syntactic structure, as it would be on a revaluation analysis, the causative rule, which manipulates argument structures, should not be able to follow it. The fact that it can is easily accounted for, however, if antipassive is characterized as a rule that takes as input a word and its argument structure and gives as output another word with a modified argument structure — specifically, one that is intransitive by virtue of the fact that the effect of the rule is to override the default linking for themes.

The second argument is based on the observation that (non-eventive) nouns can be formed from antipassivized verbs (Gerdts, personal communication). (16b) shows the antipassivized version of the verb 'sing'.

(16) a. ni cən t'i:l-t tə st'iʔwiʔəɬ — TRANSITIVE
aux 1subj sing-tr det hymn
'I sang the hymn.'

b. ni cən **t'il-əm** ʔə tə st'iʔwiʔəɬ — ANTIPASSIVE
aux 1subj sing-intr obl det hymn
'I sang the hymn.'

This form can be used as the base for either a simple noun or an agentive noun, as shown in (17a) and (17b) respectively.

(17) a. s-t'iləm — NOUN
nom-sing
'song'

b. xʷs-t'iləm — AGENTIVE NOUN
ag nom-sing
'singer'

The word formation processes illustrated in (17) are quite common. Although they work on antipassivized verbs, they do not work on verbs with passive morphology. If the output of the antipassive rule is a word rather than a syntactic structure, as on the proposed analysis, it is as expected that this rule can feed word formation processes.

The Applicative Construction

In general, an animate non-theme argument of a verb in Halkomelem with one of several semantic relations is predictably realized as its direct object, in which case the theme, if there is one, is an oblique. The verb appears with a suffix whose form is determined (at least in part) by the semantic relation of the non-theme argument. The four different kinds of applicatives are illustrated by the examples in (18).[10]

(18) a. ʔi nəʔɔ́m-n-əs-əs kʷθə John — GOAL 2
aux go-appl-tr-3erg det John
'He went up to John.' (G's 183b, p. 141)

b. ni θ'eyʔkʷ-méʔ-t-əs kʷθə sqʷəméyʔ — CAUSAL 2
aux startle-appl-tr-3erg det dog
'He was startled at the dog.' (G's 3, p. 90)

c. ni ʔám-əs-t-əs kʷθə sqʷəméyʔ ʔə kʷθə sθ'ámʔ — RECIPIENT 2
aux give-appl-tr-3erg det dog obl det bone
'He gave the dog the bone.' (G's 1, p. 90)

d. ni cən θəy-əɬc-θ-ámə ʔə kʷθ-ənʔ snɔ́xʷəɬ — BENEFACTIVE 2
aux 1subj fix-appl-tr-2obj obl det-2pos canoe
'I fixed your canoe for you.' (G's 21, p. 95)

In opposition to the usual RG analysis of applicatives, according to which they involve advancements to 2 from syntactic relations such as 3, Ben, Goal, etc., I propose that — at least in Halkomelem — they are monostratal constructions, as shown in Figure 7. The applicative suffixes register the presence of a non-theme 2 and, in some cases, a non-canonical linking of a theme argument.

(18d)

	'I'	'canoe'	'you'
Initial:	1	2	Ben
Final:	1	Cho	2

Revaluation: NO

	'I'	'canoe'	'you'
Initial & Final:	1	Obl	2

Monostratal: YES

Figure 7

The reason for entertaining a monostratal analysis is that it provides an explanation for the fact that multiple applicatives are not possible (Gerdts and Whaley in preparation). The kinds of construction indicated in (19) do not occur.

(19) *'I gave-*appl-appl* the dog the bone for the woman.'
*'Sue went up-*appl-appl* to John for me.'

It is unclear why there should be such a constraint, if applicative formation is characterized as involving advancements to 2 from various relations and the suffixes register the kind of advancement (3-2, Ben-2, etc.). Since nothing in RG precludes more than two strata, Goal-2 advancement might occur in an earlier stratum than Ben-2 advancement, as shown in (20).

(20)

*	**Sue**	**John**	**me**
Initial:	1	Goal	Ben
	1	2	Ben
Final:	1	Cho	2

The monostratal analysis explains this constraint in conjunction with (13), which guarantees that if (certain) animate non-theme arguments are initial 2s, there can be only one of these per clause.[11]

3. SEMANTIC RELATIONS

A Condition on "Extraction"

In (pseudo)cleft, question, and relative clause constructions, obliques cannot be directly extracted. Rather, they are extracted via nominalization. That is, the clause of which the focused NP is an oblique dependent is nominalized and embedded in a predicate nominal construction in which the NP in question is the subject. This phenomenon is illustrated by the examples in (21).

(21) a. níɬ k^{w}θə ʔənʔ-šápəl-ʔəɬ ni nə-š-q^{w}áq^{w}-ət — OBLIQUE
*3emph det 2pos-shovel-pst aux 1pos-**nom**-club-tr* — INSTRUMENTAL
'It's your shovel that I clubbed him with.' (G's 154, p. 72)
Literally: It's your shovel (that) was my clubbing him (with).

b. níɬ tənáʔ šéːɬ yaθ ʔu **š**-x^{w}ánčənəm-s — OBLIQUE
*3emph det 2pos-shovel-pst always lnk **nom**-run-3pos* — LOCATIVE
'It's that road that he always ran on.' (G's 155, p. 72)

In the present context the interesting fact about this kind of construction is that a different nominalizing prefix is used if the extracted oblique is a theme. (22a) and (22b) show extracted oblique themes from antipassive and applicative constructions respectively. The nominalizing prefix is *s-* rather than *š-*.

(22) a. səplíl k^{w}θə ni **s**-q^{w}ól-əm-s ɬə sɬéniʔ — OBLIQUE
*bread det aux **nom**-bake-intr-3pos det woman* — THEME
'Bread is what the woman baked.' (G's 22b, p. 154)

b. níɬ k^{w}θə púk^{w} ni **s**-ʔám-əs-t-s k^{w}θə — OBLIQUE
*3emph det book aux **nom**-give-appl-tr-3pos det* — THEME
swíwʔləs
boy 'It's a book that he gave the boy.' (G's 56, p. 103)

The condition on extraction of obliques might be formulated in terms of a distinction between obliques and 2 chomeurs (i.e. demoted initial 2s) if the antipassive

and applicative constructions involved demotion of an initial 2. Since they do not, as argued above, the condition must be formulated in such a way as to distinguish obliques according to their semantic relations:

(23) Clauses with extracted obliques are nominalized using
s- with THEMES, and
š- otherwise.

A Condition on Reflexivization

One reflexivization strategy in Halkomelem involves adding the suffix *-θət* to a verb and syntactically suppressing the argument that would otherwise be the direct object.[12] This strategy cannot be used with the direct objects of applicative verbs, as the following examples show.

(24) a. ni cən x̌íq'-əθət — THEME
aux 1subj scratch-refl
'I scratched myself.' (G's 84, p. 113)

b. * ni cən θə́y-əɬc-θət ʔə kʷθə snə́xʷəɬ — *BENEFACTIVE
aux 1subj make-appl-refl obl det canoe
'I made myself a canoe.' (G's 87, p. 113)

c. * ni cən c'əq'-méʔ-θət — *CAUSAL
aux 1subj astonished-appl-refl
'I'm astonished at myself.' (G's 143, p. 130)

The difference between (24a) and the ungrammatical cases cannot be characterized in terms of whether the suppressed argument is an initial or non-initial 2, given the analysis of applicatives adopted here; rather, it must be characterized in terms of whether the suppressed argument is a theme:

(25) Reflexivization with *-θət* is restricted to THEMES.

Conditions on Applicative Morphology

Given an analysis of applicatives involving rules sanctioning advancement to 2 from the syntactic relations 3, Ben, Goal, and Causal, the variant forms of the applicative suffix could be accounted for by conditions appealing to particular types of advancement. If, however, there are no advancements, the applicative morphology must be accounted for by conditions that refer directly to what must be characterized as semantic relations, as in (26).[13]

(26) *Applicative Verbal Suffixes*
a. *-n* registers a goal initial 2
b. *-əɬc* registers a benefactive initial 2 in a clause with an oblique theme
c. *-əs* registers a recipient initial 2 in a clause with an oblique theme
d. *-méʔ* registers a non-theme initial 2 otherwise

4. CONCLUSION

In conclusion, Halkomelem evidence adds to the empirical and theoretical sources of motivation discussed in Farrell (1991) for a kind of alternative to classical RG in which semantic relations are explicitly recognized and the role of revaluations and multistratal representations is correspondingly diminished. Internal to Halkomelem such an approach makes possible an analysis that solves several problems. Specifically, explanations become available for:

- the impossibility of causativization of transitive and passive bases
- the ability of antipassive to feed word formation processes
- the impossibility of multiple applicatives

It is important to emphasize that the kind of theory I am advocating is not simply a variant of current monostratal relational theories, as the possibility of multistratal representations of syntactic relations is not abandoned. The Halkomelem passive construction provides one kind of evidence for such representations. Moreover, there are other languages for which revaluation analyses of causative, antipassive, and applicative constructions are surely to be preferred.

NOTES

I wish to express my gratitude to Donna Gerdts for producing the thorough and engaging studies of Halkomelem that have made this paper possible and for providing additional information and data.

The following abbreviations are used:

In glosses:

				Elsewhere:	
appl	*applicative*	lnk	*linker*	G	*Gerdts (1988)*
aux	*auxiliary*	intr	*intransitive*	1	*subject*
caus	*causative*	nom	*nominalizer*	2	*direct object*
det	*determiner*	obj	*obj*	3	*indirect object*
emph	*emphatic pronoun*	obl	*oblique*	Ben	*benefactive*
erg	*ergative*	pos	*possessive*	Obl	*oblique*
intr	*intransitive*	pst	*past*	Cho	*chomeur*
l.c.	*limited control*	tr	*transitive*		
1	*first person*	2	*second person*		
3(S)	*third (singular)*				

Interlinear glosses in the Halkomelem examples cited have in some cases been changed from the source slightly due to the reanalysis.

[1] Although no explicit allowance is made for alternative linking in classical RG, there have been analyses in which this device is employed — notably Rosen's (1990) analysis of Southern Tiwa indirect objects and Aissen's (1983) analysis of benefactives in Tzotzil.

[2] Actually, I analyze *the towel* as a final oblique, as I do not recognize "chomeur" as a primitive relation. The motivation for the kind of analysis shown in Figure 3 is that it makes possible the best account of the interaction of dative shift and passive (Farrell 1991, Ch. 4). Other kinds of motivation are given for a similar approach to this kind of construction in other languages. See Farrell (1991, Ch. 3) on the claim that something like both conditions in (3) are needed.

[3] Gerdts attributes this observation to unpublished work by Thomas Hukari. Davis (1980) discusses the phenomenon in Sliammon, for which the condition is somewhat different.

[4] That the "raisee" in this construction is the final 2 of the main clause can be seen quite clearly when this NP is first or second person. The main clause verb shows object agreement with the raisee.

[5] I assume here the analysis of passive clauses presented in Gerdts (1989a), according to which passive clauses with a first or second person logical object — which can be a raisee — are PERSONAL passives. The IMPERSONAL passive analysis of this kind of clause presented in Gerdts (1988) creates a problem for (8). The un-

usual thing about passive clauses in Halkomelem with a first or second person logical object is that this argument determines a kind of object agreement. Under the assumption that object agreement is determined by a 2 in a transitive stratum, a PERSONAL passive analysis of this kind of clause is thoroughly reasonable. Indeed, the fact that object agreement occurs provides a piece of evidence for a revaluation analysis.

[6] The causative suffix is generally analyzed as a kind of "transitivity" marking (in addition to Gerdts (1988), see Galloway (1977)). It is realized as *-stəxʷ* when the object is third person, as in (9b); otherwise it is *-st* and is followed by object agreement. Galloway analyzes *-əxʷ*, which also appears with third person objects in clauses with so-called "limited control" transitivity marking, as a third person agreement marker.

[7] This analysis of Halkomelem causatives differs significantly from that suggested in Farrell (1991, Ch. 2), which I now believe to be wrong.

[8] The assumption here is that themes are linked to the initial 2 relation by default. Nothing, in principle, precludes the possibility that the default linking for themes might be overridden by an alternative linking rule. The causative rule, however, is not characterized as one that has this effect.

[9] Depending on the particular verb, an alternative suffix or no suffix at all could be used in the antipassive construction.

[10] There is no alternative paraphrase in the case of applicatives with a theme (as in (18c-d)). If a causal or goal argument is inanimate it must be realized as an oblique, in which case the applicative suffix is not used. Although it is apparently not the preferred strategy, it is possible for an animate goal to be realized as an oblique in a construction without applicative morphology.

[11] An analysis of applicatives according to which the non-theme is an initial 3 that obligatorily advances to 2 (along the lines of the analysis in Figure 3) would also explain why there can be no multiple applicatives. That is, the explanation would be that (13) precludes a structure with more than one initial 3. The proposed analysis obviates the need for a rule of 3-2 advancement; however, it requires an alternative linking rule for themes in applicative clauses — the effects of which would follow from an advancement analysis, under the assumption that an advancement to 2 would necessarily cause the initial 2 to demote to chomeur (or oblique, as in Farrell (1991)). Although they would require some reformulation, the arguments in section 3 would remain valid under the alternative 3-2 advancement analysis of applicatives.

[12] Since reflexivized verbs can be causativized, it must be assumed, given the analysis of causativization proposed here, that reflexivization is an operation on argument structure — specifically, one that has as a result that the theme is not linked to the initial 2 relation. If this assumption is correct, the constraint on reflexivization must be stated in terms of the notion theme independently of whether the alternative analysis of applicatives considered in note 11 is adopted. This assumption concerning reflexivization appears unproblematic, unless the reflexive suffix is analyzed (as in Gerdts 1989b) as consisting of a transitive marker *t-* plus a reflexive morpheme *-sut* and transitivity marking is analyzed as registering a transitive stratum. I assume that it is possible to treat the reflexive suffix as a single morpheme synchronically (as, for example, in Gerdts 1988 and Galloway 1977). Such an analysis obviates the need for an abstract underlying representation and the associated morphophonemic rules.

[13] These rules are formulated in such a way as to account for the fact that *-mé?* is used in cases where a benefactive argument is added to a basically intransitive verb (Gerdts, personal communication).

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On the Ambiguity between the Perfect and the Resultative: Evidence from V-te ar- Constructions in Japanese

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1. Introduction

V-*te ar*- constructions in Japanese have recently become a focus of attention (Sugioka 1984, Lee 1989, Miyagawa 1989, Matsumoto 1990a,b, Sells 1990).* In these constructions, the base verb, to which the verbal suffix -*te* is attached, and the verb *ar*- 'be located (inanimate)' together form a complex predicate. Syntactically, two V-*te ar*- patterns are recognized. In the first pattern, the valence of the base verb is maintained. For example, the object of the transitive verb *tome*- 'stop' is marked in the accusative in (1a), as it is without *ar*-, (1b). The base verb can be intransitive in this pattern, e.g. (1c).

(1) Valence-Maintaining V-*te ar*- Construction

a. zyoon ga soto ni **kuruma** o tomete ar- u.
NOM outside LOC car ACC stop-TE be NPST
'Joan has parked the car outside.'

b. zyoon ga soto ni **kuruma** o tome- ta.
Joan NOM outside LOC car ACC stop PST
'Joan parked the car outside.'

c. watasi wa takusan nete ar- u wa yo.
I TOP a-lot sleep-TE be NPST PRT PRT
'I've slept a lot.'

In the second pattern, the valence of the base verb is altered in such a way that its subject is suppressed and its object is marked in the nominative, e.g. (2).

(2) Valence-Changing V-*te ar*- Construction

(*zyoon ga) soto ni **kuruma** ga tomete ar- u.
NOM outside LOC car NOM stop-TE be NPST
'There is a car parked outside.'

Let us call these two types the *valence-maintaining V-te ar- construction* and the *valence-changing V-te ar- construction*, and abbreviate them as the *V-M construction* and the *V-C construction*, respectively.[1]

The sentences involving the V-*te ar*- pattern have been uniformly analyzed as resultatives, and no question has been raised as to whether they are appropriately categorized as such. In the present study it is argued that the V-M construction exhibits properties of both the resultative and the (present) perfect,[2] and that the V-C construction is ambiguous with respect to the monovalent nonlocational resultative and the bivalent locational resultative. In order to contrast the perfect and the resultative, yet another construction in Japanese is introduced, viz. the V-

te i- construction, which is considered to express the perfect.[3]

2. The Perfect and the Resultative

It is generally understood that the perfect indicates the continuing present relevance of a past situation, and that the resultative, which indicates both a state and a preceding event (i.e. action or process) from which it has resulted, is the clearest manifestation of the perfect (Comrie 1976). With this definition, all resultatives are perfects, and the perfect and the resultative thusly form privative opposites.[4]

Surveying resultatives in world languages, Nedjalkov and Jaxontov (1988) provide the following characteristics of the perfect and the resultative.

(3) a. While the after-effects of the action expressed by the perfect are nonspecific, the resultative expresses a resultant state of a specific participant.

b. The perfect, unlike the resultative, can be derived from any verb, either transitive or intransitive, either telic or atelic, including those verbs that denote situations which involve no change of the state of any participant, e.g. the verbs corresponding to *sing* and *laugh*.

c. The perfect does not alter the valence of the base verb, whereas the resultative is predominantly intransitive.

d. If adverbials of duration co-occur with the perfect and/or the resultative, they denote duration of the event with the perfect, whereas they express duration of the resultant state with the resultative.

e. If adverbials of moment co-occur with the perfect and/or the resultative, they denote the moment at which the event takes place, whereas with the resultative, such adverbials denote only a moment at which the state is in existence.

f. The resultatives of verbs of motion can collocate with adverbials which do not occur with the base verb, whereas the perfect does not allow such a collocation.

According to (3a-e), the V-M construction is categorized as perfect, and the V-C construction as resultative. However, according to (3f), the V-M construction can be categorized as resultative.

Regarding (3a), the after-effects expressed by the V-M construction are nonspecific, whereas those expressed by the V-C construction are specific. For example, (1a) can be a statement about Joan's past action or about the present state of the car, while (2) must be a statement about the car. The difference in specificity of after-effects between the perfect and the resultative is partly due to (3c), i.e. the resultative is typically intransitive, whereas the perfect need not be.

With regard to the potential base verbs, (3b), it has already been mentioned that the V-M construction accommodates not only transitive verbs but also

intransitives, e.g. (1c).[5] The V-C construction, on the other hand, permits only transitive verbs expressing some event which can result in a visible state of the object.[6] Sentence (4) is anomalous because knocking on a door usually does not leave any marks.

(4) #doa ga tataite aru. (Matsumoto 1990a)
door NOM beat-TE be-NPST
'The door is in the state of having been knocked upon.' (Intended)

When adverbials of duration co-occur with the V-*te ar-* pattern, they denote the duration of the event with the V-M construction, e.g. (5a), and the duration of the resultant state with the V-C construction, e.g. (5b). (5c) is anomalous because it involves the V-M construction, and therefore *san-zikan* 'three hours' is understood to denote the duration of the event, even though *tome-* 'stop' is not a durative verb.

(5) a. watasi wa zyuugo-zikan nete aru/#iru. (V-M construction)
I TOP 15-hours sleep-TE be-NPST
'I've slept 15 hours.'

b. kuruma ga san-zikan tomete aru. (V-C construction)
car NOM 3-hours stop-TE be-NPST
'The car has been parked for 3 hours.'

c. #kuruma o san-zikan tomete aru. (V-M construction)
car ACC 3-hours stop-TE be-NPST
'(I)'ve parked the car for 3 hours.' (Intended)

When adverbials of moment co-occur with the V-*te ar-* pattern, they denote the time at which the event took place with the V-M construction, e.g. (6a), and the time at which the resultant state is in existence with the V-C construction, e.g. (6b).[7] Notice that the tense is in accordance with the adverbial *kinoo* 'yesterday' in (6b), whereas the tense is in the nonpast in (6a).

(6) a. watasi wa kinoo kippu o katte aru/#iru.
I TOP yesterday ticket ACC buy-TE be-NPST
'(I) bought a ticket yesterday (and this fact is relevant to the current discourse).' (V-M construction)

b. kippu ga kinoo katte atta/*aru. (V-C construction)
ticket NOM yesterday buy-TE be-PST/be-NPST
Lit. 'Yesterday there was a ticket bought.'

It has so far been demonstrated that, according to Nedjalkov and Jaxontov's criteria (3a-e), the V-M construction is more appropriately categorized as perfect than as resultative. As a digression, I shall point out one of the differences between the V-M construction and the perfect V-*te i-* construction observable in (5a) and (6a). The V-M construction describes situations subjectively, whereas the V-*te i-* does so objectively.[8] The V-M construction with the third-person subject, therefore, implies that the speaker considers the referent of the subject to be

an insider, i.e. the speaker considers it appropriate to state the referent person's action subjectively. *Sono otoko* 'that man' is not used to refer to an insider, and thus (7a) with *ar-* is anomalous, whereas (7b) with *i-* is anomalous on most occasions because subjective description is the default when the speaker describes his/her own past action.[9]

(7) a. sono otoko wa tanaka ni wairo o watasite #aru/iru.
that man TOP LOC bribe ACC give-TE be-NPST
'The man has given a bribe to Tanaka.'

b. watasi wa tanaka ni wairo o watasite aru/#iru.
I TOP LOC bribe ACC give-TE be-NPST
'I've given a bribe to Tanaka.'

Resuming consideration of the characteristics of the perfect and the resultative proposed by Nedjalkov and Jaxontov, the V-C construction can collocate a *ni*-marked locative which is not permitted by the base verb, whereas such a collocation is not possible with the perfect. As shown in (8a), *ni*-locatives, e.g. *reezooko no naka ni* 'in the refrigerator', cannot collocate with *kaw-* 'buy', but they can collocate when *kaw-* is the base verb of the V-C construction, cf. (8b).[10]

(8) a. *reezooko no naka ni gyuunyuu o katta.
refrigerator GEN inside LOC milk ACC bought
(Uninterpretable)

b. reezooko no naka ni gyuunyuu ga katte aru.
refrigerator GEN inside LOC milk NOM buy-TE be-NPST
Lit. 'Milk is bought in the refrigerator.'
'Milk has been bought and is in the refrigerator.'

As has been discussed, the V-M construction exhibits characteristics of the perfect rather than of the resultative. However, although not as natural as in the V-C construction, the V-M construction can also collocate with *ni*-locatives — which is not permitted by the perfect V-*te i-*, as shown in (9).[11]

(9) reezooko no naka ni gyuunyuu o katte aru/*iru.
refrigerator GEN inside LOC milk ACC buy-TE be-NPST
'(I) bought milk, and it is in the refrigerator.'

The fact that when adverbials of moment co-occur with the V-M construction, they denote the time at which the event took place, e.g. (10a), has been discussed here. Such adverbials cannot co-occur with the V-M construction when there is a *ni*-locative which is not in the base verb's valence.

(10) a. kinoo gyuunyuu o katte aru kara kyoo wa
yesterday milk ACC buy-TE be-NPST because today PRT
kawanaide.
buy-NEG-TE
'(I) bought milk yesterday, so don't buy (any) today.'

b. *reezooko no naka ni kinoo gyuunyuu o katte
refrigerator GEN inside LOC yesterday milk ACC buy-TE

aru kara kyoo wa kawanaide.
be-NPST because today PRT buy-NEG-TE
'(I) bought milk yesterday, and it is in the refrigerator, so ...' (Intended)

Non-valence-bound *ni*-locatives can appear only when the V-M construction is understood to be resultative (stative), which does not co-occur with a moment adverbial denoting the event time. If, on the other hand, the construction is understood to be perfect, it can co-occur with a moment adverbial denoting the event time, but it cannot with a *ni*- locative. These facts indicate that the V-M construction is ambiguous with respect to the perfect-resultative distinction.[12] In the next section, the significance of *ni*-locatives to the notion of resultative will be discussed.

3. Monovalent vs. Bivalent Locational Resultative

Nedjalkov and Jaxontov recognize two semantic types of resultatives: specific resultative and general resultative. In the specific resultative, the visual state of an entity allows the observer to deduce the particular event that has brought it about, e.g. *tied, cooked.* In the general resultative, the state of an entity is described through the event the speaker has witnessed or deduced indirectly, *killed, stolen.*[13] There are two kinds of specific resultatives: monovalent, i.e. X has a visible property P (e.g. *cooked, broken*), and bivalent locational, i.e. X is located in a specific way with respect to Y (e.g. *attached to, enclosed in*).

An implicational universal is general resultative > monovalent resultative > bivalent locational resultative. That is, if the general resultative is found in the language in question, so too is the specific resultative; if the monovalent resultative is found, so too, the bivalent locational. Kozinskij (1988) claims that this preference for the specific resultative is a reflection of observability: states such as being dead, broken, etc. are more observable than some other states, e.g. being killed or stolen.

If one considers that location is merely another of the visible properties, then the bivalent locational appears to be more complex, and less observable, than the monovalent nonlocational. Therefore, the implicational universal is expected to be general resultative > bivalent locational resultative > monovalent resultative. Kozinskij, however, claims that the bivalent locational is more observable than the monovalent nonlocational. He argues that both the figure and the ground (in the sense of Talmy 1978), and often their spatial arrangement as well, are normally immediately observable. In the case of *The stamp is glued to the envelope*, for example, no previous state needs to be inferred, presupposed, or guessed.

On the other hand, in the monovalent nonlocational, e.g. *The window is broken*, an alternative state is necessary for comparison. In such a case, the ground is played by an alternative state of the same or similar entity, which is called the

norm (Chafe 1976). The ground here is outside the field of direct perception, and thus cannot be observed. Therefore, Kozinskij maintains, the more observable the situation, the higher the probability of the use of the resultative.

Both the V-C and the V-M construction can be bivalent locational resultative. While the V-M construction permits general resultative interpretations, the V-C construction permits only specific resultative interpretations. That is, the V-C construction is utilized only when the visual state of an entity allows the speaker to deduce the particular event that has brought it about.

The V-C construction is still ambiguous between the monovalent nonlocational and bivalent locational opposition which is illustrated in (11).[14]

(11) a. ningyoo no kubi ga nuite aru.
doll GEN head NOM pull-out-TE be-NPST
'A doll's head has been pulled out (of its socket).'
'There is a doll's head which was pulled out (of its socket).'

b. konpyuutaa no moodemu ga hazusite aru.
computer GEN modem NOM detach-TE be-NPST
'The modem has been detached from the computer.'
'There is a modem which was detached from the computer.'

The sentence is ambiguous when the subject contains a genitive NP, and the base verb indicates detachment of some sort. For example, (11a) can be used to describe either the state in which a headless doll is present (monovalent nonlocational; the speaker describes the state with respect to the norm), or the state in which a lone head of a doll is present (bivalent locational, even though the locative NP is not overtly present).

The *ni*-locative may appear only with the bivalent locational resultative, as shown in (12). That is, when the locative NP is overtly present, the statement is about only the doll's head or the modem — not about the headless doll or the computer without a modem.

(12) a. teeburu no ue ni ningyoo no kubi ga nuite
table GEN top LOC doll GEN head NOM pull-out-TE
aru.
be-NPST
'There on the table is a doll's head which was pulled out (of its socket).'

b. teeburu no ue ni konpyuutaa no moodemu ga hazusite
table GEN top LOC computer GEN modem NOM detach-TE
aru.
be-NPST
'There on the table is a modem which was detached from the computer.'

4. Assertion vs. Implication of the Past Event

The perfect and the specific resultatives are distinct in a crucial way. The perfect is equivalent to the simple past in terms of truth condition, whereas the specific resultative is a stative in which the preceding event is mentioned but its actual occurrence is not asserted.[15] The truth-conditional equivalence of the simple past and the perfect is shown in (13a,b). If Tanaka's alibi is being discussed, (13b) is more appropriate than (13a).

(13) a. {tanaka/ watasi} wa san-zi ni yamada o tazuneta.
I TOP 3 o'clock LOC ACC visited
'Tanaka/I visited Yamada at 3 o'clock.'

b. tanaka wa san-zi ni yamada o tazunete iru.
TOP 3 o'clock LOC ACC visit-TE be-NPST
'Tanaka visited Yamada at 3 o'clock (and this fact is relevant to the current discourse).'

c. watasi wa san-zi ni yamada o tazunete aru.
I TOP 3 o'clock LOC ACC visit-TE be-NPST
'I visited Yamada at 3 o'clock (and this fact is relevant to the current discourse).' (V-M construction)

The perfect involves the notion of modality, i.e. the speaker's mental attitude toward the proposition at the time of utterance as it is defined as the speaker's instantaneous present (Nakau 1979). The speaker considers that the past event is relevant to the current discourse, but how it is relevant is not specified. The modality part of the sentence cannot be challenged by the addressee(s) because only the speaker has the right to express her/his own attitude toward what s/he says. While the addressee(s) can deny the proposition part by uttering *sore wa tigau* 'That's not true', s/he cannot deny the relevance of the proposition to the current discourse by simply denying the previous utterance as a whole.

The perfect frequently implicates a state resulting from the event referred to by the base verb. But such a resultative reading is an implicature, which can be cancelled without yielding a contradiction.

(14) a. tanaka wa ni-nen mae ni sono uti o katte iru.
TOP 2-years ago LOC that house ACC buy-TE be-NPST
'Tanaka bought that house 2 years ago (and this fact is relevant).'

b. sikasi kare wa saikin kyuu-ni yamada ni uriharatta.
however he TOP recently suddenly LOC sold
'However, recently he suddenly sold (it) to Yamada.'

If only (14a) is heard, the natural interpretation is that Tanaka owned the house at the time of utterance, i.e. the resultative state is implicated. However, this implicature can readily be cancelled by (14b).

In contrast, with the specific resultative, the resultant state is asserted, but the previous event is not. The speaker describes the current state of an entity as being similar to the resultant state of some event *if* such an event has actually occurred on the entity.

(15) a. #biiru ga katte aru. sikasi nonde simatta kara
beer NOM buy-TE be-NPST but drink-TE finished because

moo na- i.
any-longer be-NEG NPST
Lit. 'There's some beer bought. But because (I) drank it, there's no more.'

b. biiru ga katte aru. moratta no ka mo sirenai
beer NOM buy-TE be-NPST received NMLZ Q PRT can't-know

keredo. Lit. 'There's some beer bought. It may be a gift, though.'
though

In (15a), the second sentence denies the resultant state, i.e. there is some beer — which yields a contradiction. In (15b), on the other hand, the second sentence cancels the implicature that someone bought the beer. (15b) is not perceived as contradictory.[16]

According to the criterion of truth condition, the V-M construction shows a distinct characteristic from the V-C or the V-*te i*- construction in that both the event and the resultant state are asserted.

(16) a. #zyoon ga biiru o katte aru. sikasi nonde simatta
NOM beer ACC buy-TE be-NPST but drink-TE finished

kara moo na- i.
because any-longer be-NEG NPST
'Joan has bought beer. But because (I/she) drank it, there isn't any more.'

b. #zyoon ga biiru o katte aru. moratta no ka mo
NOM beer ACC buy-TE be-NPST received NMLZ Q PRT

sirenai keredo.
can't-know though
'Joan has bought some beer. She might have been given it, though.'

The anomaly of (16b) is due to the subjective nature of the V-M construction. In order to utter (16b) felicitously, the speaker must know that Joan has bought the beer. On the other hand, (16a) demonstrates that the V-M construction asserts the resultant state.

What is peculiar to the V-M construction is that although both the event and the resultant state are asserted, only one of them can be focused by further modification. Examining (9), it was pointed out that an adverbial of moment, which denotes the time at which the event took place, cannot co-occur with a non-valence-bound *ni*-locative, which denotes the location of an entity. If *reezooko no naka ni* 'in the refrigerator' is absent, the V-M construction can

accommodate *kinoo* 'yesterday'. This restriction suggests that the construction is ambiguous with respect to the perfect-resultative opposition. On the other hand, the cancellability test suggests that the construction is both perfect and resultative.

5. Conclusions

The V-C and the V-M construction have been examined with respect to the perfect-resultative opposition. The V-C construction shows all characteristics of the (specific) resultative found in world languages, whereas the V-M construction exhibits some characteristics of both the perfect and the resultative. The V-M construction deviates from the perfect V-*te i*- construction in that (i) the V-M permits *ni*-locatives which are not in the valence of the base verb and (ii) it asserts, not implicates, the state which is resulted from the event referred to by the base verb.

Notes

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[1] Martin (1975) refers to the V-M construction as the *possessive resultative*, and to the V-C construction as the *intransitivizing resultative*.

[2] In this study, the term *perfect* is used to refer solely to the present perfect. The future perfect and the pluperfect exhibit different characteristics from the present perfect.

[3] The V-*te i*- construction also permits pure resultative readings. See Hasegawa (in prep) for further discussion.

[4] Zwicky and Sadock (1975) define privative opposites as, '[Two understandings] U_1 and U_2 are *privative opposites* with respect to [some semantic feature] F if U_1 can be represented as being identical to U_2 except that U_1 includes some specification for F that is lacking in U_2,' e.g. *dog* 'male canine' and *dog* 'canine'. With privative opposition, the more specific understanding implies the more general understanding.

[5] Unlike the V-*te i*- construction, the V-M construction does not freely accommodate intransitives; e.g., it is extremely difficult to construct sentences with *nak*- 'cry' or *waraw*- 'laugh'. The constraints on the base verbs in the V-M construction are not discussed in this study, however.

[6] Miyagawa (1989) claims that the V-C construction provides an independent and objective test for themehood, however it is defined, i.e. only those verbs which can appear in this construction assign the theme role to their object NPs. However, such a claim is untenable. As Matsumoto (1990a) convincingly argues, the acceptability of sentences with the V-C construction depends on pragmatics

rather than a particular semantic role that the base verb assigns to its object.

[7] The HAVE -EN pattern in English can collocate with cyclic moment adverbials, e.g. Tuesday, only when it is construed as the so-called experiential perfect: it cannot collocate with moment adverbials which denote a single event time (McCawley 1971, Michaelis 1991).

[8] Prototypical examples of objective description are those concerning natural events, e.g. earthquake, typhoon, and change of season. The most salient examples of subjective description occur when the speaker describes his/her own actions, where the speaker knows the actor intends to perform the described action. However, knowledge of the actor's intention is not a sufficient condition for the speaker to describe the action subjectively. The speaker must consider the actor an insider, and thus the speaker considers himself/herself entitled to make a subjective description. See Wetzel (1985) and Tokunaga (1986) for the insider-outsider distinction in Japanese.

[9] Two kinds of subjectivity are involved in the perfect constructions in Japanese. As will be mentioned in §4, whether or not the past event is relevant to the current discourse is a subjective judgment, which applies to both the V-M and the V-*te i*- construction. The point being discussed here concerns the way to describe the event itself. The event is described subjectively with the V-M construction, whereas it is described objectively with the V-*te i*- construction.

[10] This demonstration (8b) was suggested by Minoru Nakau.

[11] Both *ar*- and *i*- as main predicates have a *ni*-locative in their valence descriptions. The fact that the V-M and the V-C constructions can, but the V-*te i*-construction cannot, accommodate an extra *ni*-locative suggests that they are in distinct linkage types. The V-*te* and *ar*- jointly specify the arguments, whereas the V-*te* solely determines the arguments in the V-*te i*- construction. See Hasegawa (in prep) for analysis of these linkage types in Role and Reference Grammar.

[12] According to Zwicky and Sadock, one of the few ambiguity tests which can provide real evidence for privative ambiguities, although only in fortuitous circumstances, is the use of *co-occurrence restrictions* (CRs). Some CRs are in part arbitrary (i.e. the CRs are not explicable on semantic grounds alone) and in part dependent on the presence of a particular element of semantic representation. For example, *You bet it's cold* is ambiguous, and the obligatory absence of *that* is applicable only to the one which expresses the speaker's agreement, not to the report of a wager. Similarly, the CR of *ni*-locatives can be said to be sensitive to stativity in semantic representation.

[13] I consider it to be an instance of the perfect if the speaker asserts the occurrence of the event based on witnessing it. If the construction in question permits general resultative interpretations, then uncertainty emerges as to whether the speaker 'knows' or has inferred the occurrence of the event. This seems to be the key to the apprehension of the link between the resultative and the perfect,

both of which are expressed by the use of a single syntactic pattern in many languages. It has been suggested that the perfect is developed from the resultative diachronically (Jespersen 1924, Kuryłowicz 1964, Maslov 1988) as well as synchronically (Slobin and Aksu 1982).

[14] Katsuya Kinjoo brought to my attention some similarities between the distinction discussed here and the two Turkish past-tense morphemes, *-di* (direct experience) and *-miş* (indirect experience). One of the uses of *-di* can be characterized as perfect, and one of the uses of *-miş* resultative as they are defined in the present study. See Slobin and Aksu (1982) for details.

[15] In order to simplify the discussion, I labeled the first interpretations 'monovalent nonlocational resultative', which involves a comparison between the current state of an entity and the norm, and the second 'bivalent locational resultative', which does not require such a comparison. Strictly speaking, however, the second interpretations also indicate that the speaker has either witnessed the previous state or inferred one. The point being discussed here is that each subject NP (containing two nouns) as a whole refers to a single entity, as it usually does, in the bivalent locational interpretations, whereas the genitive NP alone has a referring function in the monovalent nonlocational interpretations.

[16] Matsumoto (1990a) claims that one condition on the V-C construction is such that an agent must have purposefully produced the situation being described by the V-C construction. I maintain that neither the actual occurrence of the event nor the purposefulness of the agent need not be asserted.

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ON JAPANESE INTERNALLY HEADED RELATIVE CLAUSES*

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1. Introduction

This paper re-examines the acceptability conditions for so-called internally headed relative clauses (IHRCs) in Japanese. Unlike previous attempts which have stated the acceptability of IHRCs solely in terms of their pragmatics, I will show that some of the conditions must be stated in syntactic and semantic terms.

After presenting the structural descriptions of typical relativization and IHRCs, I will discuss the acceptability conditions for three aspects of the construction, namely, syntax, semantics, and pragmatics[1]. Furthermore, I will argue that the construction has two functions: to present a part-whole relationship between two events; and to identify a physical entity within the embedded clause. Finally, I will argue that this duality is apparent in the interaction and discrepancy between the syntax and semantics of the construction. Unless specified, IHRCs and relative clauses refer to those in Japanese.

2. Structural differences between typical relativization and IHRCs

A common type of relative clause in Japanese is externally headed relative clauses (EHRCs). An EHRC corresponds to an argument or an adjunct in the embedded clause and it is unexpressed inside the clause. In (1) below, (NP_i-$case_X$) represents the phonetically missing target of relativization and its case marker, or a "gap" in the embedded clause. The first instance of NP_i (the target of relativization) and the second instance of NP_i (the head NP) both refer to the same entity. $Case_Y$ which is attached to the NP as a whole indicates its role in the main clause. Throughout this paper, the term typical relativization refers to EHRCs as in (2)[2].

(1) [[... (NP_i-$case_X$) ... V] NP_i]-$case_Y$
where NP_i: the target of relativization
$case_{X,Y}$... : case markers
(NP_i-$case_X$): a gap
V: the predicate
NP_i : the head NP

(2) Taroo-wa [[(NP_i-ga) hasittekita] Hanako$_i$]-o tukamaeta.
TOP NOM come-running-TA ACC catch-TA
'Taro caught Hanako who came running.'[3]

An IHRC, on the other hand, is a gapless embedded clause followed by the nominalizer *no* instead of a full NP as shown in the structural description (3). In (4a), the target of relativization is *Hanako* and no argument is lacking in the embedded clause. Here, the morpheme *no* following the embedded clause cannot be replaced by the target *Hanako* as shown in (4b), which suggests that this *no* is not a pronominal, but a nominalizer[4].

(3) [[... NP_i-$case_X$ ... V] *no*]-$case_Y$
where NP_i : the target of relativization
$case_{X,Y}$... : case markers[5]
V: the predicate
no: Nominalizer (NO)

(4) a. Taroo-wa [[Hanako$_i$-ga hasittekita] -no] -o tukamaeta.
TOP NOM come-running-TA NO ACC catch-TA
'Taro caught Hanako who came running,' or 'Hanako came running, and Taro caught her.'

b. *Taroo-wa [[Hanako-ga hasittekita] Hanako]-o tukamaeta.

Although the claim in this paper is that IHRCs are different from typical relativization, the term IHRC is used by convention. As can be seen in (4a), IHRCs can be translated into English using either a 'restrictive' relative clause (to focus on the relativizing function of IHRCs) or a so-called 'non-restrictive' relative clause (to focus on their difference from typical relativization). However, only the translation using a 'restrictive' relative clause is given for the IHRCs in the rest of the paper.

3. The acceptability conditions of IHRCs

While typical relativization can be an argument or an adjunct of the main predicate in any sentence, the acceptability of an IHRC depends on how it is used in a sentence. For example, in (4a), the *no*-marked IHRC *Hanako-ga hasittekita-no* 'Hanako's coming running', is followed by the accusative case and is used with the main predicate *tukamaeta* 'caught', giving rise to an acceptable sentence. However, in (5b), the same IHRC, when followed by the dative case and used with the verb phrase *purezento-o watasita* 'handed a present' in the main clause, results in an unacceptable sentence unlike its EHRC counterpart in (5a).

(5) a. Taroo-wa [hasittekita] Hanako-ni purezento-o watasita.
TOP come-running-TA DAT present -ACC hand-TA
'Taro handed a present to Hanako who came running.'

b. *Taroo-wa [Hanako-ga hasittekita]-no-ni purezento-o watasita.
NO-DAT present-ACC hand-TA
Intended: 'Taro handed a present to Hanako who came running.'

In the following sections, I will define the conditions for an acceptable IHRC. Kuroda proposed what he calls a "relevancy condition" in which he stated that an IHRC must be interpreted pragmatically in such a way as to be directly relevant to the main clause event (Kuroda 1976: 270). In other words, his "relevancy condition" exclusively dealt with the pragmatic relationship between the embedded clause event and the main clause event. In contrast, I argue that in addition to the pragmatic conditions, there are syntactic and semantic conditions which must be fulfilled and which must be stated separately.

3.1. Syntactic conditions

I argue that the main predicate takes an IHRC followed by the nominalizer *no*, as its argument. The case marking after the nominalizer indicates that the *no*-marked IHRC as a whole is syntactically an argument of the main predicate. In (6a) (same as (4a)), the *no*-marked IHRC is syntactically the direct object of the main predicate *tukamaeta* 'caught' as the accusative case marker after *no* suggests. The sentence can be passivized as shown in (6b), and here the *no*-marked IHRC

becomes the subject of the sentence taking the nominative case. Thus, the *no*-marked IHRC is a part of the main clause in that it is syntactically an argument of the main predicate.

(6) a.=(4) a.
Taroo-wa [Hanako-ga hasittekita] -no -o tukamaeta.
TOP NOM come-running-TA NO ACC catch-TA
'Taro caught Hanako who came running.'
b. [Hanako-ga hasittekita] -no-ga Taroo-ni tukamaerareta.
NOM come-running-TA NO NOM by catch-PASS-TA
'Hanako who came running was caught by Taro.'

3.2. Semantic conditions

The semantics of an IHRC is determined by the semantics of the main predicate. First of all, the main predicate requires, as will be discussed later, at least one of its semantic arguments to be present in the IHRC. For example, in (6c), the main verb *tukamae-ta* 'caught' takes a physical entity as the patient of the action, but not an event. Therefore, even though the syntactic direct object is the *no*-marked IHRC, the patient of the main predicate within the IHRC, namely *Hanako*, is taken as the semantic argument of *tukamaeta*.

(6) c. Taroo-wa [Hanako-ga hasittekita] -no -o tukamaeta.
TOP NOM come-running-TA NO ACC catch-TA
'Taro caught Hanako who came running,'

At the same time, the main predicate has to be a verb of physical action in order for it to take a physical entity within the IHRC as one of its arguments. Thus, typically the main predicate of an acceptable IHRC is a verb of physical contact such as *tukamaeta* 'caught' in (6c).

Hirose and Ohori (1992) have observed that compared to typical relativization, IHRCs have restricted distribution. An IHRC usually occurs either as the direct object or as the subject of a main predicate, while there is no such restriction with typical relativization[6]. For example, (6c) is acceptable since the IHRC occurs as the direct object with the accusative case. The restricted distribution of IHRCs can be accounted for in terms of their syntax and semantics. Since a *no*-marked IHRC is a syntactic argument of the main predicate, its case marking is determined by what the main predicate requires. Moreover, since a main predicate is typically a verb of physical action, the case markings of *no*-marked IHRCs are restricted to the case markings required by verbs of physical action. For further discussions of the restricted distribution, see Hirose and Ohori (1992).

Lastly, the time of the event described in an IHRC cannot be later than the main clause event[7]. This is another constraint that typical relativization does not have. In each of the sentences in (7), the embedded clause contains a time adverbial *kinoo* 'yesterday', which shows that the event happened later than the time of the main clause event, which was *sensyuu* 'last week'. Although (7a) with an EHRC is perfectly grammatical, (7b) with an IHRC is unacceptable. The function of typical relativization is merely to identify an entity by modifying it with an embedded clause, and there is no constraint regarding the tense of an EHRC. Thus, (7a) with an EHRC is acceptable. An IHRC, however, must also obey the temporal constraint. At the time of Hanako's marriage, which took place last week, the groom could not have been identified as the man who won the lottery yesterday.

Thus, because of the temporal constraint on IHRCs, (7b) with an IHRC is unacceptable.

(7) a. Hanako-wa [kinoo takarakuzi-ni atatta] otoko-to sensyuu
TOP yesterday lottery DAT win-TA man-COM last-week
kekkonsita.
marry-TA
'Last week Hanako married the man who won the lottery yesterday.'
b. *Hanako-wa [kinoo otoko -ga takarakuzi-ni atatta] -no-to sensyuu
man NOM lottery DAT win-TA NO-COM last-week
kekkonsita.
marry-TA

3.3. Pragmatic conditions

So far I have shown that there are syntactic and semantic conditions that an acceptable IHRC has to fulfill which were not treated in Kuroda's "relevancy condition". However, in addition to those syntactic and semantic requirements mentioned above, an IHRC event must be interpreted as pragmatically relevant to the content of the main clause. Thus, regarding the aspectual interpretation of an IHRC[8], an IHRC event must be: not yet completed; still on-going; or its resulting state must be present at the time of the main clause event. Examples are shown in (8). Here the IHRCs contain different forms of the verb *oti* 'fall'. Since each of them can be interpreted as having an aspectual meaning relevant to the main clause event, the sentences are acceptable (see also Nakau 1976).

(8) At the time of the main clause event:
a. (the embedded clause event has not completed)
Taroo-wa [hon-ga tana-kara otiru] -no -o uketometa.
TOP book NOM shelf ABL fall-RU NO ACC catch-TA
'Taro caught books that fell off of the shelves.'
b. (the embedded clause event is on-going)
Taroo-wa [hon-ga tana-kara otitekuru /otitekita] -no-o uketometa.
fall-come-RU fall-come-TA
'Taro caught books that were falling off of the shelves.'
c. (the resulting state of the embedded clause is present)
Taroo-wa [hon-ga tana-kara otita] -no -o hiroiageta.
fall-TA pick-up-TA
'Taro picked up books that had fallen off of the shelves.'

Typically the event described in an acceptable IHRC is interpreted as occurring in the same location as the main clause event, as can be seen in (8)[9].

When an IHRC fulfills all of the conditions stated above, the sentence is acceptable. It might be noted in passing, however, that there are some cases where it is difficult to determine what the target of relativization is, even though the sentence is acceptable. In these cases, pragmatic contexts play a role in narrowing the range of possible targets. In (9a), although the verb phrase *tukamaeta* 'caught' can either take *neko* 'cat' or *nezumi* 'mouse' as its patient, the preferred reading is the one in which the cat is taken as the target. However, if an adverbial phrase such as *saki-ni* 'in advance' is added in front of the main predicate, the interpretation 'Taro was competing with the cat to catch the mouse and Taro caught the mouse that the cat was chasing' becomes stronger in (9b). In (9c), it is the quantifier

nihikitomo 'both of the two' rather than the main predicate which requires the target to be plural, and thus the only reading is the one in which Taro caught both of the animals.

(9) a. Taroo-wa [neko-ga nezumi-o oikaketeiru] -no -o tukamaeta.
TOP cat NOM mouse ACC chase-PROG-RU NO-ACC catch-TA
'Taro caught the cat that was chasing the mouse.'[10]

b. Taroo-wa [neko-ga nezumi-o oikaketeiru]-no-o saki-ni tukamaeta.
in-advance
'Taro caught the mouse that the cat was chasing (before the cat did).'

c. Taroo-wa [neko-ga nezumi-o oikaketeiru]-no-o ni-hiki-tomo tukamaeta.
both-two
'Taro caught both the cat and the mouse while the cat was chasing the mouse.'[11]

4. Duality of IHRCs

Having defined the syntactic, semantic, and pragmatic conditions for an acceptable IHRC, I will discuss the properties of the IHRC construction. I argue that a dual function is what distinguishes this construction. One function of an IHRC is to present an event which is a part of a larger event described in the main clause. This construction also identifies a physical object which is within the IHRC. I will discuss these two functions of the construction in the following sections.

4.1. Part-whole relationship between the two events

A part-whole relationship between the two events described in the embedded clause and the main clause can be seen, first of all, in the syntax of the construction. I have suggested that an entire *no*-marked IHRC has to be a syntactic argument of the main predicate (see (6a)). Thus, as McCawley observes, unlike typical relativization, IHRCs cannot be preceded by determiners, numeral expressions or EHRCs (McCawley 1991). An example of an IHRC preceded by an EHRC is given in (10). When the EHRC (*haha-ga katta* 'that mother bought') precedes the IHRC (*Hanako-ga ringo-o kakusita* 'Hanako hid an apple'), they do not form a grammatical sentence, and thus the nominalizer *no* cannot nominalize the sequence. Consequently, the two embedded clauses followed by *no* cannot be a syntactic argument of the main predicate. Put differently, the two embedded clauses as a whole cannot describe a single event, and they cannot be a part of the main clause event. Thus, (10) is ungrammatical.

(10) *Taroo-wa [[[haha-ga katta] [Hanako-ga ringo-o kakusita]]-no] -o
TOP mother NOM buy-TA NOM apple ACC hide-TA NO ACC
sagasidasita.
find-TA
Intended: 'Taro found the apple that mother bought and that Hanako hid.'

I have argued that the embedded clause event cannot occur later than the main clause event in an acceptable IHRC. If the embedded clause event were to occur later than the main clause event, it could not be a part of the main clause event. This temporal constraint is a semantic aspect of the part-whole relationship between the two events. Pragmatic conditions also reflect a part-whole relationship between the two events. At the time of the main clause event, the IHRC event must be: not yet completed; still on-going; or its resulting state must be present (see (8a-

c)). This aspectual constraint can be viewed as requiring the IHRC event to belong temporally to the larger event described in the main clause. I have noted that the IHRC event is typically interpreted as occurring in the same location as the main clause event. This means not only temporally but also spatially an IHRC event can be viewed as a part of the main clause event.

4.2. Identification of a physical entity

The IHRC functions to identify an entity introduced in the embedded clause. A physical entity introduced in an IHRC is a semantic argument of the main predicate (see (6c)). Thus, despite all the differences between the IHRC construction and typical relativization, which is due to the IHRC construction's having a part-whole relationship, the two constructions at least have in common the function of identifying an entity.

4.3. Interaction and discrepancy between syntax and semantics

The dual function of IHRCs is apparent in the discrepancy between the syntax and semantics of this construction. Syntactically, the entire *no*-marked IHRC is an argument of the main predicate, but at the same time a physical entity within the clause is taken as a semantic argument of the main predicate. It seems that previous analyses have avoided acknowledging the syntax-semantics discrepancy by trying to predict one from the other. My approach, in contrast, is to recognize this discrepancy.

When IHRCs are compared with event nominalizations, the discrepancy between the syntax and semantics of this construction becomes clearer[12]. In both of the constructions, a *no*-marked gapless embedded clause occurs as one of the arguments of the main predicate. When the main predicate is a verb of cognition instead of a verb of physical action, the same *no*-marked embedded clause cannot be interpreted as an IHRC. Instead, it is interpreted as an event nominalization. For example, in (11), the main predicate *sir* 'know' is a verb of cognition. Here, the sentence means that 'Taro knew the event in which Hanako came running' (an event nominalization reading); it does not mean that 'Taro knew Hanako who came running' (an IHRC reading) as in (6c) (reproduced below).

Event nominalization

(11) Taroo-wa [Hanako-ga hasittekita] -no -o sitteita.
TOP NOM come-running-TA NO ACC know-TA
'Taro knew that Hanako came running.'

IHRC

(6) c. Taroo-wa [Hanako-ga hasittekita] -no -o tukamaeta.
TOP NOM come-running-TA NO ACC catch-TA
'Taro caught Hanako who came running.'

The difference between the two can be stated in terms of whether or not there exists a discrepancy between syntax and semantics. In event nominalizations, there is no discrepancy between syntax and semantics. In (11), the entire embedded clause is not only a syntactic argument of the main predicate *sittei-ta* 'knew', but it is also its semantic argument. Thus, (11) can only means 'Taro knew that Hanako came running' and cannot mean 'Taro knew Hanako'. On the other hand, in (6c), the main predicate's syntactic argument is the entire embedded clause, but its semantic argument is *Hanako* inside the embedded clause[13].

It is also necessary to note the interaction between syntax and semantics of the construction. That is, although the semantic argument is a physical entity within the embedded clause, the fact that the syntactic argument is the whole embedded clause enables the construction to semantically describe a part-whole relationship between the embedded clause event and the main clause event[14]. This function of describing a part-whole relationship between two events (or the semantic duality) is what distinguishes the IHRC construction from typical relativization.

5. Conclusions

In this paper, I have shown that in addition to the pragmatic relationship between the two events described in the embedded clause and the main clause, there are syntactic and semantic conditions for acceptable IHRCs. By defining these conditions I have demonstrated that this construction has a dual function, namely, to describe a part-whole relationship between the two events, and to identify a physical entity inside the IHRC. I have also argued that there exists a discrepancy between the syntax and semantics due to the dual function of the construction. This discrepancy is what distinguishes this construction from event nominalizations. Furthermore, the syntactic condition interacts with the semantics, and this is why the construction contains a duality.

Thus, in order to account for the Japanese IHRC construction, it is necessary to have a theory that can describe both syntactic and semantic constraints, and interactions between the two.

NOTES

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1 The term construction is used in its classical sense, to refer to the encoding of the organizational schema.

2 With the term EHRC, I include the type of relative clause in Japanese, examined in Matsumoto (1988). In that construction, the embedded clause is gapless but it is followed by a full lexical NP (unlike IHRCs) as in (a) taken from a TV commercial and reported in Ohori (1991). For a detailed account of this construction, see Matsumoto (1988).

(a) [[Zinsee-ga barairo-ni naru] wain]-da yo.
life NOM rosy DAT become-RU wine-PRED PRT
'(This) is the wine such that (if you drink it, your) life becomes rosy (=happy).'

3 The target of relativization (or the modified NP) in Japanese EHRCs does not have to be an indefinite noun. It can also be a proper noun as shown in sentence (2).

4 For detailed discussions of *no* as a nominalizer in the IHRC construction, see Kuroda (1976-77) and Tsubomoto (1981).

[5] In certain subordinate clauses in Japanese, the case marker *ga* alternates with *no*. Charles J. Fillmore called my attention to the fact that in IHRCs, however, *ga* does not alternate with *no*. See Kuroda (1976-77) for details.
[6] Ishii (1989) argues that an IHRC cannot occur in the subject position with any verb at the D–structure, but an IHRC can appear in the subject position with a transitive verb as well as that with an intransitive verb.
[7] I would like to thank Charles J. Fillmore, Yoko Hasegawa, and Derek Herforth, for calling my attention to this point.
[8] I would like to thank Masayo Iida, Minoru Nakau, and Peter Sells for bringing to my attention the aspectual meaning of IHRCs.
[9] Kuroda calls this 'co-positionality' between the embedded clause event and the main clause event (Kuroda 1976: 273).
[10] Minoru Nakau argues that other things being equal, the subject of an IHRC becomes the target (personal communication). However, for some speakers of Japanese, the reading in which the mouse (i.e., the object of the IHRC) is the target, namely, 'Taro caught the mouse that the cat was chasing.' is also possible. Furthermore, as McCawley observes, the following sentence has two readings: one in which the indirect object of the IHRC is the target; and the other in which the subject of the IHRC is the target (McCawley 1991):

(b) Doroboo-wa [Ziroo-ga Taroo-ni okane -o yatta] -no -o osotta.
thief TOP NOM DAT money ACC give-TA NO ACC attack-TA
'A thief attacked Taro as Jiro was giving him the money.' or 'A thief attacked Jiro as he was giving Taro the money.'

In any case, the point here is that pragmatic contexts narrow down the range of possible targets as exemplified in (9b,c).
[11] Kuroda calls this phenomenon of having more than one target 'split pivot' (Kuroda 1976).This phenomenon seems to be quite rare among the languages that have IHRCs (Culy 1990). See also Cole (1987) and Nichols (1984) for cross-linguistic and typological study on IHRCs.
[12] Horie defines event nominalizations as "a syntactic process of nominalizing a physically (directly) and/ or mentally (indirectly) perceived event" (Horie 1991).
[13]There are several other tests to determine whether a *no*-marked embedded clause is an IHRC or an event nominalization. First of all, an IHRC cannot contain a time adverbial which shows that the embedded clause event happens at a different time than the main clause event, while there is no such restriction with event nominalizations. Thus, adding time adverbials *kinoo* 'yesterday' in the embedded clause and *kyoo* 'today' in the main clause to (11) still yields an acceptable event nominalization interpretation as can be seen in (c) below. However, if the two adverbials are added to the clauses in (6c), it does not result in an acceptable IHRC sentence as seen in (d) below.

Event nominalization
(c) Taroo-wa [kinoo Hanako-ga hasittekita] -no -o kyoo sitteita.
TOP yesterday NOM come-running-TA NO ACC today know-TA
'Taro knew today that Hanako came running yesterday.'

IHRC
(d) *Taroo-wa [kinoo Hanako-ga hasittekita] -no -o kyoo tukamaeta.
TOP NOM come-running-TA NO ACC catch-TA
Intended: 'Taro caught Hanako today who came running yesterday.'

Paul Kay called my attention to the fact that it is not possible to have a conjoined sentence in the embedded clause for an acceptable IHRC, while it is possible for an acceptable event nominalization. In addition, an IHRC cannot contain auxiliaries such as *wa* and *mo*, whereas event nominalizations can (Kuroda 1976-77: 174-178).

[14] I would like to thank Eve Sweetser for suggesting this point.

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Mandarin Ditransitive Constructions and the Category of gei

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In this article, we show that the parallelism between Mandarin gei ditransitive constructions and their English counterparts is misleading. The gei that occurs next to a verb will be argued to be part of a complex predicate and the gei phrase that occurs after the DO (direct object) will be shown to be part of a SVC (Serial Verb Construction). The theoretical implications of this account of gei and some diachronic ramifications will also be given.

The Mandarin ditransitive constructions involving gei look suspiciously like their English counterparts with 'to' (1). Hence gei is usually treated as a preposition and the constructions accounted for with variations of dative movements (e.g. Teng 1975, T. Tang 1979, and Li and Thompson 1981). This prepositional account is also extended to a case with no corresponding English construction, where gei+IO(indirect object) occurs immediately after the main predicate (2).

(1) a. verb DO gei(cf. to) IO [post-DO gei]
b. verb IO DO

(2) verb gei IO DO [postverbal gei]

This transformation-based approach has the advantage of offering a uniform source for the two positions of indirect object and thus derivationally relates the two structures (1a) and (2). Such an account also has several theoretical consequences. For instance, this PP analysis poses a challenge to any ID/LP account of phrase structure rules fashioned after the theory of GPSG (Gazdar et al. 1985). The proposed gei-IO-DO sequence would be an exception to the generalization that NPs precede PPs in a local tree. And the DO-gei-IO sequence would prevent the formation of any precedence rules in terms of the function of the two objects. From another theoretical perspective, as observed in Li (1990), the postulation of gei as a preposition poses problematic cases with the adjacency condition on Case assignment in the GB theory.

We will show that the prepositional accounts are incorrect and that neither of the postverbal and post-DO gei's are prepositions. We will argue for the long-overlooked analyses of Chao (1968) that the V-gei sequences are compounds and that the discontinuous structure of (1a) involves a verb series. This position will not only account for the data more felicitously but also resolve the above two theoretical dilemmas.

I. Postverbal gei as a verbal affix

First, facts show that the gei occurring immediately after a verb (as in 2) is not a preposition.

(3)a. Zhangsan ti-gei-(le) Lisi yi-ge qiu
Zhangsan kick-GEI-PERF Lisi one-CLASS ball
`Zhangsan kicked a ball to Lisi.'
b. *Zhangsan ti-(le) Lisi yi-ge qiu
Zhangsan kick-PERF Lisi one-CLASS ball

The postverbal gei allows the attachment of aspect markers, as in (3a). The attachment of aspect markers is the most reliable test of verb-hood in Mandarin Chinese (Huang and Mangione 1985, C. Tang 1990, etc.), and Mandarin prepositions do not allow attachment of aspect markers (Chao 1968).

(4)a. ta fang na-ben shu zai zhuoshang
s/he put that-CLASS book ZAI desk-top
`S/He put the book on the desk,'
b. ta dui Zhangsan shuo ta bu dong
s/he DUI Zhangsan say s/he NEG understand
`S/He told Zhangsan that s/he did not understand.'

Furthermore, there is neither independent theoretical motivation nor empirical evidence in Mandarin Chinese for a PP position between a verb and an OBJ. Attested PPs in Chinese either occur after an OBJ in the VP-final position, as the locative PP in (4a), or pre-verbally after the SUBJ, as the GOAL PP in (4b). But neither of the attested PPs can appear between a verb and its direct object, as in (5).

(5)a. *ta fang zai zhuoshang yi-ben shu
s/he put ZAI desk-top one-CLASS book
b. *ta shuo dui Zhangsan ta bu dong
s/he say DUI Zhangsan s/he NEG understand

The above data suggest a structural constraint on the co-occurrence between arguments and their governing predicates. Specifically, the generalization is that a non-oblique PATIENT-like role must appear right-adjacent to the governing predicate in Mandarin. This constraint can be formulated in terms of an adjacency constraint similar to that of the Case Theory of GB or the argument obliqueness hierarchy of HPSG (following a long tradition of argument combination principles in Montague Grammar). Analyzing the postverbal gei as a preposition would either counterexemplify the above generalizations or call for otherwise unmotivated abstract accounts.

Finally, a preposition cannot be stranded in ellipsis in Mandarin Chinese. While non-oblique arguments can be freely left out in context (the so-called pro-drop phenomena), ellipsis can also involve a whole PP but not a prepositional object alone. (6) and (7) demonstrates this contrast. Ellipsis involving an object following the postverbal gei, however, can involve the indirect object only, as in (8).

(6)a. ta fang-le
s/he put-PERF
`S/He put (something) down.'
b. shuo-le
say-PERF
`(s/he) talked.'

(7)a. *ta fang na-ben shu zai
s/he put that-CLASS book ZAI
b. *ta dui shuo ta bu dong
s/he DUI say s/he NEG understand

(8) shunshou jiu di gei yi-er qian yuan de xiaofei
off-hand then hand-out GEI one-two thousand dollar DE tips
'(S/he/they) hand out tips of a couple of thousand dollars offhand.'

So far, we have shown that the postverbal gei is unlike a preposition in distribution and ellipsis, and that it has the un-preposition-like property of allowing attachment of verbal affixes. We will next discuss four sets of its properties that show it is like a verbal affix, including some earlier observations made in Huang (1990a).

The first affix-like property of postverbal gei is that it selects a subclass of verbs. Since gei can only be attached to a verb, it has the definitive affix property of selecting the grammatical category of its host. Furthermore, data suggest that gei can only be attached to transitive verbs.

(9)a. Zhangsan pao-gei Lisi yi-shu hua
Zhangsan toss-GEI Lisi one-CLASS flower
'Zhangsan tossed a bouquet to Lisi.'
b. *Zhangsan shuo-gei Lisi yi-ju hua
Zhangsan say-GEI Lisi one-CLASS words
c. *Zhangsan shui-gei (Lisi) (yi-gei xiawu)
Zhangsan sleep-GEI Lisi one-CLASS afternoon

It is shown in (9) that the combination of gei with its host is restricted. (9c) shows that gei cannot be attached to an intransitive verb: There are no exceptions to this fact. (9b), however, shows that not all transitive verbs allow the attachment of gei. We will argue that gei lexically selects a subclass of verbs that is not independently defined.

(10)a. [yiyuan] .. geng bu-hui meishi guangei shenzhuxi
assemblymen further NEG-will no-fact cap-GEI province-chair
zheme zhong de xingrongci
such severe DE adjective
'Furthermore, [these asssemblymen] will not apply such harsh expressions on the governor with no reason.'
b. *[yiyuan] .. geng bu-hui meishi guan shenzhuxi
assemblymen further NEG-will no-fact cap province-chair
zheme zhong de xingrongci
such severe DE adjective

To further support the generalization that gei can only be attached to a transitive verb, (10) also shows that gei can be attached to stative as well as active transitive verbs. In other words, the active/stative bifurcation is not relevant in the restriction on the attachment of gei. The generalization seems to be that gei selects transitive verbs whose meaning allows a secondary movement of a THEME towards a GOAL. But note that the verb shuo 'to say, talk' could satisfy this generalization and yet gei cannot be attached to it(9b). The idiosyncratic gaps can be accounted for as a typical property of the morpholexical rule of affixation.

Secondly, no constituent can intervene between gei and the verb, suggesting lexical integrity. Although this fact could possibly be accounted for in terms of some adjacency conditions, the fact that aspect affixation takes verb-gei as a whole unit, as in (11), supports the lexical integrity rather than the adjacency account. And the fact that aspect marker -le cannot intervene between the verb and -gei also follows from the fact that it is an affix, regardless of whether the aspect markers are treated as an inflectional affix (Dai 1991), or a clitic (Huang 1987).

(11)a. ta guan fu-xin
she cap husband-family+name
'She adopts her husband's family name (on top of her maiden name).'

b. ta guangei Zhangsan yi-ge hunming
s/he cap-GEI Zhangsan one-CLASS nickname
'S/he imposed a nickname on Zhangsan.'

(12)a. Zhangsan diu-gei-le Lisi yi-ge qiu
Zhangsan throw-GEI-PERF Lisi one-CLASS ball
`Zhangsan threw a ball to Lisi.'

b. *Zhangsan diu-le-gei Lisi yi-ge qiu
Zhangsan throw-PERF-GEI Lisi one-CLASS ball

Thirdly, the V-gei combination shows such lexical properties as semantic shift and idiosyncratic gaps. The semantic shift fact can be exemplified by (12). While the bare verb guan has the very restrictive meaning of 'to adopt (a family name)', guan-gei has a different meaning of 'to use/apply (certain expressions/names on someone)'. The lexical idiosyncracy fact can be best exemplified by a synonymous pair pan and panchu, both mean 'to judge, to sentence' and share identical subcategorization frames, as shown by the following two sentences from our corpus.

(13)a. fayuan panchu Li Feng-Zhou si-xing
court sentence Li Feng-Zhou death-penalty
'The court sentences Li Feng-Zhou to death penalty.'

b. zhong-gong pan ta si-xing
Chinese-communist sentence him/her death-penalty
'The Chinese communists sentenced him/her to death penalty.'

However, only pan-gei is an allowed compound, as in (14).

(14) buoying-quan yi pan-gei huashi
broadcast-right already judge-GEI CTS
'The braodcast right has already been verdicted to CTS.'

Last but not least, we can show that the affixation of -gei is accompanied by the lexical operation of inserting an additional GOAL role to the argument structure. This is demonstrated below.

(15)a. Zhangsan ti-gei-(le) Lisi yi-ge qiu
Zhangsan kick-GEI-PERF Lisi one-CLASS ball
'Zhangsan kicked a ball to Lisi.'
b. Zhangsan ti-(le) yi-ge qiu
Zhangsan kick-PERF one-CLASS ball
'Zhangsan kicked a ball.'
c. *Zhangsan ti-(le) Lisi yi-ge qiu
Zhangsan kick-PERF Lisi one-CLASS ball

In (15) ti 'to kick' is a typical transitive verb that allows -gei affixation. It is strictly mono-transitive as shown in (15b) and (15c). However, the verb becomes ditransitive when affixed with -gei, as in (15a). Other typical mono-transitive verbs that allow the affixation of -gei to add on a GOAL role include reng 'to toss', tui 'to push', na 'to take', yao 'to scoop', jua 'to grasp' etc. A more dramatic example of the productivity of this morpho-lexical rule is the possibility of attaching -gei to a non-Chinese loan word in informal speech.

(16) Meiguo telex-gei women yibi dingdan
USA telex-gei we one-CLASS order
'The US (company) telexed us a batch of orders.'
(comp. * Meiguo telex women yibi dingdan)

The fact that native speakers apply the affixation of -gei to mark the addition of a GOAL role offers one of the strongest supports to the position that -gei is a derivational affix (Huang 1990a). This also confirms the view that Mandarin does have a rather rich verbal morphology in terms of argument-changing (Huang 1991) and that argument-changing rules should be encoded on the affixes.

We have clearly demonstrated in this section that the postverbal gei is an affix and the V-gei sequence a compound. This resolves the linear precedence dilemma posed by the prepositional account. Since the NP after postverbal gei is an object of the compound verb instead of the alleged preposition, the LP generalization that NP's precede PP's in a local tree is preserved. Similarly, many complications in a GB account of Mandarin caused by a purported (non-Case-receiving) PP in a Case assignment position will prove to be superfluous.

II. Post-DO gei and the Serial Verb Construction

On the other hand, the post-DO gei does not have any affix-like property. It does not concatenate with any verb (17a), nor allow attachment of aspectual markers (17b).

(17)a. Zhangsan ti yi-ge qiu gei Lisi
Zhangsan kick one-CLASS ball GEI Lisi
'Zhangsan kicked a ball to Lisi.'

b. *Zhangsan ti yi-ge qiu gei-le Lisi
Zhangsan kick one-CLASS ball GEI-PERF Lisi

c. *Zhangsan ti-le yi-ge qiu gei-le Lisi
Zhangsan kick-PERF one-CLASS ball GEI-PERF Lisi

In addition, it cannot be stranded either, as in (18).

(18) *Zhangsan ti yi-ge qiu gei
Zhangsan kick one-CLASS ball GEI

Hence, the post-DO gei does show certain preposition-like properties and its sentence final position is also compatible with that of a typical preposition in Mandarin. In fact, C. Tang (1990) does include gei as an instance in her argument for a post-verbal PP position in Mandarin Chinese. However, we will show not only that all the above facts can be attributed to characteristics of a serial verb construction (SVC), but also that there are some facts incompatible with a prepositional account.

First, it is accepted in the literature that a verb series in a SVC can have only one tense/aspect (e.g. Sebba 1987, Mo et al. 1991). Thus, the SVC account of post-DO gei predicts the ungrammaticality of (17c). As for the ungrammatical (17b), the observation is that only the first verb can be marked with aspect when the SVC has the subordinating structure described in Mo et al. (1991).

(19) Lisi zhong jiang mai-le yi-dong xin fangzi
Lisi win prize buy-PERF one-CLASS new house
'Lisi won lottery and bought a new house.'

(20)a. [[]np=subj [V []np=obj [V...]vp=adjunct]vp]
b. [[]np [[]v' []np []cp]vp]

(19) shows that while Mandarin SVC does allow aspect to be attached to either verb, attachment to the second verb is limited to the 'concatenating' type described in Mo et al. (1991). In the SVC with post-DO gei, the gei phrase is an adjunct and an aspect marker can only be attached to the superordinating verb. C. Tang's (1990) CP adjunct account of Mandarin SVC also makes the same prediction. The structures proposed in Mo. et al. (1991) and C. Tang (1990) are given in (20)a and b respectively.

On the other hand, the fact that post-DO gei cannot be stranded may have something to do with the fact that Mandarin does not allow indirect object gaps in general (Huang 1992).

(21)a. *Lisi, ta gei-le yi-ben shu
Lisi s/he give-PERF one-CLASS book

b. *[ta gei-le yi-ben shu de ren]np
s/he give-PERF one-CLASS book DE(rel. clause marker) person

c. nei-ben shu, ta gei-le Lisi
that-CLASS book s/he give-PERF Lisi
'That book, s/he gave to Lisi.'

(22)a. *Lisi, ta gei-le yi-ben shu
Lisi s/he give-PERF one-CLASS book
b. *[ta gei-le yi-ben shu de ren]np
s/he give-PERF one-CLASS book DE(rel. clause marker) person
c. nei-ben shu, ta gei-le Lisi
that-CLASS book s/he give-PERF Lisi
'That book, s/he gave Lisi.'

Thus, we have shown that the preposition-like properties of post-DO gei are compatible with a SVC account. We will next show that gei is also involved in data that crucially depends on a SVC account.

(23)a. Lisi song-le yi ben shu gei Zhangsan (kan)
Lisi give-PERF one CLASS book GEI Zhangsan read
`(Lit.) Lisi sent a book to give Zhangsan the book to read.'
b. *Lisi song-le Zhangsan yi ben shu kan

(23a) shows that the object of post-DO gei controls the subject of a following verb. This is unexpected if the post-DO gei were a preposition.

(24) ta fang-le [yi-ge wan] [zai zhuo-shang], hen youni
s/he put-PERF one-CLASS bowl at table-top very greasy
a. 'S/he put a greasy bowl on the table.'
b.*'S/he put a bowl on the greasy table.'

Even though the predicate youni 'greasy' selects both zhuo-shang and wan, (24a) is the only possible reading. That is, prepositional objects are not eligible controllers in Mandarin Chinese, albeit they may occur immediately preceding the controllee. This may be readily accounted for with a theory of universal controller hierarchy based on grammatical functions. For instance, adopting Bresnan's (1982) theory, Mandarin data show that only the two highest grammatical functions, SUBJ and OBJ, can be controllers in Mandarin. If post-DO gei were a preposition, it would mean that a certain OBL object can be a controller in Mandarin, while a OBJ2 (second object) cannot. This is contrary to both the observed generalization in Mandarin and the universal hierarchy of controllers argued by Bresnan (1982).

Before presenting further arguments for the SVC account, it should be helpful to review the structures involving gei and possible generalizations among these structures.

(25) a. NP gei NP V NP
b. NP V NP NP
c. NP V-gei NP NP
d. NP V NP gei NP

(26) a. NP gei NP V NP
b. NP V gei NP VP
c. NP V gei NP

(27) a. NP gei NP V NP
b. NP V NP gei NP VP
c. *NP V NP gei NP

We have argued in the last section that the post-verbal gei should be accounted for as a verbal suffix marking the addition of a GOAL role. Thus the four-way structural contrast of Mandarin ditransitive constructions in (25) is reduced to three, with (25c) treated as a special case of (25b). The clear advantage of a prepositional account of (25d) is to derivationally relate it to (25a) and possibly (25b). However, we have just observed that there is another set of structural parallelism involving post-DO gei. The so-called purposive clause in (26b) and (27b) led by gei clearly favors a SVC account where gei is treated as a verb. Hence the c sentences in (25) through (27) could be accounted for as the same SVC with an optional third VP.

(28)a. baba gei Lisi yi-baiwan mai fangzi
father give Lisi one-million buy house
'Father gave Lisi a million to buy a house.'
b. baba song yi-baiwan gei Lisi mai fangzi
father give one-Million GEI Lisi buy house
'Father gave Lisi one million to buy a house.'
c. baba song yi-baiwan gei Lisi
father give one-Million GEI Lisi
'Father gave Lisi one million.'

(29)a. Zhangsan fang-le yi-bu dianying gei dajia kan
Zhangsan play-PERF one-CLASS movie GEI everyone watch
'Zhangsan played a movie for everyone to watch.'
b. *Zhangsan fang-le yi-bu dianying gei dajia
Zhangsan play-PERF one-CLASS movie GEI everyone

(30) Zhangsan fang-le yi-bu dianying qing/rang dajia xinshang
Zhangsan play-PERF one-CLASS movie invite/let everyone enjoy
'Zhangsan played a movie for everyone to enjoy.'

On the other hand, there are matrix verbs that do not allow the last VP to be elided, as exemplified in (30). Thus, one could postulate that the gei NP sequence without ensuing VP is actually a PP and the structure is derivationally related to sentences with a pre-verbal gei. Such a position is adopted in C. Tang (1990). She gives (28a) as an instance of SVC and accounts for gei as a verb head of a PredP, and treats gei in (28c) as a preposition, like zai in (24). This account would readily explain the contrast between (28c) and (29b). The ditransitive verb song subcategorizes for a GOAL PP and therefore (28c) is grammatical. The verb fang 'to play (a movie, a tape, etc.)' does not, and therefore (29b) is ungrammatical.

The prepositional account of gei in (28c), however, remains to be problematic. The ungrammatical (29b) clearly shows that the post-DO gei in (29a) cannot be a preposition. Verbs like fang 'to put on' do not subcategorize for a GOAL complement and do not allow a postverbal gei phrase, but they do occur as the leading verb in a SVC, as in (30). Thus, we can safely conclude that the post-DO gei in (29a), like qing 'to invite' rang 'to allow' in (30), is one of the verbs in a serial verb construction. There is no reason to analyze the gei in (28b) differently. In other words, a post-DO gei is clearly a verb in a SVC when there is another verb following the object of gei.

(31)a. gankuai dao bei shui gei puopuo (he)
hurry pour cup water GEI gramma drink
'Hurry, pour a cup of water for gramma (to drink).'

b. fuyin-le 'shoubiao-xin hujiaoqi' de xinzhuang gei jiankou
Xerox-PERF wrist-watch-type beeper DE shape GEI monitor-test
renyuan (cankao)
staff reference
'[They] xeroxed pictures of 'watch-shaped beepers' and gave [the copies] to test proctors (to refer to).'

The above two sentences extracted from corpus show that the leading verb preceding a post-DO gei phrase need not be a ditransitive verb. Neither dao 'to pour' in (31a), nor fuyin 'to xerox' in (31b), subcategorizes for a second object, thus the post-DO gei phrase cannot be a PP argument. Furthermore, the optional sentence-final verb indicates that these sentences involve serial verb constructions. Hence the prepositional account of post-DO gei does not offer any explanation for the contrast in the optionality of the sentence-final verb. It would correctly predict the grammaticality of all the sentences in (28) and (29), but would wrongly rule out both sentences in (31). Thus the prepositional account not only does not offer a unified account of the structural similarity between the b and c sentences in (26) and (27), it also fails to account for the contrast between (26c) and (27c).

In contrast, the SVC account straightforwardly explains the parallel structures of the above mentioned b and c sentences. The reason why a third verb is sometimes obligatory and sometimes optional in a SVC with gei as the second verb calls for additional explanation. Paul (1987) observes that a SVC cannot end with a gei phrase when the object of gei is abstract and cannot be transferred. However, this generalization allows many exceptions, such as (32).

(32)a. Zhangsan zhu tang gei ta he
Zhangsan cook soup GEI s/he drink
'Zhangsan cooked soup for him/her to drink.'

b. *Zhangsan zhu tang gei ta
Zhangsan cook soup GEI s/he

In (32), a third verb is obligatory after gei even though the object of gei is non-abstract and clearly transferrable. With the contrast of (31a) and (32a), we also show that the obligatoriness

is not dependent on the third verb. What we observe in the sentences requiring a third verb is that the objects have the role of an incremental theme. This is true for both dianying 'movie' in (29) and tang 'soup' in (32). On the other hand, the shape of a beeper (31b), water (31a), or a million dollars (28) are not created by the predicates and are not incremental themes. This observation holds for all the cases we studied. The nature of the lexico-semantic constraint that governs this distribution, however, is still unclear to us at this moment.

Last but not least, as observed Li (1990) and Chao-fen Sun (p. c.), the prepositional proverbial gei marks both the GOAL and BENEFICIARY arguments and no longer has the full predicative meaning. The post-DO gei, on the other hand, has the full predicative meaning involving the act of giving. In other words, the post-DO gei is yet to be reduced to an argument marking device and still has the lexical predicative meaning. This is another strong argument against analyzing the post-DO gei as a preposition.

To sum up, even though distribution and other syntactic tests do not yield decisive evidence for the categorical status of post-DO gei, there are arguments clearly in favor of a verbal account. First, the control facts suggest that a SVC account is supported by a universal hierarchy of controllers. Second, the fact that certain transitive verbs allow a verb series lead by gei to follow them though they do not subcategorize for a GOAL shows that a serial verb account is necessary. Last, the SVC analysis allows a more elegant account of the typology of structures involving gei. A PP account limited to a gei phrase without an ensuing verb is superfluous because the optionality of this verb following the post-DO gei phrase cannot be predicted by the transitivity of the leading verb alone. Thus, we have shown with internal motivation that the post-DO gei is best accounted for by a verb in a serial verb construction.

III. Historical Ramifications

The last argument supporting our account comes from studies of the historical changes of the ditransitive constructions of Mandarin Chinese. The result reported here is based on Peyraube (1986), C. F. Sun (p.c.), and our studies of the historical corpus at Academia Sinica.

(33)a. V IO DO
b. V DO yu2 IO
c. V1 DO V2 IO
d. V1-V2 IO DO

According to Peyraube (1986), the critical period of structural changes for Chinese ditransitive constructions occurred between the first and tenth century A. D. Of the three structures discussed in this paper, (33a) and (33b) are attested during Warring States (roughly 4th to 2nd century B. C.) documents. The third and fourth, i.e. (33c) and (33d), are innovations studied by Peyraube. Between the tenth century and modern Chinese, the most crucial change is the lexical replacement of the ancient form yu3 with the modern form gei3 in spoken Chinese. This occurred during

the fifteenth century. This position is supported by Sun's recent study of the history of Chinese prepositions and our corpus.

The reason for listing (33b) and (33c) separately is because the first historical change that took place between the first and tenth century is that a group of verbs replaces the preposition yu2. These were ditransitive verbs which have the neutral meaning of the action of the source giving a theme to the goal, without specifying other attributes of the action. The meaning of V2 will later be bleached and yu3 will become the only verb allowed in this position. A later innovation, starting from roughly the third century A.D., is the emergence of the structure (33c). Similarly, the original group occurring in the V2 position will gradually be substituted by yu3 until it becomes the only lexical item allowed in this position. Both structures are preserved in Modern Mandarin with the lexical replacement of yu3 by gei, which by all accounts, occurred in the fifteenth century.

Note the (surface) structural parallelism between (33)a, b, d and the structures studied here, (1)a, b, and (2). It is not surprizing that our affixation account of the post-verbal gei and the SVC acount of the post-DO gei are supported by their historical counterparts. Recall that yu3 is the lexical item replaced by gei.

(34) jiacai fenzuo yu2 san-ting,
family-fortune divide-become to three-part
er-fen liu-yu3 yu2 ci mu
two-share leave-YU to loving mother
'[He] divided his fortune into three equal parts and left two parts to [his] mother.'
(Dunhuang bianwen [vernaculars], ca. 10th century A.D.)

In (34), the V-yu3 sequence is followed by the archaic Chinese preposition yu2. Peyraube, assuming the previous accounts that all gei's following a verb are prepositions in Modern Mandarin, takes this as crucial evidence to show that the yu3 attached to a verb has not grammaticalized to a preposition in tenth century A.D. However, closer examination of the sentence (actually a couplet, though the bianwen rhymes and meters are usually quite free), suggests that 'liu-yu' is actually a compound verb. There is no doubt that fenzuo, the corresponding part of the liu-yu in the first half of the couplet is a compound verb, since it is still used as such in Modern Mandarin, and the alternative analysis of zuo as a preposition is not available. Thus liu-yu is most likely also a compound. Peyraube's position that yu3 is still a full fledged verb in this case is also debatable since even though the mixed structure of 'V (DO) yu2' is common in this period, we do not find yu3 "to give' as a verb in this construction. Plausible explanation of the non-cocurrence of yu3 before yu2 lies in the fact that yu3 lexically substitutes yu2 in double object constructions. Any cooccurrences of yu3 and yu2 maybe viewed as incompleted substitutions and are avoided. liu-yu, as a compound, however, will not be subject to this rule. In other words, (34) not only shows that yu3 is not a preposition, it also supports the account that V1 and V2 form a compound verb. This mirrors our account of the modern V-gei sequence in (2).

On the other hand, there are also occurrences of post-DO yu3 which suggest a SVC analysis.

(35) bixia shouming buguo bai-nian,
majesty life no+more+than hundred-year
yu zhong ci tao yu3 sheiren shi zhi
want plant this peach give who-person eat 3rd pers
'The life of your majesty is no more than one hundred years, and which is the person that you want to plant this peach for [so as to bear fruit] to give him/her to eat?'
(Dunhuang bianwen [vernaculars], ca. 10th century A.D.)

In (35), we see clearly that yu3, the historical predecesor of gei, occurs as the second verb of a verb series. Unlike the preverbal preposition which is ambiguous between a beneficiary and a goal marker, the yu3 here has the clear meaning of 'to give' and the object of it controls the subject of the following verb shi 'to eat'. In addition, the verb zhong 'to plant' also does not subcategorize for a GOAL argument. So it likely that (35) is an instance of SVC with yu3 as the second verb.

IV. Conclusion

We have shown that the postverbal gei that is concatenated to a verb is actually an affix. This account also finds historical correspondences. On the other hand, two alternative accounts of the post-DO gei have shown to be largely compatible, though language internal argument shows that the SVC account is superior. Historical precedents are also found for this account, even though we are definitely making no claim that the historical constructions and the gei constructions studied in this paper share identical structures. We think a synchronic account can certainly be strengthened if it is found to be compatible with its historical developments.

Moreover, this account entails that, except for locative PPs, all PPs in Chinese are pre-verbal. It also suggests that the SVO/SOV word order change debate can be reduced to a shift of the post-verbal PP position to a predominant pre-verbal position. Last but not least, the ad hoc typology of double object construction based on whether post-verbal gei is not allowed, optional, or obligatory can now be grammatically motivated. A verb that is inherently ditransitive, like song 'to give' can have optional -gei afffix. The verbs that are lexically mono-transitive but allow a secondary motion interpretation can form a ditransitive compound with the affixation of -gei, hence -gei is obligatory in this class of ditransitive verbs, such as yāo 'to scoop'. And since the affixation of -gei marks the addition of a GOAL, ditransitive verbs that require a second SOURCE object rather than a GOAL object do not allow -gei affixation. This is exemplified by the disambiguiation of jiegei 'to lend to'. Where jie is lexically ambiguous and has the bidirectional meaning of both 'to lend' and to 'borrow'. Thus we show that re-examining language-internal evidence can help clarify a complicated account suggested by comparative studies.

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Are there any *truly quantity-insensitive* systems?

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0. Introduction

This paper* explores the issue, relevant to the theory of metrical phonology, as to whether trochaic stress rules ever completely ignore distinctions of syllable quantity. Firstly, we will present results of a typological survey, which strongly suggests that quantitative distinctions may be partly ignored, but never be completely ignored. Secondly, we will present two case studies of Gooniyandi and Finnish, which show various ways in which weight distinctions may become manifest in trochaic systems whose feet are otherwise quantity-insensitive. The theoretical consequences of our findings are addressed in Kager (1992b).

The theories of quantity and stress allow languages to vary along two dimensions, assumed to be independent. Firstly, whether or not a language has a distinction of syllable quantity (e.g. a distinction of vowel length). Secondly, whether or not a language has quantity-sensitive stress. Quantity-insensitive feet do not take into account the weight of the syllables they parse, while quantity-sensitive feet do so, and restrict heavy syllables to head positions. For trochaic feet, Hayes (1991) expresses this distinction as one between quantity-insensitive *syllabic trochees*, and quantity-sensitive *moraic trochees*:

(1) a. *Syllabic Trochee*: Construct (* .) σ σ

b. *Moraic Trochee*: Construct (* .) σ_μ σ_μ or (*) $\sigma_{\mu\mu}$

Freely combining these two dimensions, theory predicts the following types of system. Firstly, systems without quantitative distinctions, based on syllabic trochees. Empirically, these are indistinguishable from moraic trochee systems that happen to lack quantitative distinctions. Let us call such systems *trivially* quantity-insensitive. In the absence of weight distinctions, stress alternates in a strictly binary fashion. This type is exemplified by *Anyula* (Kirton 1967), which has the characteristic bisyllabic word minimum, as well as alternating stress:

(2) a. (* .)
há.wu
"cloud"

b. (* .) . (* .)
má.ru.wa.rá.la
"with the cousin"

Secondly, theory predicts quantity-sensitive systems, with weight distinctions and moraic trochees. Here, each heavy syllable forms a foot on its own, and feet are formed of pairs of light syllables. A good example is *Nunggubuyu* (Hore 1981), where the word minimum is bimoraic, i.e. a minimal foot. Stress is on all heavy syllables and on every other syllable in a string of light syllables. (Below "-" indicates a heavy syllable, "˘" a light syllable):

(3) a. (*)
–
yúul
"bushland"

b. . (*) (* .) (*) (* .)
˘ – ˘ ˘ – ˘ ˘
dhu.màa.mù.gu.nàa.mú.rra
"snake species"

Thirdly, systems with weight distinctions, and syllabic trochees that ignore these, provide the motivation for metrical theory to consider the presence of a quantity contrast formally independent from quantity-insensitive stress. Before turning to actual languages, let us determine what such a *truly* quantity-insensitive system would look like. In its purest form, it would have a bisyllabic word minimum, and strictly binary stress alternation, ignoring syllable weight:

(4) a. (* .)
tá.taa

b. (* .) (* .) .
táa.ta.tá.taa.taa

The goal of this paper is to show that such systems are only marginally attested, and apparently always combine the syllabic trochee with the moraic trochee into the so-called *generalized trochee* (cf. Hayes 1991).

1. The generalized trochee hypothesis

Hayes (1991) observes stress systems in which both the syllabic and the trochaic trochee seem to be relevant, i.e. systems in which both [σ σ] and [$\sigma_{\mu\mu}$] are proper feet. Firstly, many syllabic trochee systems with a syllable weight contrast have *bimoraic* word minima, as in *Pintupi* (Hansen and Hansen 1969). Another case is the *Mpakwithi* dialect of *Anguthirmi* (Crowley 1981:154): "In monosyllables, the length contrast is lost, and all vowels in monosyllabic words are phonetically long. However, if a monosyllabic word is made polysyllabic by the addition of a suffix, the vowel is short." That is, the bimoraic word minimum is enforced by monosyllabic lengthening, producing alternations as in (5):

(5) a. /ra/ [ra:] "stomach"
b. /ra+ŋa/ [raŋa] "stomach (locative)"

In both Pintupi and Mpakwithi, vowel length distinctions are restricted to the first syllable. Still, relevance of the syllabic trochee (instead of the moraic trochee) can be inferred from the location of (secondary) stresses in words whose first syllable is heavy. This pattern follows the scansion (6a), rather than (6b).

(6) a. $[\sigma_{\mu\mu}\ \sigma_{\mu}][\sigma_{\mu}\ \sigma_{\mu}][\sigma_{\mu}\ \sigma_{\mu}]$ ... Syllabic trochee parsing
b. $[\sigma_{\mu\mu}][\sigma_{\mu}\ \sigma_{\mu}][\sigma_{\mu}\ \sigma_{\mu}][\sigma_{\mu}$ ... Moraic trochee parsing

Crowley (1981:156) describes Mpakwithi stress as follows: "The first syllable and every alternate syllable receives stress. [...] Note however that if an otherwise stressable syllable is the last of the word, it is not stressed." From this description it can be inferred that when the first syllable is heavy, stress alternation resumes on the *third* syllable, as predicted by the syllabic trochee, not on the second, as predicted by the moraic trochee. Rightward syllabic trochees produce the pattern:

(7) a. (* .) .
á.ra.na "toenail"

b. (* .) (* .)
ʔú.nu.wá.na "blister"

c. (* .) .
dʳée.gwa.ti "trevally"

d. (* .) (* .)
dáa.ta.má.na "sap"

We thus find that Mpakwithi employs both the syllabic and the moraic trochee. Secondly, Hayes observes that the heavy monosyllabic foot [$\sigma_{\mu\mu}$] shows up in syllabic trochee systems in another context. Estonian (Hint 1973, Prince 1980) has a rightward quantity-insensitive style of alternation (we ignore optional ternarity). Final syllables that cannot be parsed into disyllabic feet are stressed iff they are heavy:

(8) a. (* .) (* .) (* .) .
σ σ σ σ σ σ σ_{μ}

b. (* .) (* .) (* .) (*)
σ σ σ σ σ σ $\sigma_{\mu\mu}$

A near-minimal pair of examples illustrating this property is given below:

(9) a. pí.mes.tà.va.le "blinding (ill.sg.)"
b. pí.mes.tà.va.màit "blinding (part.pl.)"

In order to account for the mixed nature of the systems discussed above, Hayes proposes the *generalized trochee* as a combination of the syllabic and moraic trochees.

(10) **Generalized trochee**: Construct (* .) else (*)
σ σ $\sigma_{\mu\mu}$

By *maximality* of foot construction, generalized trochees are disyllabic wherever possible. All expansions of [σ σ] are allowed, including those in which a heavy syllable occupies the weak (right-hand) position. The heavy monosyllabic trochee [$\sigma_{\mu\mu}$] shows up in contexts where no bisyllabic feet can be constructed: in monosyllabic words and at edges of domains.
Observations about systems such as Pintupi and Estonian lead Hayes (1991:101) to hypothesize that "the theory might eliminate entirely the category of syllabic trochee systems. It appears that all languages with syllabic trochees either require a generalized trochee analysis [...], or else have no distinction of syllable quantity." Let us refer to this as the *Generalized Trochee Hypothesis* (GTH). The GTH asserts that no stress rule completely ignores quantity distinctions. In this paper, we will provide evidence for the GTH from various sources, adding typological observations and case-studies to those of Hayes.

2. Testing the Generalized Trochee Hypothesis

Let us first consider the set of syllabic trochee systems with weight contrasts that are cited by Hayes (1991), one of the most extensive sources on stress typology. This includes *Czech, Dehu, Estonian, Finnish, Hungarian, Nengone, Piro, Vogul,* and *Votic*. However, for none of these systems can a completely quantity-insensitive stress pattern be established. Firstly, the source references for the majority of these systems (Dehu: Tryon 1967a, Nengone: Tryon 1967b, Piro: Matteson 1965, Vogul: Kálmán 1965, Votic: Ariste 1968) are fairly sketchy, and quantity-insensitivity is implicit at best. Particularly, irrelevance of quantitative contrasts to stress is left unmentioned, while no stress-marked examples are presented to demonstrate quantity-insensitivity. Secondly, all of the better-documented systems (the remaining Finno-Ugric languages and Czech) display some quantity-sensitivity. Secondary stresses in these systems are fairly weak and variable, but variability is always conditioned by syllable weight, as in Estonian (Prince 1980), Finnish (Carlson 1978), Hungarian (Kerek 1971:39-40) and Czech

(Jakobson 1962:615). English secondary stress has been claimed to be quantity-insensitive, but Kager (1989) shows that it is at least partially quantity-sensitive, analyzing it by a foot parsing mode much like the generalized trochee.
Let us now test the Generalized Trochee Hypothesis for a set of systems that were not considered by Hayes. Two core predictions from the GTH are the following:

(11) a. If a language has a distinction of syllable quantity, as well as a word minimum, then the minimal word must be bimoraic, not bisyllabic.
b. If a language has a distinction of syllable quantity, then it must allow monosyllabic heavy feet, even when it does not allow monomoraic light feet.

Both predictions receive overwhelming confirmation from a survey we conducted on Australian stress systems. The testing domain consists of languages that match all of the following three criteria: (i) distinctive vowel length *AND* (ii) some word minimum *AND* (iii) rhythmic stress based on *syllabic* trochee: $[\sigma_{\mu\mu}\ \sigma_{\mu}][\sigma_{\mu}\ \sigma_{\mu}]$ instead of $[\sigma_{\mu\mu}][\sigma_{\mu}\ \sigma_{\mu}]$, cf. (6). Out of 58 languages initially considered, only eight matched all three criteria. Results are summarized in (12):

(12)

Language	*Word min.*	$[\sigma_{\mu\mu}]$ occurs non-initially
A. Systems with V-length contrasts outside first σ		
Gooniyandi (McGregor 1990)	[μμ]	yes
Ngiyambaa (Donaldson 1980)	[μμ]	yes
Yindjibarndi (Wordick 1982)	[μμ]	yes
Guugu Yimidhirr (Haviland 1979)	[μμ]	yes
B. Systems with V-length restricted to first σ		
Anguthirmi (Crowley 1981)	[μμ]	---
Mantjiltjara (Marsh 1969)	[μμ]	---
Pintupi (Hansen and Hansen 1969)	[μμ]	---
Baagandji (Hercus 1984)	[σσ]	---

A bimoraic word minimum is found in all systems, except Baagandji (see below). The second prediction, which can only be tested in systems with length contrasts outside the first syllable, is confirmed for all such systems in the sample. We conclude that both predictions of the GTH are largely corroborated for Australian languages.
Let us now consider the case of *Baagandji*. Firstly, although Baagandji has a bisyllabic word minimum, the only monosyllable *ŋii, ŋim* "yes" conforms to bimoraicity. Secondly, the presence of the syllabic trochee $[\sigma_{\mu\mu}\sigma_{\mu}]$, along the lines of Mpakwithi (cf. 6a), is only inferred from Hercus' description (1984:45): "In all words of three syllables the accent is still on the first syllable, and the final syllable [...] has a very minor secondary accent [...] In all types of words of four syllables the pattern is again trochaic with the secondary accent being more prominent." Examples marked with secondary stress are *gúnigà* "fire" and *bíradùda* "hawk". However, secondary stress is not transcribed in the only stress-example presented with an initial heavy syllable, *báagandji* "Baagandji".

3. The generalized trochee in Gooniyandi

Gooniyandi (McGregor 1990) is an Australian language with a bimoraic root minimum (where closed syllables count as heavy): "[...] all monosyllabic roots have the syllable structures C(C)aa or CVC(C), where V is a short vowel. That is, all monosyllabic roots consist of two morae." (McGregor 1990:90) Examples[1]:

(13)		*CVV roots*			*CVC(C) roots*	
	a.	baa-	"call out"	e.	gaj-	"cut"
	b.	daa-	"give"	f.	ward-	"go"
	c.	maa	"meat"	g.	barn-	"return"
	d.	nyaany	"uncle"	h.	laj	"footprint"

Monosyllabic roots comprise about eight percent of all roots, i.e. those listed in a thousand-item dictionary. Percentages below are from McGregor (1990:90):

(14)	σ *Length*	*Verbal roots*	*Non-verbal roots*	*Total*
	1	30	1	8
	2	58	29	35
	3	9	47	39
	4	3	20	16
	5	---	3	2
	6	---	(0.1)	(0.1)

Stress in simple roots is initial (except in some trisyllabic roots whose second syllable is heavy, cf. i, j, m). In roots that are long enough (except in p. and w.), a second stress falls on the penult, under clash avoidance. Finally, a stress falls on final heavy syllables in words with stressless penults, i.e. under clash avoidance:

(15)				
	a.	-	máa	"meat"
	b.	˘ ˘	bá.ga	"burr"
	c.	˘ -	ngá.boo	"father"
	d.	- ˘	bóol.ga	"old man"
	e.	- -	dóo.mboo	"owl"
	f.	˘ ˘ ˘	ngá.dda.gi	"my"
	g.	˘ ˘ -	ngá.dda.nyóo	"mother"
	h.	˘ - ˘	dá.goor.la	"hole, depression"
	i.	˘ - ˘	ma.ndáa.dda	"Leichhardt tree"
	j.	˘ - ˘	ga.ráj.bi	"boy"
	k.	- ˘ ˘	bál.nga.rna	"outside"
	l.	- ˘ -	góo.dda.ngóol	"magpie"
	m.	- - ˘	bil.gáa.li	"midnight"
	n.	- - -	góo.roo.ngál	"Christmas Creek"
	o.	˘ ˘ ˘ ˘	yí.ma.ddá.dda	"leaf"
	p.	˘ ˘ ˘ -	ngá.tha.dda.mány	(place name)
	q.	˘ ˘ - ˘	ngí.ddi.wárn.di	"across"
	r.	˘ ˘ - -	wí.li.móo.roo	"chicken hawk"
	s.	˘ - ˘ -	já.mbin.bá.roo	(a type of fish)
	t.	˘ - - -	bá.boo.ddóo.nggoo	"to the bottom"
	u.	- ˘ ˘ ˘	thárl.mi.nggí.di	"tree stump"
	v.	˘ ˘ ˘ ˘ ˘	lá.wa.gi.má.na	"white"
	w.	˘ ˘ ˘ ˘ ˘ ˘	ngá.wa.li.mí.li.ja	(place name)

McGregor (1990:122-123) proposes a mora-based analysis along the following lines. CVV and CVC are bimoraic, and a prominence pattern is mapped onto morae: SU, SUU, SUSU, SUUSU, SUUSUU, SUUSUSU, SUUSUUSU. Essentially, the pattern is ternary, avoiding lapse, while the final mora is always stressless. Mora prominence translates into syllable prominence by two rules. Firstly, a syllable is stressable if one of its morae is stressed. Secondly, if two successive syllables are stressable, only one of them may receive stress, and it is usually the one with the most morae. This analysis works as shown below:

(16) a. **S**U SU b. **S** U U c. **S** US U
dóo.mboo ngá.dda.gi dá.goor.la

d. **S** U U **S** U e. **S** U U**S** U
lá.wa.gi.má.na ngí.ddi.wárn.di

f. **S** UU **S**U SU g. **S** U**S** U
bá.boo.ddóo.nggoo ma.ndáa.dda

h. **S** UU **S** UU i. **S** U U **S**U
já.mbin.bá.roo ngá.tha.dda.mány

However, this analysis runs into two problems. The theoretical problem is that *syllabic integrity* (cf. Prince 1980) is violated. That is, in cases such as (16e,g), heavy syllables are split between moraic feet, under the natural assumption that all mora counting is done by moraic feet (trochees or dactyls). Secondly, the analysis encounters an empirical problem in words starting with double-heavy, such as *góo.roo.ngál* "Christmas Creek". This is incorrectly predicted to be **góo.roo.ngal*, since no stressed mora falls in the final syllable:

(17) **S**U US UU
góo.roo.ngál (predicted to be **góo.roo.ngal*)

Interestingly, Gooniyandi has bisyllabic reduplication, a process insensitive to the weight of the syllables involved. This diagnoses the maximal generalized trochee [σ σ]. Reduplicants constitute single phonological words, each with initial stress:

(18) A. *Initial two syllables prefixed to base*
a. gárn.da-gárn.da.di "windpipe"
b. gá.mba-gá.mba.yi "many young boys"

B. *Final two syllables suffixed to base*:
c. wí.li.móo.roo-móo.roo "chicken hawk"
d. bál.nga.rna-ngá.rna "wide"

Example (18d) shows that base segments must be mapped onto a bisyllabic *template* (cf. McCarthy and Prince 1986), since the reduplicant */ngarna/* does not coincide with a stress foot in the base.
We thus find that the prosodic morphology of Gooniyandi points to the syllabic trochee (i.e. bisyllabic reduplication), as well as the moraic trochee (i.e. the bimoraic word minimum). This only makes sense from the viewpoint of the generalized trochee. Under the GT, the stress pattern can be analyzed as below:

(19) a. Construct one trochee [σ σ] initially, another trochee [σ σ] finally.
b. Heavy syllables that remain unparsed by bisyllabic trochees under clause a. are parsed into monosyllabic heavy feet [$\sigma_{\mu\mu}$].

This correctly predicts the stress patterns of roots of one, two, four, and five syllables, e.g.:

(20) a. (* .) . (* .)
σ σ σ σ σ
lá.wa.gi.má.na

b. (* .) (* .)
σ σ σ σ
ngí.ddi.wárn.di

c. (* .) (* .)
σ σ σ σ
bá.boo.ddóo.nggoo

d. (* .)
σ σ
dóo.mboo

e. (* .) (* .)
σ σ σ σ
já.mbin.bá.roo

f. (*)
$\sigma_{\mu\mu}$
máa

g. (* .)
σ σ
ngá.boo

In trisyllabic roots, we observe a conflict between both clauses of (19a), i.e. the initial vs. the final trochee. Depending on factors to be examined below, such words may be parsed either as [(σ σ) σ] or ασ [σ (σ σ)]. Variable stress patterns in trisyllables are a common phenomenon in other Australian languages, such as *Anyula* (Kirton 1967). Let us inventarize the attested stress patterns in Gooniyandi trisyllables of different skeletal types:

(21)

a.	[σ_μ σ_μ] σ_μ	ngá.dda.gi	d.	[$\sigma_{\mu\mu}$ σ_μ] σ_μ	bál.nga.rna
	σ_μ [σ_μ σ_μ]	---		[$\sigma_{\mu\mu}$][σ_μ σ_μ]	---
b.	[σ_μ σ_μ][$\sigma_{\mu\mu}$]	ngá.dda.nyóo	e.	[$\sigma_{\mu\mu}$ σ_μ][$\sigma_{\mu\mu}$]	góo.dda.ngóol
	σ_μ [σ_μ $\sigma_{\mu\mu}$]	---		[$\sigma_{\mu\mu}$][σ_μ $\sigma_{\mu\mu}$]	---
c.	[σ_μ $\sigma_{\mu\mu}$] σ_μ	dá.goor.la	f.	[$\sigma_{\mu\mu}$ $\sigma_{\mu\mu}$] σ_μ	---
	σ_μ [$\sigma_{\mu\mu}$ σ_μ]	ma.ndáa.dda		[$\sigma_{\mu\mu}$][$\sigma_{\mu\mu}$ σ_μ]	bil.gáa.li
d.	[σ_μ $\sigma_{\mu\mu}$][$\sigma_{\mu\mu}$]	---	g.	[$\sigma_{\mu\mu}$ $\sigma_{\mu\mu}$][$\sigma_{\mu\mu}$]	góo.roo.ngál
	σ_μ [$\sigma_{\mu\mu}$ $\sigma_{\mu\mu}$]	---		[$\sigma_{\mu\mu}$][$\sigma_{\mu\mu}$ $\sigma_{\mu\mu}$]	---

The generalizations for trisyllabic words can be phrased as follows. Firstly, initial stress is always an option, except in f., which may simply be due to lack of data. Of course, initial stress is consistent with McGregor's predictions. Secondly, in trisyllables with initial stress, the final syllable is always stressed when it is heavy, and unstressed when it is light, fully according to the predictions by the generalized trochee (cf. 19b). Thirdly, second-syllable stress occurs only when the second syllable is heavy, and the first is light[2]. This suggests avoidance of the trochee [σ_μ $\sigma_{\mu\mu}$], a tendency which we have observed in several other generalized trochee languages. Some generalized trochee languages with dominant initial stress have second-syllable stress in words that start with light-heavy. Examples are *Guugu Yimidhirr* (Haviland 1979) and *Yindjibarndi* (Wordick 1982), both discussed in Kager (1992b). Such systems avoid [σ_μ $\sigma_{\mu\mu}$] initially. Other generalized trochee systems, such as *Finnish*, avoid [σ_μ $\sigma_{\mu\mu}$] under secondary stress, as we will see below.

Let us now consider the two forms in (15) that are not derived by our analysis, incidentally both place names. Firstly, final stress in *ngá.tha.dda.mány* may, again, be due to the avoidance of [σ_μ $\sigma_{\mu\mu}$], as the root ends in light-heavy. Secondly, *ngá.wa.li.mí.li.ja*, which has antepenultimate stress, is a six-syllable root, a rare class (cf. 0.1%) which is probably outside the learner's initial data set.

4. The generalized trochee in Finnish

A second example of the generalized trochee is found in Finnish secondary stress, as reported on Kiparsky (1991), whose description we follow here (a slightly different pattern of secondary stresses is described by Carlson 1978). Main stress is strictly initial, and the second syllable is stressless regardless of its weight. Interestingly, secondary stresses in the remainder of the word partly depend on quantity, where long-voweled and closed syllables are heavy. Secondary stresses fall on alternate non-final syllables, except when a light syllable would be stressed directly preceding a heavy syllable. Then, the preferred pattern is for the light syllable to be stressless, and a secondary stress to fall on the heavy syllable. Iteration resumes on the heavy syllable, producing a locally ternary pattern. Final syllables are stressed only when heavy, and no clash arises with the penult.

(22)	a.	˘˘˘˘	ló.pe.tè.ta	"finish (neg.)"
	b.	˘˘-˘˘	ló.pe.tèt.ta.va	"to be finished"
	c.	--˘˘	téu.ras.tà.mo	"slaughterhouse"
	d.	˘˘--	ló.pe.tèt.tiin	"one finished"
	e.	---˘-˘	púo.lus.tèt.ta.vìs.sa	"defensible"
	f.	˘-˘˘˘˘	á.loit.tè.li.jà.na	"as a beginner"
	g.	˘-˘˘˘˘˘	ó.pet.tè.le.mà.na.ni	"as something I have been learning"
	h.	˘˘˘-	ló.pe.te.tàan	"one finishes"
	i.	˘-˘-˘	rá.kas.tu.nèi.ta	"infatuated lovers"
	j.	˘-˘--	ló.pet.ta.jài.set	"concluding ceremonies"
	k.	˘˘-˘˘-˘	lú.e.tùt.te.lu.tèl.la	"to gradually cause to have been read"

The secondary stress pattern of Finnish is captured by constructing generalized trochees from left to right, avoiding [σ_μ $\sigma_{\mu\mu}$]. The avoidance mechanism is *skipping* (cf. Kager 1992a)[3]:

(23) a.

```
(*                  )
(*   .) (*   .) (*   .)
 _   _   _   ˘   _   ˘
púo.lus.tèt.ta.vìs.sa
```

b.

```
(*                      )
(*   .) (*   .) (* .) .
 ˘   _   ˘   ˘   ˘   ˘
ó.pet.tè.le.mà.na.ni
```

c.

```
(*          )
(*   .) (*   .)
 ˘   ˘   _   _
ló.pe.tèt.tiin
```

d.

```
(*          .)
(*   .) .   (*)
 ˘   ˘   ˘   _
ló.pe.te.tàan
```

e.

```
(*              )
(*   .)   . (*   .)
 ˘   _   ˘   _   _
ló.pet.ta.jài.set
```

f.

```
(*                      )
(* .) (*   .)   . (*   .)
 ˘   ˘   _   ˘   ˘   _   ˘
lú.e.tùt.te.lu.tèl.la
```

Interestingly, the relative ill-formedness of $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ is confirmed by some Finnish dialects which repair initial $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ into $[\sigma_{\mu\mu}\ \sigma_{\mu\mu}]$ by gemination (examples taken from Kiparsky 1991):

(24)	a.	mí.tään=>	mít.tään	"anything"
	b.	á.jaa =>	áj.jaa	"drive"

Apparently, these dialects avoid $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ during foot parsing in secondary stress feet, and repair it elsewhere, i.e. in the main stress foot. Apart from skipping and weight addition (gemination), a third reaction to $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ has been observed in trochaic systems such as *Latin* (Allen 1973, Mester 1991) and *English* (Allen 1973, Kager 1989). Instead of lengthening the first syllable in $[\sigma_{\mu}\ \sigma_{\mu\mu}]$, these systems shorten the second syllable, producing $[\sigma_{\mu}\ \sigma_{\mu}]$ (see also Prince 1991).

5. Conclusions

Summarizing, we have provided evidence for Hayes' (1991) *Generalized Trochee Hypothesis* from two sources: a typological survey of Australian languages, and case-studies of Gooniyandi and Finnish. We have observed three manifestations of syllable weight in trochaic systems with quantitative contrasts and syllabic styles of alternation:

(25) a. Heavy monosyllabic feet $[\sigma_{\mu\mu}]$.
b. Bimoraic (instead of bisyllabic) word minima.
c. Avoidance of $[\sigma_{\mu}\ \sigma_{\mu\mu}]$.

Observed reactions to $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ include:

(26) a. *Skipping* (Gooniyandi, Guugu Yimidhirr, and Yindjibarndi second syllable stress; Finnish secondary stress).
b. *Shortening* the second syllable in $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ (Latin, English).
c. *Lengthening* the first syllable in $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ (Finnish initially).

A formal interpretation of the avoidance of $[\sigma_{\mu}\ \sigma_{\mu\mu}]$ will appear in Kager (1992b), where it is analyzed as a prohibition against *clash* on the *mora* level in a two-layered theory of foot parsing. This paper also addresses other formal aspects of generalized trochaic parsing, and contains case-studies of two more Australian systems, *Yindjibarndi* and *Guugu Yimidhirr*.

Notes

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1. Transcription key: **rn** = apico-palatal nasal; **ny** = lamino-palatal nasal; **ng** = velar nasal; **dd** = alveolar flap, **rd** = apico-palatal stop; **mb** = bilabial prenasalized stop; **nd** = alveolar prenasalized stop; **ngg** = velar prenasalized stop.
2. The single form with second-syllable stress that starts with a heavy syllable is ***bil.gáa.li***. However, its initial syllable is closed, and universally closed syllables are somewhat variable in their weight, cf. Hayes (1991).
3. Kiparsky opts for a mixed iambic-trochaic analysis, where the choice of iambic vs. trochaic prominence is triggered by the quantity of the syllables that are scanned. As far as we can see, this analysis requires an extra assumption over ours, i.e. avoidance of syllable-level clashes.

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The Relation between *Wh*-islands and the Semantic Properties of Complementizers

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0. Introduction[1]

In this paper I want to defend the thesis that the relation between the semantic properties of the matrix verb and those of the complementizer is one of the crucial factors when extracting NPs out of complement phrases. I will propose to capture this relationship in the semantic notions developed within the theory of Generalized Quantifiers to explain the behaviour of for instance Negative Polarity Items (NPIs) (e.g. Ladusaw 1979, Hoeksema 1983, Zwarts 1986, 1990). Although it will turn out that there still remain a lot of problems to be solved, I hope to convince the reader that a genuine semantic approach towards *wh*-extraction provides the well-defined terms to explain this phenomenon.

This paper is organized as follows. In the first section I will show that within the syntactic accounts of *wh*-extraction some semantic-like notions have been buzzing around for quite a while. Because these notions are, from a semantic point of view, not very well-defined, I turn in the second section to the semantic approach proposed by Szabolcsi and Zwarts (1989, 1991). I will highlight the main characteristics of their approach and will point out some problems. In the third section I will focus on verbs and complementizers. I will show that, contrary to what is widely believed, the factivity of verbs is not the right property to explain the (im)possibilities of extraction. Instead, we have to look at the combination of the monotonicity properties of both verbs and complementizers.

1. Syntactic Approaches

With regard to the *wh*-extraction phenomena one might distinguish, within the Government and Binding-framework, between an "American" and a "European" branch. Within the former, Huang (1982) and Chomsky (1986) (to name only two) have proposed to explain the differences in extractability in terms of *arguments* and *adjuncts*. On their view it is easier to extract an argument than an adjunct. This view is challenged by the European branch, notably Cinque (1990) and Rizzi (1990). Rizzi, elaborating an idea of Cinque's, proposes to replace the argument/adjunct distinction by a distinction between *referential* and *non-referential* NPs. Rizzi coins referentiality in terms of theta roles: *agent* and *patient* are *referential roles*; *measure*, *manner* etc. are *non-referential*. But neither the argument/adjunct nor the referential/non-referential account serves to explain the facts in (1) to (4).

(1) a Haroun said that he had seen the Water Genie
    b Who did Haroun say that he had seen _ ?
    c Which Genie did Haroun say that he had seen _ ?
(2) a Haroun said that the Water Genie behaved generously
    b How did Haroun say that the Water Genie behaved _ ?
(3) a Haroun wondered whether he had seen the Water Genie
    b Who did Haroun wonder whether he had seen _ ?
    c Which Genie did Haroun wonder whether he had seen _ ?

(4) a Haroun wondered whether the Water Genie behaved generously
b *How did Haroun wonder whether the Water Genie behaved _ ?

In (2) and (4) *generously* is both an adjunct and non-referential. Nevertheless it can be extracted in (2), but not in (4). On the other hand, *who* and *which Genie* in (1) are extracted arguments, whereas *how* in (2) is an extracted adjunct. Still the sentences are ok. Moreover, Cinque notices that some arguments with referential roles are still sensitive to various kinds of islands, as is illustrated in (5) to (7). In all of these cases both *how much water* and *which fish* are referential arguments, but only *which fish* can be extracted.

Wh-island:
(5) a *How much water did Haroun wonder whether he drank _ ?
b Which fish did Haroun wonder whether he ate _ ?

Negative island:
(6) a *How much water didn't Haroun think that he drank _ ?
b Which fish didn't Haroun think that he ate _ ?

Factive island:
(7) a *How much water did Haroun regret that he drank _ ?
b Which fish did Haroun regret that he ate _ ?

Pesetsky (1987) explains the difference between *how much water* and *which fish* using the noting of *D(iscourse)-linking*. This notion serves to explain why *which*-phrases are often easier to extract than other *wh*-phrases. The reason is, according to Pesetsky, that *which*-phrases are in some sense more definite than other *wh*-phrases. That is, a *which*-phrase "limits the range of felicitous answers both speaker and hearer have in mind", whereas the other *wh*-phrases do not.

By way of summarizing this very sketchy overview of some of the GB accounts for *wh*-extraction, I point out that within this syntactic framework we have come across two terms with a certain semantic flavour, namely referential roles and discourse-linking. I notice in passing that also other syntacticians have used semantic or semantic-like notions to explain *wh*-extraction, e.g. *dominance* in the work of Erteschik-Shir (1977, 1986) and *definiteness* and *indefiniteness* in for instance Guéron (1980) and Fiengo (1987), respectively. With this in mind, we can try and find out what a real semantic approach like algebraic semantics has in store.

2. A Semantic Approach

Scholars in the line of research I am here referring to as *algebraic semantics*, have been concerned in the past decade with for instance the intricacies of the conditions on the appearance of NPIs (cf. references above). Recently, De Swart (1991) has demonstrated that algebraic semantics can also be used to explain the behaviour of temporal expressions, like temporal adverbs. The necessary equipment is delivered by researchers like Barwise and Cooper (1981), Keenan and Faltz (1985), Van Benthem (1986, 1991) and Westerståhl (1989). They have brought to light that quantified expressions can be regarded

as generalized quantifiers, that there are inference patterns associated with these quantifiers, and the monotonicity properties of phrases.

The monotonicity properties of quantified expressions are demonstrated in (8) to (10). The quantifier *all Floating Gardeners* is called *upward monotonic* since it allows one to draw conclusions about the state of affairs in a larger set from the state of affairs in a smaller set. With *no Egghead* it is just the other way around, whereas NPs like *exactly four N* are non-monotonic, since they do not allow to make inferences either way.

(8) Upward monotone (+)
All Floating Gardeners weep incessantly ==>
All Floating Gardeners weep
(9) Downward monotone (-)
No Egghead talks ==>
No Egghead talks slowly
(10) Non-monotone
Exactly four Shadow Warriors fight <=/=>
Exactly four Shadow Warriors fight grimly

In a paper presented at the 1989 Amsterdam Colloquium Szabolcsi and Zwarts (henceforth *S&Z*) opened up a whole new area of research by applying the semantic apparatus named above to the *wh*-extraction problems. The central issue in their research is to define the semantic environment from which *wh*-phrases can be extracted. To establish the semantic environment they do two things. First they state the monotonicity properties of phrases in terms of functions instead of sets (cf. Zwarts 1983). Second they use the mechanism of function composition to calculate, so to speak, the semantic value of the environment. Monotonicity properties behave under composition as is summarized in the calculus under (11). That is, the composition of either two upward or downward monotonic functions delivers another upward monotonic function. In the two other cases (b and c) the result of the composition is downward monotonic.

(11) Calculus:

a	+ & +	==>	+
b	+ & -	==>	-
c	- & +	==>	-
d	- & -	==>	+

Having established this technique, S&Z formulate their *Weak Islands and Monotonicity* (*WIM*):

(12) Upward monotonic contexts are good extraction domains. But paths that are not upward monotonic, viz. either downward monotonic or non-monotonic, constitute weak islands.

In addition, they notice that so-called *affective islands* seem to be the most robust, i.e. the hardest to extract from. This is illustrated in (13). According to S&Z the crucial elements in (a) to (d) (*who*, *regret*, *exactly five Glumfishes* and *often*) are all non-monotonic. This accounts for the bad extraction

possibilities of *how*. Since *wonder* and *regret* can, on top of that, be called "affective", extraction from (a) and (b) is really out of the question.

(13) a *How did Rashid wonder who behaved _ ?
b *How did Rashid regret that Haroun behaved _ ?
c ?How did exactly five Glumfishes think that Haroun behaved _ ?
d ?How did Rashid often think that Haroun behaved _ ?

I refrain from spelling out the criticism of De Swart (1992) with respect to the alleged non-monotonicity of *often*. But I do want to draw the reader's attention to the semantic status of *wonder* and *regret*. I think there are good reasons to consider these verbs downward monotonic.

Within the group of downward monotonic functions a group of anti-additive functions can be discerned (Zwarts 1986). According to De Mey (1990) these functions obey the definition in (14).[2] In this definition *f* is the function (in our case *regret*), *X* is the first argument of the function (*Haroun*) and *p* the second (the proposition *Haroun saw four Water Genies*). The second clause (*p implies q*) means: *q* is a stronger statement than *p*, i.e. *q* is true in less situations than *p*.

(14) f(X,p) & (q --> p) ==> f(X,q)

In (15) *regret* is tested on its anti-additiveness. Since the inference pattern in (15) is valid, *regret* is indeed anti-additive. The same kind of reasoning holds for *wonder*.

(15) a Haroun regretted that he saw four Water Genies
b Haroun saw five Water Genies -->
Haroun saw four Water Genies
c (a & b ==>) Haroun regretted that he saw five Water Genies

Now that we have established the downward monotonicity of *regret*, it is not difficult to explain the facts in (16). The NPI *any* can only appear in downward environments. Therefore (16a) is impeccable, while (16b) and (16c) are ungrammatical, due to the non-monotonic status of *exactly five Glumfishes* and *often*.

(16) a Rashid regrets that Haroun saw any Water Genie
b *Exactly five Glumfishes said that any boat would sink
c *Rashid hoped that he would often hear any story

Munsat (1986) provides some "circumstantial support" for the claim that *wonder* is downward monotonic. Munsat points out that *wonder* behaves in exactly the same way as *don't know* when it comes to what he calls *'that is'-expansion*. Both *wonder* and *don't know* expand in a conjunction of things, whereas a verb like *know* expands in a single item, as is shown in (17) to (19). Since *don't know* is unmistakably downward monotonic, I think there are good reasons to consider *wonder* to be downward monotonic too.

(17) I wonder what he wants: {namely/that is} {does he want/ is it} a watch, or a sweater, or etc?
(18) I don't know what he wants: {namely/that is} {does he want/ is it} a watch, or a sweater, or etc?
(19) I know what you bought: {namely/that is} {(I know that) you bought} a watch.

I close this section with a serious problem, which has also been noticed by S&Z themselves. According to the simple calculus in (11), a sentence with a double negation should provide a good extraction domain, for downward composed with downward results in upward. This expectation is not born out, as is demonstrated in (20).

(20) a *How didn't Haroun think that no one behaved _ ?
b *How does no one deny that Haroun behaved _ ?

I notice in passing that these sentences show that mere upward- and downwardness are too crude categories. Subcategories like anti-additivity should be brought in. This will result in a calculus far more complex than (11). The more complex calculus should provide an explanation for (20).

3. Verbs and Complementizers

In the previous two sections we have come across several factors that influence the extraction possibilities of *wh*-phrases. Pesetsky pointed out that the semantic contents of the *wh*-phrase itself is a factor to reckon with (cf. also Szabolcsi (1991)). And S&Z have examined the extraction environment. In this section I will concentrate on the semantic nature of the boundary that has to be crossed when extracting a *wh*-phrase.

In (21) to (24) I have kept the verb and the *wh*-phrase constant and have varied the contents of the complementizer place. We see that things get increasingly worse. The question is: why?

(21) a Haroun knows that the Water Genie needs a Disconnector.
b What does Haroun know that the Water Genie needs _ ?
(22) a Haroun knows whether the Water Genie needs a Disconnector.
b ?What does Haroun know whether the Water Genie needs _ ?
(23) a Haroun knows why the Water Genie needs a Disconnector.
b *What does Haroun know why the Water Genie needs _ ?
(24) a Haroun knows who needs a Disconnector.
b **What does Haroun know who needs _ ?

Let me start by assuming that intuitively there is some kind of "binding" relation between the matrix verb and the complementizer. This means that the verb exercises some kind of "power" over the complementizer. We can illustrate this clearly with data from the West-African creole language Krio, as reported in Nylander (1984).[3] Nylander relates that Krio has three kinds of complementizers, *sé*, *wé* and *mék*, each of which can only be used in connection with certain kinds of verbs. *Sé* can only be used with utterance verbs (like *álà* 'shout' in (25a)), cognition verbs and sensory verbs, *wé* is used with factive verbs (see (25b)) and *mék* is associated with verbs of volition, intention and completed actions.

(25) a ì gò álà sé ì táyà
he-PROS-shout-that-he-be tired
he will shout that he is tired

b ì bìn dàmú wé à wín
he-PAST-be surprised-that-I-win
he was surprised that I won

c à bìn wán mèk dèn kám
I-PAST-want-that-they-come
I want that they come/I wanted them to come

The three complementizers have specific uses with respect to presupposition. Complement sentences introduced by *sé* never presuppose the truth of the embedded clause. Complements with *wé*, however, *always* presuppose the truth of the embedded clause. And complements with *mék* are sometimes truth presupposing.

Nylander's conclusion is that in Krio "the choice of complementizer depends on the semantic value of the matrix verb" (p.132).

In Krio the relation between verb and complementizer manifests itself on the surface. In English things are not so clear. There is a long standing suspicion that factivity plays a role in *wh*-extraction. The sentences in (26) are adapted from Ross's (1967) dissertation and provide the standard example to compare between *wh*-extraction with a factive verb (*confirm*) and a non-factive verb (*allege*).

(26) a ??What did Haroun confirm that prince Bolo had eaten _ ?
b What did Haroun allege that Prince Bolo had eaten _ ?

Erteschik-Shir (1977), however, points out that this cannot be the whole story. In (27) *hope*, *resent* as well as *rejoice* are factive, but still there is a gradual difference in acceptability.

(27) a Which princess does Haroun hope that the prince likes - ?
b ?Which princess does Haroun resent that the prince likes - ?
c *Which princess does Haroun rejoice that the prince likes - ?

In order to explain these differences, Erteschik-Shir calls in the help of the feature [+/- emotional], without defining it.

This emotivity feature reminds us of the affectivity of *wonder* and *regret* in (13). These words turned out to be downward monotonic. Nevertheless, it would be too simple to say that all affective or emotional verbs are downward monotonic: in (27) *resent* is indeed downward, but *rejoice* is not.

In (28) to (35) I have listed the various categories of factivity that have been proposed in the literature[4], subdivided with respect to their monotonicity properties.

Upward monotonic + factive

(28) a What did Haroun realize that the Glumfishes had seen _ ?
b *What did Haroun realize whether the Glumfishes had seen _ ?
c *What did Haroun realize who had seen _ ?

Downward monotonic + factive

(29) a What did Haroun regret that the Glumfishes had seen _ ?
b *What did Haroun regret whether the Glumfishes had seen _ ?
c *What did Haroun regret who had seen _ ?

Upward monotonic + neg-factive

(30) a What did the Shadow Warrior pretend that he had seen _ ?
b *What did the Shadow Warrior pretend whether he had seen _ ?
c *What did the Shadow Warrior pretend who had seen _ ?

Downward monotonic + neg-factive

(31) a What did the Shadow Warrior lie that he had seen _ ?
b *What did the Shadow Warrior lie whether he had seen _ ?
c *What did the Shadow Warrior lie who had seen _ ?

Upward monotonic + semi-factive

(32) a What did the Walrus know that Haroun had said _ ?
b ?What did the Walrus know whether Haroun had said _ ?
c **What did the Walrus know who had said _ ?

Downward monotonic + semi-factive

(33) a ?What did the Walrus forget that Haroun had said _ ?
b ?What did the Walrus forget whether Haroun had said _ ?
c ??What did the Walrus forget who had said _ ?

Upward monotonic + non-factive

(34) a What did Khattam-Shud think that the Plentimaws shouted _ ?
b ?What did Khattam-Shud think whether the Plentimaws shouted _ ?
c *What did Khattam-Shud think who shouted _ ?

Downward monotonic + non-factive

(35) a ?What did Khattam-Shud doubt that the Plentimaws shouted _ ?
b ??What did Khattam-Shud doubt whether the Plentimaws shouted _ ?
c ??What did Khattam-Shud doubt who shouted _ ?

We can distinguish two groups. The first consists of the factives and the neg-factives, the second of the semi-factives and the non-factives. In the former extraction from a *wh*-complement is always impossible. This comes as no surprise, if we consider the declarative versions of (28) to (31).

(28') a Haroun realized that the Glumfishes had seen a boat
b *Haroun realized whether the Glumfishes had seen a boat
c *Haroun realized who had seen a boat

(29') a Haroun regretted that the Glumfishes had seen a boat
b *Haroun regretted whether the Glumfishes had seen a boat
c *Haroun regretted who had seen a boat

(30') a The Shadow Warrior pretended that he had seen a sword
b *The Shadow Warrior pretended whether he had seen a sword
c *The Shadow Warrior pretended who had seen a sword

(31') a The Shadow Warrior lied that he had seen a sword
b *The Shadow Warrior lied whether he had seen a sword
c *The Shadow Warrior lied who had seen a sword

We see that also the declarative sentences with *wh*-complements are unacceptible. Munsat (1986) provides an explanation for the unacceptability of the sentences with factives. Factive verbs presuppose the truth of their complements. This presupposition is at odds with *wh*-complements, since these complements extend to a conjunction of possibilities (cf. (17) to (19) above). This explanation can easily be applied to the neg-factives as well, since neg-factive verbs presuppose the falsity of their complements, and therefore do not allow a range of possible extensions either.

Thus I conclude that the inextractability from both factives and neg-factives can be explained for independent reasons.

The patterns in the second group (semi-factives and non-factives) are more or less the same as in (21) to (24), regardless of the factivity-status of the verb. That is: the combination verb + *that* gives better extraction results than verb + *whether*. And this combination gives on its turn better results than verb + *who*.

To account for these facts, we have to establish three factors that play a role. First we can put to use an idea of Givón (1980). Givón argues that there is a closer bond between verbs and *wh*-complements than between verbs and *that*-complements. It turns out that algebraic semantics provides a formal device to express this difference in "binding". Besides the operation of function composition I referred to above, there exists an operation called *application*. Informally, the difference between composition and application is that in composition two functions are entirely merged, whereas in application a function "swallows" an argument (Cf. Van Benthem 1991). Therefore composition is a suitable mechanism to represent a "close bond" and application a more "loose bond". Thus, Givón's notion of binding can be formalized by defining the connection between a verb and *that* as an application, and the connection between verbs and a *wh*-complementizer as composition.

Second, I have to assume that *wh*-complementizers are downward monotonic.[5]

Third, we can note that *that* and *whether* differ from *who*, *what* and the like, in that they introduce complete sentences. Functionally they do not belong to the matrix or the complement sentence, whereas complementizers like *who* do.

These three factors influence each other. The monotonicity property of *that* is of no importance, since this property gets lost when the verb is applied to it. Therefore sentences with upward verbs and *that*-complements provide good extraction environments. In contrast, the properties of the *wh*-complementizers are merged with those of the matrix verb through function composition. If the verb is upward the result is (in some sense) downward. This accounts for the bad extraction results in sentences with *wh*-complements (cf. (32b/c) and (34b/c)). If the verb is downward, we would expect, according to the simple calculus under (11), the composition result to be upward. However, although these extractions seem to be somewhat better than the upward verb + *wh*-complement-cases (compare (33b/c) with (32b/c) and (35b/c) with (34b/c)), the results are pretty bad, suggesting that the

environment is still downward. I suspect that the more complex calculus needed anyway to handle the double negation problem (see section 2), will be useful in giving a detailed account of these facts as well.

Finally, that the extraction possibilities of *whether*-complements tend to be better than those out of the other *wh*-complements, can be attributed to the loose relation *whether* has with both the matrix sentence and complement sentence.

From this analysis of the facts in (32) to (35) I draw the conclusion that it is feasable to explain them without recourse to their factivity-status. Added to the conclusion I reached earlier about the facts in (28) to (31), this means that *wh*-extraction is independent of factivity.

Notes

1. This paper has benefitted from comments by Jack Hoeksema, Anna Szabolcsi, Frans Zwarts and the audience at the BLS18-meeting. All remaining errors are mine.
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2. In fact, Zwarts (1986) gives another definition of anti-additivity than De Mey (1990). For presentational reasons, I use De Mey's definition. Hoekstra (1989) has shown that the same results can be obtained by using Zwarts's version.
3. See also Givón (1973, 1980). The same kind of phenemenon seems to exist in other languages as well. See for instance Szabolcsi and Zwarts (1991) about facts from Korean and the paper presented at this BLS-conference by Legendre and Rood about facts from Lakhota.
4. I refer for factives to Kiparsky and Kiparsky (1970) and Givón (1973), for neg-factives to Givón (1973, 1980), for semi-factives to Karttunen (1971) and Munsat (1986), and for non-factives to Givón (1973).
5. The problem is that the usual monotonicity tests (as applied by Szabolcsi and Zwarts (1991)) provide little convincing results. S&Z found that *who* is non-monotonic. Although I cannot come up at this point with something better, I think that non-monotonicity is too obstructive a property. If *wh*-complementizers were non-monotonic, we would lose a way of accounting for the gradual and subtle differences shown in the facts.

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SEMANTIC UNITY AND CONSTRUCTIONAL PARTICULARITY: THE FRENCH *SE FAIRE* CONSTRUCTION

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0. INTRODUCTION

French, as most other Romance languages, contains many non-coreferential uses of the reflexive. The constructions involved are well-known and are in general studied in the context of mono-clausal or uni-predicate sentences. In this paper, we examine lexicalized uses of the reflexive involving multi-predicate sentences. The relevant entries are exemplified in (1) and (2):

(1) a. Jean s'est fait tuer hier.
Jean refl be.pr make.pr kill.inf.act yesterday
Jean was killed yesterday (PSF)
Jean$_i$ made somebody kill him$_i$ yesterday
b. Jean a été tué hier.
Jean have.pr be.ppt kill.pass yesterday
John was killed yesterday

(2) Les bons livres se font rares.
The good books refl make.pr rare
Good books are becoming rare (SSF)

(3) a. 'La zone bleue [...] s'est vue réduite au tiers de sa surface antérieure'.
The blue zone [parking zone] refl be.pr see.ppt reduce.ppt to-the third of its surface previous'
The parking zone was reduced to a third of its previous area
b. 'M. E.M. se voit confier la responsabilité de la fonction publique'.
Mr E.M. refl see.pr entrust the responsibility of the function public
Mr E.M. gets the Civil Service Cabinet responsibility

Although we will touch upon each of these entries, we will focus our attention on the construction exemplified in (1a), which we call the passive *se faire* (PSF) in its non-causative reading, and will address two questions: (i) to what extent the typological markedness of (1a) can be reduced to otherwise motivated typological categories; (ii) to what extent the non-compositionality of (1a) can be reduced to otherwise motivated constructions in French.

1. WHAT IS SPECIAL ABOUT THE PSF

Sentences like (1a) are ambiguous in French. Under one interpretation, they involve a referential use of the reflexive, and mean what the morpheme glosses suggest, i.e. that someone caused something to happen to him. Under the other (PSF) reading, any notion of causation or responsibility is absent. They mean the same for all intents and purposes as their simplex passive counterparts ((1b) for example), and are often used instead of the ordinary passive in colloquial Modern French.

It is crucial to realize that the second, passive-like reading of the PSF is not a watered-down version of the literal or compositional reading of *se+faire*. The literal *se+faire* requires its subject referent to have responsibility for the event. In certain cases, this responsibility might be less salient than the affectedness of the subject referent, as in (4):

(4) Je me suis encore fait rouler/ avoir.
I refl be.pr again make.ppt con.inf/ have.inf
I got conned again

but is (probably) still present. Examples (5), however, do not even ascribe an indirect responsibility to the subject referent, and cannot be interpreted literally. Sentences like (5) are therefore genuinely ambiguous and instantiate two different constructions:

(5) a. Combien de fois nous nous sommes fait mentir par des officiels!
How.many of times we refl be.pr make.ppt lie.inf by officials
How many times have we been lied to by officials!
b. Vingt mille personnes se sont fait licensier en l'espace de 3 mois.
Twenty thousand people refl be.pr make.ppt fire in the space of 3 months.
La crise se renforce.
the crisis refl reinforce
20.000 people got fired in the last three months. The recession is worsening.
c. Quand on s'est fait calomnier par un ami, l'espérance vous quitte.
When one refl be.pr make.ppt slander by a friend, the hope you leave.pr
When you have been slandered by a friend, hope leaves you

Despite its passive flavor, the PSF differs from the ordinary passive construction in one syntactic respect. The latter requires its subject to correspond to the direct object of an active sentence. In contrast, the subject referent in the PSF can correspond to either the direct or the indirect object of an ordinary active entry of the complement predicate to *faire* (see (6) *vs* (7)):

(6) a. J'en ai assez! Je me suis fait demander au moins
I of.it have.pr enough. I refl be.pr make.ppt ask at least
vingt fois l'heure aujourd'hui.
twenty times the hour today
I've had enough! I was asked the time at least 20 times today
b. Il s'est fait couper la parole, à chaque fois qu'il a voulu
He refl be.pr make.ppt cut the speech, to each time that he have.pr want.ppt
aborder le sujet.
approach the subject
He was cut off each time he wanted to address the issue
c. Je me suis fait léguer $100.000 par un millionnaire inconnu.
I refl be.pr make.ppt bequeath.inf $100.000 by a millionaire unknown
I was bequeathed $100.000 by an unknowm milliomnaire

(7) *J'ai été demandé au moins vingt fois l'heure aujourd'hui.
I hav.pr be.ppt ask.ppt at least 20 times the hour today

The PSF construction also differs from the English *get oneself* construction, with which English speakers tend to compare the PSF. Examples (8a-b), which correspond to French (5b-c), demonstrate a difference in range between the two constructions:

(8) a. ??20.000 people got themselves fired in the last three months. The recession is worsening.
b. ??When you get yourself slandered by your best friend, hope leaves you
c. 20.000 people got fired in the last 3 months. The recession is worsening

In fact, if one were to paraphrase the PSF in English, one would normally use the simple *get*, without a reflexive marker, as in (8c). So, while both the French PSF and the English *get oneself* constructions have a reflexive marker, only the French has a relatively neutral passive function. The English *get oneself V-ed* construction, on the other hand, has a particular and restricted semantics, as R. Lakoff (1971) and Chapell (1980) discuss.

The two constructions differ in another important respect. The verbal complement to the English construction is a passive participle, whereas the complement verb to the French construction is an active infinitive verb form. This difference between the PSF and the *get oneself V-ed* constructions points to the exceptionality of the former. Unlike the English, the French construction passive-like function cannot be directly inherited from any of its parts and requires explanation.

The typological markedness of the French construction can be made even clearer by a comparison with other (more closely related) Romance languages. Italian, Spanish, and Catalan do not have a passive function arising from the combination of causative and reflexive marking, although they do allow such a morphosyntactic combination with a literal reading (see 9-10). This is especially interesting in view of the occurence of other non-compositional uses of the reflexive without a causative in those languages:

(9) a. *Jean se ha hecho arrestar por la policia. (SPANISH)
b. *Jean s'ha fet detendre per la policia. (CATALAN)
Jean refl have.pr make.ppt arrest by the police
c. *Giovanni si è fatto arrestare dalla polizia. (ITALIAN)
Giovanni refl be.pr make.ppt arrest.inf by.the police
John got arrested by the police (impossible under a PSF interpretation)

(10) a. *Me he hecho seguir. (SPANISH)
b. *M'he fet seguir. (CATALAN)
I.refl have.pr make.ppt follow
c. *Mi sono fatto seguire.
refl be.pr make.ppt follow.inf (ITALIAN)
I was followed (impossible under a PSF interpretation)

The French PSF construction thus brings to the fore a typological problem: how can a passive-like construction arise from the combination of a causative and a reflexive marker, where no marking of the passive function is apparent?

The passive function cannot stem from *faire*. The passive reading does not derive from the combination of literal *faire* and the co-referential use of *se*-- as we have seen-- and French has no independently motivated use of *faire* that could plausibly account for the PSF. Two lexicalized uses of *se*, however, stand out as plausible sources of the passive function: *se*-moyen and *se*-neutre. We examine them in turn.

2. SE-MOYEN CANNOT EXPLAIN THE PSF

Some non-coreferential uses of reflexive markers have been treated as specialized types of passive cross-linguistically (see Keenan (1985), Langacker and Munroe (1975), Shibatani (1985)). The French reflexive construction exemplified in (11), often called *se*-moyen in the French generative tradition, has also often been related to the passive (e.g. Zribi-Hertz (1982)):

(11) a. Les artichauts se mangent crus en Italie.
The artichoke refl eat raw in Italie
Artichokes are eaten raw (generally) in Italy
b. Ce pantalon se lave en deux minutes.
This pant (sic) refl wash.pr in two minutes
These pants can be washed in two minutes

It is therefore tempting to hypothesize the PSF derives from the application of *se*-moyen to a complex-predicate involving *faire* and its complement(s). The only recent literature we know of to mention the PSF, Fauconnier (1983), suggests that the construction is another case of a *se*-moyen passive-like construction. Under such a proposal the PSF idiosyncrasy reduces to the unspecified-agent deletion function of the *se*-moyen construction. There are at least two arguments against the assimilation of the PSF to *se*-moyen.

One, in other cases of *se*-moyen, no semantic argument is removed, or altered in any way. That is, in a simple *se*-moyen construction, as in (12), the event-semantic structure of the active and the "middle" are the same, as the coarse semantic representations in small capitals illustrate.[1] The PSF, unlike *se*-moyen, suppresses both the agent and the cause predicate of the alleged input to the reflexive (see (13)). If *se*-moyen were involved in the PSF, one would have to explain why in the case of *faire* alone, *se*-moyen alters the event-semantic structure:

(12) a. Les artichauts se mangent crus en Italie.
b. Les gens mangent les artichauts crus en Italie.
The people eat.pr the artichokes raw in Italie
[PEOPLE EAT ARTICHOKES RAW IN ITALY]

(13) a. Jean s'est fait arrêter par la police hier.
Jean refl be.pr make.ppt arrest.inf by the police yesterday
Jean was arrested by the police yesterday
[THE POLICE ARREST JEAN YESTERDAY]
b. Jean a fait arrêter Marc par la police.
Jean have.pr make.ppt arrest Marc by the police
Jean made the police arrest Marc
[JEAN MADE THE POLICE ARREST MARC]

Two, when other Romance languages exhibit a clear case of *se*-moyen applied to a Clause-Union structure, the semantics of the resulting sentence differs from that of the PSF. Examples (14) from Italian, and (15) from Catalan and Spanish illustrate this fact:

(14) La macchina si era fatta riparare a Giovanni/ da Giovanni (Burzio (1986))
The car refl be.pst make.ppt repair to Giovanni/ by Giovanni
We made Giovanni repair the car/ We had the car repaired by Giovanni

(15) a. El coche se ha hecho reparar (SPANISH)
b. El cotxe s'ha fet reparar (CATALAN)
the car refl have.pr make.ppt repair
Somebody got the car to be repaired (by somebody else)

(16) *La voiture s'est fait réparer
The car refl be.pr make.ppt repair.inf

All these examples imply an intermediary agent, notably absent with the PSF. The French equivalent (16) is ungrammatical.[2] Here again, the PSF *se* does not behave as an ordinary Romance *se*-moyen.

3. IMPOSSIBILITY OF A BLEACHING STORY: VOIR VS. FAIRE

One could answer our arguments against the claim that *se*-moyen is involved in the PSF, by postulating a historical "bleaching" process which first voided *faire* of most of its content. According to this hypothesis, *se*-moyen could be involved in the PSF construction, since a non-causative semantics would be independently attached to *faire*. French would then differ from Italian and Catalan in having a semantically "neutral" use of *faire*, giving rise to the PSF, when *se*-moyen applies.

A first problem with this counter-proposal is that it would leave unexplained the impossibility of *se*-moyen with the ordinary causative meaning of faire (see (16)). Any proponent of the involvment of *se*-moyen in the PSF must explain why *se*-moyen is allowed with the allegedly bleached *faire*, but not with the literal *faire*.

There are two other problems with the proposal at hand. First, it conjectures a bleaching process for which there is no independent evidence in any other uses of *faire*. Second, it assumes-- without evidence-- that if *faire* had the right semantics (i.e. none!), *se*-moyen would be able to apply to give rise to the PSF. A comparison between *se faire* and *se voir* demonstrates the frailty of these assumptions.

Voir (to see) functions in some of its uses as a general auxiliary and allows non-literal interpretations. Chocheyras (1968) collected numerous examples of voir in the active where it behaves as a semi-auxiliary, and where it retains only partly its perceptual meaning (see (17a)). All such examples involve a Raising-to-Object structure, where NP+VP complements are in general not allowed in French (see 17 b). (18) is another attested example, where *voir* is not used literally:

(17) a.'On espère voir s'implanter dans le voisinage d'autres équipements divers'.
One hope.pr see.inf refl implant in the vicinity other equipment various
We hope to see other various facilities in the vicinity
b. *On espère s'implanter dans le voisinage d'autres équipements divers.

(18) 'Les autos voient leur marche ralentie'.
The cars see.pr their progress slow-down.ppt
Cars were slowed down in their progress

Faced then with reflexive uses of *voir* like (19), for example, it is a viable hypothesis to assume these uses are linked to the existence of a generalized meaning of *voir*, where it does not only refer to a perceptual process, but to some more generic experience:

(19) 'André Bloc, qui fut jusqu'à sa mort, en 1966, l'un des animateurs de l'architecture [...], se voit rendre un hommage tardif...' (example cited by Price (1971)).
A. B. who was until his death in 1966 the one of the driving-force of the architecture, refl see.pr give a tribute late
A. B. who was until his death in 1966 one of architecture's driving force is given a late homage

This account is motivated for *voir*, since there are independently attested examples which do not involve a reflexive and where *voir* seems to have such a "bleached" meaning. But there is no comparable "bleached" use of *faire* outside of the PSF upon which to support the hypothesized "bleaching" process. The explanatory power of the hypothesis is therefore null.

Even for the demonstrably "bleached" *voir*, there is no positive evidence that *se*-moyen applies to *voir* when it takes an infinitival complement. Note that this *se*+*voir*+V_{inf} construction is semantically very restricted, by opposition to sentences involving an AP/Participial complement to *voir* (see (20)-(21)). The infinitival construction is mostly restricted to verbs of giving (literal or metaphorical) and of evaluation (blame, praise...):

(20) a. Tout notre travail s'est vu anéanti par cette misérable erreur.
All our work refl be.pr see.ppt annihilate.pass by this miserable error
All our work was wasted by this terrible mistake
b. *Tout notre travail s'est vu anéantir par cette misérable erreur.
All our work refl be.pr see.ppt annihilate.inf by this miserable error

(21) a. La formule s'est vue apprise et répétee par tant de gens
The formula refl be.pr see learn.pass and repeat.pass by so.much of people
qu'elle n'a plus d'intérêt.
that she not have.pr more interest
The formula was learnt and repeated by so many people that it isn't interesting anymore
b. *La formule s'est vu apprendre et répéter par tant de gens
The formula refl be.pr see learn.inf and repeat.inf by so.much of people
qu'elle n'a plus d'intérêt.
that she not have.pr more interest

Given these semantic restrictions, and the independent existence of bleached uses of *voir*, it is unclear that the application of *se*-moyen to *voir*+V_{inf} is needed to account for these data.

Alongside this difference, note that the *se*+*voir*+AP/Participial may involve a raising structure (always possible for *voir*), whereas *se*+*voir*+V_{inf} necessarily involves clause-union. In the latter case, the reflexive marker corresponds to the direct or indirect object of the complement verb, and not to what would be the object of *voir* under a Raising analysis. Clause-union is therefore required to license the reflexive, if one assumes (non-long-distance) reflexives must be bound locally.

Given that ordinary *se*-moyen also does not apply to *faire*+V_{inf}, as we have seen, it is best to assume a general prohibition against *se*-moyen (ordinary or not) in clause-union structures. This prohibition patterns with the impossibility of similar valence alternations in modern French. For example, Italian allows passive on clause-union structures, whereas French does not (see (22)-(24); (23) from Burzio (1986)):

(22) a. *Jean a été fait blâmer par Marc.
Jean have.pr be.ppt make.pass blame.inf by Marc
[attempting] *Jean was made to receive blame by Marc*
b. *Jean a été fait tomber.
Jean have,pr be.ppt make.pass fall
[attempting] *Jean was made to fall*

(23) La macchina fu fatta riparare a Giovanni/ da Giovanni.
The car be.pst make.pass repair to Giovanni/ da Giovanni
The car was made to be repaired by Giovanni

(24) a. Jean a été vu assis sur le bord de la rivière.
Jean have.pr be.ppt see.pass seat.ppt on the edge of the river
Jean was seen seating on the bank of the river
b. *Jean a été vu confier une enveloppe par Marc.
Jean have.pr be.ppt see.ppt entrust an envelope by Marc
[attempting] *Jean was seen entrusted with an envelope by Marc*

Even in the case of "bleached" *voir*, then, the application of *se*-moyen with the V complementation structure is arguably impossible. Being "bleached" is not a sufficient condition to license the application of *se*-moyen to Clause-Union structures in French.

4. DEAGENTIVE-SE AS A SOURCE FOR THE PSF?

We now turn to *se*-neutre, which we call the deagentive-*se* to stress its semantic function. We show that deagentive-*se* gives a constructional motivation to the PSF semantics, but that the PSF cannot be subsumed as just an instance of the deagentive construction. An example of the simple deagentive construction is presented in (25), and a diagram of the alternation is shown in (26):

(25) a. Jean a cassé la branche.
Jean have.pr break.ppt the branch
Jean has broken the branch
b. La branche s'est cassée.
The branch refl be.pr broke.ppt
The branch broke

(26) a. V
[CAUSE [$_{EVENT}$ INCHOATIVE [STATE]]]

b. V_{+REFL}
[$_{EVENT}$ INCHOATIVE [STATE]]

(27) a. *faire*
[CAUSE [$_{EVENT}$ AGENT...]]
|
PP_{par}

b. *faire*$_{+REFL}$
[$_{EVENT}$ AGENT...]
|
PP_{par}

Assuming the PSF involves deagentive-*se* would automatically account for the difference in semantics between the PSF and ordinary causatives, as a comparison between the diagrams (26) and the diagrams (27) corresponding to sentences (13) demonstrates. In both cases, the cause predicate and its agent are removed, and a reflexive marker codes this removal.[3]

Syntactically, if the PSF is the combination of a periphrastic causative and a deagentive-*se*, nothing else needs to be stated, given the rest of French grammar. We know that clause-union effects the merging of two argument structures, as work in

Relational Grammar has convincingly shown (see, for example, Aissen and Perlmutter (1983), Fauconnier (1983), Davies and Rosen (1988)). We therefore expect that, ceteris paribus, deagentive-*se* will apply to the merged argument structure, as it does with semantically comparable lexical causatives.

Moreover, there is independent evidence that deagentive-*se* can apply to a periphrastic causal construction. Consider the examples (28):

(28) a. Jean Marais se fait vieux.
J. M. refl make.pr old
J.M. is becoming old
b. Les bons disques se font, ces temps-ci, plus rares que les bons livres.
The good records ref make.pr rare these days more rare that the good books
Good records are becoming, these days, rarer than good books
c. L'air se raréfie en montagne.
The air refl rarefy.pr in moutain
The air is rarefied in the mountains

(29) a. *faire*$_{+\text{REFL}}$
[CAUSE [$_{\text{EVENT}}$ INCH [STATE]]]
|
AP

b. *faire*$_{+\text{REFL}}$
[$_{\text{EVENT}}$ INCH [STATE]]
|
AP

We will call the construction exemplified in (28 a-b) the Stative *se faire* (SSF) construction. The function of the reflexive marker in (28b) where it applies to *faire+rare* is identical to its function in (29c), where it applies to the lexical causative *raréfier*. The deagentive construction is only sensitive to the presence of the relevant causative semantics, and not to the morphosyntactic expression of this semantics. It applies in cases where the final state is lexically incorporated in the verb, as well as in cases where it is expressed by an AP (the two alternating entries for *faire* are given in (29)).[4] Other things being equal, then, deagentive-*se* should be able to apply to the clause-union *faire*.

In short, the semantic relationship between analytic causatives and the PSF is the same as that between lexical causatives and the simple deagentive construction. Moreover, accounting for the PSF with the general deagentive construction would simplify the grammatical description of French by avoiding multiple distinct constructions -- the syntax of the PSF could be predicted from other parts of French grammar. However, as the next section shows, the PSF cannot simply result from the superimposition of the causative and deagentive constructions.

5. SEMANTIC CONSTRAINTS ON THE PSF

First, the overall semantic-type of the caused-event in the simple deagentive and the PSF are different. The PSF requires the complement verb to denote a dyadic event, as the impossibility of unaccausatives and unergatives in examples (30) show. The simple deagentive, on the other hand, applies to inchoative events. The two event-types are mutually exclusive. We could subsume both event-types under the more general category of dynamic event. But we would still need further principles to explain the impossibility of unaccusatives with the PSF.

(30) a. *Jean s'est fait tomber (impossible under PSF interpretation).
Jean refl be.pr make.ppt fall (UNACCUSATIVE)
John got fallen
b. *Jean s'est fait courir
Jean refl be.pr make.ppt run (UNERGATIVE)
John got ran

Moreover, if the PSF were a simple application of the deagentive construction to a *faire* entry, we would expect other Romance languages to countenance the PSF by applying their common deagentive construction to their common causative construction. But they do not appear to do this in the way French does. They countenance the SSF (see (31)), but not the PSF, as we have seen in (9)-(10):

(31) a. Jean Marais se hace viejo. (SPANISH)
b. Jean Marais s'ha fet vell. (CATALAN)
c. Jean Marais si è fatto vecchio. (ITALIAN)

The deagentive construction of other Romance languages critically distinguishes between inchoatives and dyadic event-types. The evidence of event-types therefore suggests that the PSF and the deagentive-*se* cannot be subsumed as one construction.

Second, simplifying somewhat for the moment, the subject of the PSF construction is required to be animate. This semantic constraint is not found with the simple deagentive construction (see (33b)):

(32) a. *Mon sandwich s'est fait manger par ce salaud de Jean.
My sandwich refl be.pr make.ppt eat.inf by this bastard of Jean
My sandwich was eaten by John, the bastard
b. *L'arbre s'est fait couper par le bûcheron hier.
The tree refl be.pr make.ppt cut by the lumberman yesterday
The tree was cut by the lumberman yesterday

(33) a. *Le sucre s'est fait dissoudre.
The sugar refl be.pr make.ppt dissolve.inf
The sugar was dissolved (by somebody)
b. Le sucre s'est dissous.
The sugar refl be.pr dissolve.ppt
The sugar dissolved

The semantic constraint is not found either with the causative construction. Only when combined with a COREFERENTIAL *se*-- which in itself requires an animate subject-- does the periphrastic causative constrain its subject to be animate:

(34) Les pluies torrentielles de ces derniers jours nous ont fait annuler le picnic.
The rains torrential of these last days we have.pr make.ppt cancel the picnic
The torrential rains of the last few days made us cancel the picnic

(35) *La pluie s'est fait maudire par les vacanciers.
The rain refl be.pr make.ppt curse by the holiday-goers
The rain$_i$ made the holiday-goers curse it$_i$

If the PSF were simply the combination of a periphrastic causative and a deagentive construction (which is a non-coreferential use of the reflexive marker), we would not expect the presence of such a constraint.

It might be objected that this constraint is only pragmatic or some surface filter. To assess to what degree native speakers attach this constraint with this specific construction, we conducted a survey of 27 native speakers of French. In this study, there were 37 sentences. Some were ordinary passives, some were PSFs. Speakers were asked to rank each sentence on a scale from 1 (unacceptable) to 4 (natural French). Speakers generally accepted PSF sentences with inanimate subjects far less than corresponding sentences with animate subjects. On the other hand, this distinction had no visible effect on the acceptability of ordinary passives, (see (38) for the results, and sentences (36)-(37)) for some sentences used to assess the difference):[5]

(36) a. Eric: Dis donc! Cette table est sale.
Say then (sic)! This table be.pr dirty
Look! This table is dirty
Marc: (MEAN: 3.7) Oh oui! Elle a été salie par les peintres, je crois.
Oh yes! she have.pr be.ppt dirty.pass by the painters, I think.pr
Yes. It has been dirtied by the painters

b. Eric: Dis donc! T'as vu! Cette table est sale.
Say then (sic). you have.pr see.ppt. This table be.pr dirty
Marc: (MEAN: 1.4) Oh oui! Elle s'est fait salir par les peintres, je crois.
Oh yes. She refl be.pr make.ppt dirty.inf by the painters I think.pr
Yes. It has been dirtied by the painters

(37) a. (MEAN: 1.7) J'en ai assez. A chaque fois que je visite la France, mon portefeuille se fait voler.
I of.it have enough. to each time that I visit the France my wallet refl make.pr steal
I've had enough. Every time I visit France, my wallet is stolen

b. (MEAN: 3.7) J'en ai assez. A chaque fois que je visite la France, je me fais voler.
I of.it have enough. to each time that I visit the France I refl make.pr steal
I've had enough. Every time I visit France, I'm robbed

(38)

+anim Pass	-anim Pass
3.5	3.67
+anim PSF	-anim PSF
3.33	1.76

Moreover, some sentences involving inanimate subjects receive a higher mean score (between 2.3 and 2.9). This higher mean corresponds to a dialect split. These inanimate sentences are accepted by many speakers, while they remain unacceptable for the rest. Examples with their average scores are given in (39):

(39) a. (MEAN: 2.9) Notre nouvelle campagne de publicité s'est fait remarquer par le public.
Our new campaign of ad refl be.pr make.ppt notice by the public
Our new ad campaign was noticed by the public

b. Eric: Ben, qu'est-ce qu' il t'est arrivé?
Ben what is it that it you be.pr happen.ppt
What happened to you?
Marc: (MEAN: 2.7) Ma planche de surf s'est fait renverser par la vague,
My board of surf refl be.pr make.ppt turn.over.inf by the wave

avant que je puisse en atteindre le sommet.
before that I can.subj of.it reach the crest
My surfboard was turned over by the wave before I could reach the top

c. (MEAN: 2.3) J'en ai assez! Mon journal s'est encore fait arroser.
I of.it have.pr enough. my newspaper refl be.pr again make.ppt water.inf
I've had enough! My newspaper got sprinkled again

For speakers who accept these sentences, the animacy constraint appears to be extended to allow inanimate subjects when this inanimate subject is affected in such a way that in its changed state it affects a relevant animate entity. So, in (39c), the subscriber to the journal will not be able to read it. In (39a), the ad agency or the patrons of the agency will get noticed, if the ad gets noticed.[6]

Both the consistency of the animate/inanimate distinction, and its selective extension prove that this constraint cannot be pushed away under the pragmatic rubric. It is part of the conventional meaning associated with the PSF.

Third, there are other semantic constraints on the PSF which do not bear on either ordinary passives or on the compositional causative-reflexive. The data are rather murky, but the generalization seems to be that the overall sentence must refer to an activity which affects the subject referent. This constraint leads to the relative unacceptability of sentences with psych-verbs or psychological state verbs as complements to *faire*. Psych-verbs are bad in general, since in their most ordinary interpretation they refer to a (causal) state rather than an activity:

(40) ??Marc s'est fait agacer par son frère.
Marc refl be.pr make.ppt irritate.inf by his brother
Marc was irritated by his brother

(41) ??Marc s'est fait vexer par la remarque de Paul.
Marc refl be.pr make.ppt offend.inf by the remark of Paul
Marc got offended by Paul's remark

Similarly, psychological verbs as states cannot be given a PSF interpretation:[7]

(42) *Marc s'est fait craindre par tout le monde.
Marc refl be.pr make.ppt fear by all the world
Marc was feared by everybody

(43) *Marc s'est fait haïr par tout le monde.
Marc refl be.pr make.ppt hate by all the world
Marc was hated by everybody

Note that as soon as the verb profiles the agentivity within the event, the PSF interpretation is more acceptable:

(44) a. J'en ai assez de me faire contrarier!
I of.it have.pr enough of refl make.inf bother.inf
I'm fed up with being bothered
b. Je me suis fait humilier!
I refl be.pr make.ppt humiliate.inf
I've been humiliated

Finally, the constraint is not solely determined by the lexical semantics of the verb, but rather by the properties of the overall scene (see (45a) *vs* (45b)):

(45) a. ??Marc s'est fait lire un passage d'*Autant en emporte le vent* hier.
Marc was read a passage from Gone with the Wind
b. Marc s'est fait lire ses droits par le policier, quand il l'a arrêté.
Marc was read his rights by the policeman

Despite the complexity of these data, the mere presence of another semantic constraint affecting the PSF, but not ordinary passives, causatives, and simple deagentives, points to the autonomous existence of the PSF construction in the grammar of French.

6. CONCLUSION

The PSF is a distinct construction of modern French. It does not derive from the superimposition of a periphrastic causative and an independently motivated reflexive construction and is subject to specific semantic constraints. One of its constraints, the animacy of the subject referent, is shared by coreferential *se+faire*. It is therefore best to hypothesize the PSF construction historically evolved from coreferential *se* + *faire* and is not derived from *faire* + non-coreferential *se*. The question remains: why did the PSF construction develop in French alone? We know of three relevant facts which as a set seem unique to French.

First, in some discourse contexts, speakers may use the literal *se+faire* to focus on the affectedness of the subject referent with little concern about the degree of its responsibility (see the idiomatic (4)). Second, many uses of the French reflexive marker are not associated with a distinct role. Among these uses, the deagentive-*se* construction specifically removes responsibility of an agent. As such it can serve as an analogical basis for reanalyzing literal *se+faire*. Third, the passive function of *se+faire* in French inversely correlates with the absence of a full-fledged passive-like use of the reflexive marker with uni-predicate clauses, as is commonly found in other Romance languages. The extent to which these three factors are explanatory remains to be determined. Nonetheless only French seems to have all three. It is therefore tempting to conjecture that these factors are linked to the presence of this typologically exceptional construction.

ENDNOTES

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1. The alternation between active and *se*-moyen entries only concerns the mapping of (common) event-semantics to (distinct) syntax, and possibly discourse structure. In fact, this event-semantics preservation underlies the frequent typological classification of *se*-moyen as a passive construction (see op.cit.).

2. This example is ungrammatical under a PSF interpretation as well, because of a semantic constraint discussed below.

3. Note that the *par*-phrase codes the agent of the complement verb, not that of *faire*. It is therefore licensed by the clause-union structure independent from the application of deagentive-*se*.

4. Note that the ordinary causative entry is already marked for the reflexive. This is necessary since *faire*, when it subcategorizes for an AP must have coreference between the affected entity and the subject. When there is no coreference, French uses *rendre* as a causative verb (see (i-iii) for the relevant contrast):

i. Marc s'est fait humble.
Marc refl be.pt make.ppt humble
Marc made himself humble
ii. *Marc a fait Jacques humble.
Marc have.pr make.ppt Jacques humble
iii. Marc a rendu Jacques humble.
Marc have.pr give.back.ppt Jacques humble
Marc made Jacques humble

The fact that the relevant *faire* entry is already reflexively marked does not prohibit a deagentive construction from applying. The deagentive construction only requires the resulting structure to be reflexively marked. If the entry is already marked, the deagentive application will simply result in a structure morphologically identical to the non-deagentive entry.

5. Two out of 27 speakers showed no difference at all between animate and inanimate subjects. It is possible that the constraint is subject to dialectal variations.

6. Sentence (37a) and (32) are rated low by all speakers. Inanimate sentences that are acceptable to many speakers all involve an inanimate still present after the event to serve as an instrument affecting an animate patient. Sentences that will not result in an available instrument for this further effect on an animate entity appear universally unacceptable. The exact nature of this extension needs more precise determination.

7. Some speakers accept (43), but reject other sentences involving psychological state verbs. For us, all such sentences are acceptable only if some responsibility lies with the subject referent. In other words, it is only acceptable when read as a compositional *se faire*. Further study is needed to assess the extent of dialectal variation on this point.

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Earthquake Narratives

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Introduction

In linguistics, the study of narrative theory has been greatly influenced by Labov; the discourse genre he called "narratives of personal experience" (Labov 1972) is well-accepted in the linguistic community. In Labov's fieldwork, narratives of this type were elicited as a way to obtain samples of casual speech, but were ultimately used as the basis for Labov's theory of narrative structure.

I would like to suggest that within this discourse genre (narratives of personal experience) there may be identifiable subgenres, whose linguistic differences are related to their narratives' content. In this paper I will posit the subgenre "earthquake narratives," and explore the evidence for such a distinction, keeping in mind the implications this has for Labov's theory. My work is based on interviews done with 14 people who experienced the 1989 earthquake in northern California.

Background

On October 17, 1989, the San Francisco Bay Area experienced its second largest earthquake of the century. The quake, which measured approximately 7 on the Richter scale, caused some 65 deaths and $7 billion in property damage. Although its epicenter was in Santa Cruz County, it was felt over a vast stretch of land, causing very serious damage 50 miles north in San Francisco and Oakland.

At the time of the quake I was living in Michigan, but was in close touch with family and friends back in the Bay Area, in particular because the World Series was being played there. The evening of October 17th I turned on the TV a few minutes late, about 8:15 pm, and discovered, instead of baseball, a rerun of a sitcom and the words "Game 3 of World Series Postponed Due to Major Earthquake in San Francisco Bay Area" running along the bottom of the screen. I stared at the words in shock.

That's my earthquake narrative.

Two months later, home for Christmas, I began to collect some of the more typical narratives I was hearing about the quake. I taped interviews with 14 people, all either friends or members of my family, none of whom had experienced anything more serious than broken glass and collapsed bookcases. All my subjects were middle-class, all but 2 were white, and all were native speakers of English. The chart below shows the distribution of age, sex, residency (California native, longtime resident, newcomer) and the county in which the subject experienced the earthquake (Sonoma, Marin, San Francisco, San Mateo, or Santa Clara).

Age	Sex	Cal nat	lng res	new	Sonoma	Marin	SF	San Mat	NSClara	SSClara
77	F		X		X					
69	F		X						X	
43	M		X							X
40	F	X								X
39	F	X							X	
33	M		X				X			
29	F	X				X				
29	F	X								X
28	M		X					X		
27	F	X					X			
25	M			X				X		
14	F			X					X	
6	M	X								X
3	F	X								X

Narrative Structure

As an aid to discussion , a sample earthquake narrative is presented in (1) below.

(1) *December 1989, subject's living room, 4 people present in all.*
Katherine, 77 yrs, Sonoma County

11 Oh.. all right..
12 we were sitting here like this
13 getting ready to watch the.. baseball game
14 and things started to.. shake
15 and I said "Oh!
16 Santa Rosa's having a little earthquake."
17 [all laugh]
18 Nothing moved.. except as the house moved
19 [Interviewer: "uh huh"]
20 M- nothing fell..
21 nothing rolled over..
22 nothing like that.
23 then there was a pause
24 then there was a jolt
25 I was sitting here
26 and when the jolt came I got up
27 and said "I'm going to get out of here"
28 and I went out on the deck
29 and John was over there in his chair
30 and he followed me out
31 and we got out there
32 and that hummingbird feeder was going like this
(makes swinging gesture with hand)
33 swinging hard.
34 so I went down the steps
35 but I wasn't in any great hurry
36 by the time I got to the bottom of the steps it was quiet
37 nothing was going except the hummingbird feeder.
38 so I came up back upstairs..
39 and.. there was no power for about two minutes.
40 so then I knew.. when the TV screen was black..
41 that it wasn't a little Sa- Santa Rosa earthquake

According to Labov, a narrative consists of six possible parts: abstract, orientation, complicating action, evaluation, result/resolution, and coda. The narrative in (1) lacks an abstract, as do all my quake narratives, probably because I gave my subjects their topic. Labov's cue to his subjects was to say, in the middle of a conversation, "were you ever in a situation where you were in danger of being killed?" Because this was a more general cue, it often led to the subjects beginning with a brief summary, such as "yes, one time my brother tried to shoot me" and then proceeding to tell the whole story from the beginning. My observation is that when earthquake stories come up naturally in conversation they often still lack an abstract, but the narrator may say something like "I was in San Francisco" or "I was in the shower" before really beginning to tell the narrative. Such a comment, which can be difficult to distinguish from what Labov terms 'orientation', may function like an abstract for an earthquake narrative. When Labov's subjects prepared to tell their stories, they knew that their audience did not know time, place,

cause, or anything else about the situation. When people share quake stories they are all talking about the same twenty seconds of the same day in the same general area -- but one key piece of missing information is exactly *where* each person was.

In the narrative in (1), we can say the orientation is lines 12 and 13. Result/resolution is a bit harder to pinpoint -- maybe lines 36-41? To decide this, we must first decide what the 'resolution' of an earthquake narrative is -- the end of the quake? the discovery of collapsed bookcases? Everything else in the narrative is complicating action and evaluation, which can be very hard to pull apart, as even Labov admits. 'Complicating action' is what happens in a narrative, and 'evaluation' is the narrator's attempt to show his/her audience why this narative is important and why they should listen to it -- what its point is, in other words. This narrative as I have given it to you lacks a coda (a way of showing that the narrative is over), probably because it *isn't* over. In (1) I only present a part of the speaker's narrative -- she actually went on talking for quite awhile after this about how she felt afterwards, what happened to various members of her family, and what she thought about some of the really disastrous things that had happened, until the tape finally ran out. For some speakers, the 'coda' consisted of a sigh or a shrug of the shoulders. An example of a full-fledged Labovian-style coda from another one of my speakers is given in (2).

(2) *Rick, 28 yrs, San Mateo County*
415 so and that's my earthquake story
416 [Interviewer: "OK"]
417 probably longer than most [laugh]

A recent revision of Labov's theory is presented in Johnstone (1990). The main improvements in Johnstone's structure are the elimination of result/resolution and evaluation -- the first because not all personal experience narratives have resolutions, and the second because evaluation, although an important part of personal narratives, is not really a part of their structure. Evaluation is mixed in with everything else, and can involve things like word choice and intonation. Johnstone also shows that orientation and complicating action (which she calls 'narration') can be intermingled, although it is normal to begin a narrative with orientation. She also makes it clear that the 'abstract' is the narrator's route from conversation into narrative, and the 'coda' is the way back out again.

Johnstone's structure, like Labov's, is intended to be very general, applicable to a wide variety of narratives. However, since my aim in this paper is to discuss one specific type of narrative, earthquake narratives, I can afford to be more specific about their structure. Earthquake narratives follow a very neat pattern: below I present an outline of an earthquake narrative, based on 12 of the 14 examples in my data (the 3-year-old did not tell a typical earthquake narrative and one of the adult speakers did not tell a complete narrative). I omit discussion of 'abstract' and 'coda' from this outline because I feel my interview style affected my collection of these (if you aren't having a typical conversation, you probably won't get typical conversation markers), although my comments above on typical earthquake narrative abstracts should be kept in mind. The line numbers given refer to the narrative text in (1).

(i) I was X place, doing X (lines 12-13)
(ii) the quake began (line 14)
(iii) I responded in x way, as did objects and people around me (lines 15-35)
(iv) the quake ended (line 36)
(v) I felt X/realized X/saw or found out X had occurred (lines 37-41)

I will discuss each of the parts of this outline in detail, referring to the 12 typical narratives on which this outline is based.

Part (i), a kind of orientation (or perhaps abstract, see above) is a crucial part of an earthquake narrative. Katherine's narrative, in (1), is somewhat atypical, being only 2 lines long (12-13). However, she was interviewed in exactly the spot where she experienced the quake, so she could say "We were sitting here like this" and convey quite a lot of information. In several of the narratives I collected, the orientation continues throughout the story, as needed, to explain various events, but no one skips it at the beginning. It seems to be required. You can't just begin with "Well, the room started shaking." In the 12 narratives, orientation ranges from 2-22 lines (average 8.5 lines). Longer orientations were given by the two speakers who were at Candlestick Park during the quake, and another speaker who talked a lot about how strangely her dog acted before the quake. The other speakers generally said where they were, possibly including something about the construction material of the building they were in, whether other people were around, and what they and others were doing just before the quake. Two other examples of part (i) are presented below. (3) is a brief version and (4) is somewhat longer. In both cases I have included the first line of part (ii) in italic to show the transition from (i) to (ii).

(3) *Harry, 43 yrs, Santa Clara County*
19 well..
20 I was sitting at work.. in Sunnyvale.. inside of a building.. two-story building..
21 and..the walls started to shake..

(4)*Teresa, 29 yrs, Marin County*
9 OK.. we were all having a meeting..
10 it was in the afternoon after we had let the kids off..
11 and they were all playing.. in whatever place they were playing..
12 and we were all sitting inside in the.. small conference room..
13 in one of those old buildings (laugh) made of cement..
14 you don't know how well they're reinforced..
15 we were sitting in there in our meeting
16 and all of a sudden we felt this shaking..

Part (ii) is the beginning of the earthquake, the transition from normal life to earthquake. All 12 speakers make reference to this, although only 9 introduce it specifically. Katherine (line 14) is an example of a specific introduction, while Nora in (5) refers to it without introduction.

(5) *Nora, 14 yrs, Santa Clara County*
8 And.. um.. we had just.. we had just turned the TV on..
9 and we were moving the furniture around..
10 when.. when it started..

Part (iv), the transition from earthquake back to normal life, seems to be optional; not all speakers specifically mention the quake's end. Four don't mention it at all, four mention it without introducing it, and four specifically introduce it. Examples of these three types are given below. In (6) Teresa moves from a discussion with the interviewer about whether or not she saw the ground moving, right into what she did after the quake, with no mention of it having ended. Joanne, in (7), refers to the end but does not actually say "it ended"; Nora, in (8), does.

(6) *Teresa, 29 yrs, Marin County*

74 so we all came back inside to finish our meeting up

(7) *Joanne, 29 yrs, Santa Clara County*
31 So then.. once the earthquake had ended,
32 I had to.. had to have the courage to go into the room where we'd had a lot of damage

(8) *Nora, 14 yrs, Santa Clara County*
30 And then it stopped..

Parts (ii) and (iv) are boundaries around the action of the narrative. The content of a quake narrative can be roughly divided into two parts -- what happened while the quake was going on, and what happened after it stopped, although the edges of these can merge. An important goal of quake narratives seems to be to describe all changes that occurred in things important to the speaker, and the relevant details are inserted throughout the narrative as they occur to the speaker.

Part (iii) -- what happened during the quake -- averages 23 lines with my 12 speakers (the range is 3 to 64). There seem to be six basic subjects touched upon in this section, as follows:
1. what the speaker thought;
2. what the speaker felt;
3. what the speaker did;
4. what other people/animals did;
5. what things moved, etc.;
6. what things didn't move.

The last subject (6) is only discussed by half the speakers, while 1-5 are mentioned by all but one or two of the speakers (except 3 -- "what the speaker did" -- which everyone discusses).

Part (v) can vary the most, depending perhaps on how much damage the speaker's surroundings suffered and how long it took him/her to get home, but also possibly just on how much the individual speaker felt like talking. Many different things are discussed in part (v) -- what the speaker thought and did right after the quake, what other people did, what things were broken or out of place, what he/she did the rest of the day, how he/she felt later on (even several weeks later). This part often includes miniature earthquake narratives the speaker heard from other people, or comments on the major tragedies of the earthquake and the media reports.

Getting home, if the speaker had been away from home during the earthquake, was always a part of the narrative, perhaps because the damage suffered by one's home feels like part of the damage suffered by oneself -- or perhaps just because it was so hard to get home because of all the traffic. Omitting the little kids, who had very short parts here, and one speaker who talked for a long long time, the average length of part (v) is 70 lines -- 50 for speakers who were at home, and 90 for speakers who were away from home at the time of the quake.

Other similarities

Earthquake narratives have many other things in common. In quake narratives, people's attention is focussed in different ways and on different things than usual. Now, in normal conversation, we usually talk mainly about people. We talk about ourselves and others, and the things that people are involved in, like politics or religion. If we aren't talking about people we might talk about something that we interact with intensely -- our car, for example, or our computer -- usually something with moving parts, incidentally. However, most of us rarely talk about the walls of our home, for instance, or the linoleum -- unless something is wrong, something needs fixing. In an earthquake, this all changes. Inanimate objects become very

interesting to us, because they begin to move. Thus, earthquake narratives are full of talk about normally inanimate objects.

In the narrative in (1) there are some examples of this -- line 14 "and things started to shake", lines 32-33, 37 describe the hummingbird feeder, and line 40 mentions the TV screen. Some other examples are given below.

(9) *Stephen, 25 yrs, San Mateo County*
76 and um I remember books were falling out of the bookshelves
77 and there was a big bookshelf right in front of me
78 and I was just holding onto it cause I didn't want it to fall on me.

(10) *Nora, 14 yrs, Santa Clara County*
49 and lots of pots and stuff went flying around the room..

(11) *Harry, 43 yrs, Santa Clara County*
21 and.. the walls started to shake..
22 the ceiling started to move..
23 the floor started to move..

Another thing worth noting, on this point, is that during a quake people feel that the earthquake is in control and they are to some extent helpless. This may be another reason why things seem almost as important as people in earthquake narratives. People's actions are not as interesting as they may be in other situations, because people are not in control.

This discussion can be illuminated by bringing in the concept of frame, which emerged in the 70's from research in artificial intelligence and was developed by Minsky (1975). A frame is a sort of blueprint for normality that we hold in our mind for every object or situation we are familiar with. So, a typical American's frame for a kitchen, for example, includes a stove, refrigerator, sink, cupboards -- but probably not a piano. Frames are very culture-specific, in fact sometimes person-specific. When we observe something that violates our frame for a given situation (such as a piano in a kitchen) we are very interested in it, look at it a lot, and talk about it. Any unusual occurrence will violate frames, but an earthquake is special in that it violates many very basic frames -- such as how furniture ought to behave.

A sign, in my earthquake narratives, that speakers had experienced frame violation, is the large number of negative and/or contrastive statements that appear -- things like "I thought it was X -- but instead it was an earthquake". Some examples of these are given below. Paul, in (12), talks about how surprised he was when the ground began to move, and the contrast between his feeling that he must be dizzy and his subsequent realization that he was experiencing an earthquake. Andrew, in (13), seems to be saying that he thought it was a tornado, but it turned out to be an earthquake. Joanne, in (14), contrasts the expected behavior of falling pictures with hers, which orbited, while Teresa, in (15), describes the conflict between a teacher who doesn't realize there has been an earthquake and students who are behaving in a manner which is appropriate in an earthquake but inappropriate otherwise.

(12) *Paul, 33 yrs, Candlestick Park*
35 um.. so anyway.. uh while I was walking back with the hot dogs
36 the whole.. you know ground began to move.. a *lot* ..
37 and uh.. it was very surprising
38 because you know.. you don't kind of expect that sort of thing to happen
39 uh.. the first feeling was that.. that I was going to pass out

40 but then I realized that it wasn't me..
41 it was really the stadium

(13) *Andrew, 6 yrs, Santa Clara County*
16 And so... this is what happened... z z z z
18 It shook!
19 but.. like.. a tornado was coming..
20 but it was an EARTHQUAKE..

(14) *Joanne, 29 yrs, Santa Clara County*
61 and all the pictures that are on the mantle
62 not.. didn't just fall on the floor
63 they actually made a a orbit
64 and ended up in the back of the fireplace.

(15) *Teresa, 29 yrs, Marin County*
49 But the *kids*.. they were in the dorm..
50 that *were* in the dormitories..
51 went rrrrunning outside to the parking lots..
52 and this teacher started screaming at 'em
53 cause I don't know what the teacher had been doing but didn't..
54 she didn't *realize* that there had been an earthquake
55 and so she was like "what are you doing.. running out of the dorms
56 you're supposed to be in there at quiet time"..
57 and they're all like "no it's an earthquake (laugh)
58 we're doing what we're supposed to"..

This last example (15) points up another interesting aspect of earthquake narratives. Earthquakes, though unexpected at any given moment, do occur periodically in California, and so residents have frames for earthquakes as well. Several subjects made remarks that showed what an unusual earthquake they thought this one was. Katherine's narrative, in (1), is full of these. Lines 15-16 introduce a contrastive statement that outlines her whole narrative, ending with lines 40-41. She at first thought she was feeling a small earthquake probably centered in nearby Santa Rosa, but then realized that it was more serious than that. Some other examples are given below. Paul, in (16), mentions having had an opinion about the earthquake's size, probably based on previous experience. Gail, in (17), says that she decided it was "just a normal earthquake". Note that Stephen, in (18), although a newcomer to the state, had a frame for earthquakes based on what he had heard about them, but then realized his frame didn't fit this quake.

(16) *Paul, 33 yrs, Candlestick Park*
53 uh and I just.. I wasn't really frightened
54 I didn't realize it was a big earthquake..
55 I honestly thought it was just.. you know..
56 the it was a pretty small earthquake..

(17) *Gail, 39 yrs, Santa Clara County*
257 so I thought: well.. I guess it was just an earthquake..
258 I guess I'm I'm just making a big deal out of it.. you know..
259 just a normal earthquake.
260 So I went back to work..
261 and I was working away..
262 and then Harry came in with this -- *look* on his face (laugh)

263 and I was: uh-oh (laugh)
264 and he says: we better get out of here (laugh) *now*.

(18) *Stephen, 25 yrs, San Mateo County*
39 so it's gonna be fun
40 my first real earthquake
41 well I suddenly realized it wasn't fun
42 because all these people were *so scared*

I believe that one reason the narratives I collected are so full of this type of remark is that all the speakers knew they were speaking to another Californian, myself, who perhaps still held in her mind the old frame for earthquakes. They may have been trying to convince *me* that this earthquake was special.

Discussion

When I began the analysis of these narratives, it was with a specific question in mind: are these narratives a type? -- that is, do I have the right to call them earthquake narratives, hypothesize a "typical earthquake narrative", etc.?

Well, as I have pointed out, earthquake narratives have many things in common, in terms of structure, focus, etc. Another thing that may give me the right is the immediacy of people's responses when I asked them to tell me about the quake. I gave a variety of cues -- "tell me about the earthquake"/ "tell me what it was like for you" / "tell me your earthquake narrative" -- but got extremely similar results. People knew what I was asking for and were ready to give it. This is not always the case when one tries to collect a specific type of narrative.

Why should it be true for earthquake narratives? Well, after an earthquake, people like to tell each other about their experiences of it. "Where were you? What was it like for you?" Earthquakes are experienced by a large number of people, but each person's experience will have been different depending on exactly where he/she was at the time. For some reason part of the bonding together that occurs after a serious earthquake takes the form of sharing descriptions of experiences. Thus, when I did my taping, two months after the quake, all my subjects had probably told their stories many times to many different people and were able to rattle off a version with ease.

So maybe earthquake narratives deserve to be called a genre. Maybe. Or perhaps, as has been suggested to me, they should be considered part of a genre called "disaster stories". However, in my searches through the vast muddled literature on narrative I have found descriptions of two other types of narrative that remind me of earthquake narratives, one reported on by a sociologist and the other by two psychologists. The first is "accounts of paranormal experiences" (Wooffitt 1991). These narratives remind me of earthquake narratives because of their explicit description of what was happening before something odd happened. Wooffitt refers to this as the phenomenon of "I was just doing X... when Y". Also, the 'something odd' seems to control the narrative in the same way an earthquake controls an earthquake narrative. I quote a brief example in (19) below:

(19) (Wooffitt 1991, pp 271-272)
6 X an' I was standing right there
7 on the platform (.7) waiting
8 for this damned train to come (.)
9 Y all of a sudden (2.3)
11 I (.) began to feel as total
12 totally (.) absolutely (.)
13 insubstantial that is

14 I had no bodily feeling whatsoever

The other type of narrative that reminds me of quake narratives is called flashbulb memories (Brown & Kulik 1977). This is the -- where I was when I heard JFK was shot -- where I was when I heard about Pearl Harbor -- type of narrative. The experience was so affecting that the experiencer retained an apparently photographic memory of the time, including what he/she was doing, where he/she was, what he/she was wearing, etc. A brief example from the article is given in (20) below:

(20) "I was seated in a sixth-grade music class, and over the intercom I was told that the president had been shot. At first, everyone just looked at each other. Then the class started yelling, and the music teacher tried to calm everyone down. About ten minutes later I heard over the intercom that Kennedy had died and that everyone should return to their homeroom. I remember that when I got to my homeroom my teacher was crying and everyone was standing in a state of shock. They told us to go home." (Brown & Kulik 1977, pp 74)

Neither of these articles gives enough data for me to compare my earthquake narratives with them carefully -- and in any case, Brown & Kulik collected written narratives, not oral ones -- but they suggest that earthquake narratives may be part of a network of types of narratives -- narratives about unexpected disturbing experiences, perhaps -- that share something in common in the way of content, and, as a result, structure.

You will remember that Labov based his theory of narrative structure mainly on one type of narrative -- Danger of Death. It seems possible that he would have gotten somewhat different results if he had used another type of narrative. In the search for truth about narrative, it would be worth trying to figure out what types of personal experience narratives exist in our culture, and how they differ.

I should mention here something that I haven't brought up before: I think my conclusions about earthquake narratives are very culture-specific. Remember that I had an extremely homogeneous group of subjects. I think you would get rather different narratives from people in another culture -- or even another part of our culture -- and it would be very interesting to compare earthquake narratives across cultures to see what stays the same and what is different.

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The Comparative Conditional in Latin

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0. Introduction.[1] The construction at issue is the Latin manifestation of a form-meaning pairing that is readily identifiable cross linguistically, but has only recently captured the attention of linguistic theorists. Following McCawley (1988), I will call this construction the comparative conditional (CC). With respect to its semantic and syntactic properties, the Latin CC has much in common with the English sentence type exemplified by the proverb *The bigger they come, the harder they fall.* An example of the Latin construction is given in (1):

(1) Quanto in pectore hanc rem meo magis
how-much (AB) in heart (AB) this (A) matter (A) my (AB) more
voluto, tanto mi aegritudo auctior est in
(I) ponder that-much (AB) me (D) grief (N) greater (N) is in
animo.
spirit (AB)
"The more I turn this matter over in my mind, the greater the grief is in my soul."
Plautus, *Captivi* 781-2

Like its English analog, the Latin CC expresses a relationship between an independent and dependent variable. Thus, sentence (1) can be paraphrased in the following manner: "any increase in the duration of deliberation yields a concomitant increase in the amount of grief experienced". Syntactically, both CC constructions are biclausal, and contain a comparative phrase in each clause. The structure of the English CC has been of interest to proponents of a theory of grammar which recognizes the existence of grammatical constructions, and, in particular, formal idioms. Analysts like Fillmore (1987), Fillmore, Kay and O'Connor (1988) and McCawley have been especially interested in the following issue: to what extent is the CC syntax derivable from more basic constructions, and to what extent are its component parts—and the manner in which they are combined—unique to this structural pattern? Each argues that the English CC inherits certain syntactic properties from those constructions which it resembles semantically. Hence, the CC, like conditional constructions, suppresses future *will* from its 'protasis'. The CC also displays characteristics of comparative constructions (e.g., ordinary comparative morphology). A number also note, however, that (a) there is no established category label for the definite article in its function here as a degree marker, and (b) standard phrase-structure rules do not provide for the pairing of parallel clauses of this type. Thus, the English CC represents an extragrammatical structural pattern.

By contrast, I will argue, the syntax of the Latin CC is highly regular: the complex construction is assembled from component parts provided independently by the grammar. Thus, for example, the Latin CC appears to inherit its basic structure from the correlative template, whereby a subordinate clause introduced by a relative element is paired with a main clause containing a demonstrative element of the same lexical category. Some semantic properties of the Latin CC are also attributable to this general correlative construction. I maintain, however, that the

Latin CC represents a construction in its own right. The Latin CC cannot be reduced to the grammatical configurations from which it is built up—primarily because certain of these component parts do not have the interpretations with which they are associated elsewhere.

The semantic structure of the CC is idiosyncratic primarily because the construction imposes a special interpretation upon the paired comparative phrases [CompPhrases] within it. For our purposes, the CompPhrase consists of a morphologically comparative element—an adjective, adverb or quantity noun—and one of several ablative-case degree modifiers, e.g., *tanto auctior* ("the greater") in sentence (1). The comparative element and its degree modifer need not be contiguous. The semantics of the CompPhrase is constructionally specific in two respects: (1) the CompPhrase has two alternate readings; (2) in one of these readings, the comparative form *per se* makes no discernible semantic contribution.

Within the CC, the CompPhrase may code a variable across a range of scalar values, or it may code a fixed point upon a scale. An example of the first interpretation is given in (1). Here, the CompPhrases *quanto magis* and *tanto auctior* each stand for a range of values on scales of duration and magnitude, respectively. The scales in question are established by the individual paired clauses. An example of the second interpretation is given in (2); the CompPhrases are shown in boldface:

(2) Sed non statuendo felicitati modum,...**quanto altius**
but not setting (AB) success (D) limit (A) how-much (AB) higher
elatus erat **tanto foedius** conruit.
lifted (N) (he) was that-much (AB) worse (he) fell
"But by not setting a limit to his success, to the extent that he [M. Atilius] had risen high, he fell badly."
Livy 30.30

In (2), each of the CompPhrases codes a fixed point on the respective scales of height attained and downfall suffered.

The variable interpretation of the CompPhrase (1) is not unique to the CC; it is associated with the comparative outside of the CC. This use of the comparative involves a comparative standard that is not fixed. Hence, in both English and Latin, the comparative is a means of coding the accretion of a scalar property, as in (3):

(3) a. He became sicker and sicker $\left\{ \begin{matrix} \text{*than before} \\ \text{*than Harry} \end{matrix} \right\}$.
b. We're growing older.
c. De Graecia cottidie magis et magis cogito.
About Greece (AB) daily more and more (I) think
"I think more and more about Greece each day."
Cicero, *ad Atticum* 14.18.4

By contrast, the constant interpretation of the CompPhrase (2) seems to owe nothing to the semantics of comparison. One might say that in such examples the morphological comparative does not represent a semantic comparative. An understanding of the range of functions of the comparative will not help a naive decoder (i.e., one ignorant of the CC construction per se) to interpret (2).

The two possible interpretations of the CompPhrase render the Latin CC polysemous. That is, the syntactic template—whose properties will be described

forthwith—can express either of two types of relationships between a pair of semantic scales: (a) a link between two variables, whose ranges are determined by the two scales, or (b) an equivalence between two fixed values on the two scales. Let us refer to the first reading as the variable reading; the second as the constant reading. Strictly speaking, neither reading is calculable from the meanings of constructional subparts. The association of the constant reading with the CC template appears particularly unsupported by the grammar at large, especially the grammar of comparison. The CC is then best regarded as a conventional pairing of syntactic form and meaning.

The remainder of this paper will be structured as follows: the next section will provide a brief overview of the syntax of the Latin CC, and the manner in which the subparts of this construction are licensed by related constructions; the third part will further describe the two readings of the CC, and the manner in which linguistic context might select a preferred reading; a concluding section will highlight the advantages of a construction-based approach to the semantic phenomena at issue.

1. Syntax. The syntactic properties of the CC are represented in figure 1, using some notational conventions of unification-based Construction Grammar (Fillmore and Kay 1991):

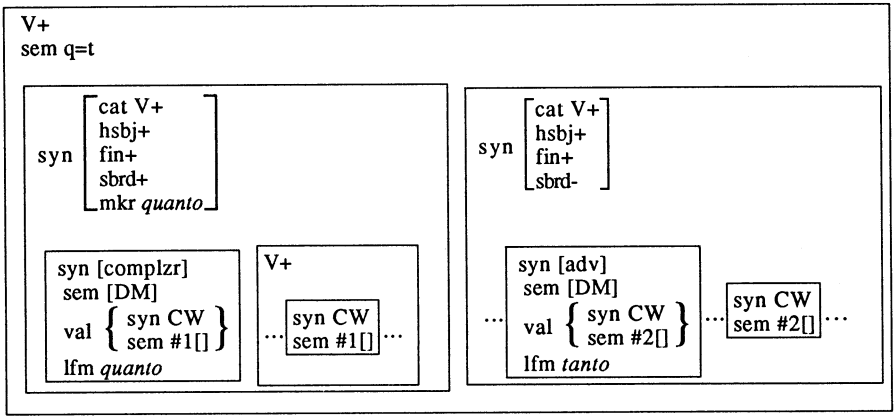


figure 1

As shown, the basic structure consists of a main and subordinate clause. The main clause is that containing the demonstrative degree-marker *tanto* (or sometimes *eo* or *hoc*). The subordinate clause contains the interrogative degree-marker *quanto* (the degree marker *quo* is also found). The subordinate status of this clause is demonstrated by such sentences as (4), in which the CC appears in indirect discourse:

(4) Non est infitiandum Hannibalem tanto praestitisse
not is disputable (N) H. (A) that-much (AB) surpass (INF)
ceteros imperatores prudentia (AB) quanto populus
other (A) generals (A) prudence (AB) how-much (AB) people (N)

Romanus antecedant fortitudine cunctas nationes.
Roman (N) supersede (SBJ) strength (AB) all (A) nations (A)
"One cannot dispute that Hannibal surpassed other generals in prudence to the same degree that the Roman people supersede all other nations in strength."
Cornelius Nepos 13.1

The verb *infitior* ("I dispute") takes an accusative-infinitive sentential complement. Hence, *Hannibal*, the subject of the verb *praesto* ("I surpass") appears in the accusative, while the verb appears in the infinitive form. It is generally true in Latin that subordinate clauses, including relative clauses and conditional protases, retain their finite form in indirect discourse, appearing in the subjunctive. As shown in (4), the verb of the *quanto*-bearing clause, *antecedo* ("I supersede"), appears in the present subjunctive. Sentence (4) also demonstrates that the main clause may precede the subordinate clause. Additionally, (4) illustrates the possibility of ellipsis within the CompPhrase. In Latin, certain scalar predicates, including those of the 'surpass' class, represent 'notional comparatives'. As such, they may be directly modified by the degree marker, without the intercession of a comparative word. Such sentences as (4) represent fixed-value correlatives akin to (2).

Within the paired clauses, only one element has a fixed position: the degree marker *quanto*. In the subordinate clause, it must appear in initial position; *wh*-elements tend to be so constrained. By contrast, the degree modifier *tanto* may appear in clause-initial position (1-2), post-subject position (4), or clause-final position, as in (5):

(5) Quanto diutius abest, magis cupio tanto.
how-much (AB) longer (he) is-absent more (I) want that-much (AB)
"The longer he is away, the more I long for [him]."
Terence, *Heautontimoroumenos* 3.1.15

Quanto, it seems, performs a double duty: it functions both as a subordinating conjunction and as a degree modifer of the comparative element within the clause. The demonstrative degree marker has only the latter of these functions; it is hence found in all positions within the main clause, as indicated by the ellipses on either side of the *tanto* constituent. The valence requirements of both degree markers call for a comparative word (CW). The comparative word is freely ordered within each clause with respect to its degree marker; this is again indicated by ellipses flanking the comparative word. What I have called the CompPhrase—the degree marker plus comparative—represents a discontinuous constituent. The degree word and comparative word need not appear in tandem. Nonetheless, the language shows a preference for an ordering in which the comparative word immediately follows its degree modifier, and these degree modifiers appear in clause-initial position. This default pattern is exemplified in (6); CompPhrases are shown in boldface:

(6) **Quo propius** hostis accedebat, **eo maior**
how-much (AB) closer enemy (N) came that-much (AB) greater (N)
caedes fugientum fiebat.
slaughter (N) fugitives (G) became
"The nearer the enemy approached, the greater the slaughter of fugitives became."
Livy 26.9

The syntax of the CC can be seen as derived from two more basic constructions: the correlative construction and the adverbially modified comparative. The correlative construction provides for the pairing of a subordinate and a main clause, in which the subordinate contains a relative element and the main clause a demonstrative element of the same lexical category—nominal, adjectival or adverbial. As in the CC, the relative element serves as a complementizer. Some examples of the general correlative construction are given in (7). The correlative words appear in boldface; the lexical category of the pair is also indicated:

(7) a. **Tot** mala passus sum **quot** in
that-many misfortunes (A) suffered (N) (I) am so-many in
aethere sidera lucent.
sky (AB) constellations (N) shine.
"I have endured as many misfortunes as constellations shine in the sky."
Ovid, *Tristia* 1.5.47 (adverbial)

b. **Tam** esse clemens tyrannus **quam** rex
that-much be mild (N) tyrant (N) so-much king (N)
importunus potest.
harsh (N) can
"A tyrant can be as mild as a king is harsh."
Cicero, *De Re Publica* 1.33.50 (adverbial)

c. ...ut...**quales** simus **tales** esse videamur.
so which-kind (N) (we) are that-kind (N) be (we) seem
"...so that we might appear as we are."
Cicero, *De Officiis* 2.13.44 (adjectival)

d. Non habuit **tantam** rem familiarem Philus
not had that-great (A) thing (A) familiar (A) P. (N)
quantam Laelius
as-great (A) L. (N)
"Philus did not have as great a fortune as Laelius."
Apuleius, *Apologia* 20 (adjectival)

The adjectival correlative counterparts of (7d) might look familiar; these are the adjectival equivalents of the paired degree-markers appearing in the CC. These adjectives are general indicators of magnitude. As modifiers, they agree in case, number and gender with the head noun. Used substantively, they can serve as degree markers, akin to *tam* or *quam* of (7b). As degree markers, they have the invariant ablative neuter singular form, *tanto*, etc. This use of a quantity adjective or noun is often called the ablative of measure. Additional examples of ablatives of this type are *multo* "by far" from *multus* ("many") and *magno* "a great deal" from *magnus* ("great"). An ablative of measure must be accompanied by a comparative word. In this role, the ablative element indicates the degree to which the comparative target departs from a comparative standard. Example sentences are given in (8):

(8) a. ...vir melior multo es quam ego...
man (N) better (N) many (AB) (you) are than I (N)
"You are a better man than I by far."
Terence, *Adelphi* 705

b. Nihilo erat ipse Cyclops quam aries
nothing (AB) was himself (N) cyclops (N) than ram (N)
prudentior.
wiser (N)
"The cyclops himself was no wiser than a ram."
Cicero, *Tusculanae Disputationes* 5.115

The CompPhrase within the CC is formed in accordance with the pattern exemplified in (8). The paired degree-markers themselves are provided by the correlative construction. The latter construction, as mentioned, also provides the biclausal syntax of the CC. Hence, the syntactic template shown in figure 1 is definable in terms of two more basic constructions: the ablative of measure and the correlative.This regular syntax does not, however, deprive the CC of its status as an independent construction. Certain semantic characteristics of the CC are attributable to those of its grammatical building blocks; some of these traits are not, and are properly regarded as idiomatic. We might now turn to those properties.

2. Semantics. As shown in (7), instances of the basic correlative construction can generally be translated via the English '*as...as* construction'. In general, the correlative expresses equivalence between two (typically scalar) values assigned to two compared entities. The entities whose values are equated may be located on one scale or two distinct (although commensurate) scales.[2] Thus, for example, (7a) involves a single numerical scale: it asserts that the numerical value that can be assigned to the set of misfortunes is equal to that which can be assigned to the set of constellations. Sentence (7b) involves two scalar properties: it asserts that the degree of clemency attributable to a tyrant might equal the degree of harshness assignable to a king. In all sentences of this type, the standard of comparison is expressed by the relative-bearing subordinate clause.

The semantics of the general correlative provides the interpretive framework of the CC construction. As indicated by the topmost *sem* value of figure 1, the CC expresses an equivalence between the degrees expressed by the relative and demonstrative degree markers. One can regard the CC as a biscalar correlative of the type exemplified in (7b), in which degrees of two scalar properties are equated. Thus, for example, sentence (5) evokes a scalar model in which any value assignable to length of absence is equivalent to some value assignable to the acuteness of longing.

There is, however, more to be said about the semantics of the CC. Let us concentrate for now on the 'variable reading' of the construction exemplified in (5-6). There are a couple of respects in which this semantic structure departs from that of the general correlative. These departures can be regarded as instances in which the semantic specifications of the more specific construction override those of more basic related constructions (cf. McCawley 1988). Firstly, sentences like (5-6) do not equate two fixed values, but the whole range of values that can be assumed upon the two paired scales. Secondly, the CC expresses an implicational relationship between the scalar properties expressed by the two clauses. That is, any increase in one property causes a proportionate increase in the other: in (6), the degree of nearness of the enemy determines the magnitude of the slaughter. The independent variable, like a conditional protasis, is coded by the subordinate clause.

Conditional semantics must be attributed to the CC template as a whole—as an idiosyncratic property of the CC vis-à-vis the general correlative pattern. It does

stand to reason that the clause coding the comparative standard of the correlative should also code the protasis of a correlative conditional; both protases and comparative standards code background information with respect to a main assertion. However, if one attempted to decode the CC armed only with knowledge of the general correlative construction, one would not know that this correlative subtype has a conditional interpretation. Further, as mentioned earlier, that the CC should express a relationship between variables—rather than an equivalence between fixed values—is not a fact about the correlative, but must be attributed to the special semantics assumed by the CompPhrase within the CC.

Within the CC, the comparative necessarily expresses what I will call 'moving-standard comparison'. English and Latin examples of this type of comparison are given in (3). In these cases, the comparative standard is necessarily unspecified, as shown by the starred continuations of (3a).The comparative standard is simply any lower value of the coded property with respect to whatever higher values are assumed over time. Such comparatives thus code the accretion of a scalar property, and function in this manner in the CC. Within the CC, the ablative of measure, *tanto* or *quanto*, accordingly codes the degree to which the comparative target departs from the moving standard. As pro-adverbs, these ablative correlative elements code not a particular degree of departure (great or little) but any degree of departure from this standard. It is important to note that although the moving-standard comparative is not unique to the CC, the fact that the comparative must have this specialized function within the CC is not *a priori* knowable.Thus, the semantics of the CC is nonpredictable, insofar as it does not simply follow from the semantics of the correlative and adverbially modified comparative.

The semantic characterization of the CC provided does not extend to sentences like (2). These sentences display all of the syntactic trappings of the CC, but are interpreted in a manner that does not involve correlated scales. As mentioned earlier, such sentences as (2) appear to express an equivalence between two fixed degrees on two scales. Further examples of this 'fixed-value' reading are given in (9); CompPhrases are shown in boldface:

(9) a. Duae Luceriam ferebant viae, altera...patens
two (N) L. (A) led roads (N), one (N) open (N)
apertaque, sed **quanto tutior, tanto**
broad-and (N) but so-much (AB) safer (N) that-much (AB)
fere **longior**. Altera, per furculas Caudinas
nearly longer (N) other (N) through forks (A) Caudine (A)
brevior.
shorter (N)
"Two roads led to Luceria—one open and broad. But that one was almost as long as it was safe. The other one, through the Caudine forks, was shorter."
Livy 9.2

b. Quantum ego dolui in Caesaris suavissimis litteris!
how I grieved in Caesar (G) most-moving (AB) letters (AB)
Quo erant **suaviores** litterae,
how-much (AB) were more-moving (N) letters (N)
eo maiorem dolorem illius ille
that-much (AB) greater (A) grief (N) that (G) that (N)
casus adferebat.
misfortune (N) brought

"How I grieved at Caesar's extremely moving letter! To the extent that the letter was moving, the grief that his misfortune brought was great."
Cicero, *Familiares*, Q.F. 3.1 §17

c. Pompeius...revertit in Italiam...Plerique non sine exercitu
P. (N) returned in I. (A) many (N) not without army (AB)
venturum in urbem adfirmarunt...**Quo magis**
would-come in city (A) had-claimed how-much (AB) more
hoc homines timuerant, **eo**
this (N) people (N) had-feared that-much (AB)
gratior civilis tanti imperatoris reditus
more-gratifying (N) civil (G) such (G) leader (G) return (N)
fuit.
was
"Pompey returned to Italy. Many had claimed that he would not come back without his army. To the extent that people had feared this, the return of such a leader as a civilian was gratifying."
Velleius 2.40.3

Semantically, these CC examples are reminiscent of biscalar correlative sentences like (7b), in which the degree markers *tam* and *quam* modify positive-degree scalar adjectives. As mentioned, sentence (7b) asserts that a tyrant and a king might be located at the same point on scales of clemency and harshness, respectively. Similarly, (9a), e.g., asserts that the road in question is located at the same point on the two scales of length and safety. The use of the comparative in (9) appears to be strictly pro forma; the ablative degree-marker requires a comparative word, but the comparative makes no obvious semantic contribution to these sentences. No comparative standards are apparently adduced in the interpretation of the paired CompPhrases of (9). In this reading, the CC again imposes a specialized interpretation on the CompPhrase. In this case, however, the CompPhrase is interpreted in a manner inconsistent with any of the semantic values that are otherwise attached to comparatives.[3,4]

This situation, in which a construction imposes a highly idiosyncratic interpretation upon a comparative, is not unprecedented in Latin. Another such construction juxtaposes two descriptors of a given entity. The construction is used to assert that the entity ranks higher on one scale than on the other scale. Both properties are coded by adjectives in the comparative form. Examples are given in (10):

(10) a. Longior quam latior acies erat.
longer (N) than wider (N) ditch (N) was
"The ditch was longer than it was wide."
Livy 32.38

b. pestilentia minacior quam perniciosior
pestilence (N) more-alarming (N) than more-dangerous
"a pestilence more alarming than dangerous"
Livy 4.52

The use of the comparative form to express that property serving as the *standard*

of comparison does not seem motivated with respect to the generally applicable semantics of comparison. Instead, a parallelism requirement of the template might supply this 'extraneous comparative'. One must know this double-comparative construction in order to interpret the extra comparative as one might otherwise interpret a positive adjective. By the same token, one must grasp the CC construction in order to disregard, as it were, the semantic contributions of the comparative morphemes in deriving a given instance of the constant reading.

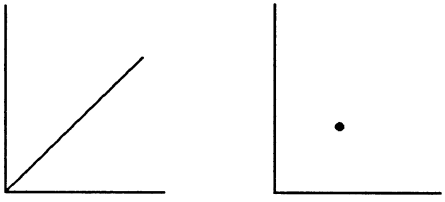
The lack of semantic motivation for the comparative in the constant reading of the CC might make such comparatives susceptible to replacement by the positive degree; there appear to be some instances of this semantic regularization in later authors. Livy and Tacitus occasionally use the positive degree in one or another of the paired clauses. An example from Livy is given in (11):

(11) Romani ovantes ac gratulantes Horatium accipiunt, eo
R (N) rejoicing and thanking H. (A) welcome that-much (AB)
maiore cum gaudio quo **prope** metum
greater (AB) with joy (AB) how-much (AB) near misfortune (A)
res fuerat.
matter (N) had-been
"The Romans rejoicing and expressing thanks welcome Horatius, with joy great to the degree that the matter had come near to disaster."
Livy 1.25

In (11) we find the positive degree *prope* ("near") rather than the expected comparative *propius* ("nearer"). This occasional use of the positive appears to be limited to those CC instances having the constant reading.[5]

It should be noted that the two readings of the CC exemplified in (1) and (2) are not wholly attributable to alternate interpretations of the CompPhrase. When the CC is used to assert an equivalence between fixed values it does not necessarily evoke a causal link between the scalar properties in question. Hence, (9a) simply asserts that road length and road safety are equal; it does not presuppose that safety determines length. Road length is simply a comparative standard, as per the correlative construction. Hence, the equivalency reading differs from the variable reading in that it is not necessarily a conditional interpretation. Typically, however, the equivalency reading does presuppose a general correlation between the scales in question. Thus, sentence (9b) presupposes that the degree of pathos expressed in a letter will determine the degree to which the reader is moved.

The difference between the two readings of the CC is schematized in figure 2. Here the paired scales are seen as a two-dimensional scalar model (Fillmore, Kay, and O'Connor 1988):



(a) (b)

figure 2

In figure (2a), the graphed identity function represents the link between scalar variables: as there is an increase along one dimension of the model, there is an increase along another dimension. Figure (2b) represents the fixed-value reading; equivalent degrees of two scalar properties are represented by a single point equidistant from the origin along both dimensions. These readings are closely aligned; one might say that they differ only in the number of coordinates plotted within the scalar model. It seems reasonable that the two meanings should find expression in the same syntactic template. Diachronic evidence suggests that this template is ambiguous rather than vague with respect to these two readings in question. A search of CC examples within a computerized corpus [6] yields no clear instances of the constant reading in early Latin. Examples like those in (9) appear to be absent from the works of Plautus and Terence, e.g. Granted, the supply of extant early Latin texts in not extraordinarily large. Nevertheless, this absence is suggestive. The constant reading might represent a semantic reanalysis of the linked-scales reading—a meaning extension which preserves the comparative syntax better suited for expressing the original reading.

The ambiguity of a CC sentence is typically resolvable via linguistic or extralinguistic context. Lingustic context includes verbal aspect. The instantiation of a range of scalar values typically requires acquisition of those values over time. The linked-variables reading often involves events having a durative character; thus, as in (6), the enemy gradually comes closer and casualties gradually mount up. In (2), by contrast, the perfective predicate *conruit* ("he fell") has a point-event construal; only one value for the seriousness of the downfall, rather than a range of such values, can be attached to that unique event. Hence, the variable reading of (2) is ruled out. One should note, as does Fillmore (1987) that the CC in its variable reading is not limited to describing a protacted episode like that of (6). The CC in this use may express a generally valid correlation, or it may express a contingent prediction. Examples of these uses are given in (12a-b), respectively:

(12) a. ...qui quidem quo severior est
who (N) indeed how-much (AB) more-severe (N) is
et tristior hoc illa quae dicuntur
and sadder (N) that-much (AB) those (N) which (N) are-said
salsiora videri solent
wittier (N) appear tend
"Indeed, the more severe and sad someone is, the more witty

the remarks that person makes tend to appear."
Cicero, *De Oratore* 2.61.289

b. Suos hortatur uti...quanto sibi in
his (A) (he) urges that how-much (AB) selves (D) in
proelio minus pepercissent, tanto tutiores
battle (AB) less (they) had-spared that-much (AB) safer (N)
fore.
will-be
"He urged his men that the less they had spared themselves in battle, the safer they would be."
Sallust, *De Bello Iugurthino* 107.1

In (12a), the increase along the linked scales of dolorousness and amusement value occurs as one scans an ordered set of raconteur-witticism pairings. In (12b), the increase along the dimensions of temerity and safety occurs as one considers the array of possible world-outcome pairings. Hence, while the constant reading is called for when a punctual event is evoked, the variable reading does not devolve upon the existence of a unique event of a durative character.
Extralinguistic context includes knowledge of what properties can be causally linked. The aspectual properties of (9a) do not disallow a variable interpretation: "the safer the road, the longer it became". This reading, however, requires an unusual background assumption: the safety of the road influences its length. The nonconditional interpretation is thereby preferred in this instance.

3. Conclusion. The CC in Latin, like its English analog, represents a formal idiom. While its syntactic properties are regular, its semantic properties are idiosyncratic. Among these idiosyncracies is its polysemous interpretation. Although the meaning alternation in question arises in large measure from alternate readings of the paired comparative phrases, it is not reducible to an ambiguity of the comparative form *per se*. The 'fixed value' interpretation of the comparative is constructionally linked; it is present only within the CC (and perhaps also the double-comparative construction of (10)). The existence of polysemous syntactic templates is problematic for those syntactic theories in which constructional meanings arise solely through semantic composition: if the meaning of a grammatical construct is solely a function of the meaning of constructional subparts, no more than one meaning should be calculable for any complex expression. Constructional polysemy is not so troubling for those grammatical theories which license departures from strict semantic composition. Among these theories are Construction Grammar (Fillmore, Kay, and O'Connor 1988) and Cognitive Grammar (Langacker 1987, 1991). Within such theories, constructional polysemy is recognized as an appropriate object of theoretical inquiry. Langacker argues (1988: 3), "phenomena like...semantic extension are central to the proper analysis of [both] lexicon and grammar". Goldberg (forthcoming) uses the CG framework in examining the network of senses associated with the English ditransitive. These frameworks represent the grammar as a repertoire of form-meaning pairings, lexical, phrasal and clausal. This repository contains formal idioms—syntactically complex constructs with which meanings must be associated holistically. These are cases in which the meaning of the syntactic construct is not calculable, but is instead conventional. Such constructions then express meanings in much the same way that words express meanings. Like words, they are "learned separately as individual whole facts about pieces of language" (Fillmore, Kay and

O'Connor (1988)). Just as speakers may recognize more or less tenuous derivational relationships among words, they may identify semantic and syntactic commonalities which link a given formal idiom to the grammar at large. The pervasive nature of lexical polysemy is commonly recognized (cf. Lakoff 1987). The recognition of a semantic kinship between words and formal idioms makes possible a principled account of constructional polysemy.

Notes

1 For valuable suggestions and criticisms, I would like to thank Charles Fillmore, Paul Kay, Jean-Pierre Koenig and Knud Lambrecht. Errores praestare nemo illorum potest.

2 In the version of scalar semantics assumed by Fillmore, Kay and O'Connor, scales do not exist independently of the elements ordered within them. That is, any given scale simply consists of entities ranked with respect to the degree to which they manifest a given property. I will assume here a slightly modified version of this view, in which scales consist of degrees to which numerical values may be assigned, and that such such degrees may be regarded as 'loci' at which the ranked entities are placed.

3 There are instances of the fixed-value reading of the CC that do not involve this unmotivated use of the comparative. These are cases in which two fixed-standard comparatives are equated:

(a) Quo pluris est...res publica quam consulatus
how-much (AB) more (G) is republic (N) than consulship (N)
aut praetura, eo maiore cura illam
or praetorship (N) that-much (AB) greater (AB) care (AB) that (A)
administrari quam haec peti debere
be-administered than these (A) be-sought ought
"By as much as the whole republic is greater than the consulship or the praetorship, that much greater care must be exercised in administering it than in seeking these offices."
Sallust, *De Bello Iugurthino* 85.2

Here the CompPhrases *quo pluris* ("by how much more") and *eo maiore* ("by that much greater") are fixed-standard comparatives, as indicated by the presence of *quam*-clauses coding the standards of comparison. In this sentence, the degree of importance of the republic and the extent of administrative care thereby required are asserted to be equal. Each of these degrees is also asserted to be greater than that attained by a comparative standard. Thus, the degree of importance attached to the republic is greater than that attributable to political offices. Similarly, the equivalent degree of administrative care that must be exercised is greater (or ought to be greater) than the care with which political offices are sought. Sentences like (a) thus equate two compared values. The interpretation of (a) appears derivable from an integration of correlative and comparative semantics alone. By contrast, as argued, the two readings of the CC discussed are not so derivable. In the case of the linked-scales reading, a specialized form of comparison is invoked. In the case of the fixed-values reading (9), the comparative makes no clear semantic contribution.

These features of comparative interpretation are unique to the CC construction.

Some CC sentences may then be three-ways ambiguous. Without context, the CompPhrases of (b) may be interpreted as moving-standard comparatives, fixed-standard comparatives, or 'pro-forma comparatives' (i.e., those with no clear comparative target). Three translations of (b) are given, the first involving correlated scales, the second equation of comparatives (cf. (a)) and the third equation of 'noncompared' fixed values:

(b) Quo plures erant, eo maior
how-much (AB) more (N) (they) were that-much (AB) greater (N)
caedes fuit
slaughter (N) was
1. "The more there were, the greater the slaughter became."
2. "By how much more numerous they were than some other group, by that much greater their slaughter was than that of the other group."
3. "The slaughter was as great as their number."
Livy 2.51

The first reading can be discarded a priori, given the perfective verb *fuit* of the main clause. This verb form supplies an episodic construal of the massacre, rather than a view of its development over time. (The imperfective predicate *fiebat*, "was becoming", welcomes the linked-scales reading, as shown in (6).). Context must decide between the latter readings. In fact, context points to the second reading given. The context immediately preceding (b) is given in (c):

(c) Capiti deinde eadem arte sunt qua
Captured (N) finally same (AB) art (AB) (they) are which (AB)
Fabios...praecipitaverunt in insidias....
Fabii (A) (they) fell-headlong in ambush (A)
"Finally they were captured by that same art by which they had captured the Fabii. They fell headlong into the ambush."

Hence, the comparatives of (b), *plures* and *maior*, have as comparative standards the number and severity of slaughter associated with the Fabii. Sentence (b) may accordingly be translated: "by how much more numerous they were than the Fabii had been, by that much greater was their slaughter". Thus, (b) has an interpretation analogous to that of (a)—the only difference being that in (b) the comparative standards are contextually supplied rather than expressed via *quam*-clauses.

4 It has been suggested that the comparative seen in sentences like (9) is that comparative which elsewhere codes a somewhat pronounced degree of a given property. Hence, the comparative *fortior* ("stronger") can be sometimes be translated as "rather strong". The standard of comparison in such instances is a norm for the scalar property in question. This reading of the comparative is also seen in English, in expressions like *the finer things* and *better suits*. It seems unlikely that this is the reading of the comparative evoked in (9). In (9b), for example, the comparative *suaviores* (lit. "more moving") cannot reasonably be interpreted as "rather moving"; the author has previously noted that the letter in

question is moving to a very high degree. Further, the 'rather X' comparative does not apparently welcome an ablative of measure. The CC comparatives of (9) are, of course, accompanied by such degree-markers.

5 Evidence of this sort is a little suspect: the replacement discussed is sporadic even within the works of a given author, and typically only one clause is affected (main or subordinate). Nonetheless, the replacement does not seem to apply to CC instances having the correlated-scales reading (at least not in Classical Latin).

6 The Packard corpus is a computerized data base containing all extant Latin texts.

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Early Latin	*Ciceronian Latin*	*Later Latin*
Plautus (d. 184)	Cicero (d. 43)	Nepos (d. 24)
Terence (d. 159)	Sallust (d. 35)	Livy (d. 17 CE)
		Ovid (d. 18? CE)
		Velleius (fl. 30 CE)
		Tacitus (d. 120? CE)
		Apuleius (d. 160 CE)

THE ORDERING OF POSTLEXICAL RULES IN ENGLISH

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0. Introduction*

The hypothesis I argue for in this paper is given below in (1).

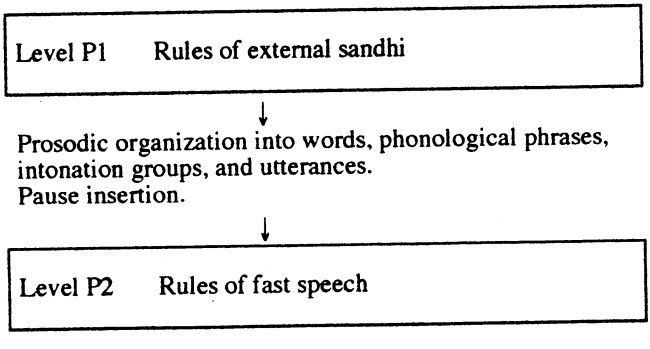
(1) P2 Ordering Hypothesis (P2OH): Phonological rules of the postlexical P2 level cannot apply sequentially; pairs of ordered rules must contain at least one lexical or P1 rule.

In Section 1, I define what I mean by the postlexical P1 and P2 levels, concepts taken from Kaisse (1985). In Section 2, I motivate the P2 Ordering Hypothesis (henceforth, P2OH) by arguing that it follows directly from three common assumptions about how phonological rules are processed psychologically. In the remainder of the paper I examine apparent counterexamples to the P2OH and show that they are not in fact genuine counterexamples. Due to space limitations, I only examine three cases, all from English; readers are referred to my dissertation (Myers in prep 1992) for discussion of further cases in English and other languages. In Section 3, I consider two cases of genuine ordering among apparent P2 rules and show that the earlier rules are not really P2 rules. In Section 4, I consider a case of apparent ordering among genuine P2 rules and show that the rules are better analyzed as applying simultaneously. Finally, in Section 5 I provide a summary.

1. P1 and P2 levels

The view of postlexical phonology argued for at length in Kaisse (1985) is represented schematically in (2) below.

(2) Postlexical Phonology [after (3) in Kaisse (1985:23)]



Both P1 and P2 rules are postlexical because both types may apply across word boundaries or be sensitive to structures larger than the word. However, they

differ in several ways; some relevant differences are listed below in (3). Roughly speaking, P1 rules are argued to be "more lexical" than P2 rules.

(3) Some properties distinguishing P1 and P2 rules [after Kaisse (1985)]

	P1 rules	P2 rules
1.	May have exceptions	May not have exceptions
2.	Syntactic units relevant	Across-the-board
3.	Inserted pauses irrelevant	Blocked by pauses

A paradigm example of P1 rules is the set of rules in Tiberian Hebrew discussed by Dresher (1983). These rules apply to the last word in a phrase, a structure larger than a word, and so must be postlexical. Many of the rules have lexical exceptions. Moreover, the concept of "phrase" is defined at least partly syntactically. Hence these rules fit the description of P1 rules.

A paradigm example of a P2 rule is Flapping in English. As far as I know, this rule is exceptionless and applies across-the-board. It is also blocked by pauses. Thus the underlined /t/ in *Joe found the bat alarming* may be flapped, while in *Joe found the bat -- mm -- alarming* it may not be.

2. Motivation for the thesis

The P2OH follows automatically from three common assumptions about the processing of phonological rules. The first of these is given below in (4).

(4) Premise 1: Lexical and P1 rules typically do not apply on-line during speech processing, but instead represent patterns across forms in memory.

One researcher who suggests something like this is Kiparsky (1975). He notes that the failure of experimental subjects to apply SPE-style rules properly when asked to produce nonwords does not mean that these rules are not psychologically real. Such "partially productive" rules "might very well be psychologically real without for all that being always 'run through' in speech production or perception" (Kiparsky 1975:203). He suggests that the reality of such rules be tested through memory experiments; thus if Velar Softening is a real rule, a nonword like *toxicism*, if taught with a [k], should tend to be recalled later with an [s]. Experiments like this conducted later validate Kiparsky's (1975) suggestion (Jaeger 1984). Shattuck-Hufnagel (1986:145) has made a similar suggestion:

> ...the output of earlier strata might correspond to the forms stored in the production lexicon that is accessed during phonological planning, while the operations described in later strata might correspond more closely to processing mechanisms.

She observes that Mohanan (1982) has also implied this when he claims that the output of the lexical phonology is what undergoes segmental permutation errors; these errors may then trigger the application of postlexical rules.

Stemberger (1986) shows that Mohanan's (1982) claim is not true in the strong form he gives; speech errors may sometimes trigger the on-line application of lexical rules as well. However, it still seems to be true that in general lexical rules do not apply on-line. This is not surprising, since by definition lexical rules

apply solely within forms which must be memorized anyway. Superficially at least, it seems more efficient to retrieve a form like *electricity* from memory with the [s] already present than to derive this [s] from an underlying /k/ every time the word is spoken or heard.

The reason for including P1 rules with lexical rules in Premise 1 can be seen if one considers what properties a rule would have to have in order for us to conclude that it *necessarily* applies on-line. One such property would be sensitivity of the rule to the environment beyond word boundaries. Words are unquestionably concatenated into word sequences on-line (except perhaps for very frequent word combinations like *in the* or idiom chunks like *kick the bucket*), so processes that are sensitive to elements beyond word boundaries must apply on-line as well. This property is, of course, one of the defining properties of postlexical rules; lexical rules cannot apply across word boundaries. However, not all rules argued to be postlexical meet this criterion. For example, Halle and Mohanan (1985) discuss several apparently ordered rules in English which they argue to be postlexical because the rules seem to lack characteristics of lexical rules, such as sensitivity to morphology. These rules do not necessarily apply on-line, though, since by their very nature they are insensitive to the environment outside of the word.

Another property of an on-line phonological rule is that its effect must be distinguishable from an on-line selection among allomorphs which are themselves *not* derived on-line. Traits that might distinguish phonological rule application from mere allomorph selection include the number of allomorphs involved; on-line allomorph selection becomes implausible if there are a large number of potential allomorphs for any given word. The existence of lexical exceptions is also relevant, if exceptions to a rule are understood as indicative of the rule's status as merely "partially productive", that is, not typically applying on-line.

Thus the process of a/an allomorphy in English clearly applies on-line, since the choice of *a* versus *an* depends on properties of the following word. It is unlikely, however, that the allomorphs *a* and *an* are themselves derived by an on-line phonological rule from some shared underlying form because any such rule would be riddled with lexical exceptions (*a* and *an* being in fact the only words it would apply to). The fact that there are only two allomorphs involved makes it reasonable to suppose that a/an allomorphy is truly just allomorphy.

This criterion implies that the postlexical rules of Tiberian Hebrew discussed by Dresher (1983) do not necessarily apply on-line, since for any given word these rules have the effect of choosing between only two allomorphs, one that appears at the end of a phrase and one that appears elsewhere. As with a/an allomorphy, the choice of allomorph must occur on-line, but not the phonological derivation of the allomorphs themselves. Given this observation, it is not surprising that the postlexical rules of Tiberian Hebrew have lexical exceptions. A similar point can be made about rules of phrase-boundary-triggered tone sandhi, such as in Taiwanese, which are notoriously difficult to characterize with autosegmental formalism (see, eg Yip 1980, Tsay 1992).

These cases may be contrasted with a rule like postlexical nasal place assimilation in English. For any given word ending in a nasal consonant, there are as many allomorphs potentially generated by nasal place assimilation as there are places of articulation; thus *ten* can end in a bilabial nasal before *books*, in a labiodental nasal before *vanes*, and so forth. It would be implausible to suppose that all of these allomorphs are stored separately and then merely chosen on-line.

Thus rules that apply on-line should be exceptionless. Moreover, rules triggered by the presence of a phrase boundary will produce only two allomorphs

for any given word, while one that applies across-the-board may produce a large number of allomorphs. These two properties are of course two of the properties distinguishing P2 rules from P1 rules. This leads directly to Premise 2, given below in (5).

(5) Premise 2: P2 rules typically apply on-line.

The final premise required for the derivation of the P2OH is given in (6).[1]

(6) Premise 3: Rules that apply on-line cannot apply in sequence.

Ideas like Premise 3 have been discussed ever since the concept of rule ordering was first proposed. A recent example is Lakoff (1989:1): "Neural processes occur in real time.... All those intermediate stages of long derivations of sentences simply cannot be realized in the brain." As is seen in this quotation, the argument typically given for Premise 3 is roughly as follows. Speech processing occurs extremely rapidly, and yet phonological systems often contain many rules. If these rules were to apply in sequence on-line, each rule would have to apply at an unrealistic, perhaps even neurologically impossible, speed. Moreover, each intermediate representation would only last for a fraction of an instant before being immediately modified again. Note that this argument rules out intrinsic ordering of on-line rules as well as extrinsic ordering.

However, the argument only concerns rules that apply on-line; rules that characterize forms stored in memory are under no such time constraint. The question then naturally arises why rules that rarely if ever apply need to be ordered sequentially at all.[2] One answer is that ordered rules in the lexical and P1 levels are ordered purely through historical accident, the ordering preserving either the order of their addition to the language or the order of their lexicalization, the later rule perhaps having remained a P2 rule longer than the earlier rule. The ordering of lexical and P1 rules, that is rules that typically do not apply on-line, is thus not necessarily part of a speaker's knowledge of her language.

Implicit in Premise 3 is the assumption that parallel processing is always faster than sequential processing, an assumption that might reasonably be questioned, since the computational demands of parallel processing often make it slower in practice than sequential processing. However, at most this can be taken to be an argument that phonological rules typically do not apply simultaneously; the argument against sequential processing of long derivations still stands. What the observation about parallel processing implies, though, is that interacting phonological rules, where the processing demands are relevant, should tend to apply in sequence. If both this and Premise 3 are true, then we should find that in pairs of interacting rules at most one of them should apply on-line; the ordering would then be an automatic consequence of the fact that the earlier one simply represents a pattern in memory.

As we will see below, this expectation is fulfilled: true cases of interacting P2 rules are extremely rare. In virtually all of the cases I have looked at so far, apparent ordering of apparent P2 rules actually involves genuine ordering of rules where at least the earlier one is not a P2 rule; I know of only one case of simultaneous interacting P2 rules, discussed in Section 4, and in this case it appears that the two rules may be aspects of a single process.

3. Genuine ordering among apparent P2 rules

So far in my search for counterexamples to the P2OH (see Myers in prep 1992) I have examined the following cases, listed with some relevant sources: coronal deletion and nasal place assimilation, coronal deletion and glottal reinforcement, flapping and flap deletion, vowel reduction and sonorant syllabification (Selkirk 1972); palatalization and y-deletion (Kaisse 1985); h-deletion and ə-deletion (Zwicky 1970, Kaisse 1985, Pérez 1991); stop glottalization and fricative stopping in the Applegate subdialect (Applegate 1961); tone sandhi rules in Ewe (Clements 1978); and the cases discussed in this paper.

These cases fall into three classes. The first and least interesting is the class of rule pairs where there is insufficient motivation that the rules are truly distinct; an example of such a rule pair is postlexical palatalization and y-deletion.

The second class consists of cases where genuinely distinct rules genuinely seem to be ordered, but where at most the later rule is in the P2 level, the other being a P1 or even a lexical rule. Two cases like this will be discussed in this section. The third class consists of genuine interacting P2 rules where it turns out the two rules may apply simultaneously to derive the same output; the one case of this I know of will be discussed in Section 4.

3.1 Raising and Voicing in Canadian English

The first case I will discuss is that of Raising and Voicing in Canadian English. The primary sources for these rules are Joos (1942) and Chambers (1973); Halle (1962) provided the classic analysis involving rule ordering.

The rule of Voicing is essentially identical to the rule of Flapping, neutralizing underlyingly distinct /t/ and /d/ as [d]; the specific environment for the rule is not relevant to a discussion of its ordering with Raising. Examples of this rule in action are given below in (7).

(7) Voicing [after (5) in Chambers (1973:118)]

bitter - bidder = [bɪdər] beetle - beadle = [biydəl]

The rule of Raising raises an underlying /a/ to [ʌ] when followed by /y/ or /w/ and a voiceless consonant, as illustrated below in (8a). Paradis (1980) argues convincingly that the voiceless consonant must appear in the same syllable as /a/ after the application of Kahn's (1976) ambisyllabicity rules, specifically his Rule III whereby an onset consonant of a syllable becomes the coda consonant of the previous syllable as well if the previous syllable is not greater in prominence. This analysis accounts for the contrast in (8b), where Raising only applies if the following syllable does not have more prominence than the syllable containing /a/.

(8) Raising [after Chambers (1973)]

a.	house	[hʌws]	houses	[hawzɨz]
	knife	[nʌyf]	knives	[nayvz]
b.	ícòn	[ʌ́ykàn]	ìcónoclàst	[àykánəklæ̀st]

Joos (1942) observed that speakers of Canadian English could be divided into two groups depending on how they used these two rules. According to his description, both groups pronounced words like those in (7) and (8) as given above but differed in their pronunciation of words where *both* Raising and Voicing could apply. In what he called Group A, speakers ignored the voicing derived by rule in their application of Raising, so that the vowels in *writer* and *rider* remained distinct. In Group B, by contrast, speakers treated the derived [d] like an underlying voiced consonant, so that the diphthongs in *writer* and *rider* were neutralized as [ay]. Halle (1962) analyzed Joos's description as following from dialect-dependent rule ordering. In both groups, he argued, *writer* and *rider* were underlyingly identical in their vowels and distinct in their consonants; in Group A, however, Raising was applied first so that the vowels could become distinct before Voicing could neutralize the consonants, while in Group B Voicing fully neutralized the two words before Raising could apply.

On the face of it, this example seems to be a serious problem for the P2OH: not only do Raising and Voicing seem to be ordered P2 rules, but apparently different dialects can order them any way they please. It turns out, however, that Raising and Voicing are not in fact both P2 rules; moreover, there is no evidence that their ordering is dialect-dependent.

First of all, Group B no longer exists in Canada (Chambers 1973). Secondly, other North American dialects with rules like Raising and Voicing always seem to order the rules with Raising first (Chambers 1973, Vance 1987). Rudes (1976) cites Black English and dialects spoken in Buffalo and the Adirondack Mountains in New York as examples of dialects where *writer* and *rider* seem to be pronounced the same, but she shows that these cases can be analyzed without resorting to extrinsic rule ordering. Finally, even if it appeared to Joos in 1942 that words like *writer* and *rider* were fully neutralized in Group B, it is likely that he was mistaken. Research into the phenomenon of *near merger* (eg, Dinnsen 1985, Harris 1985) has shown that forms that appear to a casual listener or even a native speaker to be fully neutralized often remain measurably (and thus presumably articulatorily and psychologically) distinct. Thus Dinnsen (1985) cites a variety of studies showing that the underlying distinction between /t/ and /d/ always remains after flapping in the temporal or spectral properties of the preceding vowel. If Group B was not fully neutralizing, as seems likely given what we know about dialects for which we have data, Halle's analysis of the distinction between Group A and Group B as due solely to rule ordering must be at least modified. In any event, the lack of data does not make his argument as convincing as first appears.

The only ordering we are left to deal with, then, is that in Group A, where Raising precedes Voicing. This ordering is not at all problematic for the P2OH, however, since in this dialect Raising is at best a P1 rule; only Voicing applies in the P2 level. One non-P2 property possessed by Raising is the existence of lexical exceptions. Chambers (1973) noted that some of his Group A informants pronounced *Cyclops* with the /a/ unraised; this word is phonologically identical in all the relevant ways (stress pattern, syllable structure, even in the segment following /ay/) to a word like *micron*, where Raising does apply.

Vance (1987) discusses some dialects of US English that also have a rule like Canadian Raising, the sole difference being that in the US Raising only affects /ay/, but not /aw/; as noted above, in these dialects Raising is ordered before Voicing, as in Group A. In these dialects, too, Raising has lexical exceptions. Some examples (of Vance's own judgments) are listed below in (9).[3]

(9)	nice	[náys]	{cf:	like	[lʌ́yk]}
	icon	[áykàn]	{cf:	psyche	[sʌ́ykɨ̀y]}
	bison	[báysn̩]	{cf:	vital	[vʌ́yDl̩]}

The existence of lexical exceptions means that Raising cannot be a P2 rule. What about Voicing, ordered after Raising in all known dialects? According to Chambers (personal communication), Voicing, like Flapping, does not have any lexical exceptions and apparently applies across-the-board. Thus it has the hallmarks of a P2 rule, and its ordering after Raising is to be expected.

To summarize: of the orderings of Raising and Voicing argued for in Halle (1962), only the ordering where Raising precedes Voicing seems to be found. This ordering poses no problem for the P2OH because only Voicing may be a P2 rule.

3.2 Coronal Deletion and Coronal Assimilation

The second case of genuine ordering of apparent P2 rules in English is that of Coronal Deletion (called Post-Obstruent Elision and Post-Nasal Elision in Selkirk 1972, and *-t,d* deletion in Guy 1991a,b) and Coronal Assimilation (called Coronal Assimilation-Fricative in Selkirk 1972).

For a detailed discussion of the proper formalization of Coronal Deletion, see Guy (1991a); for my purposes it suffices to note that the rule deletes [t] and [d], depending in a gradient way on the sonority of the adjacent segments, as in (10).

(10) Coronal Deletion [after Selkirk 1972:193-4]

draft-dodger → draf-dodger	thefts → thefs
exact sciences → exac sciences	lend money → len money

Coronal Assimilation changes an underlying /s/ and /z/ into [ʃ] and [ʒ], respectively, when followed by [ʃ] or [ʒ], as in (11).

(11) Coronal Assimilation [after Selkirk1972:189]

I gave Chris show tickets → I gave Chri[ʃʃ]ow tickets

Buzz shrieked → Bu[ʒʃ]rieked

As observed by Selkirk (1972:194), these rules seem to be ordered with Coronal Deletion preceding Coronal Assimilation. This is illustrated by the derivation in (12) of the pronunciation of *lost shampoo* as [lɔʃ ʃæmpu]. This pronunciation cannot arise if Coronal Assimilation precedes Coronal Deletion, or if the two rules apply simultaneously.

(12)

	lost shampoo
UR:	lɔst ʃæmpu
Coronal Deletion	lɔs ʃæmpu
Coronal Assimilation	lɔʃ ʃæmpu

Again, this seems to be a clear counterexample to the P2OH. Both Coronal Deletion and Coronal Assimilation seem to be variable (ie, optional) fast speech rules, which would mean they apply in Level P2. Moreover, Coronal Assimilation has one of the specific properties of P2 rules, being blocked by an inserted pause; thus it may not apply in a context like *I gave Chris -- mm -- show tickets.*

However, as sociolinguists have known for a while, Coronal Deletion is sensitive to morphology; specifically, the deletion of a word-final [t] or [d] depends on the use of this segment as an inflectional suffix. Thus Coronal Deletion cannot be a P2 rule. Guy (1991a,b) goes further, showing that Coronal Deletion not only appears before the postlexical stratum, but in fact appears in both Lexical Level 1 and Lexical Level 2; it then appears a third time as a postlexical rule.

There are two independent arguments for this claim. First, Guy (1991a) shows that the rate of retention of [t] and [d] in monomorphemic (M) forms like *lift* is very close to the cube root of the rate of retention p_r in the past tense forms of regular verbs like *laughed* (P forms); for many speakers, the rate of retention in semiweak verbs like *left* (S forms) is very close to the square root of p_r. Thus, as was already known, Coronal Deletion is more likely to apply in M forms than in S forms, which in turn drop [t] and [d] more often than P forms. This specific exponential relation, however, can be best understood, Guy (1991a) argues, if it is supposed that Coronal Deletion has three chances to apply in M forms, two times in S forms and only one time in P forms, each time with a retention rate of p_r. This makes sense if one recalls that [t,d] is present for a Level 1 application of Coronal Deletion only in M forms; for S forms [t,d] only appears in time for an application of this rule in Level 2, and P forms only get the opportunity to lose [t,d] postlexically. This conception is illustrated schematically in (13).

(13)

	M lift	S left	P laughed
LEXICAL	lɪft	lɛf	læf
LEVEL 1	/ \		
Cor Del	lɪf lɪft		
LEXICAL	lɪft	lɛft	læf
LEVEL 2	/ \	/ \	
Cor Del	lɪf lɪft	lɛf lɛft	
POST-	lɪft	lɛft	læft
LEXICAL	/ \	/ \	/ \
LEVELS	| |	| |	| |
Cor Del	lɪf lɪft	lɛf lɛft	læf læft

The second argument in support of this view concerns the sensitivity of Coronal Deletion to adjacent segments. Guy (1991b) finds that the relevance for word-final deletion of [t,d] of a preceding, ie word-internal, segment is greater in M forms than in P forms. By contrast, the relevance of a following segment, ie the first segment of the following word, is equal for M and P forms. This makes sense, Guy (1991b) argues, if one assumes that Coronal Deletion only gets a chance to apply in P forms at a level where the word-external environment is

relevant, while in M forms Coronal Deletion can apply before this level as well. This is just what one would expect if the picture in (13) is correct.

Guy (1991a,b) does not consider the question of whether the postlexical application of Coronal Deletion applies in the P1 or the P2 level. If it applies at the P2 level, the P2OH predicts that it applies simultaneously with Coronal Assimilation. The pronunciation of *lost shampoo* as [lɔʃ ʃæmpu] would still be derivable, however, since Coronal Deletion also applies lexically. The same is of course true if the postlexical application of Coronal Deletion only occurs in the P1 level. Hence the ordering of Coronal Deletion before Coronal Assimilation is a natural consequence of the fact that the former rule is "more lexical" than the latter.

One final point should be made before moving on. The finding that variable rules can appear within lexical phonology might seem to be problematic for Premise 1 in (4) above, whereby lexical rules are supposed typically not to apply on-line. This is because it seems reasonable to suppose that rule variability arises out of on-line processing factors; it is not immediately clear how rules instantiated primarily in memory could sometimes fail to apply.

The response to this objection becomes clear, however, when one considers how the process whereby a P2 rule becomes a P1 or lexical rule may occur within the view expressed by Premisses 1 and 2. If an on-line rule R is opaque enough, the forms that it derives may be learned by the next generation as underlying and be stored in memory as such. If the pattern in these stored forms becomes psychologically real at a later stage of acquisition, the rule R will have effectively changed from the P2 level to P1 or the lexicon. Now, if R is a variable rule, this variability can still be recorded in memory if one assumes that lexical items can have multiple representations in memory. This is in fact what one would expect with a variable P2 rule undergoing the above process; since the rule is initially opaque, the alternate forms for any given word produced by the application or nonapplication of rule R would have to be learned initially as unanalyzable allomorphs. The frequency of retrieval of these allomorphs would naturally reflect the frequency of their occurrence in the speech around the learner. Hence the rate of application of rule R would be the same in both its lexical and postlexical incarnations even though the psychological status of these incarnations are very different.

4. Apparent ordering among genuine P2 rules

The final case I will consider here is that of Vowel Nasalization and Nasal Reduction (often incorrectly called Nasal Deletion) in English; Malécot (1960) is the original source, with Kaisse (1985) and Bourgeois (1990), among many others, providing analyses. Vowel Nasalization nasalizes a vowel preceding a nasal consonant. Nasal Reduction, as described by Malécot (1960), shortens the duration of a nasal consonant before a voiceless consonant to various degrees, depending on the quality of the preceding vowel. After [æ] the nasal consonant often seems to delete completely. Kaisse (1985:29) shows that the rule only applies if both nasal consonant and following voiceless consonant are in the same syllable.

It is typically assumed (eg, Kaisse 1985:28-29) that Vowel Nasalization must precede Nasal Reduction, as in a derivation like that in (14). This is because if the rules were to apply in the opposite order, the nasal consonant would be deleted before the preceding vowel could be nasalized.

(14)

	can't
UR	kænt
Vowel Nasalization	kæ̃nt
Nasal Reduction	kæ̃t

This time it appears that both rules truly do apply in the P2 level, since both are apparently exceptionless and insensitive to morphological information. It is true that Nasal Reduction only applies within word boundaries (eg, *He can take it* cannot be pronounced **He* [kæ̃] *take it*). However, as Kaisse (1985:29) shows, this is just because Nasal Reduction is fed by Kahn's (1976) Rule III of syllabification, which does not apply across word boundaries. As Kaisse (1985:28) observes, this merely means that Rule III is not a P2 rule, but it still may feed P2 rules. Thus Rule III cannot make the /t/ following *can* in the example above become tautosyllabic with the /n/ in *can*, so that Nasal Reduction cannot apply. Hence both Vowel Nasalization and Nasal Reduction appear to be genuine P2 rules, and their apparent ordering seems to pose a real problem for the P2OH.

As pointed out by Bourgeois (1990), however, the ordering of these rules may only be apparent, since if they apply simultaneously the same result is achieved. This is demonstrated by the derivation in (15).

(15)

	can't
UR	kænt
Vowel Nasalization+Nasal Reduction	kæ̃t

Such an analysis is not only possible but actually appears to be preferable to the ordering analysis, since nasal deletion with concomitant vowel nasalization is an extremely common and phonetically natural process; one random example is diachronic change in nasal finals in many Chinese dialects (Zee 1985). That is, although vowels can be nasalized without the deletion of the following nasal consonant, processes like Nasal Reduction probably do not occur very often without the preceding vowel being simultaneously nasalized. The naturalness of the cooccurrence of vowel nasalization with nasal deletion seems difficult to explain with any principle of rule ordering. Rather, it seems to follow from phonetic constraints on the form of individual rules.

Thus in this, the sole case of interacting P2 rules I am aware of, it appears that the rules actually form aspects of a single process, not truly independent rules at all. This is further support for the claim, mentioned above in Section 2, that simultaneous application of interacting rules may be computationally costly and therefore avoided. One way of avoiding it is to shunt one of the rules off into an earlier level, which is what may have happened with Raising and Coronal Deletion. Another way is to avoid separating a single process into its two obvious subparts, as seems to be the case with Vowel Nasalization and Nasal Reduction.

5. Conclusion

In this paper I have argued essentially for two points. The first is that the P2OH follows automatically from some plausible premisses, already found in the literature, about how phonological patterns are instantiated psychologically. These premisses can be questioned in various ways, but at this point there seems to be no

strong evidence forcing us to reject them. The second point is that all apparent counterexamples to the P2OH examined so far have turned out not be counterexamples at all. On the contrary, the particulars of some of the cases seem to support the thesis in unexpected ways. For example, the fact that the postlexical rules of Tiberian Hebrew are both ordered and have exceptions is not a coincidence in light of the P2OH, as is the fact that the true interacting P2 rules of Vowel Nasalization and Nasal Reduction seem more like aspects of a single process than independent rules.

Of course there is no way to prove the P2OH conclusively, since such a proof would require the examination of *all* apparent counterexamples in *all* of the world's languages. It remains to be seen if the P2 Ordering Hypothesis will hold up in the long run. The strength of the psychological motivation and its empirical payoff up to this point, however, should make future researchers more cautious about taking apparent cases of ordered P2 rules at face value.

NOTES

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[1]Although acceptance of Premisses 1, 2 and 3 forces one to accept the P2OH, it should be noted that researchers who believe Premisses 1 and 2 do not necessarily believe Premise 3. For example, Kiparsky (1975:194) explicitly denies the P2OH, citing Selkirk (1972) as providing examples of rule ordering in phrase phonology; these examples are shown to be irrelevant below and in Myers (in prep 1992).

[2]I am indebted to a member of the audience at BLS (whose name I neglected to ask) for both this question and the one that follows.

[3]In addition to lexical exceptions, the dialects that Vance discusses contain examples of raised [ʌy] which could not have been derived by Raising. For example, Vance (1987:203) reports that in his idiolect /ay/ is raised in *idle*. In fact, this word forms a minimal pair with *idol*, which contains an unraised [ay] in Vance's idiolect. As Vance points out, then, it appears that the distinction between [ay] and [ʌy] has become phonemicized in these dialects.

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Liberated modifiers:
An Autolexical account of modifiers found outside the NP[1]

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Modern English has a set of constructions in which part of the modifier is liberated from the NP and placed before the DET. Such constructions are shown in (1).[2]

(1) a) He's such a nice boy
b) That is too big a house for us
c) This is quite a/the problem

In these constructions, instead of the normal [$_{NP}$ DET (Adv) (Adj) N'] pattern, we find what I will call for now [$_{NP}$ ModP NP]. Such a construction would be difficult for a standard transformational syntax to handle for several reasons: 1) If the grammar had a rule as in (2) which permitted it to generate sentences as in (1), it would then permit the ungrammatical constructions in (3).

(2) NP → AP NP
(3) a) *He's very a nice boy
b) *That's very big a house

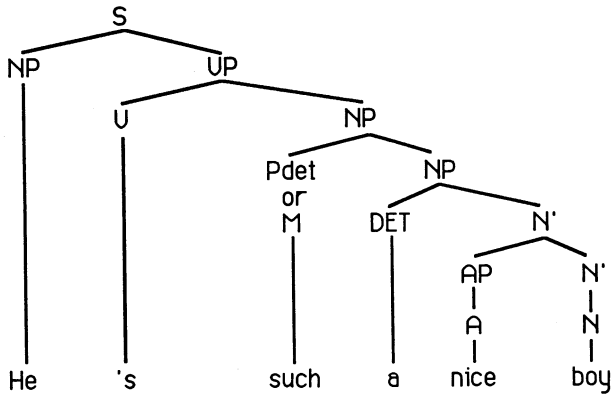
2) On the other hand, in GB, permitting movement to Spec of DP would then require movement at LF since the liberated modifiers **do** modify the N' (as in (1b) or (1c)) or the AP (as in (1a)) inside the NP. Abney (1987) suggests another alternative. He argues that the AP (or DegP) appears at d-structure in the position it has in s-structure. For Abney, "prenominal adjectives ... head the noun phrase they appear in" (p.326). That is, prenominal adjectives f-select a noun-phrase (DP in his notation) and inherit "certain nominal features from the noun phrase" (p.325).[3] However, an analysis within a system with independent modules, as in Autolexical syntax, is straightforward and not very complex. There are, in fact,

several possible solutions to the problem of how to analyze *such* and other such modifiers within this framework.

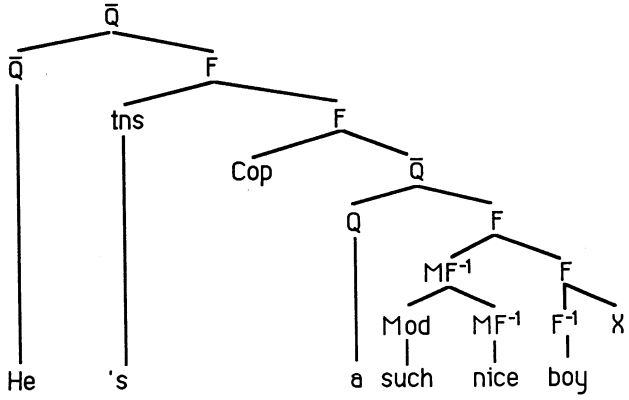
One of the advantages of an Autolexical approach to such a problem is that it allows us to describe the language as simply as possible in each of several modules. When the modules are compared in the Interface the structures in each module may match with the structures in other modules in terms of dominance and constituency, but there may also be structural mismatches between the representations in different modules. In cases where mismatches occur, either the construction is ungrammatical, or one of the modules takes precedence within limits (morphology generally takes precedence over syntax and syntax over semantics (Schiller 1989, 1991)). Two solutions to the problem of *such* involve a mismatch between what is described in the syntax and what is described in the logico-semantics. The difference between these two solutions relates to the syntactic category of the elements liberated: are they modifiers, or do they form a new category of predeterminer? For the third solution under discussion, the syntax is of the familar sort (some version of X-Bar (Pullum 1985)) with the modifier inside the NP in the syntax , but there is a mismatch between the syntax and the morphology where forms like *such a* form a superword.[4] An analysis of this sort would leave settled the syntactic category membership of *too* + Adj and *such* and other forms which can be liberated from the noun phrase. Something which may help us to both understand the construction under discussion and choose among the possible analyses is an examination of the historical source of such constructions. They are not new in English, except insofar as fixed word order has forced the question.

In Autolexical syntax, as noted, we can define node admissibility requirements which allow grammatical constructions as in (1) without allowing the ungrammatical ones in (3). In such a model, the sentence in (1a) would have the syntactic tree structure in (4a) and the semantic tree structure in (4b),[5] with a lexical entry for *such* as in (4c). In this analysis there is a mismatch between the syntax and the semantics, since the dominance relationships between *such* and *a* are different in the syntax and the semantics: *such* commands *a* in the syntax, but is commanded by *a* in the semantics. However, such a mismatch is acceptable since it violates none of the constraints proposed by Sadock (1991a). In (4a), the node label for

(4) a)



b)



c) such:

Syn: $[_{NP}$ —— NP]

Mor: P

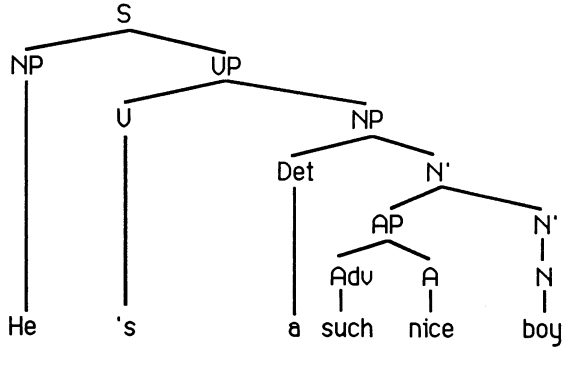
Sem: Mod

such is left undetermined, since this tree could represent one of two structures. Traditionally *such* would be called an adverb (a modifier in the syntactic module of Autolexical syntax), but it may be more illuminating to identify *such* as a member of an independent category called predeterminer. One reason to argue for that analysis is that the label adverb relies on the role of *such* in the semantics as a modifier of the adjective *nice*. However,

it's position in the syntax is not the usual position of a modifier of elements in the NP in Modern English, and the node labels in the syntax may not make reference to the semantic roles of the forms involved. It is also hard to call the form an adverb (or an adjective) in the morphology, since it takes none of the usual adverb/adjective morphology. There are no comparative or superlative forms, no **sucher* or **suchest*. We would argue, therefore, that given the syntactic structure in (4a), the best syntactic definition of *such* is a predeterminer whose characteristic is to return the same category that it takes (in this case [NP>>NP][6]). One reason to argue for the identity of *such* as a predeterminer is that that is a purely descriptive syntactic label: it describes where *such* appears in the syntax. Its role as modifier is elaborated in the semantics. This is more insightful than calling *such* an adverb and then trying to adjust the rules of the syntax to explain its modifying role.

The solution in which the modifier is within the NP in the syntax puts the burden of explanation on the morphology. This solution reflects one stage of the historical development of the *such a* construction. The semantic tree for (1a) would still be (4b) under this scenario, but the syntactic tree would be as in (5a) and there would be a morphological entry for the superword *such a*, as in (5b). This solution does reflect the historical evidence fairly well: as we shall see, there was a time when *such a* and related constructions were written as one word, suggesting that those speakers of English who could write felt that it was one word. The main problem with the superword solution is that, while *quite a* could also be de-

(5) a)



b) such a:
Syn:
Mor: W + W
Sem:

fined as a superword, the analysis leaves no room for the liberated modifiers of the type *too* + Adj *a*, as in (1b). We could propose the superwords *too good a, too big a, too rich a*, etc., but this would fail to capture the generalization that just about any adjective can appear between the *too* and the *a*. And, as Schiller (p.c.) reminded me, there is, at least in some varieties of English, the possibility of *Isn't he such the gentleman?* (and some speakers also accept *such the* in the declarative: *He's such the gentleman* (cf. (1c) above)).

Historically, *swelc* (*swilc, swylc*) was what is traditionally called a demonstrative in Old English and it was used both pronominally and adjectivally, as in (6).

(6)a) Manegum swylcum bispellum he spræc to hym
Many such parables he said to them
'He said many such parables to them'
(Mark (Kisbye 2:144))

b) Be swylcum and be swylcum
by such and by such
'By such a one and by such a one'
(Alfred: Boethius (Kisbye 2:144))

Like other members of this class, it was generally inflected with the strong adjectival endings (as in (7)) and was not usually found with a demonstrative, though it has been found with weak adjectival endings following a demonstrative in "Alfredian" prose in the ninth century (Mitchell, § 504).[7] The traditional name of demonstrative, I believe, stems from the fact that *such* pointed out (demonstrated) a quality that was said to be held by the noun being modified. However, there is no reason to treat OE *swilc* as any different from other adjectives in the syntax, since the adjective had the same endings and could also be used nominally, as in (8). Note that

in (8a), when the adjective follows the article *ða*, it takes a weak ending

(7)

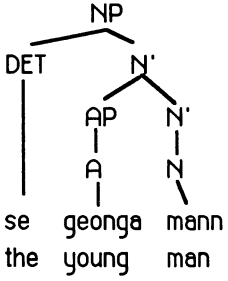
	masc	Fem	Neut
Sng:			
nom	swilc	swilc	swilc
acc	swilcne	swilce	swilc
gen	swilces	swilcre	swilces
dat	swilcum	swilcre	swilcum
inst	swilce		swilce
Pl:			
nom	swilce	swilce	swilce
acc	swilce	swilce	swilce
gen	swilcra	swilcra	swilcra
dat	swilcum	swilcum	swilcum

(8) a) we sceolon ða hungrian fedan, nacode scrydan, ... ða
we shall the hungry feed, naked clothe, ... the
ungeðwæran gesibbian, untrume geneosian, deade bebyrian.
quarrelsome reconcile, infirm visit dead bury
"We shall feed the hungry, cloth the naked, reconcile the quarrelsome, visit the infirm, bury the dead"
(ÆCHom. ii. 442 (Mitchell §133))

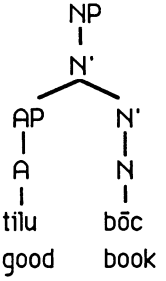
b) Þær wearð Ongenðiow ecgum sweorda
There became Ongentheow edge-dat sword-gen
blondenfexa on bid wrecen
greyhaired-nom on halt pushed
"There was grey-haired Ongentheow brought to a halt by sword-edges"
(Beowulf 2961 (Mitchell §134))

(9) a) NP → (DET), N'
N' → (AP), (N')
N' → N

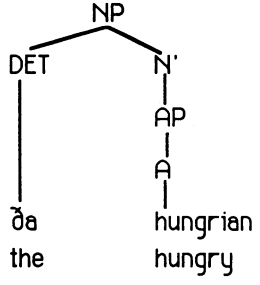
b)



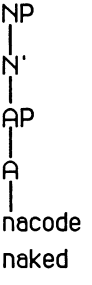
c)



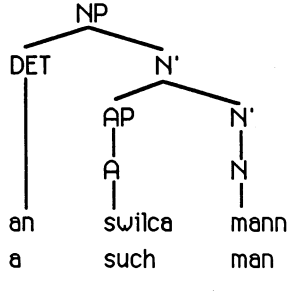
d)



e)



f)



(*-an*), and when it stands by itself, it takes the strong ending (*-e*). The articles as such, *an* and *se* , however, and the demonstrative *þē* could not in general be used alone. So the structure of the noun phrase in Old English could be defined by the rules of syntax in (9a).[8] This would give the trees in (9b-e) as possible noun phrases in Old English.[9] And since, as Mitchell notes, *swilc* has been found with a demonstrative, the tree in (9f) is also available. By the Middle English period both *a such* and *such a* became available, as in (10), possibly with the onset of the requirement that singular, non-generic NP's have a DET. (Note that in both of these sentences *swilc/such* has anaphoric reference.)

(10) a) þat of Uðere Pendragene scal arisen swilc a sune.
"that from Uther Pendragon shall arise such a son."
(Layamon Brut 18881, c1205 (OED))

b) Lute wonder it was þat strange men in is owe land dude a such trespas.
"Little wonder it was that strange men in his own land did such a trespass."
(R. Glouchester (Rolls) 379, 1297 (OED))

(11) a) To a such bale
"To such an evil"
(Sawles Warde in O.E. Hom. I 251, a1240 (OED))

b) Wel longe we mowe clep & crie, Er we a such kyng han y-founde!
"well long must we call and cry before we had found such a king"
(Elegy on Edw. I, xix, 1307 (OED))

Since *such* had been a demonstrative adjective as that is understood traditionally, and since several other Old English demonstratives (such as *this* and *which*) were making the shift from modifier to determiner,[10] the problem of how to include the more recognized determiner *a* arose and permitted either order. The syntax would still have the same rules as in (9a); however, there would be additional restrictions on when an NP could appear without a DET. The order *a such* lasted only a few centuries (the examples in (11) are the first and last citation in the OED). During the Middle English period, a related construction arose from the use of *such* in absolute constructions (as in 6b). This change also affected the absolute use of adjectives: English developed a requirement that the adjective be supported by a dummy noun, *one*. For *such (a)*, this resulted in *such (a) one*, with the form without the additional article the older.

(12) Þei schullen presenten hym to the nexte custode of þat place where euere þei find sychon
"they should present him to the next custodian of that place whereever they might find such a one"
(Wyclif Works 47, c1380 (OED))

It was often written as one word *suchon*, see (12)). This resulted in the restriction of the availability N' → AP.

We have seen three possible solutions for the problem of how to treat the liberated modifiers of (1): one where the syntax is that of the form expected in some version of X-bar and the order that we get in actual sentences is due to the morphological requirement of the superword *such+a* (written as two words by convention) and two where the syntax describes a structure where the modifier is outside of the noun phrase in the syntax. In these later two, the question is what to call the modifier in the syntax: should it be called a modifier (which is a better description of its semantic role) or a predeterminer which gives back the same category it takes. The superword analysis has the apparent advantage of reflecting one stage in the historical development, but this is primarily the development of the pronominal form and not the adjectival form. Neither the predeterminer or the modifier solution, however, contradict the historical evidence, which is fairly straightforward. A change in the morphology (loss of inflectional endings which categorized *such* as an adjective) and its semantics as a demonstrative with anaphoric reference as well as a syntax in which the word order still has not reached absolutely strict order allowed *such* to appear either before or after the determiner. Why it should be that the predeterminer position won out over the postdeterminer one is not clear (but that is for another paper). Since, however, if we decide to name the syntactic category of *such* "modifier," we are relying on the semantic function of the form to identify the syntactic node label, and since the superword solution fails to capture the generalizations demonstrated in *such a* and *such the*, and *quite a* and *quite the*, and the full range of possiblities of *too* + Adj, we prefer the solution which identifies the syntactic category of *such* and related constructions as a predeterminer which returns the same category it takes. This solution follows comfortably from the historical facts and adheres closely to the principles of Autolexical syntax. Those principles allow us to analyze the data completely in each of the relevant dimensions and this leads us to an analysis which is a clear and concise exposition of the data.

Notes

[1] Many thanks are due to Eric Schiller who has read rough drafts of this paper and offered suggestions about the Autolexical analysis presented here. Thanks are also due to the members of ANSAX-L, the electronic net for those interested in Anglo-Saxon studies, who responded to my cry for help on the forms of *swilc*. All faults are, of course, mine.

[2] Several example of *such*after the determiner were mentioned in the question period after the paper. However, it is important to recognize an important distinction between those *such*'s and the *such* under discussion here: the *such* in (i)-(iii) are demonstratvie rather than emphatic (*such* in (1a)). Also demonstrative is the such in (iv) and (v). (The examples are some of those raised at the meeting.)

i) every such case should be reported

ii) another such construction/other such constructions

iii) three such people

iv) such a person should be directed

v) such of you as want to come

The development of the emphatic stems from a construction of *such* with an N or NP and a following dependent clause which provided the basis of comparison. Such constructions date from the Old English period. Later developments allowed suppression of the dependent clause (this began roughly in the sixteenth century). For more about the development of *such*, see Schiller and Need (1992).

[3] Quirk and Greenbaum (1973) describe *such* and *quite* as "intensifiers [which] may premodify noun phrases" (128).

[4] A fourth possible solution within Autolexical theory involves the notion of surfotax (as first discribed by Steinberg and Caskey (1988) and elaborated by Sadock (1991b) in which the mismatch would be between the syntax and a fourth module, the surfotax, which would take precedence over the ordering in the syntax. In this solution the syntax is as in (4'a), but there is a template in the surfotax which requires the order *such a*. However, there is no strong motivation for the surfotax in this situation (as there is in describing the order of pronouns in Yiddish or the agreement patterns of Spanish). One major problem is how to capture the facts of which elements must come before the determiner--we could just list such elements, but that does not seem very satisfactory since it captures no generalizations. However, another reason to argue against a surfotax solution for this problem is that a strong solution can be found within the core modules of Autolexical Syntax.

[5] For more on the semantics of similar constructions, see Napoli (1989).

[6] Properly this is [N2>>N2] (for a fuller discussion see Sadock (in prep) and Schiller

1992).

[7] The weak endings for *swīlc* would be as follows:

	masc	Fem	Neut
Sng:			
nom	swīlca	swīlce	swīlce
acc	swīlcan	swīlcan	swīlce
gen	swīlcan	swīlcan	swīlcan
dat	swīlcan	swīlcan	swīlcan
inst	swīlcan		swīlcan
Pl:			
nom	swīlcan	swīlcan	swīlcan
acc	swīlcan	swīlcan	swīlcan
gen	swīlcra/swīlcena	swīlcra/swīlcena	swīlcra/swīlcena
dat	swīlcum	swīlcum	swīlcum

[8] It is important to remember that the rules of syntax in the Autolexical framework are node admissability rules, as in GPSG.

[9] Adjectives and even articles could appear after the noun; however, the structures here are the most common in prose.

[10] See Lightfoot for a discussion of the category label of items like *such*. The items Lightfoot discusses are forms that become quantifiers in Modern English.

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The development of a marker of speaker's attitude: The pragmatic use of the Japanese grammaticized verb shimau in conversation[1]

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"Imagination is more important
than knowledge" -- fortune cookie

1. Introduction

A number of studies have noted that Japanese is especially rich in linguistic resources expressing pragmatic meaning (e.g., Akatsuka 1985; Cook 1988; Iwasaki in press; Kamio 1979; Kuno and Kaburaki 1977). One interesting recurring feature associated with these linguistic forms is that the relevant morphemes appear clause-finally: for example, in the honorific system, the verb, which occurs clause-finally, encodes the hierarchical relationship between the referent and the speech participants. So-called "sentence-final particles" express the speaker's affect and epistemological attitudes clause-finally. Further, although Japanese has been known as a rigid verb-final language, we find a number of items expressing pragmatic meanings clause-finally. A recent study by Ono and Suzuki (in press) suggests that this positional tendency of pragmatic meaning in Japanese has motivated the creation of non-verb-final clause where the verb is followed by an element indicating such pragmatic meaning as the speaker's stance toward the referent.

The purpose of the present paper is to illustrate grammaticized uses of the Japanese verb shimau 'put away/finish' in spontaneous informal conversation and to advance a hypothesis regarding potential stages of the grammaticization process whereby the original lexical meaning may have developed pragmatic meanings clause-finally.

The data for this study consist of 15 transcripts of two-to-five party spontaneous informal conversation. These conversations are between 2 and 20 minutes long, which amounts to approximately 90 minutes of data. We systematically extracted all the instances of shimau, totaling 71 cases. Unless otherwise specified, our analysis will be based on these cases.[2]

First, we will briefly discuss the semantics of the lexical verb shimau. Then we will present several different grammaticized uses of shimau and suggest

a particular path for their development.

2. Lexical Meaning of Shimau

The lexical meaning of shimau is 'put away' or 'finish'; with this meaning it can be used as an independent verb as in:

(1) doogu o shimau (Iwanami Kokugojiten 1986)
tool OBJ SHIMAU
'(I) will put away the tools'

(2) kyoo no shigoto o shimau (Iwanami Kokugojiten 1986)
today of work OBJ SHIMAU
'(I) will be done with today's work'

It should be noted that the meanings of shimau emphasize the endpoint of the activity.

3. Grammaticization of the "Inability to Undo" Meaning

We hypothesize that shimau has begun to be grammaticized into an auxiliary in a new phonological form chau (see Ono, forthcoming for the details). The grammaticized functions are served either by the older form shimau or by the newer form chau, so different degrees of grammaticization may correlate with the choice between the two forms. However, the present paper focuses on the development of different grammaticized uses of both forms together without examining this correlation. Below, the different forms of shimau and chau will be glossed as SHIMAU and CHAU, respectively. Consider (3):

(3) ano ko wa moo otona ni natte shimatte iru
that child TOP already adult to become SHIMAU STATE
'That little girl is now an adult woman'

Shimatte is the gerundive form of shimau. A male and a female speaker are talking about the male speaker's girlfriend, whom he met in high school. The female speaker is slightly older than the male speaker and has a lot more experience in male-female relationships. She is telling him that his girlfriend has grown up from a little girl to an adult woman, which he does not realize. Notice the semantic change that has occurred in (3). The morpheme shimau does not mean 'put away' or 'finish', but rather that the little girl has turned into an adult woman and this process can not be reversed.

(4) kocchini moo ki-chat-ta
here already come-CHAU-PST
'(He) came/has come over here'

Chatta in (4) is the past tense form of chau. The actor referred to in (4) did not like the way he was treated in Japan, came to the U.S., and now does not have to face the problems he had in Japan. We see the same type of semantic change here. The morpheme chau does not indicate the lexical meaning of shimau, but conveys that the situation which he created by getting out of Japan cannot be easily changed.

(5) atte nai to ai-tai toka omou kedo ac-chau to tsumannai
see not when see-want COMP think but see-CHAU when boring
'When (I) don't see (her), (I) feel like seeing (her), but once (I) see (her), (I find it) boring'

Example (5) illustrates the same point. The speaker is saying that when he does not see his girlfriend, he feels like seeing her, but once he sees her, it is boring. The morpheme chau emphasizes the realization of the situation in which he sees her, which makes him bored.

It is a logical implication of the verb shimau that the item which has been put away is now less accessible or that the activity would now be difficult to undo. These implications have become the meaning of the grammaticized shimau/chau. We call this meaning "inability to undo." The newly developed auxiliary shimau/chau can be productively used with any lexical verb and in fact all the instances of shimau/chau in our data are auxiliaries; none of them is used as a lexical verb. Thus the distributional characteristics, the semantic change, and the phonological change provide evidence for the change in the structural status of shimau/chau from a lexical verb to an auxiliary.

4. Shimau/Chau Indicating Speaker's Negative Attitude

Interestingly, in some cases, shimau/chau has acquired the meaning that the speaker has a negative attitude about the situation described in the clause (cf. Iwasaki, in press). This meaning is clearly an extension of the meaning "inability to undo." We hypothesize that the speaker often emphasizes the "inability to undo" meaning by using shimau/chau when what has been done turns out to be what should not have been done. In the following examples, shimau/chau strongly indicates not only the meaning "inability to undo", but the speaker's negative attitude, such as regret or criticism, toward the situation described in the clause. Notice that this use of shimau/chau has moved from the domain of propositional semantics into pragmatics, because shimau/chau has come to incorporate the speaker's subjective view in its meaning in the course of grammaticization. It should also be emphasized that this newly developed pragmatic meaning is expressed clause-finally, just like other pragmatic devices such as sentence-final particles or honorifics.

Consider Example (6):

(6) atashi mo sono toki kai-chat-ta wa yo
I also that time write-CHAU-PST PTL PTL
'I also wrote (to her) at that time'

Two people are talking about having a surprise party for a friend's birthday. The speaker had received a letter from this friend saying that she wants to visit her sometime soon. So the speaker told her to come visit. In other words, the speaker had already written the reply in which she hinted that they will get together soon, before she came up with the idea of the surprise party. Chau here indicates the speaker's regret that she had already written to the friend.

We have noticed that when the subject of the clause is the second or the third person, shimau/chau can indicate the speaker's criticism of the referent.

Observe Example (7):

(7) nani yutte-n no yo
what say-PROG NOM PTL
'What (nonsense) (you) are saying!'

katteni jibun dake kangae-chatte sa
selfishly self only think-CHAU PTL
'(You) selfishly thought (about it) by yourself'

Chatte is the gerundive form of chau. In this example, two people are having an argument. The speaker is criticizing the addressee for planning things by himself without consulting her. The second line without the morpheme chau (i.e., kangaete sa) would simply report what happened without converging any subjective attitude. The co-occurrence of chau with katteni 'selfishly' strongly conveys the speaker's negative attitude.

Example (8) also illustrates the speaker's criticism, but this time, towards a third party. Two interlocutors are talking about a mutual male friend. The speaker is surprised and frustrated to hear that this friend spends hours talking about everything that happens to him here in the U.S. to his family members in Japan over the phone:

(8) sonna koto made ic-chau n da
such thing even say-CHAU NOM COP
'(He) even says that!?'

In this example, chau indicates not only the sense "inability to undo," but also the speaker's negative attitude towards the situation described in the clause, and more specifically, criticism towards this friend who is the referent of the clause.

We have introduced examples of the meaning of shimau/chau expressing the speaker's negative attitude, which is an extension from propositional

semantics to the domain of pragmatics. We have also mentioned that shimau/chau is another illustration of morphemes expressing a pragmatic meaning in clause-final position in Japanese. In the following, we introduce a more recent development of grammaticized uses of shimau/chau which, interestingly, indicates the speaker's "guiltily" positive attitude toward the situation.

5. Shimau/Chau Indicating Speaker's Guiltily Positive Attitude

Consider the following example (9) in which the speaker is reporting to his male friend about a skiing trip he went on with two girls:

(9) Uno o yatte shimai-mashi-ta yo
Uno OBJ do SHIMAU-POLITE-PST PTL
'(I) played Uno (with the girls)'

Shimai is a continuative form of shimau. In this example, evidently, the speaker had a great time with the girls and does not regret that he played Uno (a card game) at all. However, he uses shimau. In this example, shimau does not indicate the speaker's regret, but rather, the speaker's feeling of pleasure mixed with guilt, since the speaker had a good time without the addressee. Several examples of shimau/chau in our data follow a clause which describes a situation in which only the speaker benefits and not others, and is thus not completely justifiable. In such situations, the speaker may have started using shimau/chau to indicate his/her guilty happiness with ill-gotten gains or supposedly regrettable outcomes. (This feeling may be nicely captured by the Japanese expression shimeshime.)

A further illustration of this use of shimau/chau in our data can be seen in example (10):

(10) boku dat-tara itadai-chau kedo
I COP-if have-CHAU but
'I would have (her)'

Two interlocutors are talking about a mutual friend who had received a gift from a married woman and was harassed about it by her husband. The speaker criticizes the friend for being wishy-washy about his relationship with the woman. Then the speaker says that if he were in his friend's shoes, he would not be wishy-washy, and have the woman completely. By using chau, the speaker not only expresses the endpoint of the activity (having the woman), but also claims proudly that, from his viewpoint, having the woman completely is more desirable than treating her ambiguously in spite of the ethical problems. Chau here is thus not directly a marker of the speaker's negative attitude, but is a further extension, because it indicates the speaker's pride in his conviction in the face of his recognition of the negative social reactions it could provoke.

Consider the following example (11):

(11) atashi sa
I PTL

kookoosee ni sa
high.school.student by PTL

Shibuya no sa
Shibuya of PTL

Ichimarukyuu no mae de sa
Ichimarukyuu of front at PTL

nanpa s-are-chat-ta
approach do-PASS-CHAU-PST

'I was approached by high school boys in front of
the Ichimarukyuu Bldg. at Shibuya Station'

The speaker is reporting that she was approached by a group of high school students. She feels very flattered, because it means that she looked young enough to be approached by guys who were ten years younger than she was. Her use of chau does not indicate her negative attitude: rather, she proudly reports to her colleagues that she is flattered, but also indicates the slight guilt, since she is the only one who had such a lucky experience.

We think that shimau/chau indicating the speaker's guiltily positive attitude has emerged relatively recently. One piece of evidence for this analysis is that this use of shimau/chau intuitively feels new to us, as native speakers, and it seems to us that only members of the younger generation use shimau/chau this way. As we suggested above, this recently developed meaning of shimau/chau seems to be related to negative shimau/chau, since it indicates that the speaker has guilt about being in such a lucky situation all by himself/herself without the hearer or others. Moreover, the activities described in the clause in which this type of shimau/chau occurs have some kind of negative social connotations (e.g., having a married woman).

We have argued that the meaning of shimau/chau has been extended from the domain of propositional semantics (i.e., "inability to undo") into pragmatics (i.e., speaker's negative or guiltily positive attitude). What this means is that the speaker's subjective view has crept into the meaning of shimau/chau in the course of the linguistic grammaticization from a verb shimau to an auxiliary shimau/chau.

6. The "Automatic" Meaning of Shimau/Chau

The last grammaticized use of shimau/chau is what we call "automatic." Consider (12)-(14):

(12) harawa-nakute mo ii n daroo kedo haratte shimau to
pay-not EMPH good NOM guess but pay SHIMAU PTL
'(I) guess (I) don't have to pay, but (I find myself) paying'

(13) warac-chau
laugh-CHAU
'(I find myself) laughing/(It makes me) laugh'

(14) California de toru shashin tte minna yoku tore-chau mon
California in take photo TOP all well take-CHAU PTL
'Photos taken in California all come out well'

In (12), the speaker is saying that he knows he does not have to pay for everything when he goes out with his girlfriend but he somehow finds himself paying because it is a type of social expectation in Japan. In (13), while the speaker says waracchau '(I) find myself laughing/It makes (me) laugh', she bursts into laughter about someone's totally unthinkable behavior. In (14), the speaker is saying that any photos taken in California naturally come out well.

The uniting feature of the use of shimau/chau in (12)-(14) seems to be that the activity expressed in the clause is projected to have occurred automatically without volition or control. This is clearly related to the lexical meanings of shimau 'put away/finish', which emphasize the endpoint of the activity. Recent studies (cf., DeLancey 1985) have suggested that linguistic events can consist of several different phases, including the actor's volition, control and endpoint. We hypothesize that the endpoint orientation of the lexical meanings of shimau have developed into a marker for automaticity, because focusing on the endpoint implies the absence of such phases as the actor's volition and control in the event structure.

7. Conclusion

In this paper, we have shown that the Japanese verb shimau 'put away/finish' is developing into a new auxiliary shimau/chau, and we have proposed a course of meaning change during its grammaticization. The meaning change is hypothesized as in (15):[3]

(15)

		inability		speaker's negative		speaker's guiltily
	-->	to undo	-->	attitude	-->	positive attitude
put away finish (ex. 1,2)		(ex. 3,4,5)		(ex. 6,7,8)		(ex. 9,10,11)
	-->	automatic (ex. 12,13,14)				

The lexical verb shimau has been grammaticized into an auxiliary shimau/chau, which conveys the meaning of "inability to undo." It has then taken on a sense of the speaker's negative attitude, since many situations which have become unchangeable often have undesirable consequences for the speaker. Further, this meaning is later extended to convey the speaker's guiltily positive attitude, i.e., pleasure mixed with some guilt about the situation. We have also suggested that shimau/chau has developed the meaning of "automatic" occurrence of the situation through the endpoint orientation of the lexical meanings of shimau.

The meaning change from propositional semantics into pragmatics associated with the process of grammaticization has rarely been documented (see Traugott 1989 for an exception). The present study is a contribution to this neglected aspect of language change.

Another thing that deserves attention is that this newly developed morpheme, which expresses the speaker's attitude, occurs clause-finally and its position is consistent with other forms indicating pragmatic information in Japanese (i.e., sentence-final particles, honorifics etc.). The behavior of shimau, which shows patterns in our conversational data, confirms Du Bois's claim (1985; 1987) that grammaticization is motivated by recurring patterns in everyday language use. Thus, these Japanese data provide an interesting example that will contribute to our understanding of grammaticization (e.g., Du Bois 1985; 1987; Givon 1979; 1989; Kurylowicz 1965; Lehmann 1985; Traugott 1989; Traugott and Heine 1991).

Notes

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Some of the ideas expressed in this paper are also discussed in Ono (forthcoming). Though that paper treats some areas much more extensively than

the present paper, it is based on constructed examples, while the present paper contains further developed views on this topic based on real conversational discourse. It should be pointed out that "perfect," "frustrative," and "non-volitional" in the earlier paper roughly correspond to "inability to undo," "speaker's negative attitude," and "automatic" respectively in the present paper.

2. Some of the examples have been cleaned up for the purpose of presentation.

3. A similar semantic development of shimau is suggested by Yoshikawa (1982). Also, Genetti (1986) discusses similar types of grammaticization process of two lexical verbs, tol- 'to put/keep', dhun(-k)- 'to finish', into auxiliaries in Newari.

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Indo-European Practice and Historical Methodology

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1. Introduction

One element of the recent controversy over historical methodology set off by Greenberg (1987)'s classification of American Indian languages has been his reliance on superficial lexical resemblances, with no attempt to establish phonological correspondences and no evidence from submerged morphology. Proponents of this methodology argue (Greenberg 1949, 1987, 1990, 1991, Ruhlen 1987) that this is the methodology used to establish the Indo-European language family, and that the success of these methods in the Indo-European case shows them to be reliable.

We argue that this view of the history of Indo-European studies is seriously flawed, in two ways:

(a) for the most part, neither the recognition of languages as IE nor their internal classification have been based primarily on superficial lexical resemblances;

(b) where such methods were employed, they frequently led to erroneous results.

The history of Indo-European studies thus provides no support for superficial lexical comparison, nor, more generally, for the methods advocated by Greenberg and Ruhlen. Indeed, the true history of Indo-European studies provides important object lessons on how to establish genetic affiliation, and how easy it is to go astray.

2. Methods for Establishing Genetic Affiliation

A persuasive argument for genetic affiliation will generally contain two elements:

Regular Phonological Correspondences

Regular phonological correspondences between items including a significant amount of basic vocabulary are necessary. Unsystematic superficial phonetic similarities do not exclude chance resemblance. Correspondences in basic vocabulary are necessary to reduce the possibility that the corresponding items are loans.

An eloquent statement of this point is given by Sapir (1931/1949;74):

> Inasmuch as all sound change in language tends to be regular, the linguist is not satisfied with random resemblances in languages that are suspected of being related but insists on working out as best he can the phonetic formulas which tie up related words. Until such formulas are discovered, there may be some evidence for considering distinct languages related — for example, the general form of their grammar may seem to provide such evidence — but the final demonstration can never be said to be given until comparable words can be shown to be but reflexes of one and the same prototype by the operation of dialectic phonetic laws.

Submerged Morphology

> "It is necessary to show not only that the resemblances are so numerous and detailed as to exclude the possibility of chance as an explanation but also that they are so tightly woven into the basic fabric of the languages that they cannot be explained simply as borrowings." (Goddard 1975;259)

The great Indo-Europeanist Meillet held that correspondences in vocabulary alone were insufficient to establish genetic affiliation (Meillet 1914/1926;91):

> Les concordances grammaticales prouvent, et elles seules prouvent rigoureusement, mais à condition qu'on se serve du détail matériel des formes et qu'on établisse que certaines formes grammaticales particulières employées dans les langues considérées remontent à une origine commune. Les concordances de vocabulaire ne prouvent jamais d'une manière absolue, parce qu'on ne peut jamais affirmer qu'elles ne s'expliquent pas par des emprunts.
>
> Grammatical correspondences provide proof, and they alone prove rigorously, but only if one makes use of the details of the forms and if one establishes that certain particular grammatical forms used in the languages considered go back to a common origin. Correspondences in vocabulary never provide absolute proof, because one can never be sure that they are not due to loans.

Moreover, he held that the strongest evidence involves irregular forms (Meillet 1925/1954;27):

> Plus sont singuliers les faits dont on constate entre deux langues la concordance, et plus grand est la force probante de la concordance. Les formes anomales sont donc celles qui sont les plus propres à établir une "langue commune".
>
> The more singular the facts observed to correspond in two languages, the greater is the probative force of the correspondence. Irregular

forms are therefore those most suited to establishing a "common language".

The importance of morphological evidence was recognized also by Sapir, who considered purely lexical evidence inadequate, as shown by this passage from his letter of 27 February 1913 to Alfred Kroeber (Golla 1984;89):

> Your material is certainly suggestive, but I cannot feel that I have any right to adopt a definite stand in the matter until I know far more about Shastan morphology than I do. As you may remember, I pointed out in my review of Dixon's Chimariko paper that it is difficult to know how to weight lexical correspondences without a definite knowledge of grammatical features as well.

In the review to which he refers (Sapir 1911;143), after citing a table of 57 lexical correspondance plus "a few general morphological resemblances", Sapir wrote:

> In the absence as yet of extended grammatical studies of the Shastan dialects, it is difficult for the student to express a definite opinion.

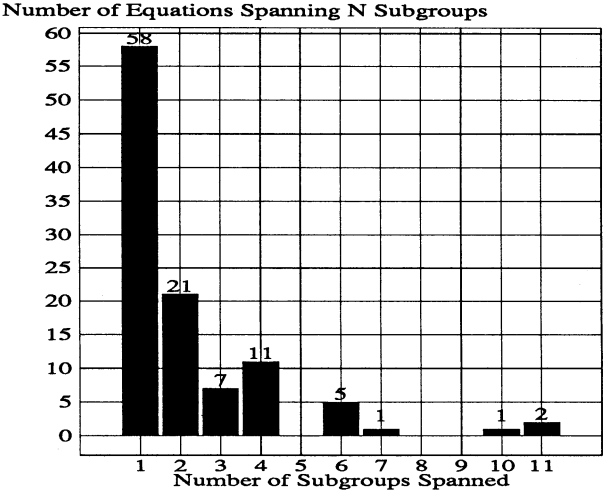
Indeed, Greenberg himself has pointed out the value of such evidence (1957;37-38):

> The presence of similar morph alternants in similar environments is of very great significance as an indication of historical connection, normally genetic relationship. This is particularly so if the alternation is irregular, especially if suppletive, that is, entirely different.

3. Greenberg's Methods

Most of Greenberg's evidence consists of lists of words taken to be similar in form and meaning, with no attempt to establish phonological correspondences. He also presents what he calls "grammatical evidence", which is not, however, the sort of submerged morphology that other scholars consider probative.

"grammatical" evidence of any kind is adduced only in a minority of cases. This can easily be seen by inspection of the following plot of the distribution of grammatical equations in LIA. We see that there are very few grammatical equations that span many subgroups. Indeed, more than half are restricted to a single subgroup.



Such "grammatical" evidence as is presented is not very convincing. Many of Greenberg's examples involve independent words, especially pronouns, which he considers to be "grammatical", in spite of the fact that pronouns have long been recognized as a weak source of evidence (Meillet 1914/1926;89-90). Indeed, entries #22 and #23 are based exclusively on independent words. Even where true morphology enters the picture, it is almost always of the most superficial sort. There are few examples of ablaut or other idiosyncratic alternations, and comparisons are almost all of isolated morphemes, not substantial portions of paradigms.

In many cases the semantic relationship between the comparanda is extremely speculative, and the phonological resemblance is vague. In many cases (e.g. #103) the resemblance is between only a single segment in each language. Indeed, almost all of the morphemes discussed are extremely short, typically a single segment.

Finally, many of the morphological analyses on which his examples are based are extremely speculative if not completely unjustified (Goddard 1987, Campbell 1988, Adelaar 1989, Poser 1992).

As a revealing example of what Greenberg considers to be convincing evidence of genetic affiliation, consider his evidence for the membership of Waicuri in the Hokan family. Greenberg (1987;132) says:

> Waicuri is an extinct language of Lower California known only from a few forms, but these appear to be decisive for its Hokan affiliation.

The sum total of Waicuri evidence in LIA is found in the following four entries in the Hokan section of Chapter 3. No Waicuri data is cited in the "Amerind Dictionary" or in the chapter on grammatical evidence.

2 ALL

Jicaque *pʰu*. Subtiaba *ba:*. **Waicuri** *pu*.

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Chimariko *po*, *poi*. Chumash: Santa Cruz *k-opok* 'dead'. Esselen *poko*. Salinan: San Miguel *p-apa* 'copulate'. Subtiaba *g-ap* 'lie sleeping'. **Waicuri** *pibikiri* 'he died', *tibikiu* 'dead ones'. Yuman: Cocopa *patχ* 'lie down', Kiliwa *pi* 'die', Maricopa *epuik* 'dead', etc.

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Achomawi: Achomawi *ipʰle*, *iplaʔtaj* 'lick', Atsugewi *apʰli*. Chimariko *hipen*, *pen* 'lick'. Comecrudo *expen*. Jicaque *berang*, *pelam*. Karok *aprih*. Pomo: East, Southeast *bal*. Salinan: San Antonio *epa:l*, San Miguel *ipał*. Seri *ʔapł*. Tequistlatec *-apał*, *beł* 'lick'. **Waicuri** *ma-bela*. Yuman: Maricopa *hipañ*, Walapai *ipaal*, etc.

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Achomawi *wina* 'top'. Pomo: East *wina:* 'on top of', Northeast *wi:nal* 'straight up'. **Waicuri** *aena* 'above, heaven'.

In other words, Greenberg considers that he has made a "decisive" case for the Hokan affiliation of Waicuri on the basis of FOUR lexical resemblances and no morphological evidence whatsoever.

In sum, Greenberg's evidence consists primarily of superficial comparison of lexical items, with a limited amount of morphological evidence, none of it submerged, and much of it based on speculative analysis of the languages in question.

4. How the Indo-European Family Was Constructed

In contrast, a survey of Indo-Europeanists' claims about methods and their actual practice shows both that the recognition of languages as IE and the subgrouping of languages within the IE family have been based primarily on submerged morphology, and, especially in the case of subgrouping, secondarily on phonological isoglosses, not on superficial lexical comparison and isolated bits of superficial morphology.

Greenberg himself acknowledges the dominant role played by morphology in Indo-European (1987;36):

> ... in Indo-European it was the numerous points of specific contact in *morphological systems* that played the major role at an early stage ...

However, he and Ruhlen deny that phonological correspondences were considered of any importance on the grounds that regular sound laws were not

recognized until the Neogrammarians in the last quarter of the 19th century (Greenberg 1990;2-7, 1991;127-128, Ruhlen 1987;40-41,122). In point of fact, the use of sound laws to establish genetic affiliation goes back at least to Hadrianus Relandus who in his *Dissertationes Miscellanae* (1706-1708) used them to relate Malay and Malagasy (von der Gabelentz 1891;26). Such early Indo-Europeanists as Rask and Grimm were familiar with sound laws. After all, both of them discovered Grimm's Law.[1]

Greenberg and Ruhlen's claim confuses regularity with exceptionlessness. As Wells (1979;41) points out, the Neo-Grammarian controversy was not about the existence of regular sound laws; it was about whether the regular sound laws everyone acknowledged were exceptionless.

> Grimm, Pott, Diez, and Schleicher all taught the doctrine of the regularity of sound-change; but not until the next stage, the Neogrammarians, was regularity taken to mean exceptionlessness.

We turn now to a consideration of several examples, two of them discussed by Greenberg, but as a review of the history shows, wrongly interpreted.

4.1. Venetic

Venetic, the language spoken in the vicinity of Venice prior to the spread of Latin, known to us only from about 300 short inscriptions, mostly in the Etruscan alphabet, was recognized as a distinct language by Pauli (1885), who argued that Venetic was Indo-European on the basis of the case morphology and derivational affixes (1885;116-117). Pauli (1891;233) added an argument based on a weak/strong grade alternation in the same root, while saying that the entirety of his monograph would confirm his view that Venetic is IE. The explicit arguments in favor of an Indo-European affiliation were strictly morphological, although he also gave interpretations of words with obvious IE counterparts.

The next comprehensive work on Venetic was the 1949 monograph by Beeler, in which he gave the following summary of the evidence that Venetic is Indo-European (Beeler 1949;13), quoted by Greenberg (1990;13):

> Venetic is an Indo-European language. Some of the evidence which proves this point is the following: a) The contrast between the inflectional endings of two series of names, one with *-os, -oi,* and *-on* (like the nominative, dative, and accusative singulars respectively of IE *ŏ* stems), and the other with *a, as* and *ai* (like the nominative, genitive, and dative singulars of IE *ā* stems). b) The verbal ending *-to*,presumably that of the third person singular of the secondary indicative middle, Greek *το*, Sanskrit *-ta.* c) A large number of derivative suffixes, e.g. *-i̯o-, -no-,-so-,-tor-,* which can be abundantly paralleled in the languages of the IE family. d) Many striking lexical

correspondences, such as *·e·χo* = Lat. *ego*, *meχo* = Gothic *mik*, *zoto* = Greek ἕ-δοτο, *lo·u·zera·i·* = Latin *Libera*. e) The characteristically Indo-European nature of the vowel alternation in *vho·u·χo·n·tah* and *vhuχiia* (Pauli).[2]

Observe that four of the five pieces of evidence cited by Beeler are morphological, including facts about ablaut, not merely correspondences in affixes. Moreover, the evidence cited by Beeler in this passage is by no means all that he was aware of, as he explicitly indicates. In particular, Beeler established phonological correspondences between Venetic and Proto-Indo-European, and discussed them at some length (pp. 16-42).

In sum, the evidence offered for the IE affinity of Venetic was at first morphological and then extended to sound laws. Superficial lexical comparison played no role whatever.

The evidence adduced for the subgrouping of Venetic is also instructive. Pauli (1885;117) argued for a subclassification with Messapic as Illyrian, on the grounds that both languages had a genitive singular in *-h*,[3] and that in both languages the nominative singular of the present active participle retains the final /t/ while losing the nominative singular suffix /s/ (1885;117-118). Beeler's classification of Venetic as Italic (as opposed to Illyrian, the then current alternative) is based partly on morphology and partly on phonology, e.g. the fact that PIE **bh* yields *f*, as in Italic, in contrast to the *b* it yields in Messapic (p. 51).

Subsequent discussions of the subgrouping of Venetic, such as Krahe (1950) and Hamp (1959), have again concentrated on phonological and morphological isoglosses. At present the standard reference on Venetic is Lejeune (1974). Of the 54 isoglosses discussed, nine are morphological and 21 are phonological.

4.2. Hittite

The first substantive claim as to the affiliation of the Hittite language was made by Knudtzon (1902), Bugge (1902) and Torp (1902) in a book devoted to two letters between the king of Egypt and a Hittite ruler, found at Tell-El-Amarna in Egypt. Knudtzon, Bugge, and Torp argued that Hittite was Indo-European, largely on the basis of the morphology. An example is the following passage from Torp (1902;108):

> Die Annahme, dass hier eine indogermanische Sprache vorliege, scheint mir durch Knudtzon's Entdeckung von *eštu*, Imp. 3. Sing. des Verbs "sein", und von *mi* und *ti* als enklitischen Possessiven resp. der 1. und der 2. Pers. sehr nahe gelegt.

> The proposal that here we have an Indo-European language seems to me to be strongly suggested by Knudtzon's discovery of *eštu*, the

> third person singular imperative of the verb "to be", and of *mi* and *ti*, the enclitic possessives of the first and second persons respectively.

They pointed to a variety of other affixes, such as the accusative singular *-an* and the first person singular preterite active in *-n*.

Although Knudtzon, Bugge, and Torp were right, their proposal that Hittite was IE was generally rejected and it was not until the work of Friedrich Hrozný (1915,1917) that Hittite was generally acknowledged to be an Indo-European language.

Hrozný had at his disposal the vast quantity of Hittite tablets discovered at Boğaz-Köi, and as a result was able to produce a comprehensive grammar of the language and to justify his decipherment and analysis with numerous examples. He announced his results in Hrozný (1915), a paper that was soon followed by a book (Hrozný 1917). While the book constitutes a grammar of the Hittite language, the paper concentrates on his evidence for the Indo-European affinity of Hittite.

The evidence that Hrozný presented was largely morphological, including the form of the present active participle (p.23), the case morphology (p.24), the existence of r/n-stems (pp. 24-25), the pronouns (pp.25-26), the verbal paradigm (p. 27), and the adverbs (pp. 27-28). When he discussed the case morphology he did not present isolated affixes, but rather a full set of six case-endings. When he discussed pronouns, he did not present an isolated pronoun or two, but a set of 23, including multiple case forms of the same pronoun, some involving irregular alternations. When he discussed the verbal paradigm, he did not present isolated forms but rather the complete paradigm of six person/number forms, which are explicitly compared with their Vedic and Greek counterparts.

Indeed, it is clear that Hrozný did not consider isolated morphological resemblances probative. The first case to strike him was the present active participle. Nonetheless, this did not convince him immediately of genetic affiliation. He notes (1915;24,fn.1):

> Als ich die ersten Übereinstimmungen des Hethitischen mit dem indogermanischen fand, erwog ich auch die Möglichkeit dass das Hethitische vom indogermanischen vielleicht bloss beeinflusst worden sei.
>
> When I noticed the first correspondences of Hittite with Indoeuropean, I also considered the possibility that Hittite might just have been influenced by Indo-European.

Only after all of this morphological evidence did Hrozný tack on thirteen lexical comparisons.

We can now see why Knudtzon's argument had little impact while Hrozný's a mere decade later soon overcame all opposition. Not only was Hrozný's argument based on a much surer analysis of the language itself, but while

Knudtzon could offer only isolated affixes, Hrozný offered complete paradigms and idiosyncratic alternations. In Hrozný's paper there is not a hint of Greenbergian methodology: lexical comparison plays virtually no role, and the morphology invoked does not consist of isolated affixes.

The evidence offered in Hrozný's book included that presented in his paper and added to it. Since the book presented a grammar, however, the evidence was diffused throughout the book. There is no part of the book devoted solely to the argument for the IE affinity of the language. We therefore disagree with Greenberg's presentation of Hrozný's argument.

Greenberg (1990a;11-12,1991;129) quotes Hrozný (1917;vii) as follows:

> Everyone who wishes to interpret the Boghazköi texts, from the moment of their publication, will, like the author, come to the same conclusion on the basis of instances like the fact that *wadar* means "water", that its genitive is not **wadaras* but, remarkably enough, *wedenas*, that the Hittites have a participle in *-nt-*, that "what" (masc.) is *kuis* and in the neuter *kuid*, that "I" is *ug* (cf. Latin *ego*), "to me" *ammug* (cf. Greek *emoige*), "thou" *zig* (cf. Greek *suge*), "to thee" *tug* (Gothic *thuk* etc.), that the Hittite present is inflected *jami, jasi, jazi, jaweni, jatteni, janzi*, etc., etc.

On this Greenberg (1991;129) comments:[4]

> Hrozný does not present a table of correspondences of the kind that have become *de rigueur* in the pages of *IJAL*, nor has anyone since...Note also that the resemblances adduced by Hrozný as decisive are with various Indo-European languages or with none in particular as with the verb paradigm he cites.

However, it is only from Greenberg's English translation that comparanda for the verbal forms are absent. In the original German text (Hrozný 1917;vii), reproduced below followed by our own translation, Hrozný gives a Greek comparandum for every Hittite form.

> Jeder, der die Boghazköi-Texte, sobald sie veröffentlicht sind, wird deuten wollen, wird gleich dem Verfasser zu dem Ergebnis kommen, dass *wâdar* "Wasser" bedeutet; dass der Genitiv hierzu nicht etwa **wâdaraš*, sondern merkwürdigerweise *wedenaš* lautet, dass die Hethiter ein Partizipium Präs. auf *-nt-* haben, dass "welcher" bei ihnen *kuiš*, "welches" *kuit/d* heisst, dass "ich" hethitisch *ug* (vgl. lat. *ego*), "mir" *ammug* (vgl. griech. ἔμοιγε), "du" *zig* (vgl. griech. σύγε), "dir" *tug* (vgl. got. *þuk* usw.) lautet, dass das hethitische Präsens folgendermassen flektiert wird: *jami* (vgl. griech. τίθημι), *jaši* (vgl. τίθης), *jazi* (vgl. τίθησι), *jawéni* (vgl. τίθεμεν), *jatténi* (vgl. τίθητε), *janzi* (vgl. τιθέασι), usw. usw.

> Whoever wishes to interpret the Boghazköi texts, as soon as they are published, will, like the author, arrive at the result that *wâdar* means "water", that its genitive is not pronounced **wâdaraš* but, remarkably, *wedenaš*, that the Hittites have a present participle in *-nt-*, that "which" (masculine) was for them *kuiš*, "which" (neuter) *kuit/d*, that "I" took the form *ug* in Hittite (compare Latin *ego*), "me (dative)" *ammug* (compare Greek ἔμοιγε), "thou" *zig* (compare Greek σύγε), "thou (dative)" *tug* (compare Gothic *þuk* etc.), that the Hittite present was inflected as follows: *jami* (compare Greek. τίθημι), *jaši* (compare τίθης), *jazi* (compare τίθησι), *jawéni* (compare τίθεμεν), *jatténi* (compare τίθητε), *janzi* (compare τιθέασι), etc., etc.

More importantly, in this passage Hrozný is not, as Greenberg suggests, presenting evidence for the Indo-European affiliation of Hittite. As inspection of the German text will reveal, the various facts cited are not evidence for anything — they are what he considers to be firm conclusions about Hittite. Greenberg's mistranslation has transformed Hrozný's list of conclusions into a list of evidence for a conclusion. This interpretation is confirmed by the immediately following lines:

> Diese und die übrigen Ergebnisse des Verfassers stehen felsenfest da, man wird um sie nicht herumkommen können. Jeder neue Text, den der Verfasser neuerdings erhält, legt wiederum diese Deutungen nahe, fordert und bestätigt sie. So wird das hier angeführte hethitische Präsensschema durch viele Hunderte von Stellen gestützt. Dasselbe gilt z. B. auch von den für die Sprachvergleichung so wichtigen hethitischen Pronomina, deren Bedeutung durch eine unübersehbare Reihe von Stellen gesichert ist.
>
> These and the author's other results are so secure that they cannot be evaded. Every new text which the author obtains again suggests these interpretations, demands and confirms them. Thus the Hittite present tense conjugation proposed here is supported by many hundreds of facts. The same is true for example also of the Hittite pronouns, so important for linguistic comparison, whose meaning is assured by an unignorable series of facts.

In sum, Greenberg's discussion of this passage is entirely inaccurate: his translation is incorrect, he is wrong about the Hittite verb forms not being compared explicitly with forms from other IE languages, and the passage is not an argument for the IE affinity of Hittite. *Ex uno disce omnia*, as Greenberg (1990b;660) would say.

The passage in which Hrozný actually summarizes his reasons for believing Hittite to be Indo-European is the following (Hrozný 1917;v):

> Eine systematische, nüchterne und vorsichtige Prüfung eines grossen Teiles der in dem Konstantinopeler Kaiserlich Ottomanischen Mu-

seum aufbewahrten Boghazköi-Texte brachte indes den Verfasser bereits in wenigen Monaten zu der festen Überzeugung, dass das Hethitische eine im wesentlichen indogermanische Sprache ist. Wörter wie *wâdar* "Wasser" (vgl. altsächs. *watar* "Wasser" usw.), Gen. *wedenaš* (vgl. griech. ὕδατος aus ὕδητος), Partizipien wie *dân* "gebend" (vgl. lat. *dans*), Pl. *danteš* (vgl. lat. Pl. *dantēs*), Pronomina wie *kuiš* "welcher" (vgl. lat. *quis*), Neutr. *kuit/d* (vgl. lat. *quid*) usw. usw., wie auch, und zwar vor allem, der ganze im Laufe der Untersuchung sich allmählich ergebende Bau der hethitischen Sprache konnten keinen Zweifel darüber übrig lassen.

A systematic, sober, and careful examination of a large part of the Boghazköi texts kept in the Imperial Ottoman Museum in Constantinople however led the author readily in a few months to the firm conviction that Hittite is essentially an Indo-European language. Words like *wâdar* "water" (compare Old Saxon *watar* "water" etc.), genitive *wedenaš* (compare Greek ὕδατος from ὕδητος), participles like *dân* "giving" (compare Latin *dans*), plural *danteš* (compare the Latin plural *dantēs*), pronouns like *kuiš* "which (masc.)" (compare Latin *quis*), neuter *kuit/d* (compare Latin *quid*) etc., etc., and also, and indeed, above all, the entire form of the Hittite language which gradually reveals itself in the course of the investigation, can leave no doubt.

Here it is clear that Hrozný's emphasis is on the morphology, not the individual lexical items. That is why he cites pairs of related forms, including such distinctive items as an r/n-stem. In the chapter on *Formenlehre des Nomens* (The Morphology of the Noun) he refers again to the importance of the r/n stems for establishing the IE affinity of Hittite (p.61), and again, after a discussion of the declension of r/n stems like *watar*, he says (p.64):

Wir haben schon Mitteilungen d. deutsch. Orient-Ges. Nr. 56, S. 24f. bemerkt, dass diese Übereinstimmung in einer so auffälligen Deklinationsart — nebst vielem anderen — als ein zwingender Beweis für unsere These zu bewerten ist, dass das Hethitische eine indogermanische Sprache ist.

We have already remarked in the *Communications of the German Oriental Society*, Number 56, pp.24sqq, that this agreement in such a striking type of declension — among many others — is to be regarded as convincing proof for our thesis that Hittite is an Indo-European language.

Nor was Hrozný alone in his evaluation of the morphological evidence as crucial. Marstrander (1919;63) pointed specifically to the argument from r/n-stems:

M. Hrozný a réussi à établir une série de thèmes hittites anomaux en *r/n* et à fournir ainsi une des preuves les plus positives du caractère indo-européen da la langue hittite.

Mr. Hrozný has succeeded in establishing a series of anomalous Hittite stems in *r/n* and thus in furnishing one of the most positive proofs of the Indo-European character of the Hittite language.

And here is Gusmani (1968;7)'s comment on Hrozný's evidence fifty years later:

...accanto a tutta una serie di concordanze di carattero morfologica (desinenze ecc.), anche diverse coincidenze lessicali tra l'ittito e le altra lingue indoeuropee che dovevano corroborare la sua teoria del carattere indoeuropeo della lingua di recente scoperta.

...near a whole series of morphological correspondences (suffixes etc.), as well as various lexical correspondences between Hittite and the other Indo-European languages which should corroborate his theory of the Indo-European character of the recently discovered language.

Marstrander (1919;7) also emphasized the peculiar pronominal paradigm:

Sur l'origine indo-européenne de ces formes il ne peut y avoir aucun doute. Leur flexion montre la mê alternance particulière de thèmes que nous retrouvons dans presques toutes les languages indo-européennes. Que *u-ga* et *am-mu-ga* proviennent de la même source que ἐγώ : ἐμέγε, *ik : mik*, *ego : me*, cela saute aux yeux.

As to the Indo-European origin of these forms there can be no doubt. Their inflection shows the same peculiar alternation in the stem that we find in practically all of the Indo-European languages. That *u-ga* and *am-mu-ga* derive from the same source as ἐγώ:ἐμέγε, *ik:mik*, *ego:me*, that leaps to the eyes.

What it is essential to understand about Hrozný's book is that the argument that Hittite is Indo-European is not restricted to the facts mentioned in the single passage quoted from the Foreword. Hrozný's entire monograph is an argument for the IE affinity of Hittite — that is why its full title is "The Language of the Hittites: its Form and its Membership in the Indo-European Language Family", and why, in the passage quoted above, Hrozný cites as evidence "...the entire form of the Hittite language which gradually reveals itself in the course of the investigation...". The evidence is found throughout, in the many places in which he points out the relationship between some aspect of Hittite morphology and that of Indo-European. Among

many examples we may cite the two tables in Chapter 3 (pp.153, 162-3) in which Hittite verb forms are given along with their Vedic counterparts.

Let us now consider the matter of phonological correspondences. If one reads past the Foreword to chapter 5, pp. 186-190, entitled "Der Lautbestand des Hethitischen" (The Inventory of Sounds of Hittite), one finds a table of correspondences between Hittite and Proto-Indo-European. It is true that Hrozný did not offer this table of sound correspondences as the primary evidence for the IE character of Hittite — he clearly felt that the morphological evidence he cited was the most striking evidence of the relationship — but he did indeed work out and present phonological correspondences. Moreover, as the five exclamations "Centum-Sprache!" (*centum*-language) and the discussion on pp. 29-30 of his 1915 paper show, he used these correspondences to determine its place within the Indo-European family. It is just not true that Hrozný did not work out and make use of phonological correspondences, despite Greenberg's claims to the contrary.

Nor is it true that subsequent authors have not given such tables of correspondances. Marstrander (1919) gives a table showing the relationship between Proto-Indo-European and Hittite on page 169, and Sturtevant (1933) devotes much of Chapter III *Phonology*, pp. 87-143, to the sound correspondences between Proto-Indo-Hittite[5] and Hittite, at every point citing numerous comparanda in other Indo-European languages.

4.3. Armenian

We turn now to an example involving subgrouping rather than affiliation *per se*. Armenian was recognized as an Indo-European language by Petermann in 1837, and soon thereafter, in 1846, was classified as Iranian by Windischmann on the basis of the many obviously Iranian words in its lexicon. This remained the dominant view, accepted, among others, by Bopp, in spite of doubts expressed by Pott and the suggestion of DeLagarde that the Iranian words represented loans, until the publication of a classic paper by Hübschmann in 1875. Hübschmann demonstrated, to the satisfaction of virtually all scholars since, that Armenian belongs to a distinct subgroup of IE, not Iranian.

Hübschmann's discovery of the correct position of Armenian within the IE family was due to his recognition that words are so easily borrowed as to be poor indicators of genetic affiliation, vastly inferior to morphology (Hübschmann 1875;10):

> Sind wir nun gegen das lexicon misstrauisch geworden, so dürfen wir uns vertrauensvoller an die grammatik wenden: ist diese doch bei allen lebenden sprachen das palladium, das fremder einfluss nicht berühren kann. Wie wüst ist das lexicon im afghanischen und neupersischen, oder im englischen, und wie klar lehrt die grammatik, dass wir dort iranisch, hier germanisch vor uns haben!

> As we have now become distrustful of the lexicon, we must turn trustfully to the grammar: it is the palladium of all living languages, which is not subject to foreign influence. How confused is the lexicon in Afghan and Modern Persian, or in English, and how clearly the grammar teaches us that we have before us there Iranian, here Germanic!

He concluded that in its morphology Armenian exhibts no specifically Iranian features, differs in an important point with Indo-Iranian, and corresponds most closely to Balto-Slavic (p. 13).

The remainder of the paper is devoted to a detailed examination of the sound laws and the demonstration, on the basis of the sound laws, that two strata of Persian loans must be distinguished from the truly Armenian stratum, which exhibits very different correspondences. His ultimate conclusion is that Armenian is an independent subgroup of Indo-European, most closely related to Iranian and Balto-Slavic.

The first lesson that we draw from this example is that reliance on the lexicon is dangerous for we run the risk of being misled by loans. The second lesson is that phonological correspondences play a crucial role in distinguishing loans from native vocabulary. Note, moreover, that Hübschmann's appeal to sound laws preceded the Neogrammarians. Indeed, his paper appeared in the same issue of the *Zeitschrift für Vergleichende Sprachforschung* as the paper of Karl Verner's that set off the Neogrammarian revolution.

5. The Reliability of Superficial Lexical Comparison

We turn now to the second part of Greenberg's claim, namely the proposition that superficial lexical comparison produced reliable results when applied by the early Indo-Europeanists. We submit that those early Indo-Europeanists who did make use of such techniques were frequently led into error.

5.1. Sir William Jones

Sir William Jones is known to most linguists solely from the famous passage below in which he proposed the nucleus of the Indo-European language family (Jones 1798;422-423).

> The *Sanscrit* language, whatever be its antiquity, is of a wonderful structure; more perfect than the *Greek*, more copious than the *Latin*, and more exquisitely refined than either; yet bearing to both of them a stronger affinity, both in the roots of verbs, and in the forms of grammar, than could possibly have been produced by accident; so

> strong, indeed, that no philologer could examine them all three without believing them to have sprung from some common source, which perhaps no longer exists. There is a similar reason, though not quite so forcible, for supposing that both the *Gothick* and the *Celtick*, though blended with a very different idiom, had the same origin with the *Sanscrit*; and the old *Persian* might be added to the same family, if this were the place for discussing any question concerning the antiquities of *Persia*.

Greenberg (1949;79, 1990a;3) cites Jones as an example of a successful user of methods like his own. Jones' published work provides only the skimpiest evidence as to his methods, for he generally gave only his conclusions, not detailed arguments and data, but a careful examination of his work suggests that in one important respect his methods did indeed resemble Greenberg's.

Jones was aware of the possibility of borrowing, and that borrowing is especially likely in cultural and technological vocabulary. However, like Greenberg and some other modern scholars, he also did not recognize that massive borrowing was possible, or that even relatively basic vocabulary can be borrowed (Jones 1799a;54-55):

> I close this head with observing, that no supposition of a mere political or commercial intercourse between the different nations, will account for the *Sanscrit* and *Chaldaic* words, which we find in the old *Persian* tongues; because they are, in the first place, too numerous to have been introduced by such means; and secondly, are not the names of exotic animals, commodities, or arts, but those of material elements, parts of the body, natural objects and relations, affections of the mind, and other ideas common to the whole race of man.

As a result, he was ready to postulate genetic affiliation on the basis of large numbers of similar words. This was the basis for his conclusion that Romani is descended from Sanskrit, as it happens, a correct conclusion (Jones 1799c;8):

> It seems agreed that the singular people, called *Egyptians*, and by corruption, *Gypsies*, passed the *Mediterranean* immediately from *Egypt*; and their motley language, of which Mr. Grellmann exhibits a copious vocabulary, contains so many *Sanscrit* words, that their *Indian* origin can hardly be doubted.

Jones was also aware that grammatical correspondences provide stronger evidence of genetic affiliation than lexical correspondences (Jones 1799c;4):

> That the written *Abyssinian* language, which we call *Ethiopick*, is a dialect of old *Chaldean*, and sister of *Arabick* and *Hebrew*; we know

> with certainty, not only from the great multitude of identical words, but (which is a far stronger proof) from the similar grammatical arrangement of the several idioms.

In other words, Jones understood some principles of valid comparison, including the necessity of excluding loanwords and the value of grammatical evidence, but underestimated the possibility of borrowing.

Since, in spite of his recognition of the problem, Jones was not careful about excluding loans, since he did not establish phonological correspondences, and since in general he based his conclusions on fairly superficial comparison of languages, his methods led him astray in many cases. A particularly striking case is his misidentification of Pahlavi, an IE language of the Iranian branch, as Semitic (Jones 1799a;52):

> This examination gave me perfect conviction, that the *Pahlavi* was a dialect of the *Chaldaic*;[6] and of this curious fact I will exhibit a short proof. By the nature of the *Chaldean* tongue most words ended in the first long vowel, like *shemia*, heaven; and that very word, unaltered in a single letter, we find in the *Pazend*, together with *lailia*, night; *meyd*, water; *nira*, fire; *matra*, rain; and a multitude of others, all *Arabic* or *Hebrew*, with a *Chaldean* termination; so *zamar*, by a beautiful metaphor, from *pruning trees*, means in *Hebrew* to *compose verses*, and thence, by an easy transition, to *sing* them; and in *Pahlavi* we see the verb *zamruniten*, to *sing*, with its forms *zamrunemi*, I *sing*, and *zamrunid*, he *sang*; the verbal terminations of the *Persian* being added to the *Chaldaic* root. Now all those words are integral parts of the language, not adventitious to it like the *Arabic* nouns and verbals engrafted on modern *Persian*; and this distinction convinces me, that the dialect of the *Gabrs*, which they pretend to be that of *Zeratusht*, and of which *Bahman* gave me a variety of written specimens, is a late invention of their priests, or subsequent at least to the *Muselman* invasion.

Similarly, Jones mistakenly classified other Iranian languages as Semitic (Jones 1799c;7-8):[7]

> ...there is very solid ground for believing, that the *Afghans* descended from the *Jews*; ...and, principally, because their language is evidently a dialect of the scriptural *Chaldaick*.

Another language mistakenly identified as Semitic by Jones is Malay (Jones 1799c;10):

> As to the *Moplas*, in the Western parts of the *Indian* empire, I have seen their books in *Arabick*, and am persuaded, that, like the people

called *Malays*, they descended from *Arabian* traders and mariners after the age of Muhammed.

Jones apparently did not recognize that Malay was an Austronesian language, for he mistakenly regarded the Austronesian languages as Indo-European, specifically Indic (Jones 1799c;12):

> From the very accurate and interesting account of it by a learned and ingenious member of our own body, we discover, without any recourse to etymological conjecture that multitudes of pure *Sanscrit* words occur in the principal dialects of the *Sumatrans*. ...If Mr. Marsen has proved (as he firmly believes, and as we, from our knowledge of his accuracy, may fairly presume) that clear vestiges of one ancient language are discernible in all the insular dialects of the southern seas from *Madagascar* to the *Phillipines*, and even to the remotest islands, lately discovered, we may infer from the specimens in his account of *Sumatra*, that the parent of them all was no other than the *Sanscrit*.

Yet another non-Indo-European language wrongly regarded as Indo-European by Jones is Tibetan (Jones 1799c;13):

> ...for, although it [Tibetan] was anciently *Sanscrit*, and polysyllabick, it seems at present, from the influence of *Chinese* manners, to consist of monosyllables, to form which, with some regard to grammatical derivation, it has become necessary to suppress in common discourse many letters, which we see in their books, and thus we are enabled to trace in their writing a number of *Sanscrit* words and phrases, which, in their spoken dialect are quite undistinguishable.

Another case in which Jones failed to recognize a real relationship is that of Hindi, which he denied could be related to Sanskrit on the grounds that its grammar was typologically so different (Robins 1990;93).

To summarize, Jones mistakenly regarded Pahlavi, "Afghan", and Malay as Semitic, and Tibetan and the Austronesian languages as Indo-European while failing to recognize that Malay is Austronesian, and that Hindi is Indo-European.[8]

5.2. Franz Bopp

Our second example is Franz Bopp, also cited as a model by Greenberg. Deservedly famous for his work on IE comparative grammar, he was less successful in his judgments as to affiliation and classification. As we have already pointed out, he, like many others, was deceived by the large proportion of Iranian loans into classifying Armenian as an Iranian language. Here he fell victim to a failure to be sufficiently wary of loans.

Bopp also argued for the IE affiliation of the Malayo-Polynesian languages (Bopp 1840ab) and of Georgian (Bopp 1846). The consensus was and is that he was wrong about both. In these two cases his error was his ready acceptance of idiosyncratic relations between comparanda. For example, he proposed (1840a;172) that Malayo-Polynesian *po* "night" is to be related to Sanskrit *kṣapas, kṣapo*, with loss of the initial syllable. He did not, however, propose that this loss of initial syllables is of any generality.

Far from representing the Indo-Europeanist norm, Bopp's work on Malayo-Polynesian and Georgian was rejected by other scholars of his day and came in for severe criticism by the Neo-Grammarians. After praising Bopp's contributions to comparative grammar, Delbrück (1884;23-24) cited Bopp's work on Malayo-Polynesian as an example of his lack of a rigorous method and specifically criticized his failure to require regular phonological correspondences.

Similarly, in a passage extremely critical of methods like Greenberg's, von der Gabelentz (1901;164-168 — emphasis ours) specifically condemned the failure to require phonological correspondences and cited Bopp's work as an example of the sort of error to which it led. We cite here the beginning and end of a four-page diatribe on the question:

> Es ist schrecklich verführerisch in der Sprachenwelt umherzuschwärmen, drauf los Vocabeln zu vergleichen und dann die Wissenschaft mit einer Reihe neu entdeckter Verwandschaften zu beglücken. Es kommen auch schrecklich viele Dummheiten dabei heraus; denn allerwaerts sind unmethodische Köpfe die vordringlichsten Entdecker. Wer mit einem guten Wortgedächtnisse begabt ein paar Dutzend Sprachen verschiedener Erdtheile durchgenommen hat, — studirt braucht er sie gar nicht zu haben, — der findet überall Anklänge. Und wenn er sie aufzeichnet, ihnen nachgeht, verstaendig ausprobirt, ob sich die Anzeichen bewähren: so thut er nur was recht ist. Allein dazu gehört folgerichrichtiges Denken, und wo das nicht von Hause aus fehlt, da kommt es gern im Taumel der Entdeckungslust abhanden. So ging es, wie wir sahen, dem grossen Bopp, da er es versuchte, kaukasische und malaische Sprachen dem indogermanischen Verwandtschaftskreise zu zuweisen. Das Schicksal hatte es merkwürdig gefügt. Es war, als hätte er die Richtigkeit seiner Grundsätze doppelt beweisen sollen, erst positiv durch sein grossartiges Hauptwerk, das auf ihnen beruht, — dann negative, indem er zu Schaden kam, sobald er ihnen untreu wurde... Die Sprachen sind verschieden, denn die Lautentwickelung hat verschiedene Wege eingeschlagen. Hüben und drüben aber ist sie ihre Wege folgerichtig gegangen; darum herrscht in den Verschiedenheiten Ordnung, nicht Willkür. **Sprachvergleichung ohne Lautvergleichung ist gedankenlose Spielerei.**

> It is terribly seductive to roam the world of languages comparing words from them at random and then to bestow upon scholarship a

series of newly discovered relationships. Very many stupidities also result from this; for the most urgent discoverers have unmethodical minds. He who, endowed with a good memory for words, has gone through a couple of dozen languages from different parts of the Earth, — he need not at all have studied them —, finds familiar forms everywhere. And if he records them, investigates them, tests intelligently whether the indications pan out, he does only what is right. Only logically correct thought belongs here, and where it is not absent from the outset then he gladly gets lost in the giddiness of the mania of discovery. Thus it went, as we saw, with the great Bopp, when he sought to assign Caucasian and Malayan languages to the Indo-European language family. Fortune had decreed him a curious fate. It was, to have to prove the correctness of his principles twice, first positively through his magnificent main work, which is based on them, then, negatively, by coming to grief as soon as he was unfaithful to them... Languages are different because sound change has taken different paths. But it has gone its way consistently hither and thither; therefore Order reigns in differentiation, not Chaos. **Language comparison without comparison of sounds is irresponsible game-playing.**

Both Jones and Bopp were led astray by their failure to take sufficiently seriously the possibility of diffusion, and Bopp fell into error through his failure to require regular phonological correspondences. Interestingly, Jones did not suffer from this latter malady. While he exhibits no awareness of the existence or role of sound laws, he was well aware that idiosyncratic resemblances were unreliable, as he explained in a plea perhaps more deserving of immortality than the passage for which he is famous (Jones 1799d;431):

> ...I beg leave, as a philologer, to enter my protest against conjectural etymology in historical researches, and principally against the licentiousness of etymologists in transposing and inserting letters, in substituting, at pleasure, any consonant for another of the same order, and in totally disregarding the vowels ...I contend, that almost any word or nation, might be derived from any other, if such licenses as I am opposing, were permitted in etymological histories.

6. Conclusion

In sum, the classification of the Indo-European languages was accomplished by the techniques advocated by critics of *Language in the Americas* and other similar work, namely sound correspondences between items of basic vocabulary and grammatical correspondences, especially those involving submerged morphology. The methods used bear no resemblance to Greenberg's; in the rare cases in which such methods were used, they led to serious

error. Thus, Indo-European practice offers no support for methods like those advocated by Greenberg, Ruhlen, and other recent proponents of controversial language groupings, but rather a caution against their use.

Notes

[1]See Hoenigswald (1990) for a general discussion of early discoveries of sound laws and their use in establishing genetic affiliation.

[2]The raised dots in the tranliteration of Venetic reflect the practice in Venetic, as well as later Etruscan, of marking syllable-initial vowels and coda consonants and glides with one or two raised dots. The letters corresponding to the Greek aspirates are believed to reflect voiced stops (Sommer 1924), but the conventional transliteration of Venetic reflects Greek usage.

[3]On this point Pauli was wrong. As Sommer (1924) demonstrated, Pauli's understanding of the writing system was imperfect, and what he took to be genitives in *-h* are actually datives in *-i*.

[4]Similar comments are to be found in Greenberg, Turner & Zegura (1986;493), who give the quotation in abbreviated form, and in Greenberg (1990a;12).

[5]Sturtevant considered Hittite to be a sister of the remainder of the Indo-European family, rather than a daughter language, and referred to the parent of Hittite and IE as "Indo-Hittite".

[6]*Chaldaic* refers to the Semitic family, especially to Aramaic.

[7]It is not clear which language Jones refers to as Afghan, but the main languages of Afghanistan, Dari and Pashto are Iranian, as are nearly all of the others. No Semitic language is, or was in Jones' day, spoken in Afghanistan.

[8]While in some cases one might attribute Jones' error to his limited knowledge of the relevant languages, this cannot possibly explain his misclassification of Pahlavi. Jones was extremely well versed in Pahlavi and in the other forms of Persian, as well as Arabic, and devoted much of his career to the study and translation of Persian and Arabic literature (Cannon 1990).

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NP Intonation Units and Referent Identification*

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0. This paper deals with the discourse function of a particular type of intonation unit (IU) in conversational English, which I call NP intonation units. The notion of Intonation Unit refers to any piece of speech produced under a coherent intonation contour, typically though not always separated by pauses (Chafe 1987, Du Bois et al. 1992). What I mean by NP intonation units then is intonation units which consist of a nominal without a verbal predicate. The arrowed intonation units in (1) are examples of NP intonation units.[1],[2]

(1) a G: 'How many 'people ^say that man.
-> b **... ^Adam,**
c ... 'Adam is ^one of them,
-> d **...(1.0) (H) ^Larry,**
-> e D: **... but ^Mike,**
-> f G: **... ^Mike,**
g ...(.9) (H) ^I don't 'know,
-> h **A- 'Alan ^McGovern,**
i D: ... M= - --
j 'yea=h, (CARSALES)

1. From a structural point of view, NP intonation units are fragmentary, since they tend to be set off by pauses and appear in a separate IU; in many cases they are not integrated into any clause structure. They constitute a noticeably 'unusual' kind of intonation unit in spoken English, where clausal IUs are seen to be typical in this language (Chafe 1987, 1991).

In this paper I hope to show that NP intonation units in English conversations have an important discourse function: they can be used by both speakers and respondents to identify referents. And the way they are used is constrained by both cognitive and interactional motivations.

2. The NP intonation unit phenomenon can be partially associated with what has been called the Left Dislocation construction, as illustrated by (1)f-g. However, as a number of scholars have demonstrated, Left Dislocation cannot be understood in terms of syntactic processes; it has important interactional ramifications (e.g., Keenan and Schieffelin 1976, Geluykens 1988, and elsewhere). I agree with these discourse researchers, but in this study I will not limit my scope of discussion to the format of 'Referent + Proposition', nor will I limit it only to

those 'Propositions' that contain an element coreferring to the initial Referent (Geluykens 1988). Instead, I take, as an operating principle, the NP intonation unit as the only criterion without considering what follows the NP. This criterion enables me to include some new phenomena that have been neglected in prior studies. Thus in my study the 'Referent + Proposition' construction is only a part of a whole range of phenomena to be dealt with.

In a highly influential study on referent establishment in discourse, Clark and Wilkes-Gibbs (1986) argue that referent establishment is a collaborative activity of discourse participants. In my study I take their proposal as a starting point.

In the past several decades, many researchers have come to realize that a number of factors outside the language system, such as human cognition and social interaction, are crucial in understanding the working principles of human language. What is less clear, however, is how these factors interact with each other. In this paper I will take the NP intonation unit phenomenon as a case study to demonstrate how these factors interact to shape the way a particular type of intonation unit is used in conversational English.

3. Since, as Clark and Wilkes-Gibbs rightly pointed out, referent identification is a process which involves both speakers and addressees (or, in my terminology, respondents), crucial to my approach is looking at the issue from both the speaker's perspective and the respondent's.

The distinction I am making between the speaker and the respondent here is locally determined. That is, I take it that within a given time period, the person who is understood as holding the floor will be labelled 'speaker'; others will be designated 'respondent'.

Let's begin our discussion with the speaker. Speakers' contribution to referent identification by using NP intonation units is principally to introduce referents into the conversation (Clark and Wilkes-Gibbs 1986, Geluykens 1988). In so doing, however, they are not merely bringing a referent to the conversation. There are cognitive processing considerations and social interactional considerations associated with it. And these motivations manifest themselves in discrete prosodic and structural features of the NP intonation unit. This leads me to divide speaker NP intonation units into three types.

1) In the first type, the NP intonation unit consists of a simple noun with a continuing intonation contour, indicated by a comma. (2)b is an example of this type.

(2) a A: There was one girl,
-> b **Jane ^Baker,**[3]
c I don't know if you knew [her].
d B: [Oh ^yeah].
e I remember [Jane].
f A: [Okay].
g .. She was ^behind 'Val. (AFRIKA)

The NP referent introduced in this type can be characterized as new and salient. It is new because it has not been talked about in the prior context. Notice that although the speaker has just mentioned 'a girl at work' in (2)a, it is an indefinite noun, thus is not to be taken the same as a person name; therefore the referent of 'Jane Baker' is still new. It is salient, because it is a human referent that the speaker wants to say something about, and wants the respondent to focus on. In addition, when the speaker introduces an NP referent of this kind into conversation, s/he does not know for sure whether the respondent can identify it or not.

For these reasons, the respondent needs to identify the referent before the conversation continues. Speaker's pauses, which set off the NP referent, address this need: they provide time for the respondent to process the referent.

In terms of interaction, on the other hand, the speaker's holding-off of the on-going talk provides an opportunity to negotiate with the respondent as well. Two issues can be involved in the negotiation. One is whether the intended referent is identifiable to the respondent, the issue of what I call referent identifiability; the other is whether the respondent accepts the referent as a potential topic for further discussion, the issue of what I call referent topicality. It could be said that both issues are important for interaction: participants need to negotiate both. But in reality, as Grice's collaboration principle predicts, conversation participants are maximally cooperative (Grice 1975), and the issue of referent topicality is often reduced to secondary importance. Thus speakers tend to be concerned primarily with the identifiability, rather than the topicality, of the referent. This is demonstrated by the fact that further exchanges between conversation participants after the referent has been introduced are often centered around whether the respondent knows the NP referent or not, as is the case in (2), intonation units (c) through (f).

2) The second type of speaker NP intonation unit consists of a simple noun with a yes-no question

intonation contour, which is called 'try-marker' in Sacks and Schegloff (1979)[4]. This is illustrated by (3)b and c. In both cases the intonation units end with a question intonation, indicated by a question mark.

(3) a R: I was talking to ...(.7) a 'gal at ^work,
-> **b** **...'Lisa .. ^Green?**
-> **c** **...(.9) 'Lisa ^Smith 'Green?**
d ...(1.3) who's going to have a ^baby.
e ...(1.3) % [Sh-] --
f L: [Does she have] 'many ^already?
g R: ... ^M- m. (LUNCH)

(4)e is another example.

(4) a B: .. There is a ^guy that comes ^out.
b .. a 'guy that 'works ... (.8) with ^her.
c ...(1.4) [that] she 'works ^for at --
d A: [Hm],
-> **e** **B: ... uh ... ^Sports Shack?**
f A: ...(.8) ^O=h. (FARMTALK)

The referents introduced in this case are also new, but not necessarily salient ((4)e)). Note that NP referents of this kind are assumed by the speaker as very likely to be identifiable by the respondent. This is their major difference from NP referents of the first type.

When speakers introduce such referents, they also provide time for the respondent to process them. However, in this case they also invite the respondent to acknowledge the proposed referent, by the use of the rising question intonation contour.

Thus for this kind of NP referent the speaker condenses the 'introduction' and the 'invitation' in a single intonation unit, whereas in the first type of NP intonation unit, the 'invitation' work is done separately, by other forms, e.g, by a syntactic embedded question form, as 'I don't know if you knew her' in (2)c.

In connection with the positive assumption about the identifiability of the referent to the respondent, the speaker in this situation typically keeps adding further information to enable the respondent to identify it. For example in (3)d, (and presumably (3)e too,) after introducing 'Lisa Smith Green', speaker R mentions 'who is going to have a baby' to help her respondent identify Lisa Green. Notice that the fact that this woman is going to have a baby is not really what speaker R wants to tell L about; this is just a piece of helping information. In contrast, in the first case speakers do not have such an assumption, therefore they do not use the strategy of

simply supplying helping information to facilitate the respondent's referent-identification; all they can do is to ask first whether the respondent can identify the NP referent or not.

3) The third type of NP intonation units used by speakers is a head noun modified by a relative clause construction in the same intonation unit. Consider (5)c and (6)f.

(5)a B: ...(1.1) ^No,
b .. 'We ^rented one.
-> c .. **The 'ones you ^rent,**
d .. boy ^they're 'high --
e ... ^they're 'heavy ^duty, (FARMTALK)

(6)a A: on my 'first 'time on 'Capitol ^Hill.
b ...(.8) and just--
c ...(.8) just ... was ^astounded,
d .. at how ^pleasant things 'were,
e and 'as I was 'out for a ^stroll,
-> f **... a 'man 'watering his .. ^lawn.**
g .. ^turned to 'me,
h .. as I was 'walking ^past,
i .. and said,
j ...(.9) <Q 'Good ^evening Q>, (DINNER)

In these cases, the speaker introduces a very different kind of NP referent from those we saw in the first two types. The difference lies in that the referents introduced here are cognitively less demanding, whereas those in the first two types require more effort on the part of the respondent.

By 'cognitively less demanding' I mean essentially two things. (1) The referent of the noun is not treated by the speaker as salient in the discourse, therefore interlocutors do not need to pay much attention to precisely identify the referent. This is illustrated by (6), where the mentioning of the man who was watering his lawn is incidental, for the speaker could well have talked about something else to illustrate his point. (2) The information conveyed by the head noun has been mentioned in the prior context, thus requires less cognitive effort to process; the purpose in mentioning the same noun referent is to provide a contrastive or alternative referent to others in the context (Keenan and Schieffelin 1976).

Because the NP referent is cognitively less demanding, speakers do not expect to get the respondent's acknowledgement, as they do for the first two types of referents. No syntactic questions and no try-markers are used for this type of NP referents. What speakers do

instead is to specify the referent by supplying minimally needed information to help the respondent identify it.

Note that for referents of both type two and type three, speakers add some information to help the respondent identify them. However, since they differ in cognitive status, the way speakers add information to them and the kind of information added are quite different in the two situations. For type two NP referents, when speakers add information to them, they do it typically in a separate intonation unit (e.g. (2d)), whereas for this third type, they do it by putting the information (conveyed by the relative clause) in the same intonation unit as the head noun. And the nature of the information differs too. For example, the relative clause in (2)d, 'who is going to have a baby', is a characterization of the referent 'Lisa Smith Green'; whereas that in (6)f, 'watering his lawn', is not to characterize the referent 'a man'.

4. Summary. Speakers use NP intonation units to introduce referents into the conversation, with discrete prosodic and morphosyntactic forms, according to (1) the cognitive status of the NP referent in the discourse; (2) assumptions about the identifiability of the referent to the respondent; and (3) the amount of interactional work needed to negotiate with the respondent based on (1) and (2).

5. But referent identification cannot be considered complete without the collaboration of the respondent. In connection with the referent introduced by the speaker and associated cognitive and interactional implications, respondents must make appropriate responses to participate. One way of doing this is to use the NP intonation unit form. Respondents' NP intonation units, as we will see next, have quite different functions from those of the speaker's for referent identification. Respondent's NP intonation units can also be classified into three types.

1). The respondent's NP intonation unit is a partial or full repetition of the speaker's. This typically occurs when the speaker has just used a try-marker, i.e., a question intonation. In (7), for example, speaker R uses two try-markers in the second and the third IUs, and respondent L then echoes the name at the arrow (in the next page) to acknowledge to speaker R that she has identified the referent.

(7) R: I was talking to ...(.7) a 'gal at ^work,
...'Lisa .. ^Green?
...(.9) 'Lisa ^Smith 'Green?

...(1.3) who's going to have a ^baby.
...(1.3) % [Sh-] --
L: [Does she have] 'many ^already?
R: ... ^M- m.
... But 'she's ^my 'age,
L: .. 'Yeah,
I ^know,
I ^remember 'Lisa.
M: 'Her 'husband the one [that had th%-] --
L: [I --
-> **^Smith]**,
I 'remember Smith, (LUNCH)

The respondent's echoing of the speaker's referent can be seen as a display of the respondent's processing of the referent introduced by the speaker. To the speaker it thus constitutes a signal that the respondent is taking up the invitation, is actively engaged in the process of referent identification, and is acknowledging it to the speaker. (For a discussion of the function of repetitions in conversational English, see Tannen 1987.)

2). The respondent's second type of NP intonation unit is characterized by a question intonation contour. Respondents use the question intonation to request verification of a referent proposed earlier by the speaker. (8)f gives an example of this.

(8) a B: There is a ... 'Livermore ^radiation 'lab,
((Ten Intervening Intonation Units Omitted))
b S: Wait,
c is that uh% ... ^Lawrence?
d .. or 'Liver--
e 'No.
-> f .. **'Lawrence ^Livermore?** (DINNER)

S is requesting verification that 'Lawrence Livermore' is what B meant by 'Livermore' in (8)a.

Sometimes the respondent may just want to pick up a specific aspect of the referent for confirmation, as in (9)d.

(9)a A: ...(1.1) (TSK) Then one ^afternoon,
b ..(1.4) this ^van pulls 'in 'there,
c B: .. [Yeah,
->d **a white ^van]**?
e A: [Sally wasn't ^home].
f .. ^Yeah. (FARMTALK)

The respondent's question intonation is obviously different from what we said about the 'try-marker': the try-marker is used in cases where the speaker has a

definite referent in mind and assumes that the respondent can also identify it, whereas in this respondent's case, the respondent is uncertain about the referent in question; this use of question intonation is to ask for verification or confirmation.

3). The respondent's third type of NP intonation unit is an addition of new referents, as illustrated in (10)d.

(10)a D: .. A 'lot of 'places to 'go if I want to= ..
^socialize,
b .. they have a 'lot of uh ...()^restaurants,
c .. [u=h],
-> **d** G: [**Clubs**],
e D: .. ^Nightclubs,
f [uh],
g G: ['yeah],
h D: ^Hotels, (CARSALES)

Here the respondent also introduces a new referent 'club' into the conversation. The respondent's referent-introducing differs from the speaker's in that this is a responsive or participatory action. The new referent mentioned by the respondent adds an example of a set named by the speaker, in this case, it pertains to the idea of 'places I want to go for socializing' set up by the speaker. Essentially this shows involvement by proposing additional similar referents.

6. Summary of respondent's NP intonation units. Respondents use NP intonation units to display the processing of referent identification and to acknowledge referent identification to the speaker. They also use NP IUs to request verification or confirmation, and to show involvement by introducing further relevant referents.

7. It is clear that NP intonation units can be used by both speakers and respondents for referent identification. In both cases, they are focussing on a referent alone, and not on an event or state.

For both participant roles, these NP intonation units have a clear interactional function. At the same time, there are also cognitive motivations that are at work. In many cases the speaker's interactional concern to negotiate with the respondent is constrained by the cognitive status of the referent in discourse. On the other hand, the cognitive status of the referent can be influenced by the social relationship between the speaker and the respondent, for example, what they share with respect to a third party. Further, the cognitive status of the referent is dynamic and changes as the interaction proceeds: this is another way that interaction and

cognition influence each other.

8. Conclusions. My examination of NP intonation units in conversational English has shown that the apparently fragmentary intonation unit, the NP intonation unit, is in fact an important device which participants of both conversation roles, that is, speaker and respondent, manipulate to identify referents. Identifying referents with NP intonation units is seen to involve both interactional motivations and cognitive motivations. These two motivations influence each other, and jointly constrain the prosodic and morphosyntactic complexity of the NP intonation unit in conversational English.

Notes:

* During the course of writing this paper, I have benefitted enormously from advice from the following people: Yung-O Biq, Wallace Chafe, John Du Bois, Mark Durie, Jiansheng Guo, Marja-Liisa Helasvuo, Lorraine Kumpf, Miriam Meyerhoff, Danae Paolino, and Ryoko Suzuki. To all of them I offer grateful acknowledgement. Particularly, I wish to thank Sandra Thompson for both her untiring inspiration and support and drawing my attention to a number of key references. Of course, I am the only person to be held responsible for the shape the ideas take in this paper.

1. The transcription conventions used in this paper follow Du Bois et al. 1992. Below are some of the key conventions.

- ,: Continuing intonation contour
- .: Final intonation contour
- ?: Question intonation contour
- ^: Primary stress
- ': Secondary stress
- 'Dots': Pauses
- ...(): Longer pauses
- []: Overlap
- --: Truncation

2. The data used in this paper come from the Corpus of Spoken American English of the Linguistics Department at the University of California, Santa Barbara. I am grateful to all the contributors to the Corpus.

3. Some of the names in the transcripts used in this paper have been changed for anonymity.

4. The yes-no question contour here refers to one which 'is realized by a marked high rise in pitch at the end of the intonation unit' (Du Bois et al. 1992). Several people in the audience at the Annual Meeting pointed out to me that in contemporary American English rising question intonation is pervasively used, for example, with many different types of clauses, with interesting functional implications, especially among younger people. (See also Guy and Vonwiller 1984 and K. Allan 1984 for similar observations on Australian English, and S. Allan 1990 on New Zealand English.) While acknowledging this point, I will not discuss other cases of question intonation here, as my focus in this paper is the NP form which makes up an intonation unit. A more detailed study of rising question intonation in American English discourse may be found in McLemore (1991).

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Secondary Signing Location in American Sign Language[1]

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1 Introduction

Location is one of the primitives of sign structure. In this paper I show that, contrary to previous proposals, signing location in American Sign Language (ASL) is divided into only two sublocations, *center* and *non-center*.[2] I also show that the two-dimensional concept of signing location needs to be extended to a three-dimensional representation of *local signing space*.

1.1 Movement as Change

Besides *location*, the primitives of signs are widely held to be: *handshape, orientation*, and *movement* (Stokoe (1960), Battison (1978)). In this paper, following Hayes (1989) and Stack (1988), I assume that movement is not a primitive construct of the sign. For the purposes of this presentation I accept without argument the notion that movement is derived from the other three parameters. For example, in (1a), UNDERSTAND is articulated with a change in handshape, in (1b), BORED, is articulated with a change in orientation, and in (1c), LIE, is articulated with a change in location. Notice that each of those changes produce what can be interpreted as movement. In this paper, I will be concerned primarily with changes in location.[3]

(1) "Movement" is Change



a. UNDERSTAND
Change in Handshape
(ΔHS)



b. BORED
Change in Orientation
(ΔOR)



c. LIE
Change in Location
(ΔLOC)

1.2 Previous Proposals

Although it is agreed that location is a primitive, a review of the proposals for phonological representations of sign language shows that there is no agreement about a single set of signing locations (Liddell and Johnson (1989), Sandler (1989), Brentari (1990)). There is even less agreement on a set of features that define the signing sublocations, i.e., the subdivisions of each location. For example, Liddell and Johnson (1989) propose a system that specifies nine sublocations, shown in (2): (i) center, (ii) and (iii) to either side of center, (iv) above center, (v) below center, (vi) and (vii) above and to the sides of center, and (viii) and (ix) below and to the sides of center.

(2) Signing Sublocations

● (vii) ● (iv) ● (vi)

● (iii) ○ (i) ● (ii)

● (ix) ● (v) ● (viii)

Considering only the signing area on the face, simple math shows that, since Liddell and Johnson proposed nine locations for the face, up to eighty-one sublocations can be specified for the face. This large number reflects their desire to provide a transcription system as well as a phonology for signs.

In a more abstract representation of location, Sandler (1989) proposes two place features, but each feature has three values, so this also generates nine sublocations. However, in contrast to Liddell and Johnson, Sandler regards the face as a single location. The result is nine sublocations on the face.

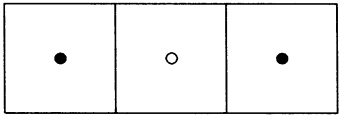
In (3), I summarize these two proposals to illustrate that previous proposals for sublocations have been on the one hand very rich and on the other hand, perhaps too sparse. The third column represents my proposal. I believe there's more than one, but fewer than nine primary locations on the face, but will say no more about that here, as I've indicated by the question marks.

(3)

	L & J (1989)	Sandler (1989)	New Proposal
Locations on the Face	9	1	??
Sublocations	9	9	2
Sublocations on the Face	81	9	$1 < ?? < 18$

Rather, in this paper, I propose that there are only two sublocations, as illustrated in (4). I claim that the two sublocations are *center* and *non-center*, where *center* is the middle of the location, marked here by an open circle, and *non-center* is the remainder of the location. I show that the two disjoint areas marked here by closed circles can be treated as a unit.

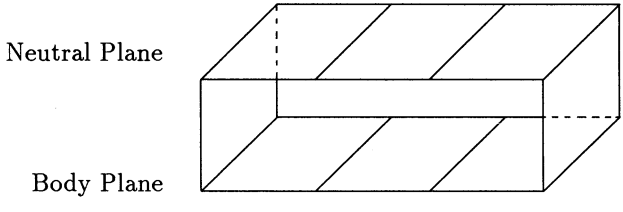
(4) Secondary Signing Locations



[-CENTER] [+CENTER] [-CENTER]

In addition to constraining the number of sublocations, I propose to extend the traditionally two-dimensional notion of signing location, to *local signing space*, a three-dimensional construct. I define *local signing space* as an area defined by two planes, the *body plane* and the *neutral plane*. The *body plane* is a planar representation of the two-dimensional signing location on the body. The *neutral plane* is a projection of the body plane onto the neutral space directly in front of the body location. The result is two parallel planes that define a local area of signing space, depicted in (5).

(5) Local Signing Space



[-CENTER] [+CENTER] [-CENTER]

The goal of this paper is to establish the following as part of a theory of visual phonology: (i) there are only two signing sublocations, and (ii) a three-dimensional representation of signing space is to be preferred over the two-dimensional concept of signing location. Finally, further support for this proposal is provided by showing that a prediction about sign metathesis follows straightforwardly from this analysis.

2 The Data

The key data are shown in (6).[4] Each is articulated at the chin. LIE, in (6a), differs from the other signs because it is articulated in continuous contact with the chin. The other three signs form a minimally distinctive group. Each has the same handshape and orientation, but makes contact with a different part of the chin. BITCH, in (6b), contacts the center of the chin and BREAKFAST, in (6c), contacts the side. BACHELOR, in (6d), is articulated with two discrete contacts, one on either side of the chin.[5]

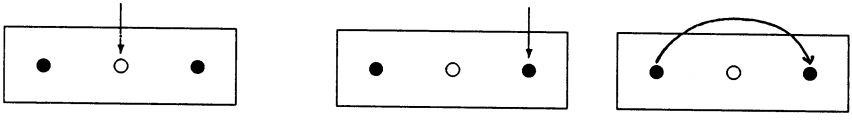
(6)



a. LIE b. BITCH c. BREAKFAST d. BACHELOR

LIE demonstrates that the chin serves as a single signing location. BITCH, BREAKFAST, and BACHELOR illustrate that some signs are articulated at only part of the chin. In (7), I present an abstraction of the movements for (6b), (6c), and (6d). The circles represent the contact points for the signs. Their independence from each other emphasizes that these are points of discrete contact and that no signs are articulated between them. The arrows represent the movement of the hand. For BITCH and BREAKFAST, the arrows show movement towards the chin; for BACHELOR, the arrow represents the change in location from one side of the chin to the other. This set of movements is exhaustive. In other words, no other combinations of changes in location occur. There are also no signs which contact more than two parts of the chin.

(7) Points of Discrete Contact



a. BITCH b. BREAKFAST c. BACHELOR

Thus, it appears that three sublocations are adequate to account for the distribution of the data. However, as indicated by the closed circles marking both sides, further investigation reveals that the sides behave as a unit.

3 Sides and Center

A striking property of signs articulated on the sides is the apparent insignificance of the right/left distinction, i.e., the side on which the sign is articulated doesn't seem to matter. This happens whether the sign contacts one side of the location, as in BREAKFAST, or two sides of the location, as in BACHELOR.

3.1 One Side of Contact

Examples of signs articulated at only one side of a location are shown in (8). ARMY, in (8a), is articulated on the side of the chest. RESPONSIBILITY, in (8b), is articulated on one shoulder. But for both of these signs the side of the location is not distinctive; ARMY can be articulated on the right or on the left. Likewise, RESPONSIBILITY can be articulated on either shoulder.

(8) a. ARMY  b. RESPONSIBILITY 

One could do the same for BREAKFAST and articulate it on the left side of the chin with the right hand. However, the addressee will think it odd if the signer is right-handed. If the signer is left-handed or the right hand is otherwise occupied, articulating BREAKFAST on the left side of the chin would be quite natural. The point is: articulating signs on the "other" side of what might be considered "natural" does not produce a unique sign. Hence, for signs that contact only one side of a location, the side of articulation is non-distinctive.

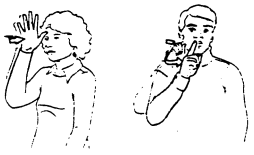
3.2 Two Sides of Contact

Significantly, it is also the case that signs that contact both sides of the location are insensitive to the right/left distinction. For signs like BACHELOR the order of articulation is ambiguous. The sign can be articulated with the hand in contact first with the right side of the chin and then the left, or vice versa. Johnson (1986) called this phenomenon sign metathesis. He noted that in signs that metathesize (e.g., PARENTS, FLOWER, RESTAURANT) the order of contact is non-distinctive and conditioned by the preceding sign.

For example, the sign for DEAF can be articulated with the index finger first touching the upper cheek and then touching the lower cheek, or vice versa. The order is determined by the preceding sign, as illustrated in (9). In the phrase MOTHER DEAF, in (9a), MOTHER is articulated at the chin, hence the first contact of DEAF is at the lower cheek, the part of the cheek closest to the chin. In contrast, as shown in (9b), DEAF is articulated from the top to the bottom of the cheek. In this case, the preceding sign, FATHER, is articulated at the forehead which conditions DEAF to begin at the top of the cheek.



(9) a. MOTHER-DEAF



b. FATHER-DEAF

Note that the cheek, where DEAF is articulated, has a vertical orientation. This differs from the horizontal orientation of the chin location. Yet, the cheek can be subdivided in the same way as the chin, into three sublocations: center, top, and bottom. This emphasizes that not only the sides, i.e., right and left, of a location are non-distinct, top and bottom are also non-distinct.

3.3 Center

In contrast to the sides, the symmetry of the center sublocation inherently blocks variation of the type noted for the sides. By definition, no variation occurs at the center.

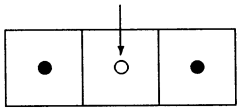
3.4 Center and Non-Center

Thus, signs articulated at the center of a location differ significantly from those articulated at the sides. Signs articulated at the side of a location, whether they contact only one side, or both, are non-distinctive with regard to side. This leads to the conclusion that the two sides be considered a single, though disjoint, unit separate from the center. In addition, observe that there is no crossing over from one sublocation to the other during a monomorphemic sign. No lexical sign is articulated with a combination of center and sides, nor are there signs articulated by contacting more than two sublocations. This emphasizes the uniqueness of the two sublocations.

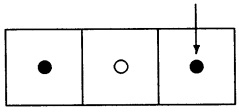
As noted above, however, the subdivisions of location must apply to both horizontally and vertically oriented locations. Hence, I propose that the appropriate distinction for the sublocations is *center* and *non-center*.

In (10) I adopt the binary feature, [+/–CENTER]. [+CENTER] represents the center sublocation, as in (10a), and [–CENTER] marks the disjoint non-center sublocation, in (10b) and (10c).

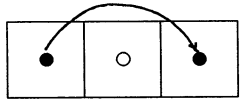
(10) A (Preliminary) Representation



a. BITCH
chin[+CENTER]



b. BREAKFAST
chin[–CENTER]



c. BACHELOR
chin[–CENTER]

But this feature alone is insufficient to differentiate BREAKFAST and BACHELOR; both are specified for the non-center sublocation.

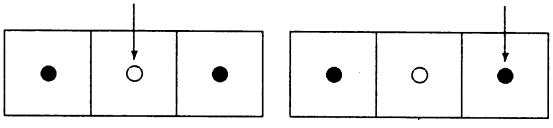
4 The Third Dimension

To separate the representation for BREAKFAST from the representation for BACHELOR, note that a salient difference between them is that BREAKFAST is articulated by contacting only one side of the sublocation. BACHELOR, in contrast, is articulated by contacting both sides of the sublocation. So one possibility is to differentiate them on the basis of sublocation usage, i.e., mark BREAKFAST as using only one half of the sublocation and BACHELOR as using two halves, or the whole, of the sublocation. However, there are more substantial differences between them.

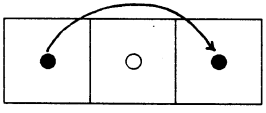
4.1 One Area of Contact, or Two

In (11), for ease of discussion, signs that are articulated at only one part of a location, either the center or a single side, are grouped together and called type A signs. Signs articulated on both sides of a location are called type B signs.

(11) Type A:
(i) Can have change in handshape or change in orientation.
(ii) Single or multiple contacts.
(iii) Can be reduplicated.



Type B:
(i) No change in handshape or change in orientation.
(ii) Single contact only.
(iii) Cannot be reduplicated.



The first difference between the two sets of signs is that the repertoire of movement for type A signs is richer than that for type B signs. The set of type A signs **includes** signs articulated with changes in handshape and changes in orientation, but Type B signs do not. For example, WHO and RED are both type A signs and both are articulated with a change in handshape. SOUR and DELICIOUS are also type A signs and both are articulated with a change in orientation. In contrast, the only type of movement that occurs for type B signs is change in location.

A second difference between type A and type B signs is that some type A signs have lexically significant multiple contacts, but type B signs do not. For example, the only difference between the type A noun/verb pair, EAT and FOOD, is that the noun is articulated with two contacts at the chin and the verb with only one (Supalla and Newport (1978)). In type B signs, only a single contact is made with each side of the non-center sublocation. There are no signs in which multiple contacts are made on one side of the location or in which multiple contacts are made on both sides of the location.

Finally, type A signs can be reduplicated but type B signs cannot. For example, some signers reduplicate the sign BITCH to produce an adjective meaning *bitchy*, but signs like BACHELOR never reduplicate.

In sum, signs like BREAKFAST and BACHELOR have more fundamental differences than using only one half or two halves of the sublocation — differences that warrant the addition of a new dimension to signing location.

4.2 Signing Planes

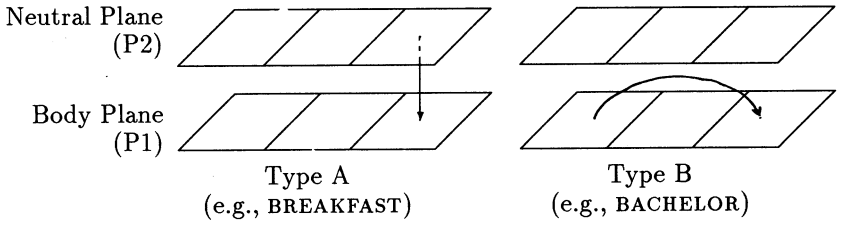
Previous analyses treat signing locations on the body as two-dimensional areas, typically characterizing them as an area on the body defined by a physical feature, e.g., the chin. I have been more specific, depicting signing location as a rectangle, thus implying that the location has length and width. However, signs really occupy three-dimensional space.

As has been noted for type A signs like BREAKFAST and BITCH, the change in location is not limited to the area directly on the chin. Rather, there is movement from the area near the chin to a point on the chin. This is true of other body locations, too. Changes in location occur between specific locations on the body and less tangible, but related, locations in the space near the body, e.g., LIKE begins with the hand in contact with the center of the chest and ends with it in the area directly in front of the chest.

In contrast, there are no lexical signs which change location from a random location in space to a specific location on the body. Lexical change in location is constrained to a "local" space in the proximity of the signing location on the body. I propose to formalize this concept of "local" space by incorporating height into the standard two-dimensional notion of *signing location.* The result is *local signing space.*[6]

In (12) I represent local signing space as two parallel planes. The plane labeled P1 represents the width and length of the location on the body and is the *body plane.* The plane, P2, represents the projection of the location on the body into local neutral space and is called the *neutral plane.*

(12) Local Signing Space



This concept of signing space reveals that the crucial difference between type A and type B signs is the type of change in location they undergo. The change in location for type A signs is from one plane to the other, whereas for type B signs the change of location is restricted to the body plane.

4.3 Representation

The three-dimensional representation of sublocations provides a distinctive representation for the data in (6), as shown in (13). The notation for change in location is ΔLOC. The secondary signing locations are marked with the binary feature, [+/–CENTER], and the signing planes are represented as subscripts of the primary location. If only one plane is listed, the change in location is restricted to a single plane. If two planes are listed, the change in location is between the two planes in the order that they are listed.

(13) a. LIE
[ΔLOC: chin_{P1}]

b. BITCH
[ΔLOC: $\text{chin}_{P2,P1}$[+CENTER]]

c. BREAKFAST
[ΔLOC: $\text{chin}_{P2,P1}$[–CENTER]]

d. BACHELOR
[ΔLOC: chin_{P1}[–CENTER]]

In (13a), the change of location for LIE is articulated across the whole chin. In (13b), the change in location for BITCH is from the center of the neutral plane, P2, to the center of the body plane, P1. The contrast between BREAKFAST, in (13c), and BACHELOR, in (13d), is now obvious. Although both are articulated at the non-center sublocation, the change in location for BREAKFAST is from the neutral plane, P2, to the body plane, P1. In contrast, the change in location for BACHELOR is restricted to P1 and is, thus, articulated at the two disjoint non-center sublocations in the body plane.

4.4 A Prediction: Sign Metathesis

Returning now to the discussion about sign metathesis, the utility of this analysis is obvious. Liddell and Johnson (1989) noted that a variety of signs metathesize, but were inconclusive about the phonological constraints on metathesis. In a framework that includes the concept of local signing space, the conditioning for metathesis is straightforward:

(14) The set of signs that metathesize are specified for:

ΔLOC: location_{P1}[–CENTER]

In other words, only signs articulated by contacting both sides of a location are candidates for metathesis.[7]

5 Conclusion

In sum, using a set of minimally distinctive signs I first showed that there are only three candidates for signing sublocations. I then showed that the sides are non-distinctive and concluded that there are only two sublocations, *center* and *non-center*. Further inspection revealed the need to modify two-dimensional signing location to three-dimensional *local signing space*. Doing so not only provides a way to differentiate between signs like BREAKFAST and BACHELOR, it also leads to a prediction about sign metathesis.[8]

This paper is part of my work on *visual phonology*, a phonology sensitive to the spatial and visual characteristics of signs. The distinction between center and non-center sublocations has implications for a principled definition of symmetry in signs, and the introduction of signing planes is a step towards developing a spatial representation of signs. In this part of the analysis I have shown that only a minimal number of sublocations are necessary and that they play a role in the formulation of phonological constraints on signs, a result not unfamiliar in spoken language phonology — evidence that a comprehensive theory of visual phonology will lead to the discovery of the mode independent phonological universals of language.

Endnotes:

[1]I am indebted to Sandra Klopping for reviewing the data, and to Jennifer Fitzpatrick Cole, K.P. Mohanan, Bill Poser, and James Scobbie for helpful discussions and comments. Naturally, I alone am responsible for mistakes.

[2]ASL is the natural language of the Deaf in most of northern America.

[3]Pictures in (1), (6a), (8), and (9) are reprinted with permission from T.J. Publishers. DEAF, in (9), is from Liddell and Johnson (1989).

[4](6b) and (6d) are from Sternberg (1987), (6c) is a modified version of (6d).

[5]The signs in (6b) - (6d) have other forms: (i) for BITCH, a 90 degree twist of the wrist substitutes for the change of location; (ii) BREAKFAST has two other forms, (a) EAT + MORNING, and (b) the same handshape, but with fingers parallel to the ground, palm facing towards the body and making small rotations near the chin; (iii) BACHELOR can be articulated with a downward brushing contact at each side of the chin.

[6]Liddell and Johnson (1989) and others differentiate spatial locations from body locations. I claim that local signing space applies to all locations.

[7]Not all signs phonologically conditioned for metathesis metathesize, probably due to semantic constraints, e.g., the metathesized form of IMPROVE, at *forearm*$_{P1}$*[–CENTER]*, means DEGENERATE. YESTERDAY, at *cheek*$_{P1}$*[–CENTER]*, is constrained by the imaginary timeline perpendicular to the body.

[8]Another consequence of this analysis is that straight and arced movement, previously analyzed as features, are phonetic properties of the system.

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PARASESSION

ON

THE PLACE OF

MORPHOLOGY

IN A

GRAMMAR

STRUCTURE PRESERVATION AND MOHAWK INCHOATIVE VERBS*

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1. Introduction: Is morphology structure preserving?

If one's linguistic theory includes a distinction between the lexicon and syntax, then one faces an important question with respect to morphology: does the concatenation of morphemes take place in the lexicon, or in the syntax? Both choices have some inherent plausibility. On the one hand, the lexicon is some kind of list of the words of a language, and morphology can be thought of as a set of operations for expanding this list. This would lead to a lexicalist approach to morphology. On the other hand, the syntax is a productive and compositional system for forming complex and novel linguistic expressions, and an important subclass of morphology has a similar compositional and productive character. One may conjecture that the human language faculty includes only one recursive system, implying that this subpart of morphology is included in the syntax. This would lead to a syntactic approach to morphology.

As a proponent of the syntactic approach to (some) morphology, I will begin by trying to clarify the true empirical issue that distinguishes the two approaches. Then I will go on to analyze an example in some detail--specifically, the inchoative morpheme in Mohawk--to illustrate the kinds of issues that arise. Of course both the lexical and the syntactic approaches exist in several variants, and intermediate positions are also possible; however, I will not be able to discuss the subtle but important issues involved here.

1.1 The structure preservation prediction

What is the heart of the difference between a lexical approach and a syntactic approach? On the lexical approach, morphology exists to derive new lexical items. Because of this, the new forms generated should be subject to the same restrictions as basic lexical items. In other words, morphology will derive new tokens, but it will not in general derive whole new types of lexical items.[1] These newly formed lexical items then enter the syntax in the same way as basic lexical items, and the syntax is oblivious to the difference between the two.

On the syntactic approach, things come out rather differently. In particular, a morphologically complex word may be associated with two or more positions in a syntactic phrase structure, whereas a morphologically simple word can only be associated with one position. Hence, their syntactic behaviors will not necessarily be the same.

This empirical issue is raised in Chomsky (1970). His central argument is that derived nouns in English appear in exactly the same phrase structure configurations as morphologically simple nouns. This is explained, he claims, if derived nominals are simple nouns from the point of view of the syntax; it then follows that they will be inserted into exactly the same structural positions. This similarity would be an unexplained coincidence if nominalizations were derived from sentences by syntactic transformations which just happened to create structures identical to those formed by the principles of phrase structure. Thus, Chomsky writes (p. 54):

> "The strongest and most interesting conclusion that follows from the lexicalist hypothesis is that *derived nominals should have the form of base sentences*, whereas gerundive nominals may in general have the form of transforms."

Hence, Chomsky adopts the "lexicalist hypothesis" for English nominalizations.

In later work, it was suggested that the lexicalist hypothesis should be extended to all of morphology. Emonds (1976) observed that most important transformations are subject to a "structure preservation" requirement, such that the output of the transformation is a structure that could have been generated by the phrase structure rules. Bresnan (1978) argued that this "structure preservation" property follows trivially if the structures in question really were base generated, lending support to a very general lexicalist position. Below I quote two more recent expressions of this form of argument. One is from Grimshaw and Mester's (1985) study of morphologically complex verbs in Labrador Inuttut Eskimo, which they claim to be identical to simple verbs from the point of view of the syntax. The other is from Di Sciullo and Williams' (1987) analysis of noun incorporation in Mohawk.

> "Our account offers a principled explanation for the fact that complex verbs have the same syntax as other verbs of the language. They appear in the same phrase structure configurations, display the same agreement and trigger the same case-marking effects." (Grimshaw and Mester 1985, p.11)

> "The atomicity thesis further predicts that the syntax of syntactic arguments will be independent of whether or not there is an incorporated noun on the verb." (Di Sciullo and Williams 1987, p.65)

As a proponent of the syntactic approach, I agree with the logic of this argument. If morphology were always "structure preserving" in this sense, then it would probably be right to accept the lexicalist hypothesis. However, I do not believe that morphology is always "structure preserving". I have nothing to say about Chomsky's case of English derived nominals one way or the other. Nevertheless, there do seem to be a variety of instances where morphologically complex words do not behave exactly like comparable simple words. The best-known and clearest case is morphological causatives: these often behave like simple transitive (or ditransitive) verbs with respect to Case and word order, but <u>not</u> for processes of anaphora or question formation. (The literature on this topic is quite vast; see Baker (1988a) for some references.) Moreover, Woodbury and Sadock (1986) have challenged Grimshaw and Mester's contention that complex verbs in Eskimo take exactly the same complements as simple verbs. Finally, Sadock (1985) and Baker (1988a, 1988b) have challenged the claim that verbs with incorporated nouns have the same syntax as simple verbs in all languages. Indeed, the evidence against structure preservation seems to be persuasive on each of these fronts.

<u>1.2 New Ground: inchoative verbs</u>

Rather than reopening one of these topics, I propose to extend the discussion to the area of morphologically complex inchoative verbs. This is important because even if it is acknowledged that some morphology is done in the syntax, one must still try to determine which morphemes this is the correct analysis for. Inchoative verbs were studied alongside causative verbs in Lakoff (1965), but they have been largely ignored in the current debate, with the notable exception of Borer (in progress).

The background to this issue is as follows. Mohawk verb stems divide into two classes. The first class contains eventive verbs, such as -v'- fall, -hri'- shatter, -ahtu- get-lost, and -nawv- melt. The second class contains stative verbs, with meanings that generally correspond to those of adjectives in English; examples include owanv be-big, -a'tsu be-dirty, -nanawv be-wet, -rakv be-white. These two classes of verbs have somewhat different properties, as will be seen below.

Mohawk also contains a productive inchoative suffix that is relevant to this domain. This suffix attaches to stative verbs like 'be big' to produce eventive meanings like 'become big'. The most common form of this suffix is [-'], although it has some other allomorphs, such as [-ha(')] and occasionally [-st].

Now we have a domain in which the "structure preservation" issue arises. If the inchoative morpheme -' is attached lexically, it should form new verbs in the eventive class. Such verbs would then behave like normal eventive verbs in all respects. If, however, the inchoative suffix is a separate element syntactically, then some of the properties of the stative verb root may still appear. The latter prediction is the correct one. Table One summarizes three properties which distinguish eventive verbs from stative verbs in Mohawk. The third column compares the properties of inchoatives. Notice that it is not identical to either of the previous two columns; rather it is a mixture of the two.

TABLE ONE	eventive V	stative V	inchoative: V_{st} -'
appears without aspect suffixes	NO	YES	NO
can be used as a bare nominal	NO	YES	NO
agrees with possessor of incorporated N	NO	YES	YES

This gives a general overview of the form of my argument. In what follows, I will go through each type of verb in some detail, with the goal of showing how a simple and elegant syntactic account can explain why inchoative verbs have the particular combination of properties that they do. In the course of the argument I will make two assumptions about noun incorporation in Mohawk: first, that it is a syntactic process; and second, that only nouns that are underlying direct objects of the verb may incorporate (see Baker 1988a, 1988b for discussion).

2. Properties of eventive verbs.

First, consider eventive verbs. (1) shows some simple examples of sentences including such verbs. (2) shows that these particular verbs allow their single argument to be incorporated. Thus, the arguments of these verbs must be direct objects underlyingly; they are "unaccusative verbs" in the sense of Perlmutter (1978).

(1) a. Y-a-w-asv'-ne' ne athvno'.
trans-fact-NsS-fall-punc NE ball
The ball fell.

b. Owise' wa'-t-ka-hri'-ne'.
glass fact-dup-NsS-break-punc
The glass broke.

c. Ka'sere' wa'-o-ke'tot-e'.
car fact-NsO-appear-punc
The car showed up, appeared.

(2) a. Y-a-w-athvno-tsher-v'-ne'.
trans-fact-NsS-ball-nom-fall-punc
The ball fell.

b. Wa'-t-ka-wis-a-hri'-ne'.
fact-dup-NsS-glass-break-punc
The glass broke.

c. Onv wa'-o-'sere-ht-a-ke'tot-e'.
now fact-NsO-car-nom-appear-punc
The car showed.

(3) demonstrates the defining property of the eventive class: verb roots from this class must in general be followed by one of the aspectual suffixes found in Mohawk. (i) shows a habitual suffix; (ii) a punctual suffix with a future prefix; (iii) a punctual suffix with a past tense prefix. (iv) is a form with no aspect suffix at all. In fact, this form is possible, but has a very special interpretation: it is a kind of third person imperative. However, since it does not form a referential proposition, I put it aside.

(3)	(i) habitual aspect (-s, -ha', -he')	t-ye-ya't-v'-**s** cis-FsS-body-fall-**hab** 'She falls (often) .'
	(ii) future-punctual (-', -e', -ne')	v-t-ye-ya't-v'-**ne'** fut-cis-FsS-body-fall-**punc** 'She will fall.'
	(iii) factual-punctual (-', -e', -ne')	t-a-ye-ya't-v'-**ne'** cis-fact-FsS-body-fall 'She fell .'
	(iv) *bare	#t-ye-ya't-v'(-n) cis-FsS-body-fall (OK only as "let her fall!")

Why must an aspectual suffix to attach to verbs of this class? Inspired by Higginbotham (1985), I assume that verbs like -v'- 'fall' have an argument structure which includes a special "event" position. This is shown in (4). Just as a nominal of some kind must appear in construction with 'fall' to express its theme argument, so an aspectual element must appear to bind the event argument. Otherwise, the lexical properties of the verb are not satisfied, and the construction is ruled out as incomplete.

(4) -v'- "fall" <theme, event>

Next, consider the syntax. A salient property of Mohawk is that forms which are verbs morphologically often play the role of nouns in a sentence. The result is roughly that of an internally headed relative clause. Thus in (5a) the verbal meaning "The glass fell" is interpreted as "the glass that fell". However, there are some restrictions. Such forms are only fully natural when they follow the verb; (5b) shows that when the verbal form precedes the verb it is awkward or unacceptable. The (c) and (d) examples show another contrast of the same type. It is important to emphasize that ordinary nominals can precede or follow the verb in Mohawk with complete freedom.

(5) a. Wa'-t-hra-hkw-e' ne t-a'-ka-wis-v'-ne'.
fact-dup-MsS-pick up-punc NE cis-fact-NsS-glass-fall-punc
He picked up the glass that fell.

b. ?/*T-a'-ka-wis-v'-ne' wa'-t-hra-hkw-e'.
cis-fact-NsS-glass-fall-punc fact-dup-MsS-pick up-punc
He picked up the glass that fell.

c. Sak wa-ha-tshvri-' ne wa'-t-ka-na'ts-a-hri'-ne'.
Sak fact-MsS-find-punc NE fact-dup-NsS-pot-break-punc
Sak found a pot that broke.

d. *Sak wa'-t-ka-na'ts-a-hri'-ne' wa-ha-tshvri-'.
Sak fact-dup-NsS-pot-break-punc fact-MsS-find-punc
Sak found a pot that broke.

There are several possible ways of accounting for this phenomenon, and the details are not particularly important here. The simplest route is in terms of extraposition. It is well-known that tensed clauses in English and many other languages normally must be displaced into a clause peripheral position; this is also true in Mohawk. Thus even ordinary complement clauses do not participate in Mohawk's otherwise very free word order; rather they are generally limited to clause-final position. (5) can be seen as another instance of this same generalization.

The third interesting property of eventive verbs in Mohawk is that when their argument is incorporated a possessor cannot be left behind. Some languages (e.g. Rembarnga, see McKay (1975)) have a "possessor-raising" effect in which a possessive NP left behind by noun incorporation is treated like an argument of the verb; it triggers object agreement on the verb, for example. (6) shows that this does not happen with eventive verbs in Mohawk:

(6) a. *T-a-ho-hur-v'-ne' ne Sak.
cis-fact-MsO-gun-fall-punc NE Sak
Sak's gun fell.

b. *Sak wa'-t-ho-wis-a-hri'-ne'.
Sak fac-dup-MsO-glass-break-punc
Sak's glass broke.

c. *Wa'-ako-athvno-tsher-ahtu-'.
fact-FsO-ball-nom-get.lost-punc
Her ball got lost.

If one wants to express the possessor of such a noun, one has no choice but to leave that noun unincorporated.

It is important to realize that the problem with (6) is not the verb agreement per se. It is perfectly possible for verbs of this class to bear animate object agreement, as seen in (7). Here benefactive morphology has been added to the verb root. While its meaning is not identical to the intended meaning of (6a), it is so close that speakers spontaneously offer these as alternatives to the ungrammatical forms. Thus, it is not the presence of object agreement that is the problem, but rather the fact that object agreement is associated with a syntactic possessor.

(7) Wa-ho-hur-v-'s-e'.
fact-2sO- gun -fall-ben-punc
The gun fell on him; he dropped the gun.

In order to explain these facts, it is necessary to take a brief digression into the structure of Mohawk nominals. The basic facts are presented in (8).

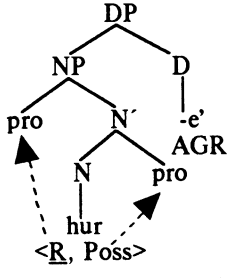
(8) a. ka-hur-e'
NsS-gun-??
'gun'

b. rao-hur-e'
(NsS/)MsO- gun -??
'his gun'

a. ka-kwetar-vs
NsS-cut-hab
'it cuts (it)'

b.' ro-kwetar-vs
(NsS/)MsO-cut-hab
'it cuts him'

c.

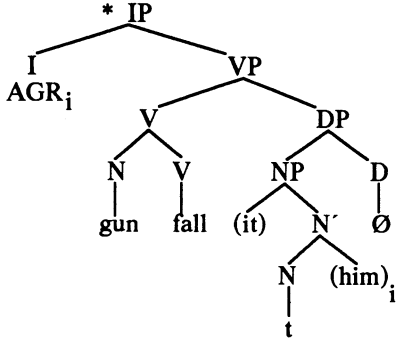


A free-standing nominal in Mohawk typically consists of three morphemes: the noun root itself, an apparently meaningless suffix, and an agreement prefix. This prefix is cognate to the agreement prefixes found on verbs. If the noun is unpossessed, as in (8a), the prefix agrees with the referent of the noun in gender and number features, as if that referent were the subject of the noun; compare the prefix in (8a').[2] If the noun is possessed, as in (8b), then the noun also shows the equivalent of object agreement with the understood possessor; compare the verbal prefix in (8b'). I suggest that these morphological parallels are to be taken literally. This means that the possessor really is the structural object of the noun; it also means that the referent is represented as an NP which counts as the structural subject of the noun.[3] For concreteness, I will assume that the nominal suffix is a residual determiner, and that the agreement potential of the construction is due to its presence. This fits with the fact that nouns which lack a nominal suffix--loan

words, onomatopoeic animal names, etc.--also lack an agreement prefix. Thus, the structure of an ordinary nominal is given in (8c).

Now, consider the configuration which results when this structure is used as the complement of an eventive verb and noun incorporation takes place. The result will be (9), corresponding to sentence (6a):

(9)



Since the head noun has incorporated, the determiner is left stranded. Since the determiner is a bound form, it must be left null phonologically. Now the observation we wish to explain is the fact that the agreement associated with the verb (here represented under the Infl node) cannot be related to the stranded possessor inside NP. A plausible reason is the presence of the determiner node, which intervenes between the two. What we need is a principle like (10):

(10) An agreeing head X cannot be coindexed with an NP Y if there is another (potentially) agreeing head Z such that Z c-commands Y but not X.

This condition is independently motivated by Borer's (1986, p. 403) study of subjects in Hebrew and the Romance languages. It means that D as a node that may bear agreement prevents the agreement in I from seeing inside its domain.[4]

3. Properties of stative verbs.

Consider now the class of stative verbs. Simple examples are given in (11). (12) shows that these verbs too can have their nominal argument incorporated. Thus, they like the eventive verbs in (1) count as "unaccusative verbs", selecting a theme/object NP as their only argument. In this respect there is no difference between the two classes.

(11) a. Kowanv thikv okwire'.
NsS/big that tree
That tree is big.

b. Yo-hniru ne anitskwara.
NsO-hard NE chair
The chair is hard

c. Te-yo-a'tsu thikv ka-na'ts-u.
dup-NsO-dirty that pail
That pail is dirty

(12) a. Ka-kwir-owanv thikv.
NsS-tree-big that
That tree is big.

b. Yo-anitskwara-tsher-a-hniru.
NsO-chair-nom-hard
The chair is hard

c. Te-yo-na'ts-a'tsu thikv.
dup-NsO-pail-dirty that
That pail is dirty.

There is an obvious difference between these verbs and the eventive verbs, however: the verbs in (11) and (12) do not end in an aspectual suffix. In spite of this, they are well-formed, and constitute propositions with well-defined truth values. The habitual affix -s may optionally attach to these verbs, but when it does it has a rather different interpretation. Thus, the habitual suffixes in (13) indicate that the nominal argument of the verb is plural:

(13) a. Yo-anitskwara-tsher-a-hniru-s.
NsO-chair-nom-hard-hab
The chairs are hard.

b. W-a'ther-owanv-s ki.
NsS-basket-big-hab this
These are big baskets

At first this seems surprising. However, upon reflection it becomes clear that the more standard use of the habitual in (3i) also has plural force: it refers to multiple events of falling. These facts can be accounted for if we assign to stative verbs an argument structure like that in (14). These verbs are like eventive verbs, except that they lack the special event argument:

(14) -hniru 'hard' <theme>

Since these verbs have no event argument to be expressed, they do not need to appear in construction with an aspect suffix. Furthermore, when a habitual suffix is attached to such a verb, there is no event argument for it to quantify. In this situation, its plural force is attributed to the only argument the verb has: its theme argument. This gives forms like those in (13).

Next, recall that eventive verb forms can function as nouns, but only if they follow the verb whose argument they express. Stative verb forms are different in this respect: they can either precede or follow the main verb with relative freedom. This is shown in (15):

(15) a. Ka-na'ts-a-rakv i-s-atst.
NsS-pot-white Ø-2sS-use
Use the white pot.

b. Yo-anitskwara-tsher-a-hniru wa'-k-hninu-'.
NsO-chair-nom-hard fact-1sS-buy-punc
I bought a hard chair.

c Sak te-yo-na'ts-a'tsu wa-ha-tshvri-'.
Sak dup-NsS-pot-dirty fact-MsS-find-punc
Sak found a dirty pot.

This difference is expected. In general only tensed clauses are under an obligation to extrapose; tenseless phrases such as nominals and infinitives need not. Since stative verbs lack an event argument, they need not have tense/aspect morphology. Hence they need not extrapose either; rather they may appear in the same range of positions as ordinary NPs.

Finally, suppose that the argument of a stative verb is incorporated. In this case it is possible for a possessor of the incorporated noun to be left behind, with the possessor triggering object agreement on the main verb (cf. Michelson (1991, p.760, fn.5). Examples of this type are given in (16); they contrast directly with the eventive verb forms in (6).[5]

(16) a. Thikv ro-a'ther-owanv.
that MsO-basket-big
That guy's basket is large.

b. Ro-ris-er-akerahs.
MsO-sock-nom-stink
His socks smell.

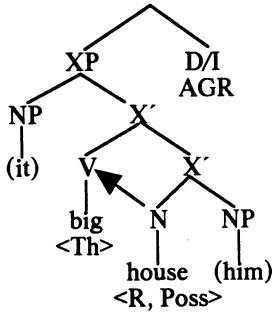
c. Te-ho-hur-a'tsu ne Sak.
dup-MsO-gun-dirty NE Sak
Sak's gun is dirty.

Why should this difference be? I suggest that stative verbs can appear in a completely different structure from the kind considered so far; specifically, the structure given in (17). Here the nominal is not the object of the verb. Rather, the verb and the noun are joint heads of the single phrase, marked XP. Since the NP "it" is contained in this joint maximal projection, it counts as an argument of both heads: it is the theme of 'big' and the referent of 'house'. Since the argument 'him' is in the lower X´, it is an argument of the noun only: it receives the possessor role. This gives the correct interpretation for the sentence. The N then incorporates into the verb, and the jointly headed phrase can be used as either an NP or a VP in the syntax. The principles involved in this structure are those that Baker (1989) uses to account for serial verb constructions, but I will not discuss the parallelisms here.

The important thing about (17) for our purposes is the fact that the verb does not take a complete nominal projection as an argument. Hence, there is no determiner which dominates the noun but not the verb; if there is a determiner at all,

it is outside the projection of both. Thus, the verbal agreement can be related to the possessor NP in this structure without violating (10).

(17)



To complete this account, one must explain why eventive verbs cannot appear in a structure like (17). If they could, then we would expect them to allow "possessor raising" as well, contrary to fact. The reason is fairly simple. Recall that eventive verbs have an event position in their argument structure, which must be bound by aspectual morphology. However, there is no place for this aspectual morphology to appear in a structure like (17).[6] Hence eventive verbs cannot be used in this way. Indeed, (18) presents a very similar contrast in English. Both verbs and adjectives can be used as predicate phrases, as in (18a). However only the adjective can be an NP-internal modifier, as in (18b). The reason is the same as in Mohawk: the verb has an event argument which cannot be satisfied when it is internal to the maximal projection of the noun.

(18) a. The glass fell
The glass is dirty
b. *The fall glass
The dirty glass

4. Inchoative verbs.

Now at last we know enough about stative and eventive verbs to be able to understand inchoative verbs--verbs made up of a stative verb root and the suffix -'. Simple examples of inchoative verbs are given in (19). (20) shows that these verbs can still incorporate their noun argument, unsurprisingly.

(19) a. Thikv a'share' wa'-t-yo-a'tsu-'-ne'.
that knife fact-dup-NsO-dirty-inch-punc
That knife got dirty.

b. Rao-ris wa-w-akera-'-ne'.
MsP-socks fact-NsS-stink-inch-punc
His socks began to stink.

c. Kana'tsu wa'-ka-hutsi-'-ne'.
pot fact-NsS-black-inch-punc
The pot turned black

(20) a. Thikv wa'-t-yo-a'shar-a'tsu-'-ne'.
that fact-dup-NsO-knife-dirty-inch-punc
That knife got dirty.

b. Wa'-ka-ris-er-akera-'-ne'.
fact-NsS-sock-nom-stink-inch-punc
The socks began to stink.

c. Wa'-ka-na'ts-a-hutsi-'-ne'.
fact-NsS-pot-black-inch-punc
The pot turned black.

Now we turn to the more distinctive properties of these verbs. (21) shows that inchoative verbs appear with the full range of tense/aspect affixes. Indeed, an aspect suffix is obligatory; if none appears, the verb can only be interpreted as a third-person imperative, as shown by (21d).

(21) a. Tyotku te-yo-a'tsu-ht-a-'-s
always dup-NsO-dirty-caus-inch-hab
It always gets dirty.

b. Wa'-t-yo-a'tsu-'-ne'
fac-dup-NsO-dirty-inch-punc
It got dirty.

c. T-v-yo-a'tsu-'-ne'
dup-fut-NsO-dirty-inch-punc
It will get dirty.

d. #Te-yo-a'tsu-'-n
dup-NsO-dirty-inch
(Let it get dirty.)

(22) shows that inchoative verbs like eventive verbs lose the ability to act as NPs in preverbal position, although they may appear postverbally.

(22) a. Sak wa-ha-tshvri-' ne wa'-t-yo-na'ts-a'tsu-'-ne'.
Sak fact-MsS-find-punc NE fact-dup-NsO-pot-dirty-inch-punc
Sak found a pot that got dirty.

b. *Sak wa'-t-yo-na'ts-a'tsu-'-ne' wa-ha-tshvri-'.
Sak fact-dup-NsO-pot-dirty-inch-punc fact-MsS-find-punc
Sak found a pot that got dirty.

c. V-se-k-kwatako-' ne wa'-o-anitskwara-tsher-a-hnir-ha-'.
fut-rep-1sS-fix-punc NE fact-NsO-chair-nom-hard-inch-punc
I will fix the chair that became hard.

d. ??Wa'-o-anitskwara-tsher-a-hnir-ha-' v-se-k-kwatako-'.
fact-NsO-chair-nom-hard-inch-punc fut-rep-1sS-fix-punc
I will fix the chair that became hard.

So far, the data are consistent with the lexicalist hypothesis: inchoative verbs are behaving exactly like simple eventive verbs. The crucial facts, however, involve the incorporation of possessed nouns. (23) shows that this is possible, and that the "possessor raising" effect is found, with object agreement on the verb indicating the features of the possessor. This is a property carried over from the stative verb root in a way that seems incompatible with the lexicalist analysis.

(23) a. Wa-ho-anitskwara-tsher-a-hnir-ha-'.
fact-MsO-chair-nom-hard-inch-punc
His chair became hard.

b. Wa-ho-ris-er-akera-'-ne'.
fact-MsO-sock-nom-stink-inch-punc
His socks became smelly.

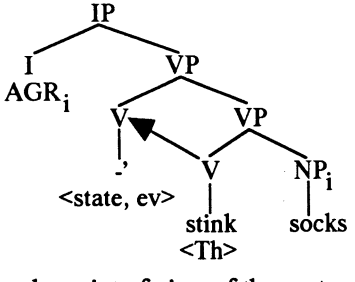
c. Uke-na'ts-a-hutsi-'-ne'.
fact/1sO-pot-black-inch-punc
My pot turned black

Consider now the syntactic alternative. In particular, suppose that we analyze the inchoative morpheme as an independent verb 'become' in the syntax, more or less along the lines of Lakoff (1965). This verb will take a "state" argument, expressed as a VP. It obviously takes an event argument as well. These properties are indicated in (24):

(24) -' 'begin', V <state, event>

A simple inchoative example like (19b) will have the (simplified) syntactic structure in (25). The stative verb then combines with the inchoative morpheme by moving in the syntax. This instance of "incorporation" is fully compatible with the constraints on head movement discussed in Baker (1988a) and elsewhere.

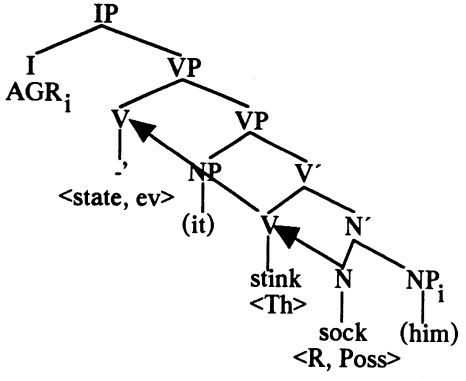
(25)



Now from the point of view of the syntax, we have not one verb but two: a higher eventive verb and a lower stative verb. Thus, syntactic processes which look at the structure in (25) from the outside will treat (25) like an ordinary eventive clause. On the other hand, syntactic processes which are internal to the lower VP should treat (25) as a stative construction. Thus we expect a mixture of properties--and indeed we find exactly the right mixture. Since the higher verb has an event

argument, aspect morphology will be obligatory, as in fact it is. Since the clause as a whole counts as tensed, it is required to extrapose rightward, as seen in (22). On the other hand, since the lower verb maintains its separate existence in the syntax and has no event argument of its own, it is free to enter into a double-headed construction with a noun root. This gives the structure in (26), which is a straightforward embedding of (17) under the inchoative verb:

(26)



Now the individual morphemes in this structure are combined by successive cyclic instances of incorporation. Thus, the N incorporates into the stative verb; this complex then combines with the inchoative verb, and finally with the aspect and agreement features associated with Infl. This sequence of events automatically derives the correct order of morphemes in the complex verb, as shown in (27):

(27) ...ho- ris-er - akera -' -ne'
[agr- [[sock - stink] -inch] -aspect]

Moreover, since there is no possible agreement-bearing category between the verbal agreement located in Infl and the possessor NP, the two may be related, giving the effect of possessor-raising. This explains the grammaticality of the examples in (23). I trust that it also shows the explanatory virtues of the syntactic approach to morphology.[7]

In closing, it is instructive to compare this approach to morphology with the theory of generative semantics. While generative semantics was a source of inspiration for aspects of this approach, I do not think that it will have nearly as broad a scope as generative semantics did. To show why, consider again the verb hri' 'to shatter'. Probably any reasonably fine-grained semantic decomposition of this verb would identify an inherent state predicate plus an inchoative operator; certainly this is true of achievement verbs in Dowty's (1979) system:

(28) hri': [become [shattered (x)]]

Thus, in terms of lexical semantics 'shatter' may be essentially identical to 'become stinky'. Nevertheless, it is simply not the case that 'shatter' can be divided morphologically into a stative root and an inchoative suffix in Mohawk. Correlated with this is the fact that the stative component of 'shatter' is not sufficient to permit

the possessor raising effect (cf. (6b)); this aspect of its meaning is invisible to the syntax. This suggests that morphological complexity often induces syntactic complexity, but semantic complexity by itself does not. Now I do not know where to draw all of the dividing lines in cases of opaque or idiosyncratic morphology; I believe that this is an empirical question to be decided by careful analysis of individual cases. However, in doing such analyses it is important to look for failures of structure preservation, rather than being guided purely by an a priori lexical semantic analysis.

Notes

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1. This assumption is not logically necessary. It is not incoherent to propose a theory in which morphology derives lexical entries with properties very different from those of basic lexical entries of the language. However, the restriction in question is a very natural way of giving the lexicalist hypothesis empirical content, and in practice it has been assumed (implicitly or explicitly) by most proponents of the lexicalist hypothesis as the quotations below demonstrate.

2. These facts are over-simplified somewhat in that I am abstracting away from the well-known "active" properties of the Mohawk agreement system.

3. Williams (1981) and Higginbotham (1985) argue that nouns have a theta role "R" for the referent in their argument structure; my innovation is simply to say that in Mohawk this can be assigned to an NP position like any other theta-role.

4. In (7), on the other hand, the masculine singular element is semantically an "affected object" argument of the benefactive verb. As such, it is directly under the verb phrase, and not within the domain of a determiner. Hence, it can be related to the verbal agreement node in Infl. In this way the contrast between (6a) and (7) is accounted for.

5. Crucially, stative verbs cannot have this type of animate object agreement if the noun is not incorporated. This proves that the masculine element in (16) is not some kind of "affected argument" of the verb itself, as it is in (7).

6. If an aspectual morpheme did appear in construction with the XP in (17), it could potentially bind an event argument associated with the V. However it would not bind any similar argument position in the N. Thus, we would have binding into only one head of a double-headed construction. This can be interpreted as a violation of a generalized coordinate structure constraint.

7. This argument is less strong if one believes that noun incorporation is a lexical process: then one can analyze (23) in terms of noun incorporation feeding inchoativization within the lexical component. The challenge for this view then would be to provide a principled explanation for the contrast between (6) and (16)

in purely lexical terms. While this may well be possible, I am not aware of any current theory that predicts these results.

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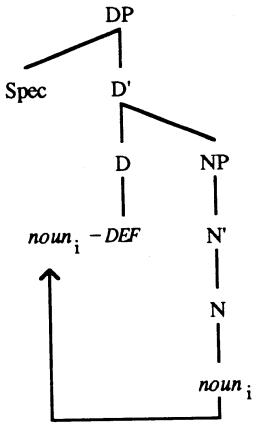
An argument in favour of a syntax-morphology distinction: Scandinavian and Balkan noun phrases*

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1. INTRODUCTION

In the Scandinavian languages and the Balkan languages except Greek[1], a full referential definite noun phrase can consist of a singular count noun carrying a definite ending (referred to as DEF in this paper). Within the framework of recent transformational theory, an analysis such as the one in (1) has been proposed for such noun phrases (e.g. Delsing (1988, 1989) and Holmberg (1990) for Swedish; Taraldsen (1990) for Norwegian; Dobrovie-Sorin (1987) and Grosu (1988) for Romanian).

(1)



Implicit, or sometimes explicit in such analyses are two claims. Firstly, DEF is a syntactic and not a morphological element, or, in other words, it is a **clitic**, not an **affix**. A stronger version of this claim is that there is no distinction between syntax and morphology, so that the phenomena that have traditionally been dealt with by the morphological unit can be accounted for in the syntax. The second claim made in (1) is that DEF is a (syntactic) determiner.

In stating the first of these claims, I have made a distinction between morphology and syntax, between affixes and clitics. Here, morphology can, for the moment, be defined as the set of rules which govern the formation of words, syntax being the set of rules which govern the formation of phrases and sentences. There is, however, one type of unit which shares many characteristics with a word, but the formation of which is governed by syntactic rules. Such units are **host-clitic** combinations. The first claim above is then either that all NOUN-DEF combinations are governed by syntactic rules, or that there is no distinction between morphological rules and syntactic rules, and therefore no distinction between **stem-affix** combinations and **host-clitic** combinations. In this paper, I hope to show that in order to describe the behaviour of DEF in the languages under discussion, the

distinction between morphology and syntax must be maintained. I will also demonstrate that not all of the DEFs discussed here are clitics. With respect to the second claim, I will provide evidence that DEF does not act as a syntactic determiner in all of these languages.

In section 2, I will consider the DEFs of the Scandinavian and Balkan languages in the light of criteria for the distinction between clitics and affixes that have been proposed in the literature (proposed and discussed by e.g. Carstairs (1981, 1987), Klavans (1983, 1985), Sadock (1991), Spencer (1991), Zwicky (1985) and Zwicky and Pullum (1983)). In section 3, I will discuss the consequences of analysing DEF as a syntactic determiner. In section 4, I summarize the discussion .

2. DEF AS A CLITIC OR AN AFFIX

2.1. Phrasal hosts vs. non-phrasal stems

It is usually assumed that the position of a clitic is defined in terms of a phrasal unit, which we will call a **host phrase**, following Klavans (1983, 1985). More specifically, a clitic tends to occur on or near the edges of the host phrase. For DEF, we can assume that the host phrase is the noun phrase. The word that the clitic is phonologically attached to can then be termed the **host word**. The position of an affix, on the other hand, is defined in terms of a particular syntactic category, the **stem**.

As the data in (2) shows, the position of the Swedish (S) DEF cannot be defined in terms of a phrasal unit. From (2a), we might conclude that DEF attaches to the leftmost word of the phrase, or that its host word is the rightmost word of the phrase. However, the data in (2b) and (2c) show that neither of these hypotheses is correct. The same holds for DEF in the other Scandinavian languages.

(2) a. [gris-**en**]$_{NP}$ S
pig-DEF

b. [den här gamla smutsiga gris-**en**]$_{NP}$ S
this old dirty pig-DEF

c. [gris-**en** [med smutsigt tryne] [som tycker om gröt]]$_{NP}$ S
pig-DEF with a dirty snout who likes porridge

The Balkan languages are often assumed to have DEF in second position, a Wackernagel position within the noun phrase (cf. for instance Dobrovie-Sorin (1987) and Grosu (1988), but for a different view and also to some extent differing grammaticality judgements, see Halpern (this volume)). This is most consistently true for Macedonian and Bulgarian.[2] Data from Macedonian (M) are presented in (3).

(3) a. čovek-**ot** M
man-DEF 'the man'

b. dobr-**iot** čovek M
good-DEF man 'the good man'

c. dobr-**iot** mal čovek M
good-DEF little man 'the good little man'

In Romanian (R), there are three ways of saying 'the good man'. These are given in (4). The first two examples do not pose any problems for a 'second position' analysis. If in the example in (4c), the *l* of *cel* is assumed to be DEF, as the

glossing here implies, the DEF is not in second position. However, Dobrovie-Sorin (1987) provides arguments against such an analysis. Instead, she claims that *cel* as a whole fills the function of DEF here, and therefore DEF is in second position.

(4) a. om-**ul** bun R
man-DEF good 'the good man'

b. bun-**ul** om R
good-DEF man 'the good man'

c. om cel bun R
man PART.DEF good 'the good man'

From the data presented here, we can conclude that the Scandinavian DEF behaves like an affix with respect to this criterion, and that DEF in the Balkan languages, with some exceptions, shows the characteristics of a clitic.

2.2. Low degree of selectivity

As long as the positional criteria with respect to the host phrase are fulfilled, a clitic is expected to show a low degree of selectivity with respect to the category of the host word. An affix, on the other hand, displays a high degree of selectivity with respect to its stem. The examples in (5a) to (5c) show that in Swedish, a noun phrase becomes ungrammatical if DEF is attached to an adjective, a verb and a particle, respectively. As (5d) illustrates, DEF cannot even attach to any noun within the noun phrase, but only to the semantic head noun.

(5) a. flicka-**n** som var trött / *flicka som var trött-**en** S
girl-DEF who was tired girl who was tired-DEF

b. flicka-**n** jag träffade / *flicka jag träffade-**n** S
girl-DEF I met girl I met-DEF

c. brev-**et** hon slängde bort / *brev hon slängde bort-**et** S
letter-DEF she threw away letter she threw away-DEF

d. flicka-**n** med byxor / *flicka med byxor-**na** S
girl-DEF with trousers girl with trousers-DEF

In the Balkan languages, DEF is less selective with respect to the category of the word it attaches to. In (3) and (4) examples were provided where DEF attached either to a noun or an adjective. DEF in these languages can also attach to *wh*-words, possessive pronouns, and certain numerals. Examples are provided in (6), where A stands for Albanian.

(6) a. cil-**i** djalë A
which-DEF boy 'which boy'

b. moj-**ot** časovnik M
my-DEF watch 'my watch'

c. întîi-**ul** etaj R
first-DEF floor 'the first floor'

In Macedonian, DEF can even attach to a word that does not directly modify the noun, as shown in (7).

(7) četiri-**te** stotini lug'e M
four-DEF hundred people 'the four-hundred people'

In each of the Balkan languages there is a small number of categories which can occur in noun phrase initial position, but which do not allow DEF to attach to

them. In these cases, an alternative strategy is found. Examples from Bulgarian (B) and Macedonian are given in (8) and (9). In neither language can DEF attach to an adverbial modifying an adjective. In such noun phrases, the Bulgarian DEF can attach to the AP as a whole, but in Macedonian, this is not possible. Instead, an independent determiner must be used, as in (9c).

(8) a. *mnog-**ət** star teatər B
very-DEF old theatre

b. mnogo starij-**ət** teatər B
very old-DEF theatre 'the very old theatre'

(9) a. *mnogu-**ot/ta/to/te** golem čovek M
very-DEF big man

b. *mnogu golem-**iot** čovek M
very big-DEF man

c. **onoj** mnogu golem čovek M
that very big man 'the very big man'

DEF in the Scandinavian languages clearly behaves like an affix with respect to this criterion, since it shows a high degree of selectivity. Even though, in the Balkan languages, there is some degree of selectivity as to the host word, I conclude from the data discussed and referred to here that DEF in these languages shows the characteristics of a clitic rather than an affix.

2.3. Morphophonological idiosyncrasies

In a theory of grammatical organization such as that envisaged by, for example, Klavans (1983, 1985), morphophonological irregularities occur only in units formed by the morphological rules. The only changes expected in combinations governed by the syntactic rules are those predictable on the basis of general phonological rules. This means that we expect unpredictable irregularities to occur only in stem-affix combinations but not in host-clitic units. A small selection of data in (10) to (14) indicate that such irregularities occur in all the languages. In (11), F stands for Faroese. I will return to these data in section 4.[3]

(10) a. |gymnasium+et| → gymnasiet S
secondary.school.DEF

b. |centrum+et| → centret, centrat OR centrumet S
centre.DEF

(11) a.	staður	staður-**in**	stað-**num**	F
	place(MASC)	place-DEF.NOM	place-DEF.DAT	
b.	seyður	seyður-**in**	seyð-**inum**	F
	sheep(MASC)	sheep-DEF.NOM	sheep-DEF.DAT	

(12) a. |teatar+ot| → teatrot M
theatre.DEF

b. |realisam+ot| → realismot M
reality.DEF

c. |turisam+ot| → turisamot M
tourism.DEF

(13) a. |familii+i| → familiei R
family.GEN/DAT.DEF

b. |copii+i| → copiii R
child.PLU.DEF

(14) krye krye-t kre-u A
head head-DEF head-DEF

Another type of irregularity which is often assumed to be characteristic of stem-affix combinations is arbitrary gaps. This means that if a particular NOUN-DEF combination fails to occur in a language, without there being any principled explanation for this distributional gap, then this can be taken as an indication that in this language, DEF is best viewed as an affix. Arbitrary gaps of this type can be found in the Scandinavian languages. I refer the reader to Börjars (1992a) for examples. I have not found any examples of arbitrary gaps in the Balkan languages, but since they are the kind of examples which are not very likely to occur in a grammar of the language, and which are also unlikely to be presented by a native speaker informant, I do not want to claim that there are no arbitrary gaps in the Balkan languages.

3. DEF AS A SYNTACTIC DETERMINER

3.1. Co-occurrence with syntactic determiners

In most current analyses of noun phrases, be they NP or DP analyses, it is usually assumed that each noun phrase can only contain one syntactic determiner. If DEF is analysed as a syntactic determiner, we would expect that it cannot co-occur with other syntactic determiners. With respect to this expectation, the Scandinavian languages display interesting differences. In Swedish, DEF co-occurs with most, but not all definite syntactic determiners, as illustrated in (15).

(15) a. **den** gamla mus-**en** / *mus S
the/that old mouse-DEF mouse

b. **den** mus-**en** / *mus S
that mouse-DEF mouse

c. **den här** mus-**en** / *mus S
this mouse-DEF mouse

d. **denna** mus / *mus-**en** S
this mouse mouse-DEF

Norwegian (N) DEF behaves similarly to the Swedish DEF with a few exceptions. A crucial difference is seen on comparing (15d) with (16).

(16) denne bil-**en** / *bil N
this car-DEF car

Fjeldstad and Hervold (1989:39) claim that the co-occurrence of definite determiners and DEF, i.e. the so-called double determination 'is more commonly used in *Nynorsk* than in *Bokmål*, and many use it consistently.' However, Å.-B. and R. Strandskogen (1980:57), in their grammar of *Bokmål* signal an increased use of 'double determination' also in this variety of Norwegian. It seems then as if the official varieties of Norwegian are already in, or are moving towards, a situation in which definite independent determiners always co-occur with DEF. This means that if DEF is analysed as a syntactic determiner, all definite Norwegian noun phrases containing an independent determiner must have two determiner nodes.

In Danish (D), DEF occurs in complementary distribution with syntactic determiners. Examples are found in (17).

(17) a. mand-**en** D
man-DEF

b. den unge mand / *mand-**en** D
the young man man-DEF

c. den mand / *mand-**en** D
that man man-DEF

d. denne mand / *mand-**en** D
this man man-DEF

In Icelandic (I), DEF occurs in complementary distribution with most independent definite determiners, as the examples in (18) show.

(18) a. maður-**inn** I
man-DEF

b. þessi maður I
this man

c. sá maður I
that man

d. hinn mikli maður[4] I
the great man

e. mikli maður-**inn** I
great man-DEF

For emphasis, some of the determiners in (18) can also be used in combination with DEF, as in (19).

(19) a. þau ár(-**in**) I
those years-DEF 'those (very) years'

b. þetta ár(-**ið**) I
this year-DEF 'this very year'

There is, however, one determiner in Icelandic which requires the presence of DEF. It is homonymous with the definite article (except in NEUT.SG.NOM/ACC), and is usually translated as 'the other'. An example is provided in (20).

(20) **hinn** maður-**inn** / *maður I
the.other man-DEF man

In Faroese, there is frequently optional co-occurrence between definite syntactic determiners. Barnes (1990:23-25) does provide some indications of preference, but the rules governing co-occurrence remain vague. This is illustrated in (21).

(21) a. **tann** svarti kettlingur(**-in**) F
the black kitten-DEF

b. **henda** genta(**-n**) F
this girl-DEF

c. **tann** tíð(**-in**) F
that time-DEF

There is as much variation in the behaviour of DEF with respect to co-occurrence restrictions in the Balkan languages as in the Scandinavian ones. In Albanian, for instance, there are cases of optional co-occurrence, as illustrated in (22).

(22) a. **ky** djalë / djal-**i** A
this boy boy-DEF

b. **ai** djalë / djal-**i** A
that boy boy-DEF

In Macedonian, if the possessive pronoun is not considered a determiner, DEF does not co-occur with any syntactic determiners. Since DEF can actually attach to a possessive determiner, as in (6b), there are good reason to assume that it is itself adjectival in nature. Examples can be found in (23).

(23) a. **toj** čovek / čovek-**ot** / ***toj-ot** čovek M
that man man-DEF that-DEF man

b. **ovoj** čovek / *čovek-**ot** / ***ovoj-ot** čovek M
this man man-DEF this-DEF man

Whether or not the demonstrative independent determiners in Romanian require the presence of DEF depends on the position of the demonstrative. As (24) illustrates, if the demonstrative is in prenominal position, the noun does not carry DEF. DEF is, however, obligatorily present if the demonstrative follows the noun. Since in the latter case the demonstrative carries an ending, it is possible that arguments can be found in favour of analysing the demonstrative as adjectival when it follows the noun. For a discussion of comparable cases, see Lyons (1991).

(24) a. **acest** om R
this man

b. om-**ul** acesta R
man-DEF this

On the basis of the data in 2.1 and 2.2, I concluded that DEF in the Scandinavian languages behaved as an affix, whereas DEF in the Balkan languages showed the characteristic behaviour of a clitic. If the co-occurrence argument used in this section is accepted, the data discussed here have showed that the syntactic status of DEF cuts through the distinction between affixes and clitics. In Norwegian and Swedish, we find total, or near total, co-occurence; in Danish, Macedonian and Bulgarian, there appears to be complementary distribution; in Icelandic and Romanian, the distribution of DEF and syntactic determiners is approaching

complementary distribution; finally, in Faroese and Albanian there is optional co-occurrence. I will return to these facts in section 4.

3.2. Co-ordination

In English, the free syntactic definite determiner *the* can determine a co-ordinated nominal. If the co-ordinated nominal forms a close semantic unit, as in (25), this may even be the only possibility if the unit meaning is to be maintained.

(25) [fish and chips] + definite article → the [fish and chips]
↛ the fish and the chips

In Swedish, where DEF behaves like an affix, it cannot determine a co-ordinated nominal, as (26a) shows. The example in (26c) indicates that the ungrammaticality of (26a) is not likely to be due to disagreement in number, since the singular indefinite determiner *en* can determine the same co-ordinated nominal.

(26) a. *[mamma och pappa] -**n** S
mother and father -DEF

b. mamma-**n** och pappa-**n** S
mother-DEF and father-DEF 'the mother and father'

c. Hon har en trevlig [mamma och pappa]. S
she has a.SG nice.SG mother and father

However, if we compare this with data from Macedonian, where DEF is clitic-like, we find the same inability to determine a co-ordinated nominal. This is illustrated in (27).

(27) a. *[maži i ženi] -te M
husbands and wives -DEF

b. *[maži-**te** i ženi] M
husbands-DEF and wives

c. maži-**te** i ženi-**te** M
husbands-DEF and wives-DEF 'the husbands and wives'

4. CONCLUSIONS

The data discussed in the previous sections can be summed up as in Table 1 below. A plus sign (+) in bold print indicates that DEF in this language behaves like a clitic with respect to this criterion, a smaller plus sign means that DEF in this language can plausibly be analysed as a clitic with respect to this criterion, but only if some assumptions are made about seeming counter-evidence. A minus sign (–) indicates that DEF has the characteristics of an affix. A few comments on the table are in order.

As seen in 2.3, morphophonological irregularities occur in all the Scandinavian and Balkan languages. The criteria discussed in 2.1. and 2.2, on the other hand, do divide the languages into two distinct categories, one where DEF is a clitic, i.e. the Balkan languages, and one where DEF shows the characteristics of an affix, i.e. the Scandinavian languages. Therefore, I do not want to conclude from 2.3. that all DEFs are affixes. I take the data summed up in the column 'Irregularities' to indicate that clitics and affixes are not different in kind with respect to the type of phonological attachment, but that there are differences of degree of phonological attachment. The difference between clitics and affixes lies

mainly in how their position is defined; the selectional frame of a clitic refers to a phrasal element and that of affixes to a non-phrasal element.

I have no explanation for why these DEFs cannot determine a co-ordinated nominal. There are languages where what appear to be relatively free determiners cannot determine a co-ordinated nominal either. One such language is Welsh, where the determiner *y* may, for instance, carry stress in marked cases. An example from Welsh is given in (28).[5]

(28) a. y pysgodyn a'r sglodian W
the fish and.the chips 'the fish and chips'

b. *y pysgodyn a sglodian W
the fish and chips

It seems then that the explanation for the ungrammaticality of (26a), (27a) and (27b) should be sought in the nature of determination rather than the nature of affixation and cliticization.

	Clitic vs. Affix			Syntactic	
	Phrasal host	Selectivity	Irregularities	Co-occurrence	Co-ordination
Swedish	–	–	–	–	–
Norwegian	–	–	–	–	–
Danish	–	–	–	+	–
Faroese	–	–	–	– (opt.)	–
Icelandic	–	–	–	+	–
Albanian	+	+	– (arb. gaps?)	– (opt.)	–
Romanian	+	+	– (arb. gaps?)	+	–
Macedonian	+	+	– (arb. gaps?)	+	–
Bulgarian	+	+	– (arb. gaps?)	+	–

Table 1 Schematic representation of the behaviour of DEF in the Scandinavian and Balkan languages with respect to criteria for clitic status

If we "add up" the criteria represented in Table 1, we get a sliding scale from affix to clitic, or from morphology to syntax, as represented by the horizontal line in Table 2. However, as the vertical line indicates, there is a sharp dividing line along this sliding scale. With respect to the first two criteria in Table 1, the Scandinavian languages behave clearly as one group and the Balkan languages as another. With respect to the syntactic behaviour of DEF, specifically as regards co-occurrence restrictions, the languages divide differently. This means that in order to reflect this two-way distinction, our representations must have two dimensions. I suggest that these two dimensions are syntax and morphology. All DEFs will have some manifestation in the morphology, though their morphological selectional frame will vary; in some cases it will refer to a phrasal unit, and in some cases to a non-phrasal one. At the syntactic level, some DEFs will occur under a node of their

own, functioning as a syntactic determiner. This will be the case for Danish and Romanian. Others will not be represented individually in the syntax, but occur only as morphological marking on another word. This will be the correct representation for Norwegian, and probably also for Albanian. Whether or not DEF has an independent representation in the syntax is independent of its morphological status.

To my mind, representations of the kind given in (1) do not provide a suitable formalism for making the distinctions set out in the previous paragraph. We are dealing here with discrepancies between the morphological and the syntactic level. One of the most obvious frameworks for representing discrepancies between different levels of the grammar is Autolexical Syntax, as proposed by Sadock (1991). I refer to Börjars (1992b) for examples of how the noun phrases discussed here could be represented within Autolexical syntax.

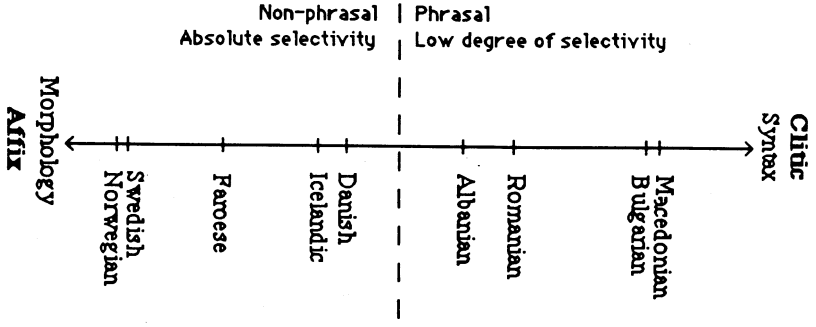


Table 2 A "clitic cline" for DEF in the Scandinavian and Balkan languages

FOOTNOTES

* I would like to thank Martin French and Mirjana Kočoska for their help with the Balkan data. I have also greatly benefited from discussions on these topics with John Payne, Nigel Vincent and Martin French. In spite of the fact that I have not adopted all their suggestions in this paper, I am grateful to Aaron Halpern, Alec Marantz and Philip Miller for their comments and helpful conversations at the BLS meeting. Finally, I would like to express my thanks to Andrew Masters for his help in preparing this article. Of course, the responsibility for errors that may still be found in this paper is entirely mine.

[1] In this paper, for the sake of simplicity, I will use the term 'the Balkan languages' to refer to the Balkan languages which have DEF, thus excluding Greek.

[2] Albanian data pose problems for an analysis in terms of a Wackernagel position within the noun phrase (cf. Börjars 1992a).

[3] With respect to the data in (12), native speaker judgements may vary slightly, but to my knowledge, they will always involve unpredictable irregularities.

[4] According to Kress (1982:174), the use of the prenominal definite article is literary. In the spoken language, the definite end article, or a demonstrative pronoun (*sá*, *sú* or *það*) is more common.

[5] I am grateful to Bob Borsley, who pointed this out to me, and to Winifred Davies, who provided the native speaker judgements.

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Pretty Derivational Morphemes All in a Row

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1. Introduction. In this paper I will describe the verb morphology of the Tibeto-Burman language Manipuri (M), which is an agglutinative language spoken in Northeast India in the state of Manipur. In particular I will show how the linear ordering of the sixteen derivational verb morphemes in M is governed by a different ordering principle than that of the inflectional morphemes. I will also provide examples from Cuzco Quechua and Saint Lawrence Island Eskimo to show that such mixed systems of morphological organization can be found in these languages as well.

2. Inflectional categories. In (1) a schematic representation of the M verb is given. Note that the categories of DM and IM are not obligatory in the M verb (there is no number-person-gender agreement between the verb and its arguments). What is minimally needed for a M verb to be an acceptable form is the verb ROOT and an enclitic.

(1) Schematic representation of the M verb:

ROOT-derivational morphology (DM)-inflectional morphology (IM)-enclitics

If DM and IM are both optional categories and if IM is not relevant to the syntax, then why and how can a distinction be drawn between IM and DM? The initial answer to this is given in (2), which is the list of the rules needed to generate words in M.

(2)
a. W ---> W enc
b. W ---> STEM (IM)
c. STEM ---> STEM (suffix)
d. STEM ---> (prefix) ROOT
e. ROOT ---> ROOT (root)
f. IM ---> ($infl_1$) ($infl_2$) ($infl_3$)

As shown in (2f) the category of IM can consist of a series of three inflectional categories where im_1, im_2 and im_3 represent respectively, the inflectional categories 1, 2 and 3 given in (3).

(3) List of inflectional categories in the Manipuri verb

Cat 1	Mood 1:	-kə	'potential'
		-loy	'nonpotential'
Cat 2	Mood 2:	-tə	'necessity'
		-təw	'obligation, probability'
		-toy	'intention'
Cat 3	Aspect:	-li	'progressive'
		-lə	'perfect'

There can be one and only one instantiation of each category in a given verb and each instantiation must occur in the order specified (i.e. category 1 before category 2 and 2 before 3). This can be opposed to the type of rule needed to derive the linear ordering of the DM morphemes. The exact formulation of this rule is addressed in section 3.

3. Derivational categories. In this section I will identify and describe the meanings of the sixteen DM morphemes which belong to one of ten semantically defined categories. This semantic categorization predicts co-occurrence restrictions between members of the same category, since morphemes which signal analogous meanings never co-occur. For example, a verb will never be suffixed by two markers from the "direction" category (category H): if a verb is marked by -lə 'proximal' (which indicates that the action took place near the speaker) it would be semantically anomalous for that same verb to be marked by the distal marker -ləkˈ (which indicates that the action was performed at a distance from the speaker). Thus the semantic categorization of the markers in this section encodes the (1) semantic similarity and (2) the co-occurrence restrictions of the morphemes that are members of the same category.

Category A consists of 2 markers: -nə 'reciprocal' which is used to indicate that two or more people are doing some action in conjunction with each other or that one person is joining in to perform an action with another and -min 'comitative' which indicates that the actors perform the same action at the same time in a group.

Category A: Reciprocal and comitative

(a) -nə 'reciprocal'

khəŋnəy

khəŋ **-nə** -i
know -recip-NHYP
'know each other'

(b) -min'comitative'

tumminŋəydə

tum **-min** -ŋəy -tə
sleep-together-during-dat
'when sleeping together'

Category B consists of 2 markers which indicate to or for whom the action described in the verb is carried out: -pi indicates that the action is performed for someone other than self and -cə indicates that the action is performed for the sake of the performer.

Category B: V to or for sake of other or self

(a) -pi 'V to someone other than self'

yéŋsinbirəbədi

yéŋ-sin-**pi** -lə -pə -ti
see -in -rec-pro-inf-DLMT
'If the (parents) look into these things (for the children's sake).'

(b) -cə 'V for sake of self'

tumǰərunu

tum **-čə** -lu -nu
sleep-self-pro-probh
'(For your own sake) don't go to sleep while on duty.'

Categories C and D consist of the causative marker -hən and the desiderative marker -niŋ respectively.

(c) Category C: Causative

təwhənbəni

təw-**hən** -pə -ni
do -caus -inf -COP
'cause the work to be done'

(d) Category D: Desiderative

lónniŋŋi

lón **-niŋ** -i
lock-wish-NHYP
'to wish to lock'

Categories E, F and G encode the speakers's opinion towards the action described in the verb. **Category E** consists of two suffixes which indicate the extent to which or the number of times that an action is performed: -mən indicates that an action is performed in excess and -kən 'V repeatedly, habitually'.

Category E: V how much / how many times

(a) -mən 'V in excess'

čáməlle

čá-**məl** -lə -e
eat-excess-perf-ASRT
'(I've) eaten too much (rice).'

(b) -kən 'V repeatedly, habitually'

nokkənbə

nok **-kən** -pə
laugh-repeat-inf
'someone who laughs all the time'

Category F consists of two suffixes which indicate whether an action is carried out at an appropriate or inappropriate time: the inceptive suffix -həw indicates that

an action has been initiated in the nick of time or that a limited window of opportunity is available for such initiation. Thus in (a), the speaker is unable to begin eating at the required time. The marker -khi indicates the speaker's attitude or expectation about the time frame within which an action is performed or a state is attained. Thus in (b) the speaker indicates that an action is completed before the expected state.

Category F: V at an appropriate or inappropriate time

(a) čáhəwdəre

čá-**həw** -tə -lə -e
eat-still -neg-perf-ASRT
'(I) didn't get to eat.'

(b) pakhirəmmi

pa **-khi**-ləm-i
read-still-evd -NHYP
'had already read'

Category G consists of -ləm, the indirect evidence marker which indicates that the speaker has evidence to support the truth of a proposition.

Category G: Indirect evidence

(a) čárəmmi

čá-**ləm**-li
eat -evd -prog
'(When I got there he) had been eating.'

Category H consists of three markers which indicate the position of the subject with regards to the position of the speaker. These are the proximal marker -lə, which indicates that the subject performs an the action at the place of the speech act (a); the distal marker -lək which indicates that an action takes place or is initiated at some location other than where the speech act occurs (b); and -lu, which indicates that an action takes place somewhere away from or moving away from the location of the speaker (c).

Category H: Direction

(a) -lə 'proximal'
(b) -lək 'distal'
(c) -lu 'V away from speaker'

(a) čárəri

čá **-lə** -li -i
eat-prox-prog-NHYP
'comes here and eats'

(b) čárəʔi

čá **-lək** -i
eat-dist -NHYP
'ate over there'

(c) čətlure

čət-**lu** -lə -e
go -adir-perf -ASRT
'went (and returned)'

Category I consists of the negative marker -tə which is used to describe an action or state that was not or has not up to the time of speech been performed or realized. **Category J** consists of the prospective marker -lə which indicates that an action is viewed from the point of its initiation.

Category I: Negative	Category J: Aspect
-tə 'negative'	-lə 'prospective aspect'
təwde	ləyrəmməgəni
təw-**tə** -e	ləy-ləm-**lə** -kə -ni
do -neg-ASRT	be -evd-pro-pot-COP
'do not do'	'probably is waiting'

One striking characteristic of the morphemes discussed in categories A-J is that it is possible to point to related productive stems in M from which these suffixes must have been derived. In the process of lexicalization from stem to suffix, the stems have lost their stem tone, the original meaning of the stems is obscured and following a common lexicalization pattern in M, the vowels of the stems appear as ə in the lexicalized suffix. A list of the suffixes and related stems is given in (4).

(4) List of derivational suffixes and related stems

Suffix		Related Stem	
-min	'comitative'	min	'be together'.
-pi	'V to or for someone other than self'	pi	'give'
-cə	'V for sake of self'	ca	'body'
-hən	causative	han	'advance/push ahead'
-niŋ	'desire to V'	niŋ	'dream, wish'
-mən	'V in excess'	man	'greedy'
-kən	'V repeatedly, habitually'	kən	' save'
-həw	'inceptive'	haw	'begin, grow'
-ləm	'indirect evidence'	lom	'approximate'
-lək	'distal'	lak	'come'

4. Variable orders of derivational morphemes. Recall that IM categories (which were numbered 1, 2, 3) occur in a fixed order. On the other hand, DM categories are not fixed in order: for this reason the DM categories are not numbered but indexed with a letter of the alphabet. The order reflected by the capital letters encodes the most commonly occurring orders: thus A usually occurs before B, B usually occurs before C, and so on. This does not reflect structural

information about DM. Instead, it is more the case that there are some meanings that are more commonly used than others and so some sequences are more common than others.

As reflected by the data in (5) the order Category A before B before C is certainly not the only order in which the DMs can occur. Consider, for example, the interaction of the marker -khi 'still' with the evidential marker -ləm in (5a) and (5b). In (5a) the sequence -khirəm has the meaning'probably still V' whereas in (5b) the sequence -rəmkhi has the meaning 'still seems V'. Thus, the order of -khi and -ləm is not fixed and the order of the suffixes changes the meaning, showing that these markers have scopal properties.

(5a)	čákhirəmmoy	(5b)	čətləmkhiroy
	čá-khi-ləm-loy		**čət-ləm-khi**-loy
	eat-still-evd -npot		go -evd -still-npot
	'probably still did not eat'		'still seems (that he) has not left'

These two points about the DM are further exemplified by (5c) and (5d), and (5e) and (5f). In (5c) the sequence -niŋhəl has the meaning 'cause to wish' and in (5d) the sequence -hənniŋ has the meaning 'wish to cause'. Similarly, in (5e) the sequence -həlləkh has the meaning 'caused to V when there' whereas the sequence -ləkhən in (5f) has the meaning 'cause to V here (towards this direction)'.

(5c)	čániŋhəlli	(5d)	pahənniŋŋi
	čá -niŋ-həl -i		pa **-hən -niŋ**-i
	eat-wish-caus-NHYP		read-caus-wish-NHYP
	'made me feel like eating'		'wished to cause him to read'
(5e)	čáhəllə?e	(5f)	purəkhənkhre
	čá-həl -lək-e		pu **-lək-hən**-khi -lə -e
	eat-caus-dist -ASRT		carry-dist-caus -still-perf-ASRT
	'I was made to eat when I was there.'		'(Tomba) caused him (when over there) to bring the letter here (at an earlier time).'

5. Doubling of derivational morphemes. There is one additional characteristic of DM which opposes it with IM. As shown in (6a) and (6b), morphemes in DM that signify a quantifiable meaning can be doubled in order to intensify the meaning of the marker. For example, in (6a) the prospective marker which, when used in an undoubled form implies that the speaker is certain that action described in the verb is to take place, in a doubled form indicates that the

speaker is absolutely sure that the action in question is to take place. A similar fact is seen in (6b) with -khi 'still' where the duration of time is emphasized with the doubling of the marker.

(6a)	sawrərərəni	(6b)	čákhikhinu
	saw -lə **-lə -lə** -ni		čá**-khi-khi**-nu
	angry-prox-pro-pro-COP		eat-still -still -probh
	'is certainly going to be angry'		'(under any conditions) don't eat yet'

The possibility for doubling is not present with IM morphemes even though most of these morphemes do signal quantifiable meanings (that is, one could for example, imagine the duplication of one of the mood 2 markers where such duplication would indicate a strong necessity instead of a mild one). The lack of this possibility in the IM can be attributed to difference in the organization of IM as opposed to DM. The fixed order of morphemes in IM indicates that linear ordering is controlled by linear precedence rules such as a templatic formula or position class system. In this case, one would not expect doubling since in such systems no position is filled more than once.

6. Summary. Example (7) gives a summary of the facts described so far for DM and IM. Since there is no evidence to show that the morphemes of IM have scopal properties, I assume that IM has a flat structure that contributes a composite inflectional meaning which has scope over the whole verb.

(7) Differences between DM and IM

	DM	IM
Order of morphemes	variable	fixed
Morphemes exhibit scopal properties	yes	no evidence
Doubling	yes	no
Lexicalized equivalents of stems	yes	no

Note that IM cannot be differentiated from DM on the basis that IM is carried out in the syntax and DM in the Lexicon; since there are no agreement features encoded by IM, there is nothing about IM, as opposed to DM, which makes it relevant to the syntax. There is no reason to assume then, that the morphemes IM are not concatenated to the verb in the same place as the concatenation of DM. If this is true, then what M exhibits is a morphological system which employs two different linear ordering principles.

The DM is governed by semantic co-occurrence restrictions and some sort of categorially-based syntax of the morphemes such as the rule in (8), where parentheses stand for optionality of occurrence, subscripts stand for the semantic category and commas indicate that constituents are unordered.

(8) ((DM) ---> (dm_a), (dm_b), (dm_c)....)),

The rule for DM will overgenerate: there will be some sequences generated that are ruled out because they are semantically awkward even though they might be understandable. The variable ordering of DM morphemes must be a productive characteristic of DM since consultants rarely rule out an order completely. Most often judgments about unusual orders are that these orders are understandable, but that they sound more like the product of a nonnative than of a native speaker of M.

7. Structure imposed on words by phonology. We might want to consider if there is some other way to predict the ordering of morphemes, besides the use of syntactic rules. For instance, does the phonology interact with the morphology in a level ordered fashion along the lines of Lexical Morphology and Phonology (Kiparsky 1982, Mohanan 1986). In fact, there are a number of lexical phonological rules in M. However, as will be seen below, the phonology imposes a different structure on words than the morphology does (in terms of the distinction between DM and IM established above).

The phonological rule of Lateral Deletion applies to delete l in an kl sequence as illustrated in (9). Lateral Deletion applies with the suffixation of the perfect marker -lə, the progressive marker -li and the evidential marker -ləm (in these cases, k becomes glottal stop by a post-lexical rule).

(9a)	yóʔəbə	(9b)	purəʔibə	(9c)	laʔəmmi
	yók **-lə** -pə		pu **-lək** -li -pə		lak **-ləm** -li
	rear-perf-inf		carry-distal-prog-inf		come-evd -prog
	'rear up'		'coming'		'carried here'

As seen in (9d), Lateral Deletion fails to apply with the suffixation of the distal marker -lək. Instead a rule of Velar Deletion applies to delete k (of -thok) in the kl sequence. Here, the l of -lək becomes r by a post-lexical rule.

(9d) čoŋthorəʔəgə

čoŋ -thok**-lək** -ləgə
jump-out -distal-after
'having jumped out'

It is fairly obvious that the rule of Lateral Deletion and Velar Deletion are in a bleeding relationship with each other. That is, if Lateral Deletion applies first, the environment for Velar Deletion will no longer be available and if Velar Deletion applies the environment for Lateral Deletion will no longer be available. A level ordering of these rules will help solve the problem, as seen in (9e).

(9e) Level ordering of rules of Velar deletion and Lateral deletion

L1	Velar deletion	-lək
L2	Lateral deletion	-ləm, -lə (perfect), -li

The application of the Velar Deletion rule is paired with the suffixation of -ləkˀ and turned off with the suffixation of the markers listed at Level 2. This prevents the misapplication of the Velar Deletion rule with the markers -ləm, -lə and -lə and correctly pairs its application with the marker -ləkˀ. The application of the Lateral Deletion rule is paired with the suffixation of the markers at L2 thus correctly characterizing the application of the rule on these markers. See Chelliah (1990) for further discussion of level ordered phonological rules in M.

The structure imposed on words by this level ordering, while correctly characterizing the interaction of phonology and morphology, is at odds with the structure imposed by linear ordering principles in the morphology proper. That is, the LPM places the DM morpheme -ləkˀ in a different level of word structure from another DM morpheme -ləm and this separation is not enforced by the morphology. Furthermore, the LPM analysis places the DM morpheme -ləm along with the IM morphemes -lə and -li. Thus one phonologically determined level straddles two morphological levels.

This mismatch between morphological and morphophonological structure about M support arguments put forward by Sproat (1988), that morphophonology and morphology are distinct components and that word structure should be viewed as being determined through representations in (at least) these two components. Further support for such a view comes from the fact that there exist mixed morphological systems, such as the one described for M. One can conclude from this that linear ordering in morphology is not exclusively determined according to phonological criteria, compositionality, or position classes, but through some combination of these linear ordering principles.

8. Other mixed morphological systems. Of course, M is not special in exhibiting such a mixed system. For example, the morphological systems of Cuzco Quechua and Saint Lawrence Island Yupik Eskimo exhibit similar facts. Muysken (1988:260) lists twenty-two derivational verbal markers for Cuzco Quechua, and shows that, although there are semantic restrictions on the combinatory possibilities of these markers, there are, "for every verb stem... many thousands, if not an infinite number... of fully suffixed verb stems." He notes that variable orders are possible for these markers. The examples in (10a) and (10b) illustrate this second point.

(10a)	mikhu-**naya-chi** -wa-n eat -DESI-CAU-lob-3 'It causes me to feel like eating.'	(10b)	mikhu-**chi** **-naya**-wa-n eat -CAU-DESI -lob-3 'I feel like making someone eat.' (examples from Muysken (1988:278))

However, the morphemes of the inflectional morphology occur in a fixed order.

The facts in Saint Lawrence Island Yupik Eskimo are somewhat more complicated. Here, a base can be followed by derivational morphology which is fixed in order. This can be followed by an internal syntax component in which morphemes combine freely (restricted only by semantic considerations). For further explanation of the differences between derivational morphology, internal syntax, and inflectional morphology in Eskimo, see de Reuse (1992). It appears that the markers of internal syntax exhibit the same possibility for variable orders (see (11a) and (11b)) and doubling (see (12a) and (12b)), as seen for DM in M.

(11a) qaviisqesaghtughaa
qavagh-**sqe** **-yaghtugh**-aa
sleep -ask.to.V-go.V -IND(3s-3s)
's/he went to ask him/her to sleep'

(11b) qavaghyaghtiisqaa
qavagh-**yaghtugh-sqe** -aa
sleep -go.V -ask.to.V-IND(3s-3s)
's/he asked him/her to go sleep' (examples from de Reuse (p. c.))

(12a) ukinimaaquq
ukini-**ma** -aqe -uq
sew -V.with.interruptions-PROG-IND(3s)
she is sewing with interruptions

(12b) aqelqaamamaaquq
aqelqagh-(ng)u **-ma** **-ma** -aqe -uq
guest -be.N -V.with.interruptions-V.with.interruptions-PROG-IND(3s)
'he visits with large interruptions' (examples from de Reuse (1988:146))

The internal syntax is followed by inflectional morphology which is again fixed in order.

9. Conclusion. To adequately describe the morphology of languages such as Manipuri, Cuzco Quechua and Saint Lawrence Island Yupik Eskimo, morphological theory must account for mixed morphological systems. This would be made possible if Morphology (and therefore the organizational principles within morphology) were considered an independent grammatical component.

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Abbreviations:

For the Manipuri examples abbreviations for the DM and IM can be figured out by looking at the definition of the morpheme in question in the body of the paper. Enclitics are given in CAPS in the morphemic gloss. The abbreviation conventions used for the enclitics are:

Abbreviation	**Meaning**
NHYP	nonhypothetical
DLMT	delimitative
COP	copula
ASRT	assertive
PROBH	prohibitive
TAG	invariant tag question
EX	exclusive

Abbreviations used in the Quechua examples:

CAUS	causative
DESI	desiderative
1ob-3	1st person object-3rd person subject

Abbreviations used in the Eskimo examples:

IND	indicative
3s-3s	3rd person subject-3rd person object
PROG	progressive

Towards a Constrained Theory of Morphological Discongruities: "Tops-together" Parallel Representations

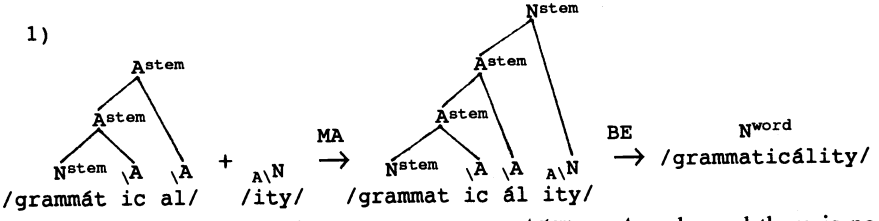
Henry Churchyard
The University of Texas at Austin

0. Introduction

To account for bracketing paradoxes in a constrained way, compatible with Lexical Phonology, this paper proposes a new type of 'parallel' structure, in which the representations of two sub-components interact only weakly, through their topmost (root) nodes (so that the autonomy of modules of grammar is respected). These "tops-together" parallel representations will handle bracketing paradoxes, shed new light on the nature of Bracket Erasure, and explain syntactically-relevant morphological incorporation within a constrained morphology-syntax interface.

1. Minimal Theory of Morphology

Since the rise of the Lexicalist Hypothesis, the most constrained view of morphology (the null hypothesis) has been that morphological representations are always simple, strictly hierarchical tree representations, and that there are only two kinds of operations on these representations. First, there is morpheme addition, which is a phonologically-peripheral adjunction to the top (root) node of the morphological representation of the base. This is illustrated on the left of diagram (1), in which a pseudo-categorial-grammar notation is used to show the affix subcategorizations, and for convenience orthography is used instead of phonological representations:



Here /-ity/ cannot adjoin to a non-topmost A^{stem} or $\backslash A$ node, and there is no way to add /-ity/ non-peripherally between /-ic/ and /-al/ in the phonological string. Non-concatenative morphology, such as melody-to-skeleton association, prosodically-governed infixation etc. can be handled within a slightly expanded definition of "peripheral" (since these phenomena make reference to either the right or left edge of the bases to which they apply: McCarthy and Prince 1990).

The second operation is *Bracket Erasure*, in which a morphological (sub-)tree is simplified by deleting all nodes except the topmost node. Any categorial (morphosyntactic) information associated with the non-topmost nodes is lost, while the phonological information percolates to the topmost node. In any lexicalist theory the syntax only sees bracket-erased morphological representations, so that words are syntactically unanalyzable atoms. In the theory of Lexical Phonology, Bracket Erasure also occurs in the morphology between strata; this is shown on the right of (1) for the simplest version of Lexical Phonology (with only an early 'stem' or cyclic stratum, and a late 'word' or non-cyclic stratum – Kiparsky 1986).

2. Bracketing Paradoxes

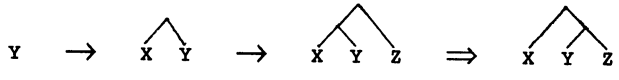
In Lexical Phonology, rules of morpheme-addition create successively larger domains for the application of phonological rules. If this assumption is combined with that of Level-Ordered morphology, the result is that the affixes which trigger cyclic and/or more deeply morphologized phonological rules must be added in earlier strata of the morphology/lexicon, while less phonologically cohering (relatively non-stem-affecting) non-cyclic affixes are added at later strata.

Here the phonological constituency of the well-known bracketing paradox *ungrammaticality* must be *un*[[*grammatical*]*ity*], where cyclic (stress-shifting) /-ity/ is be added at an earlier stratum than non-cyclic /un-/. But morphosyntax and compositional semantics requires [*un*[*grammatical*]]*ity* (/un-/ subcategorizes to attach to an adjective, not a noun, and /-ity/ has scope over /un-/, so that the word means 'the property of not being grammatical', rather than 'not the property of being grammatical'). In Lexical Phonology, *grammaticálity* would have undergone stem-level Bracket Erasure to unanalyzable [$_{N}$*grammaticálity*] (as on the right-hand side of (1) above) before the affixation of /un-/, so that this affixation could not derive the desired output constituency [$_{N}$[$_{A}$*un*[$_{A}$*grammátical*]]*ity*].

3. Types of Bistructural Derivations

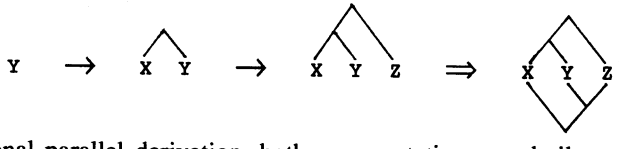
Most accounts of bracketing paradoxes are 'bistructural', i.e. represent the two conflicting constituencies separately (as opposed to the 'monostructural' theory of §1-2 above). There are several logical possibilities for representing two conflicting constituencies (the following typology is a modification and expansion of that in Sproat 1985). In a monorepresentational bistructural approach, one representation is built up during the course of a derivation, with a constituency reflecting the successive domains of morpheme-addition. The constituency of this representation is then transformed by a special operation, so that the two conflicting constituencies are never both represented at the same stage of the derivation.

2) Representation 1



In birepresentational approaches, both constituencies are represented simultaneously (i.e. the end result of the derivation is what has been called a 'parallel representation'). In a birepresentational non-parallel derivation, the second representation is derived from the first, after the first representation has been built up:

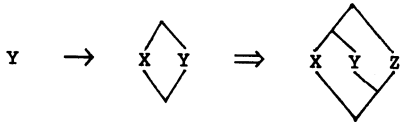
3) Representation 1



Representation 2

In a birepresentational parallel derivation, both representations are built up during the course of the derivation (here the representation of component **2** must undergo restructuring as part of the derivation):

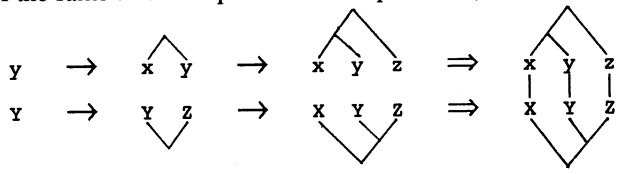
4) Representation 1



Representation 2

Finally, in a biderivational, birepresentational account the representation of each morphological component is built up separately, and the two representations are only correlated with each other after being fully derived. (In diagram (8), *x*, *y*, and *z* are the representations of three morphemes in component **1**, and *X*, *Y*, and *Z* are the representations of the same three morphemes in component **2**.)

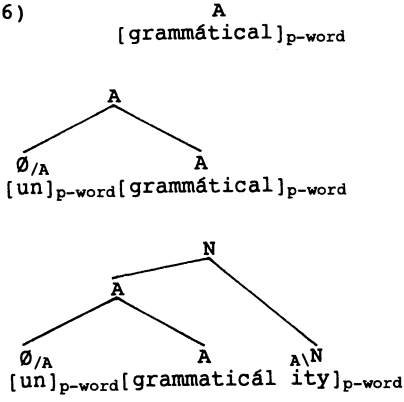
5) Representation 1



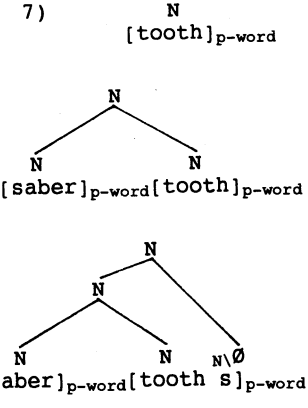
4. Prosodic Account of Cohn (1989), Aronoff and Sridhar (1983)

Aronoff and Sridhar (1983), Booij and Rubach (1984), and Cohn (1989) have pointed out that even the conventional morphological derivations of section 1 above are birepresentational in one sense: during the course of the derivation, a prosodic phonological hierarchy (syllable, foot, prosodic word) is built up which is independent of morphological constituency. Since the application of phonological rules can be restricted by such prosodic domains, these authors propose to explain bracketing paradoxes by identifying the domains within which the relevant phonological rules apply as far as possible with these prosodic categories (especially the prosodic word), rather than with the cyclic morphological domains created by successive morpheme-addition operations. So this is a birepresentational parallel derivation like that in (4) above. As in the theory of §1 above, morphemes are added in the order which reflects morphosyntactic/morphosemantic compositionality, and prosodic constituents are restructured by morpheme addition (such prosodic restructuring will take place anyway even in non-bracketing-paradox cases, such as *sabertooths* in (7) below, under almost any theoretical account).

6)



7)



Prosodic restructuring occurs in the last stage of the derivations in (6)-(7), where the affixes /-ity/ and /-s/ form a close prosodic constituent only with *-grammaticál-* and *-tooth-*, even though each of them is morphosemantically and categorially construed with the base as a whole. Here the former 'stem'-stratum rules of Lexical Phonology apply only within prosodic words (but not necessarily early in the derivation), while the former 'word'-stratum rules can apply across

the prosodic word boundaries within a lexical compound phonological word (what Cohn, using a somewhat unfortunate terminology, calls the 'clitic group').

In such an account of bracketing paradoxes, where the order of morpheme additions reflects morphosemantic/morphosyntactic considerations, and the domains of phonological rule application are derived by restructuring (do not reflect derivational history), Level Ordering is not obeyed. Thus in (6) the non-cyclic affix /un-/ is attached before cyclic /-ity/. However, Fabb (1988), Aronoff and Sridhar (1983), and Churma (1983), among others, have criticized strict Level Ordering. It has been observed that word/non-cyclic affixes are not always added outside stem/cyclic affixes, in English and other languages, and that most phenomena explained by Level Ordering in conventional Lexical Phonology can be accounted for by invoking selectional restrictions among affixes, marking of some affixes as [+Latinate] with subcategorization of affixes to attach only to [+Latinate], and by making a distinction between productive and non-productive inflectional endings. So such a 'morphology-driven, phonological-restructuring' account of bracketing paradoxes cannot be ruled out simply because Level Ordering is violated.

4.1 Problems for the Prosodic Account

This prosodic account has the advantages of being a very restrictive theory that differs very little from the minimal morphological theory of §1 above, and of using an independently-needed mechanism (the prosodic hierarchy of phonological theory). Unfortunately this account has some complications and inadequacies.

One problem is that the domains of phonological rule application for English cannot actually be expressed in purely prosodic terms. Only certain non-cyclic affixes form independent prosodic words, so that the remaining non-cyclic (or 'word') affixes must still be distinguished in a non-prosodic way from 'stem'/cyclic affixes. Thus the domain of the former cyclic or 'stem'-stratum rules must have a non-prosodic restriction in the new theory: such rules will apply only between a stem and an adjacent 'stem'-affix within the prosodic word. So the unification of early-stratum with prosodic-word-domain rules is not complete.

Also, there are general problems with any 'morphology-driven, phonological-restructuring' approach. The first problem is shown by a reduplication process in Tagalog (discussed in Carrier-Duncan 1984:279-80,285 and Marantz 1982:477-80, and termed "R2 reduplication" by Carrier-Duncan). When this reduplication process applies to inflected CVCVC verb stems, as in forms such as *sundinsundin* 'obey somewhat' and *tiŋnantiŋnan* 'watch somewhat', the reduplication is a "moderative" derivational affix, which forms a categorial/semantic constituent with the bare verbal stem (such as /sunod/ or /tiŋin/), while /-in/ and /-an/ are inflectional "topic marker" affixes. The difficulty is that /-in/ and /-an/ must have been morphophonologically affixed before the reduplication applies, since they are copied by the reduplication. Furthermore, the phonological syncope of *sunod-* → *sund-* and *tiŋin-* → *tiŋn-* (triggered in the verbal stem by the presence of /-in/ and /-an/) must apply between the affixation of /-in/ or /-an/ and reduplication, since this reduplication never copies three syllables. But in Cohn's morphology-driven theory, where the order of word-building follows categorial/semantic constituency, the inflectional topic-marker suffix /-in/ or /-an/ would have to be added after the derivational reduplication has applied (since reduplication is an affix which forms a semantic constituent with the uninflected verb stem). But in this case, /-in/ or /-an/ would not yet be present to be reduplicated![1]

The second problem comes from cases of prefix-prefix bracketing paradoxes, inflection inside derivation, etc. where there are apparent discontinuous morphological constituents. Here a morphology-driven phonological restructuring account would lead to the phonologically unwanted operation of morpheme infixation at word-internal morpheme boundaries, as in Speas (1986) (the location of real infixation is always governed by prosodic factors).[2] Such an operation, e.g. /A+B/ → /A+C+B/, would allow A to interact phonologically with B, before C was added (where the only way to avoid this would be to abandon altogether the interleaving of morphological affixation operations with phonological rules).

The third problem is the case of 'suppletion paradoxes', apparently discovered by Sproat (1985). For example, in *underwent*, /under/ idiosyncratically modifies the meaning of the verb root, while morphological past tense modifies the meaning of the whole preverb-root compound.[3] In a phonological-restructuring account, /under/ must then be affixed before addition of the past tense to the verb root, leading to the phonologically unwanted operation of replacement of the phonological material [gō+d] by [wɛnt], as in Sproat (1985). Here /under/ could phonologically interact with /go/ before this replacement, so again we are messing up the phonology to accommodate the categorial/semantic side of the morphology.

So this simple morphology-driven phonological-restructuring account of Cohn (1989), and Aronoff and Sridhar (1983), with bistructural birepresentational parallel derivations (where the two parallel representations are the morphological and the prosodic), is not adequate. None of the three apparently distinct types of constituency in morphological/phonological derivations (the morphosyntactic/morphosemantic constituency, the successive cyclic domains (not necessarily prosodic) of phonological rule application, and the purely prosodic constituency of syllable, foot, prosodic word, etc.) can be eliminated.

5. Alternative Accounts

What are the possible alternatives to this prosodic account? Kiparsky (1983) proposes a monorepresentational bistructural theory of bracketing paradoxes (cf. (2) above), with 'phonology-driven morphological-restructuring' derivations (i.e. morphemes are added in the order which reflects successive domains of phonological rule application, so that /-ity/ is attached before /un-/ in the derivation of *ungrammaticality*, and it is the final morphosyntactic/morphosemantic constituency structure that does not reflect the derivational history of morpheme-addition operations). This avoids the problems with morphology-driven accounts listed in §4.1, but Kiparsky must posit the "rebracketing" of ill-formed intermediate representations such as [$_{N}$*un*[$_{N}$[$_{A}$*grammatical*]*ity*]] (where the subcategorization of /un-/ for an adjective is violated) to [$_{N}$[$_{A}$*un*[$_{A}$*grammatical*]]*ity*], introducing the powerful device of transformations into the morphological component. Also, since /un-/ and /-ity/ are affixes from different strata, the internal structure or bracketing [[*grammatical*]*ity*] must be an exception to Bracket Erasure, in order to survive into the next stratum to be available for "rebracketing" when /un-/ is added (Kiparsky 1983:25). As pointed out by Sproat (1984:111), one problem with this idea is that one might expect bracketing paradoxes to show exceptional phonological behavior, since their internal structure would be accessible to the phonology longer.

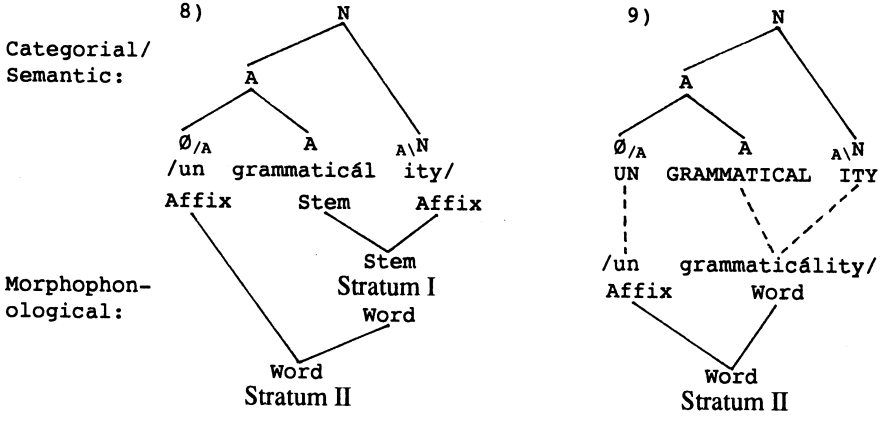
A birepresentational non-parallel account (cf. (3) above) would also introduce transformations into the morphology (such as Pesetsky's 1985 "affix raising" or Sproat's 1985 "operators"); and in Sproat's morphology-driven account, the

constituency of the successive phonological domains of rule application will have nothing to do with course of derivation, which is fatal for interleaving morpheme-addition operations with phonological rules (this is duly abandoned in Sproat 1985). In a biderivational account (cf. (5) above), for every word there would be two separate derivations, which would always exactly parallel each other, except in the case of bracketing paradoxes, leading to much needless duplication (see also the discussion of "bottoms-together separate terminals" parallel representations in §6 below). For all these reasons, this paper will adopt a 'phonology-driven, morphological-restructuring' theory with birepresentational parallel derivations (cf. (4) above), resulting in some type of parallel morphological representation.

6. Bottoms Together Parallel Representations

The advantage of parallel representations is that the different constituencies required by the different aspects of morphology can be represented simultaneously. But there are actually several types of parallel representations. Sproat (1984) and Chelliah (forthcoming) adopt parallel representations in which different constituencies are built up from a shared set of terminal nodes, as in (8) below; my term for this type of structure is a "bottoms-together shared terminals" parallel representation. A problem here is that the parallel representations of the two subcomponents interface through their terminal nodes, so that the internal details of the representation of one component are accessible to the other component; this strong interaction violates the principle of autonomy of components of grammar.[4] And in this theory every word has parallel representations, but these have no function except to account for the few bracketing paradox cases. Also, this approach does not extend to apparent cases of discontinuous morphological constituency.

To represent inter-stratum Bracket Erasure (or suppletion paradoxes such as *underwent*) in a "bottoms-together" manner, one would have to use a representation like (9) (which would be the output of stem-level morphophonological Bracket Erasure, as in the right-hand side of (1) above), where the two parallel representations do not share terminal nodes (as in the structures of Sadock's 1991 Autolexical Syntax). This allows additional degrees of freedom, and the result, as with the transformations of §5 above, would be a too-powerful morphology.



7. "Tops-Together" Parallel Representations

In this paper, I will use a new type of parallel structure in which the representations of the different sub-components of grammar interface only through their root (topmost) nodes (thus the name "tops-together" parallel representations). The vertical double line in the schematic representations in (10) indicates only that the whole tree dominated by the topmost node of one component corresponds to the whole tree dominated by the topmost node of the other component; no correspondences between sub-trees or terminal nodes of the two components are directly encoded. Therefore the access which each sub-component has to the internal structure of the representations of the other sub-component is at a minimum. So "tops-together" parallel representations (unlike those in (8) above) are compatible with an autonomous modular relationship between the components of grammar.

10)

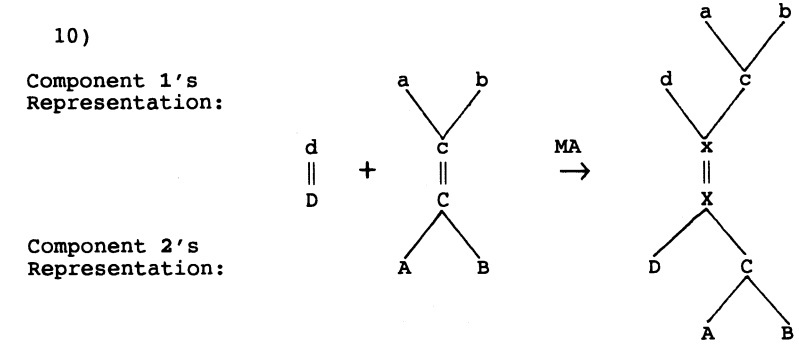
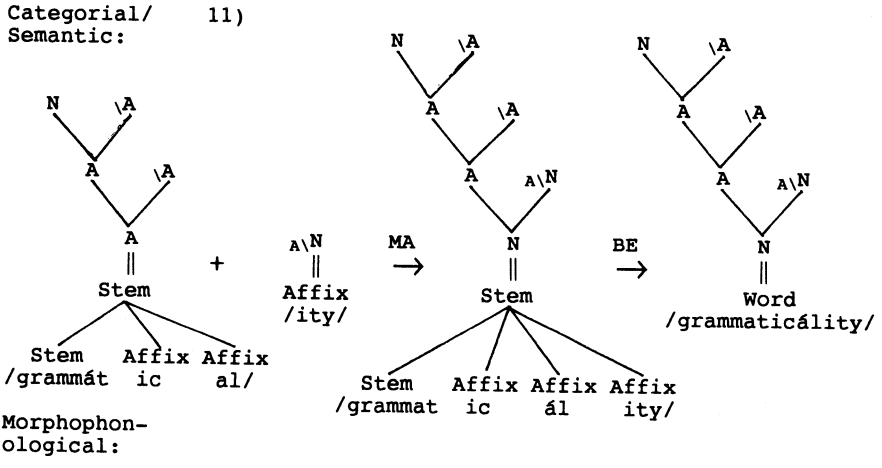


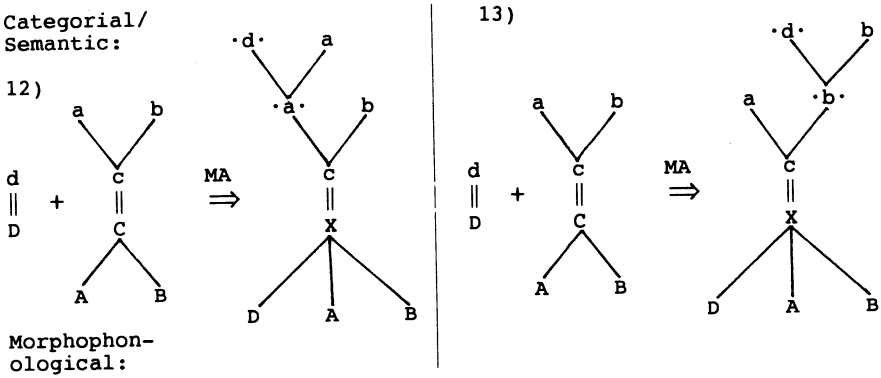
Diagram (10) schematically represents normal "non-paradoxical" word-building (as in (11) below). Here adjunction to the topmost node of the representation of the base occurs in both components, so that the former topmost nodes in each component are no longer topmost, and thus no longer directly connected (e.g. on the right hand side of (10), after the morpheme whose representation is *d* in component **1** and *D* in component **2** has been added to the base, there is no longer any direct indication that subtree *c* corresponds to subtree *C*, or that *d* corresponds to *D*). Thus the word-building operation in (10) actually *destroys* information, automatically accomplishing a part of what has been attributed to Bracket Erasure in Lexical Phonology, as a normal part of word-formation. It will get progressively harder to indirectly reconstruct the correspondence between a morpheme's two representations as they move away from each other in the course of a derivation, since the root node is the most accessible part of each component's representation.

Here is an actual linguistic example, the last morpheme-addition operation in the derivation of *grammaticálity* (the "tops-together" counterpart of the left side of (1) above). On the left of (11) one can see how a morpheme's two representations (e.g. /-ic/ in the morphophonology and the most deeply embedded $\backslash A$ node in the categorial/semantic representation) become more separated with each successive morpheme addition; since the two are not directly connected, a "tops-together" representation contains *less* information than a conventional representation such as [[[[*grammat*$_N$]*ic*$_A$]*al*$_A$]*ity*$_N$] in (1) above. One difference between (10) and (11) is that there does not seem to be any need for a hierarchical morphophonology.

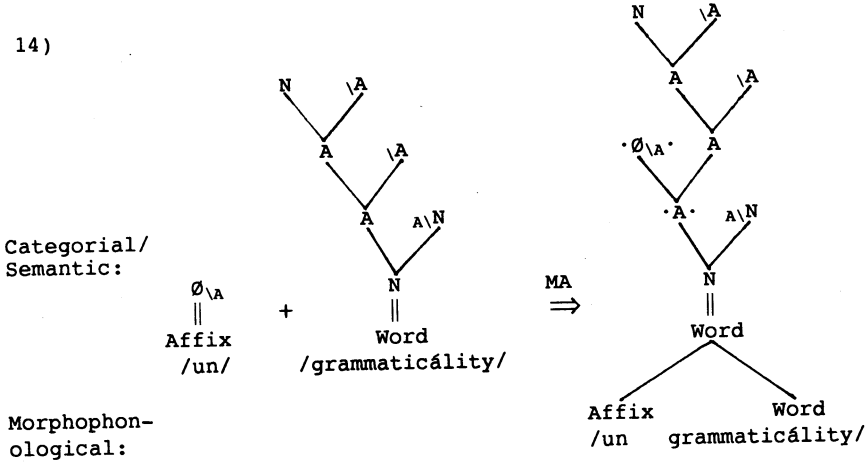


On the right-hand side of the first derivation in (11), the fact that the stem *grammatical* is an adjective is no longer directly represented (only that the overall stem *grammaticálity* is a noun). This automatic dissociation between morphosyntactic constituency and phonological constituency, is both stronger and weaker than Lexical Phonology's Bracket Erasure. It is stronger because it occurs as an automatic consequence of the "tops-together" word-building operation, (10), while Lexical Phonology's Bracket Erasure can be put off until the end of a morphological stratum, and can have exceptions even then (as in Kiparsky's analysis in §5 above). But the effect of (10) is also weaker than that of Lexical Phonology's Bracket Erasure (1), since (10) only destroys information about the *correspondences* between the morphophonological and categorial/semantic representations without simplifying the two representations themselves. Therefore the "tops-together" theory will still have an explicit counterpart to the Bracket Erasure of Lexical Phonology in (1) above; this operation will simplify the morphophonology without affecting categorial/semantic structure, as seen on the right side of (11).

So in the "tops-together" theory, categorial/semantic structure can remain accessible even when the corresponding morphophonological structure is no longer accessible, since these two aspects are represented separately. Here bracketing paradoxes and discontinuous constituency cases are derived by word-building processes in which the categorial/semantic representation of the morpheme that is being added is adjoined *within* the categorial/semantic representation of the base (rather than being adjoined to its topmost node). This is more marked than normal word-building (10) since it directly manipulates non-topmost (component-internal) structure. In bracketing paradoxes, the categorial/semantic representation adjoins to that of the base as the leftmost node, and the morpheme's morphophonological representation is also adjoined as a leftmost node, as in (12); here the constituency in the representation of the categorial/semantic component on the right side of (12) is $((d{=}D,a{=}A),b{=}B)$, despite the fact that in the course of word-building the morpheme $d{=}D$ was added to the base $(a{=}A,B{=}b)$. Discontinuous constituency is still more marked than bracketing paradoxes; here adjunction violates the "leftmost/leftmost" constraint.[5] In the following schematic derivations, the nodes that are added to the representation of the base are flanked by "•" marks:



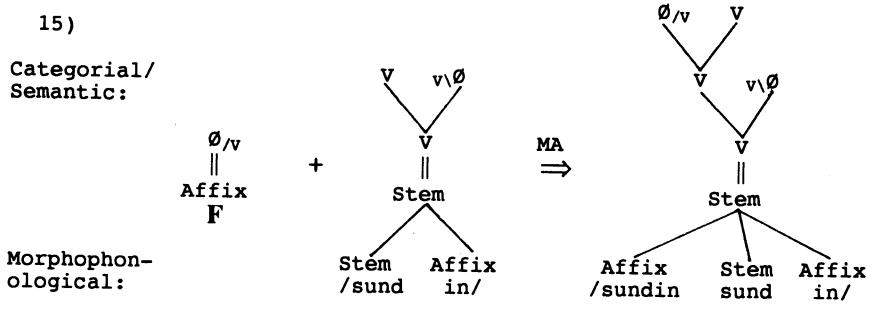
Using the operation of (12), bracketing paradoxes can be explained even with strict Level-Ordering and stratum-final Bracket Erasure (although Level-Ordering is not a necessary part of the "tops-together" theory of morphology):



In this account there is nothing whatever exceptional about the input to /un-/ affixation, whereas in Kiparsky's account bracketing paradoxes with affixes from different strata must be at least partial exceptions to Bracket Erasure, as discussed in §5. The operations in (10) and (11) clarify the various functions of Bracket Erasure (dissociating morphosyntactic and phonological constituency vs. making the morphophonology underived). Operations (12) and (13), unlike (10), result in "tops-together" representations which have no equivalent non-parallel representations. (Note that the possibility of adjoining to a non-topmost or non-peripheral node of a representation will only be permitted in the categorial/semantic subcomponent. This difference between the two sub-components can be explained by the non-hierarchical nature of the representations of the morphophonology.)

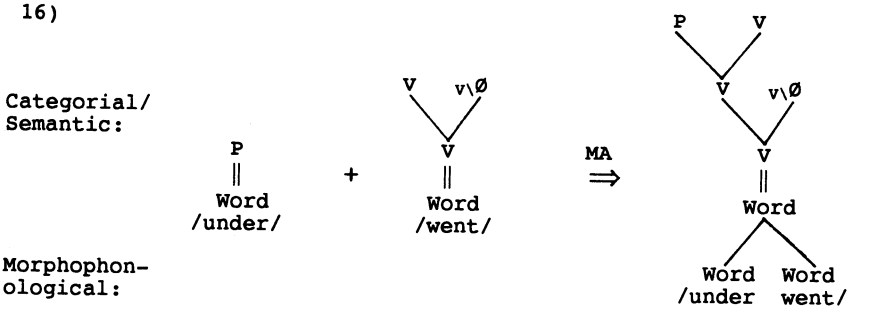
Tagalog R2 reduplication, discussed in §4.1 above, is essentially the same as (14), but here there is more unequivocal evidence of the derivationally earlier morphophonological affixation of the wider-scope suffix:[6]

15)



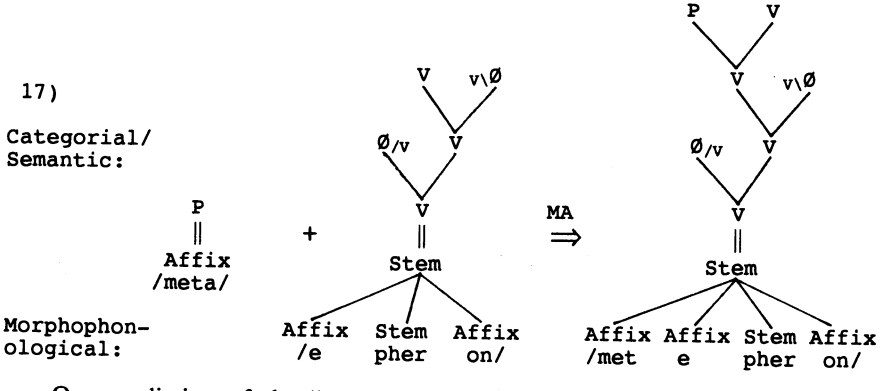
Suppletion paradoxes also involve the application of operation (12), but here the item /went/ has a complex categorial/semantic representation in the lexicon:

16)



Discontinuous morphological constituency cases often also involve preverbs and inflection, but the inflection is found between preverb and verb. Here the Greek verb *met-e-pher-on* 'among/with-PAST-carry-1ST.SING.ACT.' "I was transferring/changing (*transitive*)" is derived using operation (13) above (this is a relatively simple case analogous to the much more complex Athabaskan verb):

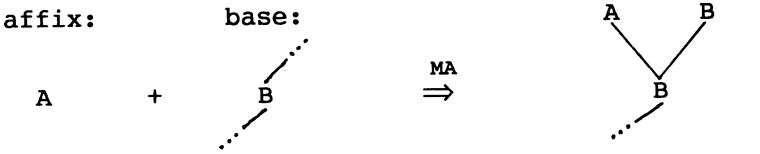
17)



One prediction of the "tops-together" theory is that a categorial/semantic element which adjoins to the non-topmost node of a categorial/semantic repre-

sentation must not change the lexical category of what it adjoins to (cf. (18) below), since the categorial subcategorization requirements of affixes must be satisfied at all stages of the derivation. Thus category-changing derivational affixes should not be able to cause bracketing paradoxes or discontinuous constituency. This prediction is borne out, as far as I am aware.

18)

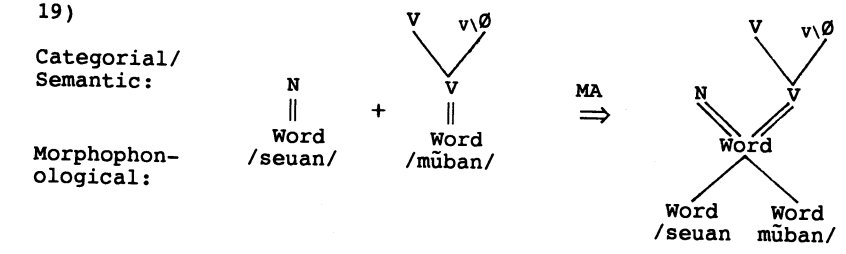


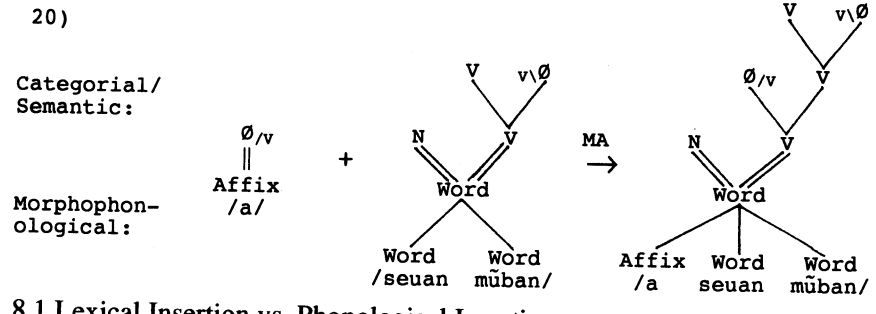
So in this "tops-together" theory the mechanism for handling bracketing paradoxes, (12), is not very different from the operation used in non-paradoxical cases of word-building, (10): the difference between (11) and (14) is only one of adjoining within the morphosemantic tree vs. adjoining at the top. It can be postulated that (12) is a more marked case because the topmost (root) node is the most accessible node in the categorial/semantic representation. And "tops-together" parallel representations are not motivated solely by the need to handle bracketing paradoxes, but also contribute to the theory of Bracket Erasure.

8. Syntactically-relevant Morphological Incorporation

The phenomenon of "incorporation" is where two word-stems have been combined into a single morphophonological word by a word-formation process that appears to be a simple case of compounding or affixation (*not* cliticization), from the viewpoint of morphophonology (purely external form). However, the two remain syntactically separate entities (two syntactic heads, or $\mathbf{X}^0$ categories). So the $\mathbf{N}^0$ head of a noun phrase object can be morphologically incorporated into its governing verb (but remain syntactically independent), leaving the rest of the NP behind (determiners, adjectives, etc.), as in Southern Tiwa *Yede a-seuan-mũ-ban* 'that 2SING.-man-see-PAST' "You saw that man" (Baker 1988a:93). This is as if the components of English **N-V** compounds, such as *to baby-sit, to grocery-shop*, or *to bar-tend*, were individually accessible to the syntax, so that the **N** could be modified by a "stranded" external determiner, adjective, or complement.

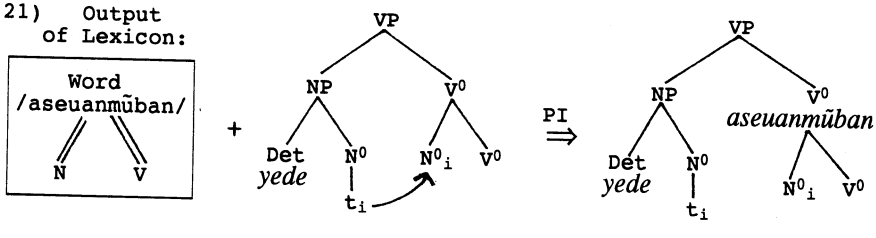
In the "tops-together" theory, syntactically-relevant morphological incorporation will be handled with an operation which unites two morphological representations into a single morphophonological entity, but which does not relate the two categorial/semantic representations to each other within the categorial/semantic component of the morphology. Thus in the following derivation of an incorporated lexical item, in the output of incorporation on the right side of (19) the topmost node of the single morphophonological tree is associated (in a somewhat autosegmental sense) with both the topmost nodes of the *two separate* representations in the categorial/semantic component. (Cases of multiple incorporation could be handled through the recursive creation of branching association structure, again without any categorial resolution within the morphology/lexicon.) Note that the derivation of discontinuous morphological constituency in (20) is not a violation of the leftmost/leftmost constraint, since /a-/ adjoins leftmost within the categorial/semantic representation of **V** (the separate categorial/semantic representations of the **V** and **N** are probably linearly unordered). (For simplicity I have assumed here that /-ban/ is a stem-level affix, without any particular evidence.)





8.1 Lexical Insertion vs. Phonological Insertion

In an incorporated form, the only thing accessible to the syntax, after all Bracket Erasure, is the association between the entire morphophonological entity (a phonological string of morphophonological category *Word*) and the two syntactic categories, exemplified on the left side of (21) (this is graphically inverted with respect to diagrams (19)-(20) above) – cf. Lapointe (1987). This complex item generated by the lexicon can be inserted (by a graph unification operation) into the N^0-adjoined-to-V^0 syntactic configuration resulting from Baker's syntactic rule of head-to-head movement. Here it is necessary to assume that a lexical item's phonological representation is *not* handed over at **D**-structure (since the syntax has no use for this information). Instead, the lexicon will only hand over non-phonological information for insertion at **D**-structure, and at the end of the syntax, the syntax will "inquire" of the lexicon what the phonological representation of each word is, in order to convert **S**-structure into the input to **PF**. This delayed phonological insertion is exactly the phonology-syntax interface argued for in Hayes (1990), where he applies the same principle to the members of inflectional paradigms, and to phrasal contextual phonological variants of a word. (Cf. also the "phonology-free syntax" of Pullum and Zwicky 1989.) So in the "tops-together" account of incorporation, word-formation operations are not interspersed with syntactic rules, and the syntax is ignorant of phonology, unlike in Baker (1988b).



9. Conclusion

This paper has argued for a new type of representation in the morphology, "tops-together" parallel structures, in order to account for syntactically-relevant morphological incorporation in a way compatible with the Lexicalist Hypothesis (i.e. a constrained morphology-syntax interface), and to handle bracketing paradoxes within a constrained theory of the internal structure of the morphological component. Unlike previously-proposed types of parallel representations, a "tops-together" structure respects the autonomy of the two sub-components of grammar (since their two representations interact only weakly through shared root nodes, rather than strongly through shared terminal nodes). The possible discrepancies between the representations of the morphophonological and categorial/semantic subcomponents of morphology are severely restricted by adopting non-hierarchical peripheral-adjoining morphophonology, the requirement that categorial subcategorizations be satisfied at all stages of the derivation, and the leftmost/leftmost constraint. In both bracketing paradoxes and incorporation, categorial/semantic structure can remain accessible even when the corresponding morphophonological structure is no longer accessible. An advantage of the "tops-together" theory is that it never complicates the phonology to accommodate morphological discongruities (as with Speas' morphemic "infixation", Sproat's replacement of the phonological material [gō+d] by [wɛnt], and Kiparsky's exceptions to Bracket Erasure). The "tops-together" theory is also compatible with Lexical Phonology's interleaving of morpheme affixation operations and phonological rules, and disentangles and clarifies Bracket Erasure's various functions in Lexical Phonology.

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1 To account for such forms, Cohn would have to resort to the device of attaching an abstract reduplication marker morpheme to the verb stem, which would be phonologically realized only *after* the topic suffixes had been added.

2 Sproat actually uses *forwent*; presumably *underwent* serves just as well here.

3 Evidence in Hyman and Mchombo (1992) suggests allowing the non-prosodic circumscription of a morpheme at the edge of a word for morphophonological processes such as infixation. However, this limited relaxation of the prosodic nature of circumscription (McCarthy and Prince 1990) would not allow the unrestricted morphemic infixation necessary for the Athabaskan verb in the theories of Speas (1986) or Kari (1992).

4 The "informational encapsulation" of modules in Fodor (1983).

5 Linear order is present in the categorial/semantic representation only to be able to constrain discrepancies between the two representations. Note that the categorial counterpart to the right side of (11) is delayed until the end of the lexicon.

6 Here **F** means that the morphophonological representation of the reduplicative affix can be thought of as roughly a foot template (though there are complexities involved in the exact specification of this particular reduplication process).

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A fine-grained approach to "double-barreled" adjectives

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> I regret to see that vile and barbarous vocable *talented*, stealing out of the newspapers into the leading reviews and most respectable publications of the day. Why not *shillinged*, *farthinged*, *tenpenced*, etc.? The formation of a participle passive from a noun, is a licence that nothing but a very peculiar felicity can excuse. . . . Most of these pieces of slang come from America.
>
> — Coleridge, *Table Talk* (1837), quoted in Hirtle (1970)

The construction that upset Coleridge is in fact ancient and pervasive (Jespersen, 1942, Hirtle, 1970). Many instances of it in modern English, unlike *talented*, are compounds, with an adjective or noun modifier preceding the noun to which *-ed* is suffixed, as in (1):

(1) green-eyed, warm-blooded, six-legged, snub-nosed, narrow-minded, marble-floored, rubber-soled, double-barreled, many-splendored

It is apparent that the suffix *-ed* in these adjectives is not the inflectional *-ed*, but a derivational morpheme affixed to nominals, as the nonexistence of the verbs *to blood*, *to leg*, *to nose*, *to splendor*, etc. attests. Even when a homophonous verb-noun pair exists, this construction is demonstrably distinct from the participial adjective – a *light-skinned* person is not a *skinned* person (Hirtle, 1970), and the modifier of a participle is adverbial, not adjectival, as the contrasts in (2) show:

(2) *warmly/warm blooded animals, *narrowly/narrow minded people (*cf.* competently/*competent staffed agencies)

Although the process forming these double-barreled adjectives seems fairly productive, there are clear constraints on the kinds of nouns and modifiers that produce admissible compounds of this sort. I will discuss two sets of constraints in this paper, the first semantic and the second morphological.

The principal semantic constraint is that the head noun of double-barreled adjectives is prototypically a body part; this can be extended in partially predictable ways to abstract human qualities, and to objects that can be viewed metaphorically as parts of bodies. In its graded and partially predictable nature, this constraint reflects the radial category structure discussed by Brugman and Lakoff (1988) and Lakoff (1987). A second constraint limits modifiers of double-barreled adjectives to numerals and those denoting the head's more or less permanent or inherent properties, though here too there are occasional exceptions.

The morphological constraints concern the status of compounding in the formation of double-barreled adjectives. Standard views of compounding in English

(Kiparsky, 1982, Mohanan, 1986, Liberman and Sproat, 1992) assign this process either to level 2 morphology or to the domain of syntax, and assume that the elements of compounds are stems which stand on their own lexically. I argue here that the compounding in double-barreled adjectives takes place earlier, in level 1 morphology, and that the resulting compounds are, like roots, morphologically dependent, in the sense of Inkelas (1989). Bloomfield (1933) hints at a similar view, in the following passage, quoted in Kiparsky (1982):

> ". . . forms like *long-tailed* or *red-bearded* are not aptly described as containing the words *tailed, bearded* (as in *tailed monkey, bearded lady*); the natural starting point is rather a phrase like *long-tail* or *red-beard*, from which they differ by the presence of the suffix *-ed*."

This hypothesis is incorporated in the following three claims, which I claim account for the morphological peculiarities of double-barreled adjectives:

(3) a. Double-barreled adjective formation is a lexical level process.

b. The compound form in the course of this process is morphologically dependent, and it is this compound, not only the head noun, which combines with the *-ed* suffix.

c. The compounding involved in double-barreled adjective formation takes place at level 1 of morphology.

I will argue for (3)a on the basis of the consistent assignment of primary stress to the first element (i.e., the modifier) in almost all double-barreled adjectives, as well as the impossibility of elements intervening between the modifier and the head noun. The claim in (3)b also is supported by the facts regarding stress, and by semantic considerations that depend on compound formation preceding *-ed* affixation for their interpretation. Morphological dependence is motivated by the impossibility of iterated double-barreled adjectives, in which respect they differ from noun-noun compounds. Finally, I argue for (3)c by showing that level 2 affixation within each element of a double-barreled adjective is at best marginal, though judgements on this show some variation among speakers. I then present rules within the framework of Inkelas (1989), which embody these claims; these rules imply that the compounds formed in the course of double-barreled adjective formation resemble roots in their morphological dependence, but differ from other roots in being derived constituents endowed with prosodic structure.

2. Semantic constraints

As mentioned above, double-barreled adjective formation is a productive process, but sometimes the results are somewhat peculiar-sounding. Consider the examples in (4):

(4) white-shirted, wool-rugged, six-roaded, broken-trucked, lousy-teachered

I can see no phonological or morphological basis for the oddity of these examples, so I will now suggest some semantically based ones. In compiling lists of double-barreled adjectives it becomes apparent that large numbers of them refer to parts of the body, as in (1). Nonetheless, many have other meanings, so that it is not correct to claim that this is their sole semantic domain. I have attempted to provide a rough semantic classification of various double-barreled adjectives in (5).

(5)

ABSTRACTNESS	POSSESSIONS	BODY PARTS		PARTS OF INANIMATES	
		HUMAN	ANIMAL	CLOTHES	STRUCTURES
	landed	snub-nosed dark-haired green-eyed six-fingered	sulphur-crested ivory-billed eight-legged winged	hooded short-sleeved pinstriped polka-dotted	high-beamed marble-floored steel-hulled
	moneyed	BODY CAPABILITIES			
		keen-sighted			six-sided
		sure-footed			double-edged
		able-bodied		multi-hued	
	cultured	weak-kneed			
	gifted	MENTAL CAPABILITIES AND CHARACTERISTICS		many-splendored	
	talented			fine-grained	
		kind-hearted lily-livered two-faced small-minded	long-winded mean-spirited quick-witted bad-tempered	detailed	

The vertical dimension in (5) corresponds to abstractness; the words toward the bottom tend to describe more abstract qualities. Along the horizontal dimension are arrayed various semantic domains more or less related to human body parts, the domain in which the largest cluster of these adjectives is found. This diagram resembles the cognitive topologies that Brugman and Lakoff (1988) and Lakoff (1987) have discussed; various meanings are related through metaphors and metonymies. Starting with the column labeled BODY PARTS, we see words like *snub-nosed* and *dark-haired.* These types of adjectives occur frequently in animal names as well as descriptions of humans, as birdwatchers know. *Sulphur-crested cockatoos* and *ivory-billed woodpeckers* are just two of many examples. Moving down the column, to more abstract capabilities of the body and its parts, we find terms like *sure-footed* and *keen-sighted.* Still more abstract are various mental capabilities and characteristics, at the bottom of the column. Two types of metaphor appear to be at work here. In some of these words, the term for a body part is used metaphorically to refer to a disposition, while in others the metaphor seems to be that of possessing a mental quality like *wit* or *spirit* just as one possesses arms and legs.

In the columns further to the right are terms describing various types of inanimate objects that might be seen as analogous to the body. Again, these range from fairly concrete to abstract, and some of the abstract ones in the lower right may simply be exceptions to the classification, since their meanings are quite broad.

In the left-hand column are terms referring to possessions, again ranging from concrete to abstract. Note that they are all dispositional; someone who happens to be carrying around a lot of cash would not be described as *moneyed*; rather, it means something like *rich*. This brings up another common feature of almost all double-barreled adjectives – they describe things that are possessed inalienably, like body parts. This may be why some of the examples in (4), such as *white-shirted* and *wool-rugged* are peculiar. Shirts are not inallienably possessed by people, nor are rugs an inherent part of floors or rooms. Along the same lines, note that *gifted* cannot describe someone who has received a lot of presents – it refers to one's inalienable capabilities and talents. Most of the modifiers in (5) are either quantifiers, or refer to persistent or dispositional qualities of the head noun. Thus the adjectives *tired-bodied* and *dirty-sleeved* sound aberrant, though there are exceptions like *bare-chested*, *empty-handed*, and *open-mouthed*, which are fully acceptable.

Thus, the oddity of many double-barreled adjectives that morphologically well-formed, such as those in (4), lies in their semantic distance from the prototypical case of a double-barreled adjective in which the head denotes a body part and its modifer is persistent, dispositional, or quantificational. Because various departures from the prototype are allowed and deviance from it is a matter of degree, varying judgements of acceptability are to be expected in marginal cases. For example, shirts may be more closely connected with their wearers than watches, so that *white-shirted* sounds more natural than *Swiss-watched.* Examples that bear little resemblance to the prototypical case, such as *lousy-teachered class*, *broken-trucked driver*, or *six-roaded intersection*, sound rather bizarre.

3. Morphological constraints

I will now turn to the morphological analysis of double-barreled adjectives. The following discussion draws on the work of Inkelas (1989) on lexical phonology and morphology, in which both morphological and phonological constituent structures are posited at each level of lexical derivation (these will be indicated by m and p subcscripts respectively). Rules of morphological and phonological constituent formation (MCF and PCF) apply at each level to material that is not yet organized at that level (the designations α and β will refer to rules and constituents at levels 1 and 2 respectively, and no independent specification of levels is necessary).

The form of the argument is this: first, I show that double-barreled adjective formation is a lexical, not a phrasal, process. If this is so, then the question of ordering between the two processes of *-ed* affixation and compounding of the

modifier and head arises. I argue that the compounding precedes *-ed* affixation in the derivation of these words, and that a morphologically dependent compound headed by a noun exists at some stage of double-barreled adjective formation. Furthermore, the evidence suggests that this compounding takes place at level 1, before level 2 affixes can apply to either of the words of the double-barreled adjective.

One indication that double-barreled adjective formation is lexical and not phrasal is their uniformly assigned modifier (lefthand) stress[1], which suggests a lexical level syntactic constituent (Liberman and Sproat, 1992). If double-barreled adjective formation were phrasal, then we would expect that main stress would fall uniformly on the righthand element, under the Nuclear Stress Rule. If it is a lexical process, however, the NSR would not apply, and we would not expect a righthand stress pattern in double-barreled adjectives. (Compound adjectives other than double-barreled adjectives may be syntactically phrasal, such as *pale green, brand new, revenue neutral*, or *formal semantic*, which have main stress on the final element and secondary stress on the initial one, or lexical, such as *northwest, well-intentioned, heartfelt*, or *praiseworthy*, in which only one main stress is present.) This argument parallels that made by Liberman and Sproat with regard to phrases used as epithets; for example, in:

(6) Hey, bíg mouth!

the main stress is on *big*, whereas in:

(7) You've got a big móuth.

the main stress is on *mouth*. Liberman and Sproat suggest that the difference in stress in this case and related ones is a consequence of the lexicalization of epithets and related constructs, such as place names.

Furthermore, no material may intervene between the elements of double-barreled adjectives, so that forms like *so kind a hearted man* or *strong and fair-minded* (meaning 'strong-minded and fair-minded') are ill-formed[2]. Lastly, unlike phrasal processes, no iteration is possible in the process of double-barreled adjective formation; thus forms like *green-eyed-headed* or *eight-long-legged* are ill-formed.

We have established, therefore, that double-barreled adjectives are derived lexically. Since double-barreled adjective formation involves both a compounding process and an *-ed* affixation process, there are two altenative orderings to consider; compounding either precedes *-ed* affixation to the head noun, or follows it, but in any case both are lexical processes, not phrasal ones.

The first alternative is preferable to the second on several counts. First, the hypothesis that double-barreled adjective formation is lexical implies that their stress is not assigned by the Nuclear Stress Rule, but does not in itself predict the uniformity of stress assignment that we observe. The ordering of compounding

before *-ed* affixation, however, does entail this uniformity. After compounding, the modifier will receive main stress through the same rules that assign stress to the lefthand element in other syntactically lexicalized noun-noun and adjective-noun compounds (Liberman and Prince, 1977, Liberman and Sproat, 1992). Subsequent affixation of the stress-neutral *-ed* does not affect stress assignment. The contrasting derivations of double-barreled adjectives and other compound adjectives is nicely illustrated with forms containing the root *multi-*, which differ in stress:

(8) a. múlticolored, múlti-legged, múlti-pronged
b. multicúltural, multi-éthnic, multiláteral, multi-strátal

The examples in (8)a generally bear main stress on the first syllable of *multi-* (although main stress on the second element seems possible in some cases also). Those in (8)b, however, may never bear main stress on *multi-*, but only on the second element. The difference is explicable if the double-barreled adjectives in (8)a are assigned stress at a stage when they are noun-headed, which the adjectives in (8)b never are. At that stage, the Compound Stress Rule will apply to the forms *multi-color*, *multi-leg*, and *multi-prong*, assigning stress to the first syllable of *multi-*. Such a stage will arise if compounding precedes *-ed* affixation, but not not under the reverse ordering.

In addition, the absence of terms like *warmly-blooded*, as opposed to *warm-blooded*, is predicted under the first ordering but not the second, because *blooded* is presumably an adjective which we would expect to take an adverbial modifier if the second alternative were correct. The term *warmly-blooded* could only mean something like 'blooded in a warm fashion'. Hirtle (1970) provides several parallel examples, which demonstrate that the modifer in double-barreled adjectives modifies the noun head before *-ed* affixation. Furthermore, there are examples of double-barreled adjectives that are quite clearly derived from a previously existing compound, such as the following:

(9) pot-bellied, polka-dotted, pinstriped

In form and meaning these appear to come from the lexicalized compounds *pot-belly*, *polka dot*, and *pinstripe* respectively, as the first alternative would have it. Assuming that the same processes form the examples in (9) and other double-barreled adjectives, this supports the ordering of compounding followed by affixation.

The next issue I will consider is the level at which compounding takes place. A standard view of compound formation in English (Kiparsky, 1982) is that it takes place at level 2, and Mohanan (1986) has suggested that it takes place at a distinct level 3. I propose that the compounding involved in double-barreled adjectives takes place earlier, at level 1, and that unlike other compounding processes in English, it results in a morphologically dependent constituent – essentially, a derived root. There are two considerations that lead to this view. The first one is that ordinary level 2 processes of compounding and suffixation cannot precede the

formation of double-barreled adjectives in a derivation. Consider the level 2 affixes *-ing*, *-ly*, and *un-*, and note the contrasts in (10):

(10)	wood-floored	*wood-flooringed (*cf.* high-ceilinged)
	warm-hearted	*warm-feelinged
	web-footed	??webbing-footed
	kind-hearted	*kindly-hearted, *unkind-hearted
	even-tempered	*uneven-tempered

Secondly, compounding in either element of a double-barreled adjective yields at best questionable results, as the examples in (11) show:

(11)	keen-sighted	?keen-eyesighted
	heavy-browed	?heavy-eyebrowed
	heavy-beamed	*topheavy-beamed

These two observations make it difficult to maintain that the compounding involved in double-barreled adjectives takes place at level 2. If it did, we would expect these examples to be perfectly good, because ordinary compounding can apply cyclically and there is nothing to block it from applying several times until *-ed* affixation ends it. Likewise, the examples in (10) could have the suffixes applying on one cycle, followed by the double-barreled compounding and *-ed* affixation on the next.

Thus I propose that double barreled adjectives are a level 1 construct, at least at the compounding stage. This blocks all of the ill-formed examples in (10) and (11), while at the same time allowing such examples as (12), in which level 2 affixes occur outside the *-ed*:[3]

(12) left-handedness, single-mindedly

Still, if we posit a compounding process at level 1, we need to prevent it from applying repeatedly, as before. The solution to this problem lies in the morphological dependence of the nominal compound formed at level 1. Starting with two stems, x_1 and x_2, a compounding rule constructs morphological and prosodic structures as in (13), again following the model developed by Inkelas:

(13) α P-Compounding

morph. const.		morph. const.	prosodic const.
$[x_1]m_\alpha$ $[x_2]m_\alpha$	——>	$[\,[x_1\ x_2]m_\alpha\ [\,]\,]$	$[x_1]p_\alpha$ $[x_2]p_\alpha$

The compounding rule posited in (13) creates a morphologically dependent compound of category α. Morphological dependence has two desirable consequences here. First, this compounding process cannot be iterated, because the morphologically dependent output may not serve as one of the inputs, which are specifically not dependent. Thus, forms like *green-eye-headed* and *six-finger-handed* are correctly ruled out. Additionally, morphological dependence accounts

for the requirement that *-ed* affixation to the resulting compounds will occur, since these compounds are not found without the *-ed*.[4]

The *-ed* affix that satisfies the output's subcategorization need not be distinguished from the *-ed* forming participial adjectives like *guarded* or *pointed*. Note that it would be undesirable to assign the output of *-ed* affixation in double-barreled adjective formation to level 1, because we would again face the problem of repeated compounding; the resulting adjective, no longer morphologically dependent, could serve as input for another cycle of compounding. For example, *green-eyed* could serve as a modifier of *head*, and we would therefore predict that forms such as *green-eyed-headed* would be perfectly acceptable. Since they are not, I will assume that the morphological subcategorization of *-ed* specifies that the resulting form is at level 2, as in (14):

(14) $[\,[\,]\,\text{ed}\,]_{m\beta}$

On the other hand, it is undesirable, on theoretical grounds at least, to delay *application* of *-ed* affixation until level 2. If the output of the α P Compounding rule in (13) advanced directly to level 2 without *-ed* affixation applying, it would still be morphologically dependent as it exited level 1. That is, its morphological subcategorization would still be unsaturated, which would be unlike the behavior of any other root. Therefore, the subcategorization in (14) does not specify the level of the complement of *-ed*, and affixation may take place at level 1 but yield a level 2 output. To illustrate, the following shows the derivation of the double-barreled adjective *green-eyed*:

(15) derivation of *green-eyed*

a. α MCF	$[\text{green}]_{m\alpha}$	$[\text{eye}]_{m\alpha}$
b. α P-Compounding	$[\,[\text{green eye}]_{m\alpha}\,[\,]\,]$ $[\text{green}]_{p\alpha}\,[\text{eye}]_{p\alpha}$	
c. α PCF	—	
d. Stress Rules	$[\text{green}]_{p\alpha}\,[\text{eye}]_{p\alpha}$ s w	
e. *-ed* affix		$[\,[\,]\,\text{ed}\,]_{m\beta}$ $[\,[\,]\,\text{ed}\,]_{p\beta}$
f. *-ed* Affixation	$[\,[\text{green eye}]_{m\alpha}\,\text{ed}\,]_{m\beta}$ $[\,[\text{green}]_{p\alpha}\,[\text{eye}]_{p\alpha}\,\text{ed}\,]_{p\beta}$	

The double-barreled adjective construction is thus unusual in English in that it involves a morphologically derived root, the noun-headed compound in step b of (15). Unlike underlying roots, these come furnished with a prosodic constituent structure, since they are derived, and therefore serve as a domain for phonological rules. This includes rules of stress assignment, shown in step d, which yield the uniform left-element stress discussed earlier.

Some people's judgements are more liberal than my own when it comes to the acceptability of multiple compounding in (11). My analysis of the ordering of compounding and *--ed* affixation suggests that, for these speakers, there is no level 1 compounding rule and the compounding in double-barreled adjective formation takes place in level 2. But we will still want to distinguish it from "normal" noun-noun compounding because of the morphological dependence of the resulting compound. Those speakers who find *keen-eyesighted* or *high-foreheaded* acceptable still don't accept *green-eyed-headed* or *eight-long-legged*. The unsaturated morphological subcategorization of the compound will block these, because it does not match the morphological requirements of the normal P Compounding rule.

4. Conclusion

Double-barreled adjectives provide evidence of a type of compounding that differs in two respects from that found in other morphological constructions in English. First, the compounding rule I have proposed in (13) appears to apply at an earlier stage than other types of compounding. Second, its output is morphologically dependent, and resembles a root in this regard. Unlike roots, however, these compounds are already endowed with prosodic constituent structure when formed, and are thus immediately subject to phonological rules. This situation is one that Inkelas's framework does not rule out, and double-barreled adjectives suggest that it should not be ruled out. Lastly, the combination of morphological characteristics and semantic constraints that apply to double-barreled adjectives serves to explain their productivity and, contrastingly, their relatively narrow range of uses.

Notes

I am particularly indebted to Cleo Condoravdi for extensive discussion and numerous suggestions, and to Sharon Inkelas, Tibor Lacsko, Will Leben, and Martha Swearingen for discussion and examples. None of these people necessarily agrees with what I have said here, however.

1. There are a couple of exceptions to this uniformity. *Double-barreled* appears to allow main stress on the first syllable of *barreled*, and *single-minded* behaves similarly. I do not know why these should be exceptional.

2. Jespersen (1942) cites examples like these, but they are not acceptable to any of the speakers I have consulted.

3. There is more to be worked out here, because prefixes like *un-* still cannot be affixed at this stage. For example, **un-kind-hearted*, meaning 'not kind-hearted', seems just as ill-formed as the meaning intended in (10), 'having an unkind heart'. Nothing that I say here rules out the first of these meanings.

4. Like *pot-belly* and *polka dot*, there are a few such compounds that may surface without an added *-ed*, such as *redeye*, *redneck*, and *sweetheart*. However, with the possible exceptions of animal names like *bottlenose* (a type of dolphin) or *ruby-throat* (hummingbird), and epithets like *big mouth*, these are uncommon and idiosyncratic, as the nonexistent *green-eye*, *strong-neck*, and *kind-heart* show.

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Morphologically-Mediated Relational Profiles

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1. The Landing Site Problem.[1]

The Relational Grammar view of universal grammar currently consists of a set of hierarchically-organized grammatical relations (1 > 2 > 3 > OBL); a list of possible constructions (e.g., advancements (OBL → 3, OBL → 2, 3 → 2, etc.) retreats (1 → 2, 1 → 3, 2 → 3), ascensions (POS → 2, POS → 3, etc.) and unions (downstairs 1 → upstairs 2, downstairs 1 → upstairs 3)), and some universal laws (Stratal Uniqueness Law, Oblique Law, etc.) that place constraints on the resulting structures. Research in Relational Grammar has yielded much new and interesting information about constructions in the world's languages. However, RG has made little attempt to "predict" the array of constructions found in one language versus another and thus has garnered complaints from practitioners of allegedly more explanatory theories, such as Government/Binding.[2]

Criticism of RG comes from two directions. First, no language yet discovered makes use of all of the possible revaluations (and combinations thereof) that need to be posited for Universal Grammar. For example, in Halkomelem (Gerdts 1988), advancements of the 3 → 2 and BEN → 2 type are found, as (1a) and (1b) show, but OBL → 3 advancement doesn't seem to exist, as (1c) shows.[3]

(1) a. ni ʔa.m-əs-θám̓ʔš-əs ʔə kʷθə pukʷ
aux give-adv-tr+1obj-3erg obl det book
"He gave me the book."

b. ni q'ʷəl-əɬc-θám̓ʔš-əs ʔə kʷθə sce.ɬtən
aux bake-ben-tr+1obj-3erg obl det salmon
"He baked me the salmon."

c. ni q'ʷəl-ət-əs kʷθə sce.ɬtən (*ʔə ɬə słeniʔ)
aux bake-tr-3erg det salmon obl det woman
"He baked the salmon for the woman."

We have a totally different situation in Georgian. Here, Harris (1981) shows that Georgian has a rule of BEN → 3 advancement (see (2b)).

(2) a. gelam šeḳera axali šarvali merabisatvis.
Gela-ERG he-sewed-it-II-I new trousers-NOM Merab-for
"Gela made new trousers for Merab."

b. gelam šeuḳera axali šarvali merabs
Gela-ERG he-sewed-him-it-II-I new trousers-NOM Merab-DAT
"Gela made new trousers for Merab."

However, unlike Halkomelem, Georgian apparently lacks BEN → 2 or 3 → 2. Our impression of RG is that it has too many "landing sites" for rules as they apply in individual languages.

Paradoxically, in other ways it seems that RG does not have enough landing sites. In RG, only 1s, 2s, and 3s are term relations. Furthermore, the Stratal Uniqueness Law (Perlmutter and Postal 1983) limits the number of term relations to one each per stratum. In addition, the Oblique Law (Perlmutter and Postal 1983) bans revaluations to OBL. This view runs head-first into Kinyarwanda data like (3a), where Kimenyi (1980) has shown that 2s, 3s, and BENs can simultaneously act like terms; for example, he shows that each can passivize, relativize, and incorporate as pronouns (see (3b)):

(3) a. Umugóre a-ra-he-er-a umugabo imbwa ibiryo.
woman she-pres-give-appl-asp man dog food
"The woman is giving food to the dog for the man."

b. Umugóre a-ra-bi-yi-mu-he-er-a.
woman she-pres-it-it-him-give-appl-asp
"The woman is giving it to it for him."

Kimenyi also gives cases of Instrumental applicatives where the 2, 3, and INSTR can simultaneously act like terms.

(4) Umugabo y-eerek-eesh-eje ábáana amashusho ímashiîni.
man he-show-instr-asp children pictures machine
"The man showed pictures to the children with the machine."

This has led Kimenyi to claim that multiple objects are possible in Kinyarwanda. However, if we abandon the Stratal Uniqueness Law as a universal construct, then we further complicate the landing site problem discussed above. The universally available list of constructions would not only include BEN → object advancement,

but also BEN → 2nd object, BEN → 3rd object, BEN → 4th object, etc. Our landing site problem would be worsened geometrically. In addition, we must explain why other languages—for example, Halkomelem, Ilokano, and Chamorro, lack multiple objects in parallel examples (see Gerdts and Whaley, in prep.). Furthermore, we need an explanation for why—even in Kinyarwanda—an unlimited number of objects is not possible. For example, Kimenyi (p. 113) notes that examples involving both Benefactive objects and Instrumental objects do not seem to exist. Thus we reach a stand-off.

Southern Tiwa presents another challenge for landing sites. Allen and Frantz (1983) show that sentences involving the verb *wia* 'give' come in pairs like (5a) and (5b).

(5) a. ti-khwien-wia-ban seuanide-'ay
1SG:3iSG-give-PAST man-to
"I gave the dog to the man."

b. ta-khwien-wia-ban seuanide
1SG:3iSG:3iSG-give-PAST man
"I gave the man the dog."

What we would like to say is that the recipient in (5a) advances to a term relation in (5b). In (5b) we see triple agreement, so we sould want to claim, as does Rosen (1990), that there is a final 1, 2, and 3 in (5b). But if *seuanide* 'man' is a final 3 in (5b), where did it advance from? After all, on semantic grounds, RG posits that recipients are initial 3s, so *seuanide* is already a 3 in (5a)! Thus, Southern Tiwa presents an interesting puzzle.

Taking what we have said so far about advancements in RG, we see, paradoxically, that there are both **too many** and **too few** places for advancing nominals to "land". I will refer to this as the Landing Site Paradox.

This problem is not unique to RG; Government/Binding theory has similar difficulties. The theory is constrained by the θ-criterion (Chomsky 1981), which excludes θ-assigned positions such as object and indirect object as landing sites. So, for example, *him*in *I believe [him to be a fool]*can not "raise" to become the object of the matrix verb *believe*. However, *him* can pick up object "effects" not by moving but rather by being exceptionally governed and therefore case marked by the higher verb. Baker (1988) gives a parallel treatment for a variety of object-effect constructions including applicatives, causatives, and noun incorporation. This approach, however is not easily extended to indirect objects. Thus, Baker does not

treat BEN → 3 advancement or other revaluations to 3 at all in his discussion. In various footnotes he questions the relevance of such phenomena for syntax. For example, he claims (1988: 489-90): "...RG has argued for rules changing benefactives to indirect (dative) objects. These could simply be instances where two different prepositions—the "benefactive" one and the "dative" one—happen to overlap in the range of theta roles they assign..."

But reviewing the relevant Georgian data, we find that more than case changes in BEN → 3 clauses. As Harris (1981) shows, advancees determine agreement and thus pro-drop (see (6b)).

(6) a. gelam šeḳera axali šarvali šentvis.
Gela-ERG he-sewed-it-II-I new trousers-NOM you-for
"Gela made new trousers for you."

b. gelam šegi̱ḳera axali šarvali (šen)
Gela-ERG he-sewed-you-it-II-I new trousers-NOM you-DAT
"Gela made new trousers for you."

Binding facts (Harris 1976) are affected as well, as (7a) and (7b) show.

(7) a. važam gadatargmna anzoristvis tavisi leksi.
Važa-ERG he-translated-it-II-I Anzor-for self-s poem
"Važa$_i$ translated for Anzor$_j$ his$_{i/*j}$ poem."

b. važam gadautargmna anzoris tavisi leksi.
Važa-ERG he-translated-him-it-II-I Anzor-DAT self-s poem
"Važa$_i$ translated for Anzor$_j$ his$_{i/j}$ poem."

There is even an extra morpheme—the "version vowel" (in bold face in (6b) and (7b))—that registers the BEN → 3 advancement. Thus, BEN → 3 "effects" parallel those in "object effect" applicatives and cannot be dismissed so easily. In short, GB has a landing site problem.

Recent versions of the theory, however, may provide a solution for this problem. Chomsky (1989) posits structures that include not only a *T*(ense) and an *agr*(eement) position corresponding to subject agreement, but one for object agreement as well. Since each *T*/*agr* comes with a θ-less SPEC position, we have many more landing sites than previously posited. Suppose we add additional *agr*s to accommodate indirect object (as required in Georgian) and fourth object (as required in Kinyarwanda), each with its own SPEC position. Now we have an

adequate number of landing sites—in fact, too many. Unless we have some principled means for limiting the number of *agr*s per language and per construction, we have more landing sites than most languages would ever make use of.

We have seen that constructions with object, indirect object, and fourth object "effects" provide a cross-theoretical problem. How do we have a constrained syntactic theory that is nevertheless flexible enough to fit the data?

2. Relational Profiles

One thing that is quickly apparent to the reader of any RG treatment of an individual language is that some relational concepts are much more central to the grammar of that language than others. Take Halkomelem, for example. Rules of the grammar pivot on the concept **object**,[4] while the concept **indirect object** seems to be irrelevant. We can see this by comparing the attested and unattested constructions for Halkomelem given in (8).

(8) Halkomelem constructions:

attested	unattested
passives	
unaccusatives	
psych unaccusatives	inversion (1 → 3 retreat)
antipassive	definitive cases of 2 → 3 retreat
reflexives with 1-2 multiattachment	reflexives with 1-3 multiattachment
3 → 2 advancement	initial 3 as final 3
BEN → 2 advancement	BEN → 3 advancement
other oblique advancements to 2 (directional, causal)	advancements to 3
POS revalued to 2	POS revalued to 3
causee to 2 revaluation	causee to 3 revaluation

The information in (8) allows us to formulate a relational profile for Halkomelem: it is an object-centered language. An examination of attested vs. unattested constructions in Georgian yields a very different picture. As (9) shows, it has an indirect object-centered relational profile that is almost the mirror image of the facts for Halkomelem:

(9) Georgian constructions:

attested	unattested
passives	
unaccusatives	
inversion (1 → 3 retreat)	
2 → 3 retreat	antipassive
initial 3 as final 3	3 → 2 advancement
BEN → 3 advancement	BEN → 2 advancement
other Advancements to 3 (superessive)	advancements to 2
POS ascension to 3	POS ascension to 2
causee to 2 revaluation (intransitives)	
causee to 3 revaluation (transitives)	causee to 2 revaluation (transitives)

In fact, this distinction—object-centered vs. indirect object-centered—holds for a large number of languages. The Appendix presents a compilation of information concerning the relational profiles of twenty languages for which relationally compatible grammars are available. We see that, with the exception of Kinyarwanda, these languages can be straightforwardly classified as object-centered or indirect object-centered.

What property differentiates these three types of languages? The answer is simple: the A, B, and C languages differ in how many nominals they allow as direct arguments. How do we know which nominals are direct arguments in a given language? As often noted (see especially Gerdts 1990 and Everett 1988), direct arguments get core morphosyntactic marking: that is, they determine agreement (pronoun incorporation, cliticization), license S(tructural)-Case (as opposed to I-case (initial-level, aka inherent, thematic, semantic case)), or appear in a fixed word order (e.g., adjacent to the predicate). Reviewing the chart in the Appendix, we find that the A, B, and C languages have respectively 2, 3, and 4 morphosyntactically-licensed argument positions (henceforth MAPs).

Furthermore, nominals that are linked to MAPs are generally more "accessible" than other nominals. For example, they can often: be antecedents/targets of reflexives, be relativized, float quantifiers, be passivized, or, sometimes, be raised. In the type A language Nubian (Abdel-Hafiz 1988), 1s and 2s antecede reflexives and raise; in the type B language Albanian (Hubbard 1985), 1s, 2s, and 3s float quantifiers; in the type C language Kinyarwada (Kimenyi 1980) ls, 2s, 3s, and BENs relativize.

3. The Landing Site Principle

Examining the data in the Appendix, we see a perfect correlation between the maximum number of MAPs allowed in a language and the grammatical relation that serves as the pivotal position in the relational profile. On the basis of these data, I propose the following generalization:

(10) **Landing site principle:**
Part A. Only morphosyntactically-licensed argument positions can be revaluation landing sites.

Principle (10) has an interesting effect: since the number of MAPs varies across languages, the number of landing sites will vary as well. It predicts that 2-MAP languages can allow OBL → 2 and 3 → 2 but not OBL → 3 or OBL → OBL, 3-MAP languages can allow OBL → 3 but not OBL → OBL, while 4-MAP languages may allow what appears to be OBL → OBL advancement (as in Kinyarwanda). Thus (10) accommodates much of the data discussed above. The problem remains, however, of how to constrain 3-MAP languages from allowing OBL → 2 or 3 → 2. A second part to the landing site principle can ensure this.

(11) **Landing site principle:**
Part B. The last MAP is the preferred landing site.

The Landing Site Principle will give us the flexibility we need but still allow us to maintain a highly constrained view of advancements.

4. MAPing Theory

But how can this generalization be formally implemented? To do this we must provide our theory with a level of representation that encodes information concerning the MAPs of the language. I briefly outline a theory, referred to here as MAPing theory, that will accomplish this. Originally conceived as a morphological component to augment Relational Grammar, MAPing theory, in fact, provides an alternative means for stating generalizations that would refer to the concept of final level in classic RG[5]. MAPing theory consists of several modules and rules for relating one module to another. Three perspectives on a nominal are encoded: its thematic relation, its grammatical relation (corresponding to its initial grammatical relation in classic RG), and its MAP (corresponding to its final relation in classic

RG), if it is a direct argument.[6] For example, (12) represents a clause in which there are three nominals, each bearing a term relation in initial structure and also three MAPs (e.g. the Southern Tiwa data in (5b)):

(12)

thematic relations:	agent	theme	goal	
	|	|	|	
grammatical relations:	1	2	3	(initial relations in classic RG)
	|	|	|	
MAPs:	A	B	C	(final relations in classic RG)

MAPs are ordered positions (represented here as A, B, C, etc.) linked to morphological statements (for example: subject agreement licenses A, the position immediately adjacent to and following the verb licenses B, DAT case licenses C). In any given clause, we assign the number of MAPs based on three things: first, the lexical semantic valence of the verb, second, MAP-reducing or -building morphology, and third, the MAP thresholds set for the language (that is, the maximum and minimum number of MAPs allowed).

The principles for linking GRs to MAPs are given in (13).[7]

(13) Principles for Linking GRs and MAPs:

SATURATION PRINCIPLE: every MAP must be linked to a GR or cancelled.

BIUNIQUENESS PRINCIPLE: every MAP is linked to a single GR (except for multiattachment under coreference), and every GR is linked to at most one MAP.

NO DELINKING PRINCIPLE: there are no "delinkings".

Unmarked associations proceed in a vertical, non-crossing, left-to-right fashion. For example, (12) above shows unmarked association in a three MAP case. **Marked associations**, however, may involve non-vertical linkings or the linking of an "extra" nominal not lexically subcategorized by the verb subject to specifications in a grammar. These are generally accompanied by morphological conditions. Getting these specifications right is the biggest task of a MAPing grammar. Some examples of marked association rules are given in (14):

(14) i. benefactive applicative morphology = add a MAP (up to threshold) and link the benefactive
ii. passive morphology = do not link the 1, cancel one or more MAPs
iii. inverse morphology = link the 1, but not to MAP A.

Furthermore, I claim that marked associations will be constrained by the universal principle in (15), which requires linking to the lowest MAP in the case of non-vertical linking; this will give us the instantiation of the pretheoretical (10) and (11)—the landing site principle.[8]

(15) MARKED ASSOCIATION PRINCIPLE:
Link to the lowest MAP.

The effect of (15) can be seen in the following structures. (16a) shows unmarked association in a 2-MAP case. The 1 links to A and the 2 to B. The 3 is unlinked and therefore gets licensed as a non-argument by a peripheral means, such as an adposition. (16b) shows a Dative applicative: the 3 links to B, and the 2 is a non-argument.

(16) a. 2 = B (unmarked association), (e.g. S. Tiwa (5a))

θ-Rs:	agent	theme	goal
GRs:	1	2	3
	|	|	
MAPs:	A	B	

b. 3 = B (marked association), (e.g. Halkomelem (1a))

θ-Rs:	agent	theme	goal
GRs:	1	2	3
	|		
MAPs:	A	B	

In a 3-MAP language like Georgian, the oblique (introduced by marked association) can link to C, as in (17a), but not to B, as in (17b). (17b) violates (15) because the oblique does not link to the last MAP.

(17) a. OBL = C (e.g. Georgian (2b))

θ-Rs:	agent	theme	ben
GRs:	1	2	OBL
	|	|	|
MAPs:	A	B	C

b. *OBL=B (*Marked Association Principle)

θ-Rs:	agent	theme	ben
GRs:	1	2	OBL
	|		
MAPs:	A	B	C

In Kinyarwanda, a 4-MAP language, a BEN can link to D, as in (18a), or an INSTR can, as in (18b). But the BEN and INSTR cannot both link to D (18c) due to the Biuniqueness Principle in (13), so such sentences are ruled out.

(18) a. BEN=D (Kinyarwanda (3a))

θ-Rs:	agent	theme	goal	ben
GRs:	1	2	3	OBL
	|	|	|	|
MAPs:	A	B	C	D

b. INSTR=D (Kinyarwanda (4))

θ-Rs:	agent	theme	goal	instr
GRs:	1	2	3	OBL
	|	|	|	|
MAPs:	A	B	C	D

c. *Benefactive and Instrumental Applicatives in Kinyarwanda

θ-Rs:	agent	theme	goal	ben	instr
GRs:	1	2	3	OBL	OBL
	|	|	|	|	
MAPs:	A	B	C	D	

We see then that MAPing theory easily accounts for the range of advancements attested and unattested in the languages in my sample.

A full discussion of MAPing theory would necessarily contrast the constructions it allows versus those allowed in classic RG.[9] This is outside the scope of the present paper. However, I will emphasize one difference. The Marked Association Principle is stronger than the Oblique Law in some respects but weaker in others. Unlike the Oblique Law, the Marked Association Principle allows BEN and INSTR to link to a 4th position (as in Kinyarwanda), and it also allows unlinked 3s (as in Southern Tiwa). However, the Marked Association Principle prohibits BEN → 2 and 3 → 2 in Georgian and BEN → 3 in Halkomelem. The oblique law would be irrelevant to these constructions, since they do not involve an oblique landing site. These differences are summarized in the chart in (19).

(19) Summary:

	Marked Assoc. Principle	**Oblique Law**
OBL → OBL	yes, if 4 MAP clause	no
3 → OBL	yes, if 3 MAP clause	no
OBL → 3	yes, if 3 MAP clause	yes
OBL → 2	yes, if 2 MAP clause	yes
3 → 2	yes, if 2 MAP clause	yes

I conclude that MAPing theory together with the Marked Association Principle does a better job than classic RG at "predicting" what advancement "effect" phenomena will be allowed in any given language.

5. Conclusion

This paper has shown that a purely syntactically based view of advancements in universal grammar is necessarily doomed to failure. Languages differ systematically in the type of advancements (and, for that matter, revaluations in general) that they allow.[10] A syntactic approach to the problem fails to predict this systematic variation. We see, however, that the pivotal position in a language's relational profile is correlated with the maximum number of morphosyntactically-licensed argument positions allowed in the language. This can be stated as a generalization—the Landing Site Principle—that predicts the types of advancements that a given language may have.

In addition, I have presented the rudiments of a MAPing theory for linking grammatical relations to morphosyntactically-licensed argument positions. This theory provides the concepts that allow the formal instantiation of the Landing Site Principle.

Footnotes

[1]Thanks go to the many people who have given me suggestions and comments on various versions of this research, especially Judith Aissen, Bill Davies, Katarzyna Dziwirek, Patrick Farrell, Mercedes Hinkson, Sea-Eun Jhang, David Perlmutter, Carol Rosen, Nathalie Schapansky, Charles Ulrich, Lindsay Whaley, and LaLani Wood. My research is supported by grants from the Social Science Humanities Research Council of Canada and the SFU President's Research Fund.

[2]For example, for comments on the phenomena discussed here, see Baker (1988, p. 246, 258).

[3]Even worse, in Halkomelem, as in many other languages, unadvanced 3s and BENs are never seen. Languages of this type present a special challenge to RG and the claim that all languages have initial 3s and BENs. (See Blansitt 1984, Dryer 1986, Faltz 1978, Givon 1984.)

[4]The concept absolutive is also important, since the language shows many ergative properties.

[5]This is especially true for phenomena like relativization, quantifier float, raising, etc., as discussed above. This radically monostratal version of MAPing theory may subsequently have to be softened to accommodate multipredicate clause phenomena such as causatives.

[6]This paper can only give a brief look at MAPing theory and furthermore does not compare it with other similar theories. Woolford (1986) is perhaps the closest theory in its notation and intention.

[7]These principles for linking GRs to MAPs are fairly typical in linking theories; see, for example, Ostler (1980), Woolford (1986), and Yip et al. (1987).

[8]I exclude passive from discussion here. The MAPing theory approach to this phenomenon is to require that the 1 does not link. This will automatically set up a situation that forces either dummy insertion or the marked association of some other nominal to the A position. The associations required to "fix" passive are not subject to (15).

[9]Suffice it to say that many of the classic laws and also some of the recent "improvements" to RG (see especially Farrell 1991 and Perlmutter 1989) will be automatically accommodated in MAPing theory.

[10]The presented version of the paper also discussed retreats. However, due to space limitations, these are not dealt with here.

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Appendix.

	Agr	Case	1D	2D	3A	BenA	OblA	Pos	Causee =
A. Arabic	1	N, A			2				2
Blackfoot	1, 2	Ø	2	bare	2	2	Com → 2	2	2
Chamorro	1, 2	Ø		bare	2	2		2	2
Halkomelem	1, 2	Ø		Obl	2	2	Sti, Dir → 2	2	2
Ilokano	1, 2	Ø		Obl	2	2	Sti, Ins, Loc → 2		2, Obl
Indonesian	——[SVO]——				2	2	Ins, Loc → 2		
Kalkatungu	1, 2	E, Ab		D	2	2	Sti, Goal, Ins, Loc, Pur → 2	2	
Nubian	1, 2	A			2	2			2
Sierra Popoluca	1, 2	Ø			2	2	Ins → 2 (intr)	2	
Tzotzil	1, 2	Ø			2	2		2	2
B. Albanian	1; 2, 3	N, A, D	3		= 3	3	Sti → 2 (intr)	3	3
Basque	1, 2, 3	E, Ab, D	3		= 3	3			intr 2, 3; tr 3
Choctaw	1, 2, 3	N	3	3	= 3	3	Abl → 3	3	2
Georgian	1, 2, 3	E, N, D	3	3	= 3	3	Sup → 3	3	3
Japanese	Ø	N, A, D	3	3	= 3	3	Loc → 2	2	2, 3
Polish	1	N, A, D	3		= 3	3	Adv → 3		3 (equi union)
Southern Tiwa	1, 2, 3	Ø			= 3			3	3
Turkish	1	A, D		3	= 3	3			3
Warlpiri	1, 2, 3	E, Ab, D		3	= 3	3	Adv, Com → 3		3
C. Kinyarwanda	1: 2, 3, 4	[SVO]			= 3	= 4	Ins, Man, Goal → 4; Loc → 2	3i, 2a	2/3/4

Agr = agreement. Agreement; clitics. Agreement: incorporated pronouns. N = nominative. A = accusative. D = Dative. E = ergative. Ab = absolutive. 1D = 1 demotion. 2D = 2 demotion. 3A = 3 Advancement. BenA = benefactive advancement. OblA = oblique advancement. Com = comitative. Sti = stimulus. Dir = directional. Ins = instrument. Loc = Locative. Pur = purpose. Abl = ablative. Sup = superessive. Adv = adversity. Pos = possessor ascension. Intr = intransitive.

The Balkan definite article and pseudo-second position[1]

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1. Introduction

Lexical Phonology (Kiparsky 1982, Mohanan 1986) provides us with a theory of the output of the lexicon according to which all nonautomatic phonological and morphological processes are carried out in that component of the grammar. I will be assuming the essential correctness of this approach and indirectly addressing the issue of the relationship between the lexicon and the rest of the grammar. I want to emphasize that this assumption doesn't a priori commit us to a Lexicalist view of syntax, though the proposal in this paper will be along those lines. Instead, this assumption, that the phonological aspects of word formation form a module, makes it easy to ask an important question:

> If we define the output of the lexicon, in the Lexical Phonology sense, as the morphological word, what is the relationship between the morphological word and the syntax?[2]

Current theories provide us with several answers or hypotheses, of which I'll mention three. The Lexicalist approach claims that the morphological word is the atomic syntactic unit, the terminal node. The Incorporation approach, combined with a readjustment and spellout component, *à la* Halle (1989), might be taken to claim that morphological words correspond to a syntactic constituent which we might call the maximal X^0 – an X^0 which is not dominated by another X^0, thus the highest node in an adjunction structure resulting from head movement.

The differences between these two views are very subtle for the question at hand, and I won't go into them here. On the other hand, they both are significantly different from another view, which we might associate with the works of Marantz (1988), Sproat (1988) and Sadock (1991). In this paper, I will primarily be concerned with a proposal by Sadock, regarding the treatment of the definite article in languages of the Balkan area, but many of the observations here apply equally to the other approaches. The Autolexical approach allows, under restricted circumstances, two or more syntactic nodes which don't have to form a constituent to correspond to a single morphological word, in contrast to the other two approaches. The empirical issues this raises are most pointed in the consideration of clitics. What we will want to know is the validity, as a universal, of the following generalization:

> Bound morphemes fall into two classes, often called clitics and affixes, which differ both in their distribution and their morphological or phonological properties.

As a rule of thumb, we find some bound morphemes appearing at or near the edge of the phrase they are semantically or syntactically associated with, having only minor, unexceptional interactions with their host. Others appear on the head of the phrase and can interact more strongly with it. If this generalization were universal, it would clearly support the Lexicalist or Incorporation approaches over the Autolexical account. However, proponents of the Autolexical approach point to the existence of morphemes which seem to have phrasal distribution (at or near the edge of a phrase) but do form a morphological word with their hosts. In this paper, I will examine one such case, and show that it can and should be reanalyzed in a way compatible with requiring morphological constituents to be (minimal) syntactic constituents. The analysis I propose is an extension of ideas developed in Poser (1985), Zwicky (1987), and Miller (1991).

In several languages in the Balkan area, specifically Bulgarian, Rumanian, Macedonian and Albanian, the definite article usually shows up as a suffix or enclitic to the first word of a noun phrase. The grammatical status of the article has been a point of controversy in the literature on these languages – see for instance Scatton (1980), Mayer (1988) and Elson (1976). With some exceptions, the discussion has basically been over whether the article should be considered a suffix or a clitic, with the question arising because the article apparently has the distribution of a clitic, but the phonology of a suffix. Examples (1)–(3) illustrate some basics of its distribution which suggest that it is in second position within NP. (Unless otherwise noted, all examples are taken from Bulgarian.)

(1)	kniga-ta	"the book"
(2)	xubava-ta kniga	"the nice book"
(3)	moja-ta xubava kniga	"my nice book"

On the other hand, it acts phonologically like a suffix. In (4), one aspect of its phonology is reviewed. There, we see that a word-level phonological rule of final-obstruent devoicing, applying in (4a), is blocked from applying before the article, as with other inflectional suffixes, as in (4b,c), while it does apply before various clitics, as in (4d,e). In this and other ways which I don't have room to go into here, the definite article has the phonology of an inflectional suffix rather than a clitic (see, e.g., Scatton 1980).

(4)
a. /grad/ → [grat]; "a city"
b. /grad+ove/ → [gradove]; "cities" (Scatton 1984, p. 128)
c. /grad+ət/ → [gradət]; "the city" (Elson 1976)
d. /grad#e/ → [grat e]; "It is a city." (Elson 1976)
e. /grad#li#e/ → [grat li e]; "Is it a city?" (Elson 1976)

2. Second Position

In the rest of this paper, I will argue that, despite the data in (1)–(3), the definite article is not really a true second position (2P) clitic, and should be treated as a special type of inflection. In order to make the case against calling the article a 2P clitic, I will briefly consider the analysis of clear, uncontroversial cases of 2P so that we can compare them to the definite article.

Take the example of second position clitics in Serbo-Croatian. Serbo-Croatian sentential clitics (including auxiliary verbs, the interrogative particle, and clitic pronouns) may usually appear after the first phrase of the sentence. Alternatively, they may also appear after the first word. Furthermore, they immediately follow a complementizer which introduces a subordinate clause. These various options are illustrated in the examples in (5)–(8).

Serbo-Croatian:

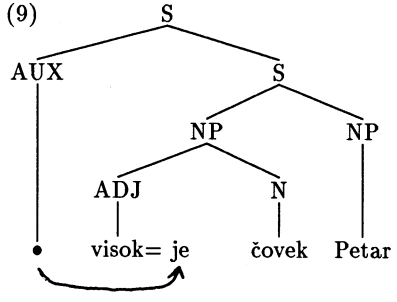
(5) Visok=je čovek Petar.
tall=AUX man Petar
"Petar is a tall man."

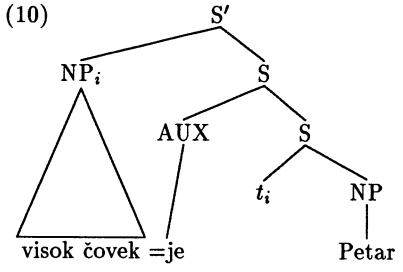
(6) Visok čovek=je Petar.

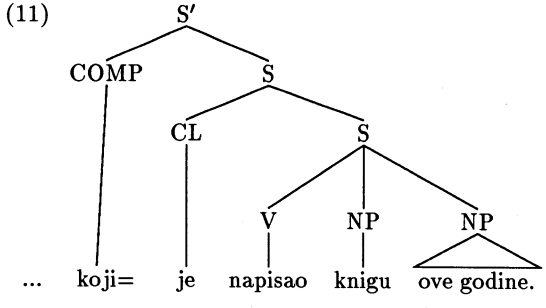
(7) ... pesniku koji=*je* napisao knjigu ove godine
... poet who=AUX wrote book this year
"... a poet who has written a book this year."

(8) *... pesniku koji napisao=*je* knjigu ove godine

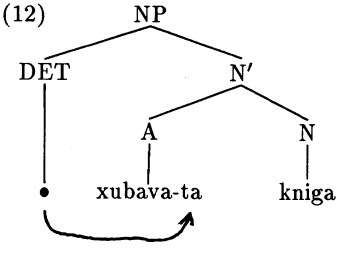
Various analyses have been proposed for dealing with these data, and other second position clitics. My own favorite (see Halpern 1992) works roughly as follows: second position results from an interaction of two factors. Second position clitics are subject to syntactic conditions which place them first in the appropriate domain. In the case of the Serbo-Croatian clitics, they are placed in a position which is at the beginning of a clause, except that a topicalized or focused phrase may be placed in front of them. They are also subject to a phonological condition which can result in their appearing in a surface position different from that which the syntax assigns them. This condition is a requirement that there be a phonological word to their left to which they may cliticize. This second condition will mean that if the clitic has no word preceding it in the syntax, it will be forced to move out of its syntactic position past the word which is to its right in the syntax. However, if the clitic *is* preceded by a word or phrase in the syntax, then its phonological condition will be satisfied without moving and it will stay put. This analysis is illustrated by the diagrams in (9)–(11). Though the notation is quite different, this analysis of 2P is basically available within the Autolexical framework.

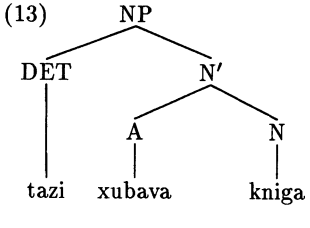






The question to ask now is, do we want to apply this sort of analysis, or an alternative treatment, to the definite article? To a first approximation, the answer of course is "yes". That's why we started looking at 2P in the first place. The examples in (1)–(3) can be accounted for in much the same way that the Bulgarian and Serbo-Croatian clitics were treated. We can say that the definite article is a determiner which the syntax places in the same position that it puts demonstratives – at the beginning of the Noun phrase, possibly preceded by a quantifier. Unlike the demonstratives, it must attach to a word on its left and so it generally winds up on the surface after the word which follows it in the syntax, as illustrated in (12). This will account for the basic examples where the clitic appears after the first word. (13) shows an example of the situation with demonstratives according to this account. This analysis, notation aside, is a slight simplification of that which Sadock (1991) made for the Macedonian definite article.





3. Definite article positioning: fine points

However, when we look more closely, we find that there are certain respects in which this analysis is problematic. For one thing, uncontroversial cases of second position clitics seem restricted to appear in one of the positions available to the Serbo-Croatian clitics. That is, they end up after the first phonological word (or some other prosodic unit) of their domain, or after the leftmost syntactic daughter of that domain, but not somewhere in the middle of this first daughter.

In the examples of the definite article discussed so far, either of these descriptions is applicable. However, when we examine various complicated cases, problems come up. When a noun phrase begins with an adjective or deverbal adjective modified by a prepositional phrase, the article comes immediately after the adjective; this shows that it can't be right to say that the article can appear after the first phrase, though it is consistent with saying that it appears after the first word. When we look at other examples, it is clear that the article isn't always after the first word either, and in fact sometimes must appear in positions which are neither after the first word nor after the first phrase. This can be seen in the examples in (14)–(17). To emphasize the significance of this, no clear second position clitic which I know of has this distribution, giving us reason to look more carefully at the definite article.

(14) silno razprostranena-ta upotreba
strongly widespread-DEF use
"the very widespread use"
(Səpostavitelno ezikoznanie #2, 1990 p. 14)

(15) vse oshte sporni-te kriterii
always yet controversial-DEF criteria
"the still controversial criteria" (p. 110)

(16) səstojala-ta se prez vreme na konferencija-ta okrəgla masa
occurred-DEF REFL during time of conference-DEF round table
"the round table which took place during the conference" (p. 85.)

(17) pochti nerazrabotena-ta u nas problematika
almost undeveloped-DEF among us problem.area
"the problem area which is almost undeveloped among us" (p. 90)

Another problem for this sort of analysis has to do with the occurrence of multiple copies of the article within a single NP or with cooccurrence of the article and a demonstrative. The second position analysis given above entails that only a single copy of the article should appear per NP, and that the article and demonstratives should be in complementary distribution: the presence of one should block the presence of the other. Both of these predictions are reasonably accurate for Bulgarian, but there are a couple of circumstances in which they are problematic, and a look at the situation in Macedonian and Rumanian makes it clear that they are wrong in the general case.

In Bulgarian, in most cases, neither a demonstrative nor other words in an NP with a demonstrative may host the definite article, as shown in (18a-c). However, in a noun phrase which has a quantifier before a demonstrative, it is possible to

also have the definite article on the quantifier, as in (18d,e). The second position analysis makes this unexpected.

(18)	a.	tezi profesori	"these professors"
	b.	*tezi-te profesori	"these-the professors"
	c.	*tezi profesori-te	"these professors-the"
	d.	vsički tezi profesori	"all these professors"
	e.	vsički-te tezi profesori	"all-the these professors"

Data regarding the definite article in Macedonian, which is much like the article in Bulgarian, supports this argument. At least in certain dialects of Macedonian, it is possible to have the definite article cooccur with the demonstrative even if nothing precedes demonstrative. (19) give some basic Macedonian examples, while (20) illustrates the point at hand.

Macedonian: (Lunt 1952, Sadock 1991)

(19)	a.	čovek-ot	"the man"
	b.	malijot čovek	"the little man"
	c.	dobrijot mal čovek	"the good little man"

(20) Ona malki-te Grci shto gi imashe...
Those few-DEF "Greeks" that there were...
"Those few Greeks that there were"

As for multiple copies of the definite article, once again the clitic analysis is generally right, but there are occasional counterexamples. Mayer (1988) discusses the situation in Bulgarian when a noun phrase begins with a set of coordinated adjectives. Most of the time, only the first adjective will receive the definite article, but in certain cases it may appear on each conjunct. Mayer argues that repeated articles result from full noun phrases having been coordinated and with part of the first one getting deleted. An elliptical analysis of this sort seems reasonable given the meaning of the examples involved, so if we only look at Bulgarian, this may not be problematic. Examples, from Mayer (1988:73), are given in (21).

(21) a. xubava-ta i plodorodna zemja
"the beautiful and fertile land"
b. bəlgarski-te i səvetski-te studenti
"the Bulgarian and the Soviet students"

However, looking at some data from Rumanian, it becomes clear that this does not fully solve the problem. In Rumanian once again, definiteness can be expressed by a suffix or enclitic roughly in second position, as in (22)–(25). Contrary to what we would expect if it were truly a clitic, when we look at NP's involving coordination, we find that the definite article must appear on each conjunct. That is, duplication of the article is obligatory if a noun phrase begins with a coordinate structure, even when the meaning is not consistent with an elliptical analysis. Moreover, the article will sometimes appear more than once even in the absence of coordination. Examples illustrating these points are given in (26) and (27).

Rumanian: (Lombard 1974, Grosu 1988)

(22) poétu-l máre
poet-DEF great
"the great poet"

(23) máre-le poét
great-DEF poet
"the great poet"

(24) senzaţional-a nouã idee
sensational-DEF new idea
"the sensational new idea"

(25) foarte frumosul cal
very beautiful-DEF horse
the very beautiful horse"

(26) mîndra (şi) frumoasa femeie
proud-DEF (and) beautiful-DEF woman
"the proud and beautiful woman"

(27) frumosul, noul vas
beautiful-DEF new-DEF vase
"the beautiful new vase"

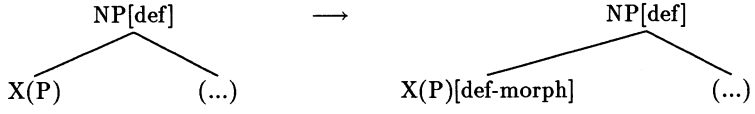
Similar cases of definite articles appearing more than once in a single noun phrase occur in Greek (C. Condoravdi, p.c.) as well as the unrelated case of Amharic (Halefom 1990). It appears then to be a general property of definite articles of this type that they *can* appear more than once in a single NP, unlike what is observed of true second position clitics.

4. Analysis

In the light of these arguments against treating the article as a second position clitic, let us consider an alternative analysis. In line with the phonological and morphological evidence for treating the article as a suffix, suppose we claim that it is actually an inflectional affix. Of course, the immediate problem is that as an inflection pertaining to noun phrases, we expect to find it on the head of the NP. I suggest that this is simply too limited a view of inflection, and that the resolution to the paradox posed by the article is not to allow clitics to have phonology of affixes, but to allow affixes to appear in other locations. My proposal is based in part on ideas in Halpern and Miller (in prep) and Svenonius (1991).

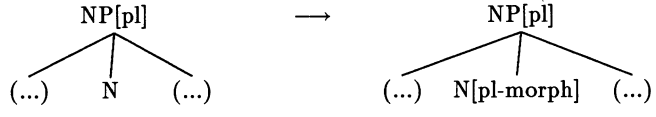
First, we have to distinguish two things: the semantic or syntactic property of being definite (represented as the specification "def" in the following diagrams), which is a property of the entire noun phrase, and the morphological property of having the definite suffix (represented as the specification "def-morph"), which is primarily, though we will see not exclusively, a property of lexical items. The two are obviously intimately related, and we can treat the syntactic property as responsible for triggering the morphological property, as in the implicational rule in (28), which I will refer to as "Rule 1". This rule says that if a noun phrase is syntactically definite then its leftmost daughter is morphologically definite.[3]

(28) Balkan definiteness, Rule 1



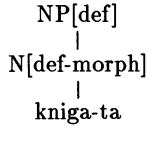
For the sake of comparison, consider the corresponding rule in (29) which we might write for the English plural. It says that a syntactically plural noun phrase should have plural morphology on its head. The difference between the two rules is that the first requires the leftmost daughter bear certain morphology while the second imposes that specification on the head.

(29) English plural rule

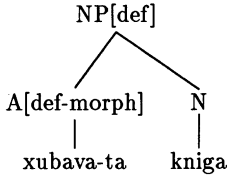


Rule 1 accounts for the distribution of the definite article in the simple case where the first member of the noun phrase is a single word by requiring that word to bear definite morphology. Once this is determined, the morphology treats this specification the way it treats any specification about inflection: it adds the appropriate affix to a stem or word, in this case an allomorph of the definite article. The result is illustrated in (30)–(32).

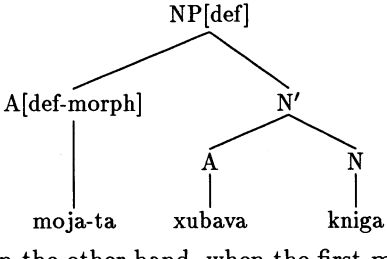
(30)



(31)



(32)

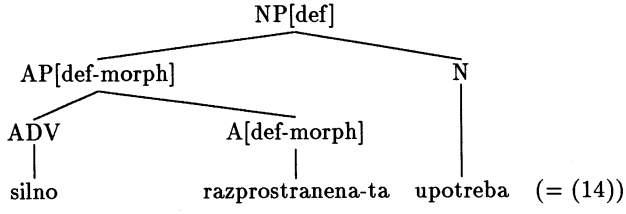


On the other hand, when the first modifier of the noun phrase is a phrase itself, Rule 1 will result in the modifier phrase as a whole bearing definite morphology. Rule 2, in (33) indicates how this is to be interpreted: if a phrase is definite marked (that is, is specified "def-morph"), then its head must be. This seems to be the right result, in light of cases like examples (14)–(17) above. In all of these examples, the article appears on the adjective which is the head of the first daughter of the NP. The analysis given to (14) is shown in (34).

(33) Balkan definiteness, Rule 2



(34)



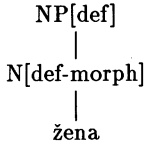
This is the essence of my proposal regarding the Balkan article: Rules 1 and 2 determine which word in a noun phrase must be definite-marked and inflectional morphology determines the forms of words which are so specified.

There are three extensions which I will now turn to. The first has to do with the demonstratives. As noted above, demonstratives and the definite article don't generally cooccur in Bulgarian, but they can do so in a certain environment, namely when the demonstrative is preceded by a quantifier. This is evocative of another class of words which don't take the definite article themselves, but may cooccur with it if preceded by a modifier, namely kinship terms for close family members. See (35)-(37).

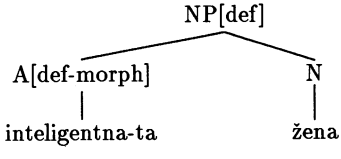
(35)	žena	ambig: "a woman/wife" or "the (my) wife"
(36)	*žena-ta	intended: "the (my) wife"
(37)	moja-ta žena	"my wife"

We can explain this as follows. One consequence of treating the definite article as an inflectional suffix rather than a clitic is that it will be possible to have exceptionally inflected forms. We can say that while the definite form of most words is formed by adding the definite suffix, some words are their own definite form, just as in English the noun "sheep" is its own plural or the verb "hit" is its own past tense. We can say then that the kinship terms and the demonstratives are their own definite forms. When they are initial in a definite NP, rule 1 will force them to appear in their definite form, but this will not result in any visible change. However, when they are not initial in an NP, the definiteness marking will pass onto another form, as in (38)–(41).

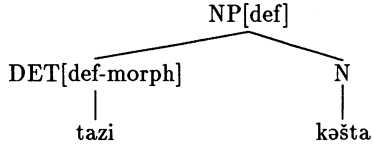
(38)



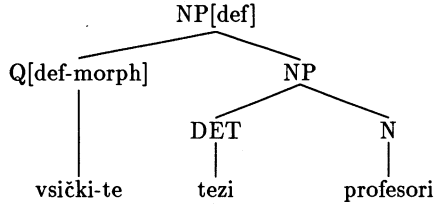
(39)



(40)



(41)



Support for the claim that demonstratives as well as kinship terms can be their own definite forms comes from the behavior of a set of clitic possessive pronouns. These clitic pronouns generally can only follow a word with the definite article attached to it, as in (42) and ((43). However, (44) and (45) show that they may, apparently exceptionally, follow the kinship terms without an article, and at least marginally may also follow demonstratives.

(42)	*inteligentna mi žena	"my intelligent wife"
(43)	inteligentna-ta mi žena	"my intelligent wife"
(44)	žena mi	"my wife"
(45)	? tazi mi kəšta	"that house of mine"

The second issue has to do with the behavior of the article and coordinated adjectives. As I said, the usual result in Bulgarian is for the article to appear only on the first conjunct, but in Rumanian it must always appear on all conjuncts. It seems that we have to say that rule 2 is interpreted differently in the two languages for coordinate structures, so that it puts the definite morphology specification on only the left conjunct in Bulgarian but on all conjuncts in Rumanian. Of the two, the pattern in Bulgarian is probably the more marked situation, but this interpretation is supported by the existence of other cases cross-linguistically where inflections appear on only one conjunct in a coordinate structure, leaving the others in an uninflected form – see Payne (1985).

One final point is that there are certain adjectives, primarily of foreign origin, which can't serve as hosts for the definite article; furthermore, when they are the first modifier in an NP, the article can't appear on another word. This is illustrated in (46) and (47). (48) shows that these adjectives may be used in definite NP's, as long as they would not be expected to host the definite article.

(46) *serbez-ta žena
quarrelsome-DEF woman
intended: "the quarrelsome woman"

(47) *serbez žena-ta
quarrelsome woman-DEF
intended: "the quarrelsome woman"

(48) tazi serbez žena
that quarrelsome woman
"that quarrelsome woman"

These adjectives turn out to be generally defective with respect to nominal inflection, showing either reduced inflection for number and gender or none at all, as shown in (49) and (50).

(49) serbez čovek
quarrelsome man
"a quarrelsome man"

(50) serbez žena (cp. *serbeza žena)
quarrelsome woman
"a quarrelsome woman"

All that we need to say to account for this is that these adjectives are syntactically unexceptional but that they lack a form inflected for the definite article, preventing their insertion under a node specified for "def-marking". Such gaps in an inflectional paradigm are unremarkable, but it would be an odd result for a clitic.

5. Conclusion

To summarize, the definite article in several Balkan languages acts like an inflectional suffix phonologically and morphologically. As for its distribution, three arguments were made against the obvious characterization of the article as a second position clitic. First, in NP's with complex modifiers it turns out that the article appears, as a rule, neither after the first word nor the first branch of the NP. Second, it is possible for the article to cooccur with demonstratives in certain circumstances. Third, multiple copies of the article can appear in a single NP. These facts may be better explained if the article is treated as an inflection whose distribution is determined by the two rules given in (28) and (33). This account also gives us a way of treating the exceptional properties of kinship terms and demonstratives with respect to the clitic possessive pronouns, and accounts for the behavior of certain morphologically defective adjectives. I conclude that the Balkan definite article is an argument in favor of allowing inflectional suffixation away from the head of a phrase, and indirectly an argument against allowing clitics to interact strongly, in phonological terms, with their hosts.

Notes

[1]I would like to thank Wayles Browne, Donka Farkas, Victor Friedman, Sharon Inkelas, Philip Miller, Bill Poser, Ivan Sag, Ernie Scatton, Maxim Stamenov, Peter Svenonius, Draga

Zec and Arnold Zwicky for discussion and aid in various ways. All errors and lunacies are mine.

[2]Note that this is not the same question as that of the relationship between the phonological or prosodic word and the syntax.

[3]I am calling this a 'rule', and writing it as such, but ultimately it is better treated as a feature instantiation principle along the lines of the Head Feature Convention of GKPS (1985).

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Morphotactic Constraints in the Chichewa Verb Stem

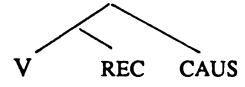
Larry M. Hyman and Sam Mchombo
U.C. Berkeley

A major issue in determining the place of morphology in a grammar concerns the role of "morphotactic constraints".[1] In many languages with complex morphologies, affixes may not be combined freely, but rather are subject to different kinds of sequential constraints. As has been known for some time among Bantuists (e.g. Guthrie 1962), verbal suffixes such as those cited from Chichewa in (1) may occur in different orders with a corresponding meaning difference.

(1)	a.	mang-	V	[verb root]	'tie'
	b.	mang-its-	CAUS	[causative]	'cause to tie'
		mang-ir-	APP	[applicative]	'tie for/with/at'
		mang-an-	REC	[reciprocal]	'tie each other'
		mang-idw-	PASS	[passive]	'be tied'
		mang-ITS-	INT	[intensive]	'tie well'

In (2a), for instance, we see that a causativized reciprocal has the sequence -an-its-, while in (2b) a reciprocalized causative has the sequence -its-an-:

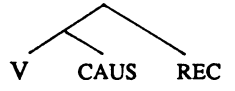
(2) a. [X cause [Y_i tie e.o.$_i$]]



[[[mang] an] its]

'cause to tie each other'

b. [X_i cause [e.o.$_i$ tie Y]]



[[[mang] its] an]

'cause each other to tie'

Such facts are clearly relevant to the issue of establishing the place of morphology within a grammar: Are the reasons for different suffix orders to be found in the semantics, the syntax or the lexicon? To what extent are ordering and cooccurrence constraints a property of the individual morphs themselves? In this paper we shall take a close look at the morphotactic constraints holding between the Chichewa verb suffixes in (2b). We shall focus particularly on cases where the order of suffixes conflicts with what would be expected from compositionality, or scope. Our comprehensive study of suffix combinations in Chichewa reveals a considerably more complex situation than what one is led to believe from studies that cite only some of the possible suffix pairings.

To begin, as observed in (3),

(3)	a.	REC-CAUS	mang-an-its-	'cause to tie each other'
		CAUS-REC	mang-its-an-	'cause each other tie'
	b.	APP-PASS	mang-ir-idw-	'be tied for[*ben*] ~ with[*instr*] ~ at[*loc*]'
		PASS-APP	mang-idw-ir-	'be tied at[*loc*] ~ for[*reason*]'

c.	APP-REC	mang-ir-an-	'tie for each other'	
	REC-APP	*mang-an-ir-		
		mang-an-ir-<u>an</u>-	'tie each other for/with/at'[2]	
d.	REC-INT	mang-an-ITS-	'tie each other well'	(=INT-REC)
	INT-REC	mang-ITSITS-an-	'tie well each other'[3]	(=REC-INT)

four of the ten combinations of two suffixes occur in both orders. Of the remaining six combinations, two of these, in (4), fail to combine in either order.

(4) a.	*REC-PASS	*mang-an-idw-	(*'be each other tied')	
	*PASS-REC	*mang-idw-an-	(*'be tied each other')	
b.	*CAUS-INT	*mang-its-ITS-	('cause to tie well')	
	*INT-CAUS	*mang-ITSITS-its-	('cause well to tie')	

In (4a) the reciprocal and passive cannot combine, because the transitive verb -mang- can only be detransitivized once. In (4b), bimorphemic sequences such as -its-ITS- are ruled out by the Menn and MacWhinney's (1984) Repeated Morph Constraint (RMC): Assuming cyclicity, two morphosyntactic features may not successively be spelled out by the same morph in Chichewa. As in Bantu generally, any morphosyntactic derivation that requires a violation of the RMC is simply blocked.[4] In (5) we present a hypothesis concerning the relationship between causative -its- and intensive -ITS(ITS)-. As seen, the latter not only has a reduplicative allomorphy, but also involves a H tone that is lacking in the corresponding causatives (cf. Mtenje 1986; Kanerva 1989).[5]

(5) a. INTENSIVE → [+reduplication] / ___ suffix

b. INTENSIVE → CAUSATIVE + H tone

In (6) we show that the RMC is not in effect when another suffix intervenes:

(6) a.	*mang-ir-ir-a	'tie for [s.o] at [s.pl.]'	
b.	mang-ir-an-ir-<u>an</u>-	'tie for each other at [s.pl.]'[2]	
c.	mang-ir-idw-	'be tied at [s.pl.]' =	
	mang-idw-ir-	'be tied at [s.pl.]'	
d.	*mang-ir-ir-idw-	'be tied with [sth.] at [s.pl.]'	
	mang-ir-idw-ir-	'be tied with [sth.] at [s.pl.]'	

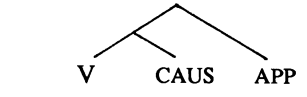
In (6a), although it is semantically reasonable to express both a benefactive and a locative on the same verb, we see that it is not possible to combine two applicative suffixes in sequence—in fact no matter which semantic roles they express. In (6b), however, where reciprocal -an- intervenes between the two applicative morphs -ir-, the verb form is good. Another suffix that may intervene between two applicative morphs is the passive -idw-. In (6c), an applicative -ir- that introduces a locative may optionally appear either before or after the passive suffix -idw-. However, (6d) shows that locative -ir- must follow passive -idw-, if the latter is already preceded by an applicative morph (here introducing an instrument).

We have now covered six of the ten combinations of two suffixes. Those pairs still not accounted for are presented in (7).

(7) a.	CAUS-APP	mang-its-ir-	'cause to tie for (~ with ~ at)'
	*APP-CAUS	mang-ir-its-	'cause for (with/at) to tie'
b.	CAUS-PASS	mang-its-idw-	'be caused to tie'
	*PASS-CAUS	*mang-idw-its-	'cause to be tied' (use CAUS-PASS)
c.	INT-APP	mang-ITSITS-ir-	'tie well for (~ with ~ at)'
	*APP-INT	*mang-ir-ITS-	'tie for (~ with ~ at) well' (=INT-APP)
d.	INT-PASS	mang-ITSITS-idw-	'be tied well'
	*PASS-INT	*mang-idw-its-	'be tied well' (=INT-PASS)

In (7a), we see that independent of the scope, causative -its- must precede applicative -ir-. Thus, while an applicativized causative spells out directly in (8a), we must somehow block the incorrect spellout of a causativized applicative in (8b).

(8) a. [for W [X cause [Y tie Z]]]



[[[mang] its] ir]

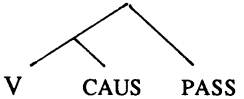
b. [X cause [for W [Y tie Z]]]



*[[[mang] ir] its]

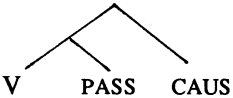
Similarly, in (7b) we see that independent of scope, causative -its- must precede passive -idw-. That is, while a passivized causative spells out directly in (9a), a causativized passive cannot surface as in (9b).

(9) a. [passive [X cause [Y tie Z]]]



[[[mang] its] idw]

b. [X cause [passive [Y tie Z]]]



*[[[mang] idw] its]

Turning to (7c) and (7d), though not related to scope, intensive -ITS- also may not follow either applicative -ir- or passive -idw-. This presumably is due to its identity with the causative morpheme -its- (cf. (5) above).

One possible solution would be to establish negative filters (cf. Muysken 1981) either against the forbidden morph sequences *-ir-its- and *-idw-its- in (10a) or against the corresponding morphosyntactic sequences in (10b).

(10) a.	*-ir-its- / *-ir-ITS-	b.	*APP-CAUS / *APP-INT
	*-idw-its- / *-idw-ITS-		*PASS-CAUS / *PASS-INT

Either way, (11) shows that these negative filters apply only locally, since the suffix orders in (10) are fine when another suffix intervenes, for example, the reciprocal suffix -an-:

(11) a.	*APP-CAUS	*mang-ir-its-	'cause to tie for [s.o.]'
	APP-REC-CAUS	mang-ir-an-its-	'cause to tie for each other'

b.	*APP-INT	*mang-ir-ITS-	'tie for well'
	APP-REC-INT	mang-ir-an-ITS-	'tie for each other well'

The same demonstration is made in (12) with a more complicated example involving the unacceptable sequence *PASS-INT in (12a).

(12) a.	*PI	*mang-idw-ITS-	'be tied well'
b.	*PAI	*mang-idw-ir-ITS-	'be tied well at [s.pl]'
c.	RC	mang-an-its-	'cause to tie each other'
	RCP	mang-an-its-idw-	'be caused to tie each other'
	RCPA(R)	mang-an-its-idw-ir-an-	'be caused to tie e.o. at [s.pl.]'
d.	RCPARI	mang-an-its-idw-ir-an-ITS-	'be caused to tie e.o. at [s.pl.] well'

As seen in (12b), we cannot place an applicative -ir- between the passive and intensive suffixes, because the sequence APP-INT also violates the filters in (10). Instead, in (12c) we first causativize a reciprocal form to derive the sequence -an-its-. The resulting verb form is then passivized, yielding the sequence -an-its-idw-. Now, when this output is applicativized by adding -ir-, we obtain the sequence -an-its-idw-ir-an- by the required doubling of the reciprocal suffix -an-. Finally, (12d) shows that this complex verb can be intensivized, thereby creating a long-distance sequence of passive -idw- plus intensive -ITS- (interrupted by -ir-an-).

There is a serious drawback, however, to negative filters. While the statements in (10) correctly forbid the sequences in question, they do not at the same time capture the fact that the reversed suffix orders are used with the intended meanings. A second statement is thus required in the grammar to indicate, e.g. as in (13), that the order -its-ir- is used in the place of *-ir-its-. Whether stated as a metathesis of morphs, as in (13a), or as a metathesis of morphosyntactic features, as in (13b), the presence of such readjustment rules makes redundant the filters in (10).

(13) a. -ir-its- → -its-ir- (same metathesis with intensive -ITS-).
-idw-its- → -its-idw-

b. {APP, PASS} + {CAUS/INT} → {CAUS/INT} + {APP, PASS}

But is morpheme metathesis required in these cases?

We now attempt an analysis that both saves compositionality and captures the relevant facts in one statement. As in most models, we assume two levels of morphological representation: an abstract (featural) morphosyntactic level vs. a concrete morph level (Anderson, in press; Baker 1990; Halle 1991; Hollenbach 1984; Zwicky 1985, etc.). Let us assume that the spell-out of abstract morphosyntactic features as surface morphs is cyclic and follows scope, i.e. proceeding in a compositional manner in the default case. In order to get the surface constraints in (10), we shall expand McCarthy and Prince's (1990) notion of prosodic circumscription to include cases as in (15) where the spell-out of one morphosyntactic feature requires that a previously assigned morph be marked off or "circumscribed" (see also Hammond 1991).[6]

(15) a. -ir- → < ir > / ___] {CAUS/INT}

b. -idw- → < idw > / ___] {CAUS/INT}

(15a) states that the applicative morph -ir- is marked off when falling within the immediate scope of a CAUS or INT feature. (15b) shows the parallel circumscription of the passive morph -idw-, again when followed by the CAUS or INT feature. Sample derivations are shown in (16).

(16)			
a.	[[mang] APP]		[[mang] PASS]
b.	[[mang - ir]		[mang - idw]
c.	[[mang - ir] CAUS]		[mang - idw] CAUS]
d.	[[mang] CAUS] <ir>		[[mang] CAUS] <idw>
e.	[mang - its] <ir>		[mang - its] <idw>
f.	[mang - its - ir]		[mang - its - idw][7]
	'cause to tie for'		'cause to be tied'

In the derivation on the left, we begin by associating to the APP feature in (16a) the morph -ir- in (16b).[8] We then expand the verb to include the CAUS feature in (16c). By the process in (15a), the applicative morph -ir- is circumscribed in (16d), followed by the spellout of the causative morph -its-, which now directly affixes to the verb root -mang- in (16e). The derivation is completed by bringing the circumscribed morph -ir- back into the verb base, which will then undergo affixation of an inflectional final vowel (e.g. -a). The derivation on the right is exactly parallel, except for the involvement of the passive morph -idw-, which must invoke the circumscription process in (15b).

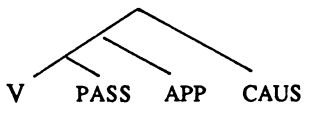
As expected, the derivation in (17) shows that morphemic circumscription will not obtain if another suffix intervenes.

(17)		
a.	[[mang] APP]	
b.	[mang - ir]	'tie for'
c.	[mang - ir] REC]	
d.	[mang - ir - an]	'tie for each other'
e.	[mang - ir - an] CAUS]	
f.	[mang - <u>ir</u> - an - <u>its</u>]	'cause to tie for each other'

In (17a-d) first the applicative and then the reciprocal suffixes are spelled out. In (17e), when the verb is expanded to include the causative feature, the morph -ir- of the base is not circumscribed because the reciprocal morph -an- intervenes. The causative is simply spelled out as -its-.

As a final illustration, consider the derivation in (18) which shows that morphemic circumscription can be iterative:

(18) a.



b. [mang - idw - ir] 'be tied at [s.pl.] ~ for [s.reason]'

c. [[mang - idw - ir] CAUS]

d. [[mang - idw] CAUS] <ir> (circumscription by (15a))
e. [[mang] CAUS] <idw - ir> (circumscription by (15b))
f. [mang - its - idw - ir] 'cause be tied at [s.pl.] ~ for [s.reason]'

The morphosyntactic features PASS and APP of (18a) are spelled out normally in (18b). When the CAUS feature is added in (18c), the applicative morph -ir- is circumscribed in (18d) by (15a). This then feeds the circumscription of the passive morph -idw- in (18e) by (15b). Finally, in (18f), the morphs are reunited.

On the surface, the effect of morphemic circumscription appears to be metathesis. It is significant that the desired result can be obtained by extending prosodic circumscription, which is independently needed for infixation and various base-internal modifications associated with multiplanar morphology.[9] Crucially, we reject approaches such as in (19) which attempt to generate the correct suffix orders in one step: First, in (19a), one might separate linear precedence from immediate dominance in morphology as GPSG does for syntax (and as Fabb 1988 has proposed for English morphology). (19a) is to be read in the following way: The morph -its- must precede either the morph -ir- or the morph -idw-. Assuming the Adjacency Condition of Siegel (1977), the effect would be a strictly local condition on the spell-out of -its- before the other two morphs.

(19) a. linear precedence: -its- $\supset$ { -ir- , -idw- }

b. non-cyclic, non-derivational line-crossing of feature/morph association:



The same effect would be felt in a completely non-derivational approach such as (19b), where the indicated mini-templates instruct the indicated feature sequences to be spelled out with crossing association lines.

The evidence against such single-step spellouts is largely phonological. Since Chichewa does not provide unambigous evidence for cyclic stem phonology, let us consider the data in (20) from nearby Cibemba:

(20)

	UR		MORPHOLOGY		PHONOLOGY		MORPHOLOGY		PHONOLOGY
a.	-lub- 'be lost'	→	-lub-ị- 'lose'	→	-luf-ị-	→	-luf-il-ị- 'lose for/at'	→	-luf-is-ị- (-luf-ish-ị-)
b.	-lil- 'cry'	→	-lil-ị- 'make cry'	→	-lis-ị-	→	-lis-il-ị- 'make cry for/at'	→	-lis-is-ị- (-lish-ish-ị-)

In this language, the causative morph -ị- causes a mutation on a preceding non-nasal consonant (labials become [f], while linguals become [s]). In the examples in (20), causative -ị- is first added to the intransitive verbs 'be lost' and 'cry'. The transitive verbs 'lose' and 'make cry' then undergo consonant mutation. This is followed by suffixing the applicative suffix -il- between the mutated verb root and the causative morph -ị-. As seen, the /l/ of the applicative suffix then undergoes consonant mutation. As shown by Hyman (1991), if the applicative and causative suffixes had been directly spelled out as -il-ị-, there would have been no way to get

the root-final consonants to mutate (especially since the applicative morph -il- does not by itself cause consonant mutation, e.g. -lub-il- 'be lost for/at'). Instead, Cibemba and many other Bantu languages require the spell-out to be cyclic, as we have assumed also for Chichewa.

Let us now address in (21) the doubling of reciprocal -an- after applicative -ir-.

(21) a. mang-ir-an- 'tie for each other'
b *mang-an-ir-
c. mang-ir-an- 'tie each for [s.o.] ~ with [sth.] ~ at [s.pl.] ~ for [s.reason]'
d. mang-an-ir-<u>an</u>- (=(21c))

(21a) shows that reciprocal -an- may follow applicative -ir- with no problem. In (21b), however, we see that the reverse is ungrammatical. One of two things must happen. In (21c) we observe that the order -ir-an- can also be used instead of (21b), i.e. used as an applicativized reciprocal. To handle this, we propose another process of morphemic circumscription in (22).

(22) -an- → < an > / ___] {APP} (optional)

Reciprocal -an- is optionally circumscribed when followed by an applicative. If, on the other hand, the circumscription is not chosen, (21d) shows that -an- must be doubled on the other side of the applicative morph -ir-.

While having parallels in other Bantu languages (e.g. the doubling of causative -ị- in Cibemba discussed by Hyman 1991), doubling represents a rather unusual state of affairs and a challenge. Furthermore, (23) shows that unlike the RMC and morphemic circumscription, doubling is global—in apparent violation both of Siegel's (1977) Adjacency Condition and Williams' (1981) Atom Condition:

(23) a. *mang-<u>an</u>-its-<u>ir</u>-
mang-an-its-ir-<u>an</u>- 'cause to tie each other for ~ with ~ at'
b. *mang-<u>an</u>-its-idw-<u>ir</u>-
mang-an-its-idw-ir-<u>an</u>- 'be caused to tie each other at ~ for [reason]'

The example in (23a) shows that the causative morph -its- is apparently transparent to the -an-ir- problem, and hence doubling of -an- is required. The example in (25b) is even more striking: In this form, when -ir- is spelled out, there are two suffixes, -its- and -idw-, that intervene between it and the preceding -an-. Still, doubling of reciprocal -an- is required.

It is clear that doubling is required whenever an applicative is suffixed to a base that has a reciprocal anywhere in it. Let us attempt the following two-part solution. First, let the reciprocal feature percolate outwards as a feature on the entire base. It is this feature (rather than the internal morph -an-) which conflicts with the outside applicative.[10] Second, we propose in (24) that the applicative and reciprocal spell-out rules apply in that order but constitute a *conjunctive* rule block. In (24a), the applicative is spelled out in the first cycle, where reciprocal spelling cannot apply. On the second cycle, applicative spelling cannot reapply because of the RMC, while reciprocal spelling does apply.

(24) a. [[[mang] APP] REC] 'tie for each other'

Cycle 1:

-ir- APP → -ir-

--- REC → -an-

Cycle 2:

--- APP → -ir- (blocked by RMC)

-an- REC → -an-

b. [[[mang] REC] APP] 'tie each other for ~ with ~ at'

Cycle 1:

--- APP → -ir-

-an- REC → -an-

Cycle 2:

-ir- APP → -ir-

-an- REC → -an- (triggered by percolated REC)

In (24b), applicative spelling cannot apply on the first cycle, but reciprocal spelling does. On the second cycle, applicative spelling applies—followed by a second spell-out of the reciprocal morph -an-. Since the reciprocal feature percolates, non-local re-spelling of the morph -an- will occur even when there is an intervening suffix, as we have seen.[11]

Continuing with this problem of doubling, (25) shows that one might expect to get multiple respellings of reciprocal -an-. In these forms we begin with -mang-an- 'tie each other'. In (25a) we have attempted to express more than one applicative, with respelling of -an- after each one. The result is not very acceptable.

(25) a. mang-an-ir-an- 'tie each other for [s.o.]'

?*mang-an-ir-an-ir-an- 'tie each other for [s.o.] with [sth.]'

*mang-an-ir-an-ir-an-ir-an- 'tie each other for [s.o.] with [sth.] at [s.pl.]'

b. ?mang-an-ir-an-its-ir-an- 'cause to tie e.o. for [s.o.] with [sth.]'

'cause to tie e.o. with [sth.] at [s.pl.]'

?mang-an-ir-an-its-ir-an-ITSITS-ir-an- 'cs. tie e.o. for [s.o.] with [sth] well at [s.pl]'

'cs. tie e.o. with [sth] at [s.pl.] well for [s.reason]'

There are two possible explanations for this. First, perhaps there is a dislike of multiple -an-ir- sequences. Or, second, perhaps there is a dislike of repeated applicative FEATURES. If the doubled morphs are invisible, the unacceptable forms in (25a) would be violations of the RMC. In other words, the applicative morphemes in (25a) are actually adjacent to each other, just as they would be if there were no -an- doubling. In support of this second view, note in (25b) that the forms are better when a causative or intensive morph occurs between a doubled -an- and the following applicative -ir-. Of course, it is conceivable that this may also have something to do with the nature of the applicative itself, to which we now turn.

In (26) we illustrate the functions that the applicative may have when added to a verb such as -mang- 'tie'.[12]

(26)	a.	mang-ir-a mchômbo	'tie for Mchombo'[13]	[benefactive]
	b.	mang-ir-a chingwe	'tie with a rope'	[instrumental]
	c.	mang-ir-a m-nkhalăngo	'tie in the forest'	[locative]
	d.	mang-ir-a ndalâma	'tie for money'	[circumstantial]

What is of interest for the study of morphotactic constraints is that the applicative and passive suffixes have different orders according to the function of the applicative (cf. Alsina, in press): If the applicative introduces a benefactive, goal or instrument, -ir- must precede the passive morph -idw-. If it introduces a circumstantial, -ir- must follow -idw-. Finally, if it introduces a locative, either order is acceptable—without any semantic or grammatical difference that we have been able to discover.[14]

These facts are illustrated in the sentences in (27)-(30). The benefative and instrumental data in (27a) and (28a) with -ir-idw- should be contrasted with the circumstantial data with -idw-ir- in (30a). In (29) we see that independent of which role is made the subject of the passive, both of the orders, -ir-idw- and -idw-ir-, can occur when the applicative introduces a locative. The question is why.

(27) Applicative [benefactive] + Passive

a.	Mchómbó a-na-máng-ír-idw-á nkhûni	'Mchombo was tied firewood'
	*Mchómbó a-na-máng-ídw-ir-á nkhûni	
b.	*nkhúní zi-na-máng-ír-idw-á Mchômbo	('firewood was tied for Mch.')
	*nkhúní zi-na-máng-ídw-ir-á Mchômbo	[*PATIENT subject w/BEN]

(28) Applicative [instrumental] + Passive

a.	chingwe chi-na-máng-ír-idw-á nkhûni	'a rope was used to tie firewood'
	*chingwe chi-na-máng-ídw-ir-á nkhûni	
b.	*nkhúní zi-na-máng-ír-idw-á chingwe	('firewood was tied with a rope')
	*nkhúní zi-na-máng-ídw-ir-á chingwe	[*PATIENT subject w/INSTR]

(29) Applicative [locative] + Passive

a.	m-nkhalangó mu-na-máng-ír-idw-á nkhûni	'in forest was tied firewood'
	m-nkhalangó mu-na-máng-ídw-ir-á nkhûni	
b.	nkhúní zi-na-máng-ír-idw-á m-nkhalăngo	'firewood was tied in forest'
	nkhúní zi-na-máng-ídw-ir-á m-nkhalăngo	

(30) Applicative [circumstantial] + Passive

a.	*nkhúní zi-na-máng-ír-idw-á ndalâma	
	nkhúní zi-na-máng-ídw-ir-á ndalâma	'firewood was tied for money'
b.	*ndalámá i-na-máng-ír-idw-á nkhûni	('[for] money was tied firewood')
	*ndalámá i-na-máng-ídw-ir-á nkhûni	[*CIRCUM subject of passive]

For this purpose, Alsina (in press) presents a model which invokes the familiar thematic role hierarchy in (31).

(31) agent > benefactive > goal > instrument > patient > locatives > circumstantials

Applicative ARGUMENTS (participants) — Applic. ADJUNCTS (settings)

The roles that we have designated as "applicative arguments" result in an applicative -ir- that precedes passive -idw-, while those that we have identified as "applicative adjuncts" result in an applicative -ir- that follows passive -idw-. As seen, locatives are intermediate in the hierarchy, and thus can pattern either with applicative arguments or applicative adjuncts. (As mentioned, we have not found that the order of locative -ir- varies according to the semantic or grammatical properties of the locative that it introduces.)

There is in fact additional reason to believe that the schematic hierarchy in (31) is involved in determining suffix morphotactics in Chichewa. We have mentioned scope as determining the default ordering of suffixes. What about cases that do not conform? For example, as illustrated again in (32), causative -its- must precede applicative -ir- even though in most verb forms the scope is exactly opposite:[15]

(32) a. uk-a 'wake up'
b. uk-ir-a 'rebel against' (= 'wake up' + APP)
c. *uk-ir-its-a 'cause to rebel against'
d. uk-its-ir-a 'cause to rebel against' (also = 'wake up [s.o.] for (~ with ~ at)')

When the intransitive verb uk-a 'wake up' in (32a) is applicativized in (32b), the resulting idiomatic meaning is 'rebel against'. According to scope considerations, when (32b) is causativized, we should get the suffix order in (32c). Instead, as seen, the correct order is (32d). Thus, even in cases where a root+suffix combination must be listed as a lexical entry, morphemic circumscription can separate the two parts, as in (32d). Which brings us to the essential question: why? Why does the causative suffix have to precede an adjacent applicative suffix?

As indicated in (33a), the thematic hierarchy partially accounts for suffix orders that depart from what we would expect from scope. A second principle seems to be that suffixes that target roles higher on the thematic hierarchy should precede suffixes that target roles lower on the hierarchy. Since the causative introduces an agent, the highest thematic role, it will tend to come first. Since the applicative introduces benefactives, goals and instruments—and since the reciprocal tends to realize a patient argument—applicative - · · should precede reciprocal -an-. Unfortunately, an applicative should follow a reciprocal when it introduces a locative or a circumstantial—lowest on the hierarchy—but only optionally does. It seems that the ordering properties have become fixed according to the prototypical functions of each of the affixes. This leaves only the intensive orders in (33b).

(33) a. ir [ben] - CAUS [agt] → CAUS < ir > (agent ⊃ benefactive, etc.)
idw [pat] - CAUS [agt] → CAUS < idw > (agent ⊃ patient, etc.)
an [pat] - APP [ben] → APP < an > (benefactive ⊃ patient)

b. ir [var.] - INT [adverbial] → INT < ir > (adverbial ⊃ benefactive, etc.)
idw [var.] - INT [adverbial] → INT < idw > (adverbial ⊃ patient, etc.)

Since the intensive suffix has an adverbial function, we assume that it has widest scope, and yet it must precede both the applicative in all of its functions as well as

the passive.[16] Here again we apparently are dealing with the shared morphology of the intensive with the causative, the latter of which comes early by virtue of its being agentive. If this is correct, then something like the thematic hierarchy plays an important role in surface morphology as well as in syntax.

To summarize, although we have suggested that scope serves as a default for determining suffix ordering, other variables that may override scope include morphemic circumscription and the thematic hierarchy. In addition, the RMC plays an important role not only in blocking multiple spellings of the same morph, but potentially also in accounting for the doubling of reciprocal -an-. This latter phenomenon differs from everything else we surveyed in providing the only truly non-local effect within the Chichewa verb stem—and hence a serious challenge to current theories of morphology.[17]

The above having been said, we would like to conclude with some rather perplexing material that is not consistent with the cyclic spell-out hypothesis. Consider the morphosyntactic representation in (34a):

(34) a. [[[[mang] REC] APP] CAUS] 'cause to tie e.o. with'
b. *mang-an-ir-its-
c. *mang-ir-an-its- (=ungrammatical with intended scope)
d. ?mang-an-ir-<u>an</u>-its-
e. mang-an-its-ir-<u>an</u>-
mang-its-an-ir-<u>an</u>-
mang-its-ir-an-

As seen in (34b), cyclic spell-out of the REC, APP and CAUS features produces an ungrammatical output: both -an-ir- and -ir-its- are ungrammatical sequences. The crucial point is that if the derivation is cyclic in nature, it should be possible to fix up *-an-ir- *before* the spell-out of -its-. However, (34c) shows that it is not possible to spell out REC-APP as -ir-an- (by optional morphemic circumscription in (22)) when this sequence is in turn followed by -its-. In (34d) we see that doubling of -an- is at best marginal when -an-ir-an- is followed by -its-. On the other hand, the suffix orders in (34e) are all possible realizations of (34a): -its- may appear between -an- and -ir- (with doubling of -an- after -ir-); -its- may appear before the -an-ir-an- sequence or -its- may appear before the -ir-an- sequence that derives from REC-APP by morphemic circumscription in (22). Though not pointed out earlier, for expository reasons, the form in (2b), repeated as (35a), is actually ambiguous:

(35) a. mang-its-an- 'cause each other to tie; cause to tie each other'
b. mang-an-its- 'cause to tie each other' (*'cause each other to tie')

While the sequence -its-an- is ambiguous in scope, the opposite order -an-its- in (35b) has only one scope. Following the approach taken earlier, we apparently need to set up another optional case of morphemic circumscription:

(36) -an- → < an > / ___] {CAUS/INT} (optional)

In the last two examples in (34e), *two* instances of morphemic circumscription have applied: one marking off -ir- by (15a), one marking off -an- by (36).

What the data in (34) show is that the position of the causative suffix -its-

must be established before any attempt is made to deal with the -an-ir- problem. Again, this is consistent with its higher position on the thematic hierarchy, but in this case the result is an anti-cyclic spellout: It would appear that the entire morphosyntactic representation in (34a) is available from the start and that different features are spelled out in an order which, as we have seen, is partially influenced by the thematic hierarchy. Or, stated slightly differently, the spell-outs are weighted according to their position on that hierarchy, such that the first issue is to determine where the causative suffix will be. Throughout Bantu there is an unmistakable tendency for causative spelling to be early. The rest of the suffixes seem to accommodate the causative, rather than the other way around. In Cibemba, as we saw in (20), causative -i- will always be spelled out before applicative -il-, even though the latter *precedes* -i- on the surface. While the early spelling of causative -i- in (20) provides evidence for a cyclic derivation in Cibemba, the early spelling of causative -its- in (34e) provides evidence for anti-cyclicity in Chichewa. Needless to say, the special status of the causative (and, parasitically, the intensive) provides an important issue for future research into the morphotactic constraints that obtain within the verb stem of different Bantu languages.

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[2]As discussed further below, reciprocal -an- must be spelled out a second time when added to a base that has an applicative in it. In this paper, all instances of doubled -an- are underlined.

[3]The intensive suffix -ITS- (capitalized to distinguish it from causative -its-) must be reduplicated to -ITSITS- when followed by another derivational suffix. Note in the examples in (3d) that the two orders are synonymous and hence do not reflect a difference in scope (cf. note 16).

[4]As a result, there is no way to express an intensivized causative or a causativized intensive; nor is there any way to express two applicative arguments of the same verb if the sequence -ir-ir- is required: *nkúní zimene ti-na-máng-ír-ir-a mchómbó chingwe 'the firewood that we tied up for Mchombo with a rope'. Although Menn and MacWhinney (1984) show cases where the RMC results in haplology (cf. Stemberger 1983) or allomorphy, most Bantu cases which involve the morphological expression of argument structure result in blocking (or what Menn and MacWhinney call "avoidance"). Thus, with respect to the applicative, one -ir- cannot "register" more than one thematic role. The one exception is that a lexicalized causative may be causativized a second time, e.g. dy- 'eat', dy-ets- 'feed', dy-ets-ets- 'cause to feed'. We assume in these cases that the inner brackets of [[dy] ets] are not visible to the productive causative and other suffixes. We suspect that the RMC conflates more than one phenomenon. In some languages one cannot suffix a morph to a base whose final is partially similar to it. In Chichewa, intensive -ITS- cannot be suffixed to any base that ends in [ts], e.g. it may not suffix to the exceptional causative -uts- 'wake up [tr.]' (< -uk- 'wake up [intr.]') to derive *uts-ITS-. It may on the other hand be added to the exceptional causative -opsy- 'frighten' (< -op- 'be afraid') to yield opsy-ETS- 'frighten well'. While this also explains why we cannot get *-its-ITS-, it does not account for why *-ITSITS-its- is impossible (where the intensive precedes the causative and is hence doubled).

[5]For this reason we have chosen a toneless verb root mang- 'tie'. With an inflectional final vowel -a and in non-phrase final position, the causative form mang-its-a is still toneless, while the final H of form mang-ITS-á 'tie well' is due to the intensive suffix -ITS-. Note that (5b) is a "rule of referral" in Zwicky's (1987) sense (cf. Cairstairs' 1987 notion of "takeover").

[6]The standard example of prosodic circumscription comes from Ulwa (Nicaragua), where the construct state is created by circumscribing the first foot of a word and then inserting -ka- (which thus surfaces as an infix) (cf. McCarthy and Prince 1990; Lombardi and McCarthy 1991).

[7]As indicated above, this can also mean 'be caused to tie', from [[[mang] CAUS] PASS].

[8]Note that we consider "spell-outs" not to be rewrite rules, but rather statements of assignment or association, e.g. the morphemic feature APP becomes associated with the surface morph -ir-, etc.

[9]Hammond (1991) also introduces the notion of morphemic circumscription, particularly to handle so-called bracketing paradoxes.

[10]Muysken (1988) also discusses some non-local effects in Quechua that raise similar problems.

[11]Needless to say, we are concerned about this weakening of the Adjacency Condition. We have not been able to find any convincing explanation for why it should be the reciprocal suffix -an- that has this property in Chichewa. As documented by Hyman (1991), the causative morpheme -ị- doubles after a reciprocal in Cibemba. Why this should be so is also not clear. We would ideally like to avoid two undesirables: (i) allowing all outside suffixes to see any inside suffix (adjacent or not); (ii) allowing all features to percolate and hence be successively available to all outside suffixes. Note, finally, that there is a slightly different way to achieve the doubling of -an-: We could say that the APP feature is spelled out as -ir-an- if it attaches to a base that is [+REC]; otherwise it spells out as -ir-. In this approach it becomes an accident that the "allomorph" that is used after a [+REC] base just happens to have an extra -an- in it. That is, it would have been no less complex to spell out the APP as -ir-ik- or even -ik-at-, with one or both VC sequences having no relation to APP -ir- or REC -an-. It is not clear how crucial it is that the second part of -ir-an- is identical to REC -an-, though a similar relation exists in Cibemba, where CAUS + REC is realized as -ị-an-ị- (Hyman 1991). The important fact to capture about -an-ir-an- is that the sequence -ir-an- counts as one "cycle", i.e. does not involve a second abstract REC marking on the verb.

[12]The major function missing is goal, e.g. bwer-ets- 'bring' (< 'cause to come'), bwer-ets-er- 'bring to'.

[13]Technically, a benefactive (rather than instrumental) reading is most likely when there is an overtly expressed patient, e.g. 'the firewood that they tie for Mchombo'.

[14]We have tested numerous properties of locative applicatives against the two orders -ir-idw- and -idw-ir-. In almost every case, both orders are acceptable. The one exception to this statement concerns pairs of sentences such as the following:

galú a-na-í-thámang-its-idw-ir-â = mo 'the dog was chased into it' (-i- 'it' < nyŭmba 'house')
?galú a-na-í-thámang-its-ir-idw-â = mo

At present, we have no explanation for this difference in judgment.

[15]A typical example might be imb-its-ir- (< imb- 'sing') which clearly is interpretable first as 'cause to sing to' (with the APP having scope over the CAUS), rather than 'cause on behalf of [s.o.] to sing'. For different scopes, consider also the ambiguity of the form -lir-its-ir- (< -lir- 'cry'):

[with Z [X cause [Y cry]]] → [[[lir] CAUS] APP] -lir-its-ir- 'make cry with [instr]'

[X cause [for Z [Y cry]]] → [[[lir] APP] CAUS] -lir-its-ir- 'make cry for [s.o.]'

[X cause [Y cry for Z]]] → [[[lir] APP] CAUS] -lir-its-ir- 'make cry for [sth]'

In the first representation, the applicative introduces an instrument (e.g. ndodo 'stick') used to make Y cry. In the second representation, the applicative introduces a benefactive for whom X has made Y cry. Finally, in the third representation, the applicative introduces a thing which Y is crying for (i.e. wants).

[16]The adverbial and wide scope nature of the intensive is further demonstrated by two additional facts. First, intensive -ITS(ITS)- is the only suffix that cannot occur in verb stem reduplication, e.g. mang-a.mang-a 'tie repeatedly', mang-its-a.mang-its-a 'cause to tie repeatedly' etc. vs. *mang-ITS-a.mang-ITS-a [with H tone]. We attribute this to the semantic markedness that would result: Since mang-ITS-a means 'tie well' in the sense of tie tightly or tie securely, *mang-ITS-a.mang-ITS-a would mean 'tie tightly repeatedly', etc.) Second, there are cases where -ITSITS- cannot be followed by a sequence of two suffixes: *mang-ITSITS-an-its- 'cause to tie each other well' (vs. mang-its-an-ITS- 'cause each other to tie well'); *mang-ITSITS-ir-idw- 'be tied well with', etc. Thus, if forms like mang-ITSITS-ir- 'tie well for', mang-ITSITS-an- 'tie each other well' and mang-ITSITS-idw- 'be tied well' are to be accounted for by morphemic circumscription, it cannot be iterative in the way we saw for -its- in (20).

[17]Not addressed at all in this paper, is the potential relevance of the RMC, morphemic circumscription and morph doubling to the debate over whether morphemes are "rules" or "things" (see Anderson, in press; Janda 1983). The above phenomena appear to single out morphs, hence things, although we have tried to express the relevant facts in terms of rules wherever possible. It may turn out to be that morphemes are considerably more than things OR rules (see Rhodes 1993).

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The Place of Level-Ordering in Morphology *

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The morphological construct of level-ordering (Siegel 1979, Allen 1978, Kiparsky 1982, Mohanan 1982) has recently come under attack, both as a theoretical device and as a phenomenon. Many of the criticisms, including those of Sproat 1985 and Aronoff and Sridhar 1984, involve specific applications of this device to specific phenomena in English. The main aim of this paper is to counter the pessimistic outlook on level ordering with evidence from an altogether different source, a widespread phenomenon which the theory of Lexical Phonology has largely neglected. This is the phenomenon of position class morphology. I argue that level ordering is the only available mechanism within (some version of) this theory to even describe position classes, thus answering the objections of its critics.

1 Original motivation (from English)

The original inspiration behind level ordering was a generalization about English word formation. It had been noted in SPE that affixes in English subdivide into two main classes according to the phonological boundary with which they are associated. Siegel 1979 showed that this subdivision correlates with linear order: Class I affixes occur closer to the root than Class II affixes. The proposal that affixes belong to distinct, ordered strata was advanced to cover both the phonological and morphological facts, and constitutes one of the several hypotheses that together make up the theory of Lexical Morphology and Phonology (Allen 1978, Pesetsky 1979, Kiparsky 1982, Mohanan 1982)

Although Lexical Phonology, as formulated in Kiparsky 1982, conceptualizes strata as derivationally ordered subcomponents of the morphology, alternative models of level ordering exist as well. Selkirk 1982 accounts for Siegel's generaliztion by proposing two types of lexical constituents, the Root and the Word, with which affixes selectively combine (Class I suffixes combine with Roots; class II suffixes with Words (1b)). The phrase structure rules in (1a) ensure that Words dominate Roots but not vice versa, accounting for the ordering facts. A related proposal is developed in Inkelas 1990 (2); according to this view, each word is associated with parallel morphological and prosodic hierarchical structures whose various constituent types correspond directly to the levels of Lexical Morphology.

(1) a. Word → Word Af
Word → Root
Root → Root Af

b. -ous: [N^r ___]
-less: [N ___]

(2) a. n
|
...
|
2
|
1

b. -ous: [[ ]$_1$ suff]$_1$
-less: [[ ]$_2$ suff]$_2$

Both accounts rely heavily on affix subcategorization frames to implement level ordering, as seen in the (b) examples, though Selkirk's framework makes limited use of phrase structure rules in addition.

2 Attacks

Attacks on the segregation of English morphology into at least two levels have taken two forms. First, critics have noted the existence of bracketing paradoxes; see Aronoff 1976, Strauss 1982, Aronoff and Sridhar 1984, Pesetsky 1985, and Sproat 1985 for extensive discussion. The second basis for dissent involves redundancy. Aronoff and Sridhar 1984 have argued that a morphological Stem/Word affix distinction is sufficient and that phonological levels are not required in English; conversely, Sproat 1985 argues that level ordering effects are strictly phonological, *not* morphological in nature. Finally, Fabb 1988 claims that level ordering is redundant from every perspective, and should be jettisoned from the analysis of English in favor of lexical selectional restrictions.

There are, of course, other languages for which claims of level-ordering stand relatively unimpeached (so far): these include Malayalam (Mohanan 1982); Sekani (Hargus 1988); Tamil (Christdas 1988); and Kashaya (Buckley 1992). However, in this paper I will attempt to support the claim of level ordering by introducing data of a new type: position class systems. I will argue that some device approximating level ordering — irreducible to local selectional or syntactic restrictions — has a rightful place in morphological theory. We turn first to Nimboran, a Papuan language of New Guinea.

3 A new use for levels: Nimboran position classes

Verbs in Nimboran conform to the descriptive template in (3). A few examples in (4) show verbs of average complexity. (The analysis in this section is taken from Inkelas 1992, based on the comprehensive grammar by Anceaux (1965).)

(3)

0	1	2	3	4	5	6	7	8
root	PlSubj	DuSubj PlObj	MObj Particles	IncDuSubj	Loc	Iterative	Tense	SubjPers
		------Durative-----						

(4)

a. ŋgedúo-maN-ná-r-ám → ŋgedúomanarám
draw.sg-IncDuSubj-5Loc-Fut-Inc 'You (sg) and I will draw far away'

b. príb-tem[+A]-ŋkát-t-u → príptemgétɪ
throw-Dur-Iter-Pres-1 'I am throwing repeatedly here'

c. ŋgedúo-rár-maN-ná-r-ám → ŋgedúoremanarám
draw.sg-MObj-IncDuSubj-5Loc-Fut-Inc 'You and I (sg) will draw him far away'

The position classes represented in (3) not only order morpheme classes, but also impose internal complementarity. We consider three examples. First, (5) and (6) show that the co-positional Dual Subject and Plural Object block each other. This is shown by the failure of Dual Subject marking to surface in (6), which is parallel to (5) except in possessing a Plural Object marker. In (6), Dual and Plural subject are both represented by the Plural Subject marker:

(5)	a. Sg subj:	ŋgedúo-d-u draw.sg-Fut-1	→	ŋgedúodu 'I will draw (here)'
	b. Du subj:	ŋgedóu-k-d-u draw-DuSubj-Fut-1	→	ŋgedóukedú 'We two will draw (here)'
	c. Pl subj:	ŋgedói-<i>-d-u draw.pl-<Pl>-Fut-1	→	ŋgedóidiu 'We (many) will draw (here)'
(6)	a. Sg subj:	ŋgedóu-dár-d-u draw-PlObj-Fut-1	→	ŋgedóudáru 'I will draw them (here)'
	b. Du/Pl subj:	ŋgedói-<i>-dár-d-u draw.pl-<Pl>-PlObj-Fut-1	→	ŋgedóidiedú 'We two will draw them (here)'

Anceaux (p. 107) makes it clear that the blocking is not semantically motivated; forms with PlObj are ambiguous as to (nonsingular) number, *not* forcibly plural:

(7) "As far as their meaning goes [=PlObj verbs with nonsingular subjects], they are no typical Plural Actor forms, as they may have the meaning of Dual Actor, in the case of the Third Person Neutral even exclusively so."

A second case of co-positional blocking occurs between Masculine Object and Durative. Thus, the usual contrast between presence and absence of a Masculine Object marker (8) is neutralized when a Durative marker is present (9).

(8)	a. No object:	príb-be-t-u throw-6Loc-Pres-1	→	príbetú 'I throw from here to above'
	b. Masc obj:	príb-rár-be-t-u throw-MObj-6Loc-Pres-1	→	príbrebedú 'I throw him from here to above'
(9)	Durative:	príb-tem[+A]-be-t-u throw-Dur-6Loc-Pres-1	→	príptembetɪ 'I am throwing (him) from here to above'

Again, Anceaux assures us that the blocking is not semantic in nature (p. 109):

(10) "Though this is seldom the case, an object may be mentioned in a sentence in which the predicate is a Durative form. This object, however, does not have any influence on the verb-form, in other words: Durative forms are indifferent to sex or number of the object."

Both cases of blocking we have just seen are simple: each morpheme belongs to a given position class, and only one morpheme may surface per position. The picture is complicated by the Durative. As seen above, it blocks the position 3 Mobj. As shown in (11), however, it also blocks the position 2 DuSubj.

(11)	a. Dual:	ŋgedóu-k-t-u draw-DuSubj-Pres-1	→	ŋgedóuketú 'We two draw (here)'
	b. Plural:	ŋgedói-<i>-t-u draw.pl-<Pl>-Pres-1	→	ŋgedóitiu 'We (many) draw (here)'
	c. +Durative:	ŋgedói-<i>-tem[+A]-t-u draw.pl-<Pl>-Dur-Pres-1	→	ŋgedóitiemtí 'We (2 or more) are drawing (here)'

Though not illustrated here, the Durative also blocks the position 2 PlObj. Based on these facts, we may suppose that the Durative occupies positions 2 and 3 simultaneously, a sort of positional portmanteau. This possibility is confirmed by the more extreme case of 'particles', which can block anywhere from one to four positions. There are 70 or so of these (synchronically) semantically empty morphemes. About half of the approximately 300 roots discussed by Anceaux select for some particle under specified conditions. (12) illustrates two particles; notice in (b) that root and particle need not be adjacent to one another in the verb.

(12) a. patiá-**rár**-bá-k-u → patiárebáku
hold_a_pig_feast-particle-Loc-Past-1 'We held a pig feast above'

b. iɪé$_0$-k$_2$-**rim**-na[+A]$_5$-k$_7$-u$_8$ → iɪékrimenekí
signal_them-DuSubj-particle-Loc-Past-1 'We two signalled them from here to far'

The distributional restrictions on particles are much more complex than is indicated by the rough assignment to position 3 in (3). (13) illustrates two of the simpler constraints Anceaux notes on the distribution of particles:

(13) With *iabí-* 'gather' and particle *-de:* Iterative, Loc markers disallowed
With *skrí-* 'shake' and particle *-damaN[+A]:* DuSubj, IncDuSubj disallowed

Some constraints on particle occurrence can be traced to constraints on the root seleting that particle; others reside with individual particles themselves. We focus here on the latter type of constraint. Note that these constraints can always be stated in terms of which other morphemes must not occur in the same verb (14a). What is yet more significant is that the complementarity can be stated in terms of entire position classes (b):

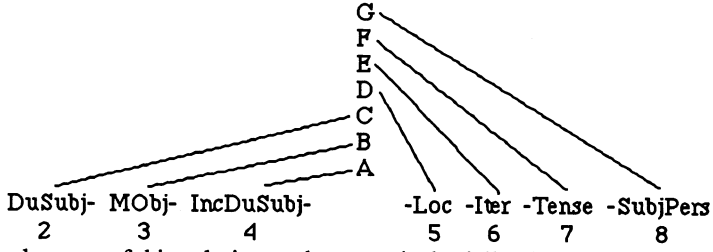
(14)

	a. Morphemes prohibited	*representative particles*	*b. Position class*
i.	IncDuSubj	*-maN[+A]-*	4
ii.	DuSubj and IncDuSubj	*-demaN[+A]-*	2,3,4
iii.	DuSubj	*-dáN[+A]-*	2
iv.	all Loc and Iter	*-N-*	5,6
v.	DuSubj, all Loc and Iter	*-náN[+A]-*	2,3,5,6
vi.	DuSubj and all Loc	*-ta[+A]-*	2,3,5

The various position classes with which a given particle may block are clearly not random. Rather, *each target of mass blocking by particles is a set of contiguous positions*. The one exception to this is position 4, whose sole occupant is the Inclusive Dual subject marker (4a,c). We know from (14) that certain particles block positions 3 and 5 without blocking the IncDu marker. This discontinuity poses a fatal problem for a model which conceptualizes positions in terms of a linear template. Such a model can obviously handle those affixes restricted to a single position or, conceivably, those which, like the position 2-3 Durative, occupy a string of contiguous positions. However, a linear template by its very nature cannot handle an affix which occupies two nonadjacent positions but permits the intervening position or positions to be filled by a different affix. This is exactly what would be required by the particles in (14v) and (14vi).

The solution I propose is to distinguish linear order (precedence) from position (dominance), identifying each affixal position class with a hierarchical level. The familiar linear positions are represented on the horizontal dimension; the new, hierarchical position I am proposing are represented on the vertical dimension:

(15)



The relevance of this solution to the paper is the following: I claim that the levels in (15) are precisely the levels of level-ordering theory, and that the same subcategorization frames developed for affix level selection in Inkelas 1990 extend straightforwardly to affixes in Nimboran. The lexical frames for 'normal', single-position affixes are given in (16). Note that we capture position-internal complementarity by assigning each affix a level-changing lexical frame: attachment of one affix at a given level bleeds any further affixation at the same level.

(16) a.

MObj:	[rár	[ ]$_B$]$_C$
DuSubj:	[k	[ ]$_C$]$_D$
IncDuSubj:	[maN	[ ]$_A$]$_B$

b.

Loc:	[[ ]$_D$ bá	]$_E$
Iterative:	[[ ]$_E$ ŋkát	]$_F$
Tense:	[[ ]$_F$ k	]$_G$
SubjPers:	[[ ]$_G$ am	]$_H$

(17) shows the parametric difference between a suffix in English (where affixation to a level is potentially recursive) and one in Nimboran (which permits no nesting):

(17) a. English suffix: [[ ]$_i$ suff]$_i$ [[ ]$_2$ ness]$_2$
b. Nimboran suffix: [[ ]$_i$ suff]$_{i+1}$ [[ ]$_D$ ná]$_E$

We may now characterize mass blocking as just a special case of regular positional blocking. Whereas inner and outer brackets of 'regular' affixes (17), differ by only one level, those of massively blocking affixes (18) differ by more than one:

(18)

Affix:	lexical frame	levels blocked
Dur:	[*tem[+A]* [ ]$_B$]$_D$	C-D
PlObj:	[*dár* [ ]$_B$]$_D$	C-D
Particle:	[[ ]$_A$ *demaN[+A]*]$_D$	A-C
Particle:	[*náN[+A]* [ ]$_B$]$_E$	C-E

To summarize: 'level' is defined hierarchically. There is no such thing as a simple 'level *i*' affix; rather, each affix may contrastively specify the level of the hierarchy at which it attaches, and the level produced as a result of attachment.

4 A new puzzle solved: adjective prefixation in Chaga

The next set of data to which we apply the revised theory of level ordering is Kivunjo[1], a member of the Chaga family of Bantu languages, spoken in Tanzania. Kivunjo has a number of noun classes with corresponding nominal, adjectival and verbal concord[2] (19). Our primary concern are the relationships between adjectival and verbal concord and between adjectival and nominal concord.

(19)

class	prefixes				
	subject	adjective	noun	demonst.	Plural Class
1 (sg)	a-	m-	m-	-cù	2
2 (pl)	wa-	wa-	wa-	wà-	
3 (sg)	u-	m-	m-	-cù	9
5 (sg)	lyi-	lyi-	Ø-, i-	-lyì	6
6 (pl)	gha-	ma-	ma-	-ghà	
7 (sg)	ki-	ki-	ki-	-kì	8
8 (pl)	shi-	shi-	shi-	-shì	
9 (sg, pl)	i-	i-, ŋ-	m-	-ì	10
10 (pl)	tsi-	tsi-	ŋ-	-tsì	
11 (sg)	ɬu-	ɬu-	u-	-ɬù	10
14	u-	u-	u-	-ù	
16	ha-	ha-	ha-	-hà	
17 (sg)	ku-	ku-	ku-	(-pf-)	6

At least four small puzzles emerge from this small corpus. We will look at them in turn, ultimately proposing a unified solution based on the premise of level ordering.

Puzzle 1: The question of zero prefixes

Though each noun root in Kivunjo must be underlyingly specified for noun class (which is generally unpredictable), nouns take class-marking prefixes nonetheless. We assume that this redundant class marking follows from the fact that nouns are bound roots and require prefixes to be well-formed. Support for this claim comes from the existence of a number of exceptional noun roots which, in the (unmarked) singular context, fail to take the prefix normally found on nouns of the relevant class. Nouns of this sort occur in classes 5 and 11. In (20), the (a) nouns take prefixes while the (b) nouns do not.

(20)

	Singular	Plural	gloss	class
a.	tondo	ma-tondo	'stupid person'	5/6
	imba	ma-imba	'maize'	5/6
	uruka	ŋ-urukua [ŋgyuruka]	'country'	11/10
	uha	ŋ-uha [ŋgyuha]	'palm of hand'	11/10
b.	i-kaŋgasi	ma-kaŋgasi	'dry-roasting pan'	5/6
	i-ndo	ma-ndo	'thing'	5/6
	u-ku	ŋ-ku [ŋgu]	'firewood'	11/10
	u-waŋgo	ŋ-waŋgo [mbaŋgo]	'cow barrier'	11/10

We propose that the exceptional (a) nouns are lexically specified as free stems. Already marked for noun class, they have no need for a noun class prefix.

(21) a. Bound root: [[ ] kaŋgasi]$_{5/6}$ a. Free stem: [tondo]$_{5/6}$

Interestingly, this behavior is systematic in noun classes 3 and 9:

(22)

a.	mdli	mdli	'town'	3/9
	moo	moo	'life'	3/9
b.	umbe	umbe	'cows'	9/10
	numba	numba	'house'	9/10

One might initially suppose these two noun classes simply lack prefixes altogether. However, the productive process of Augmentation shows this hypothesis to be wrong. Augmentative status is conveyed upon a noun by sending it into class 3, whereupon it takes the syllabic nasal prefix /m-/ (23a). Plural Augmentatives are formed by sending these derived class 3 nouns intact to class 9 (23b). There they acquire a second (homophonous) prefix.

(23)

Citation form of base noun			a. Sg. Augmentative (class 3)	b. Pl. Augmentative (class 9)
cl. 1	'old lady'	m-kyeku	m-kyeku	m-m-kyeku
cl. 3	'town'	mdli	m-mdli	m-m-mdli
cl 5	'stool'	lodliŋga	m-lodliŋga	m-m-lodliŋga
cl 7	'granary'	ki-kumbi	m-kumbi	m-m-kumbi
cl. 9	'soil'	teri	m-teri	m-m-teri

Evidence for the noun classes of Augmentatives comes from the adjectival (24), verbal and demonstrative (25) concord they inspire:

(24)

Class 3 Aug (sg)	*Class 9 Aug (pl)*
a. m-sodlo **m-**ɬeshi Cl3-man Cl3-tall 'tall man (Aug)'	c. m-m-sodlo **ŋgi-**ɬeshi (< cl1 m-sodlo 'man') Cl9-Cl3-man Cl9-tall 'tall men (Aug)'
b. m-timba **m-**ɬeshi Cl3-shack Cl3-tall 'tall shack (Aug)'	d. m-m-timba **ŋgi-**ɬeshi (< cl5 i-timba 'shack') Cl9-Cl3-shack Cl9-tall 'tall shacks (Aug)'

(25)

a.	ki7-kumbi=ki7	'this granary'	base sg class 7
b.	shi8-kumbi=shi8	'these granaries'	base pl class 8
c.	m3-kumbi=cu3	'this granary (Aug)'	Aug sg class 3
d.	m9-m3-kumbi=i9	'these granaries (Aug)'	Aug pl class 9

In sum, class 3 and 9 nominal prefixes exist. The free stem status that is exceptional in class 5 and 11 roots is simply regular in underlying roots of classes 3 and 9[3].

Puzzle #2: Identity of the adjectival prefix:

Noun classes form two categories according to which prefix they assign to adjectives. As can be seen from the chart in (19), adjectives take either the Np or the Sm, depending on noun class. In classes 1, 3, and 6, head nouns and modifying adjectives both take the Np (noun class prefix):

(26)

Cl 1:	**m**-sudi	**m**-ɬeshi	n-**a**-i-imba	
	Np-man	**Np**-tall	Foc-**Sm**-Tns-sing	'The tall man is singing'
Cl 3:	mringa	**m**-ca	**u**-samb-i-o	
	water	**Np**-good	**Sm**-eat-appl-pass	'The good water is being used for washing'
Cl 6:	**ma**-imba	**ma**-tutu	**gha**-i-zrem-o	
	Np-maize	**Np**-small	**Sm**-Tns-farm-pass	'The small maize is being cultivated'

By contrast, adjectives modifying class 5, 10 or 11 nouns take the Sm, not the (distinct) Np. The sentences in (27) have an NP-VP structure; the verb exhibits the same Sm as the adjective in the subject NP.

(27) Cl 5: **i**-kaŋgasi **lyi**-tutu **lyi**-angu kuta lodlinga
Np-dry-roasting pan **Sm**-small **Sm**-Tns-light compared_to stool
'The small dry-roasting pan is lighter (in weight) than the stool'

Cl 11: **u**-ku **ɬu**-tutu **ɬu**-Ø-ha
Np-firewood **Sm**-small **Sm**-Tns-burn
'The small firewood was burning'

Cl 10: **ŋ**-caa **tsi**-tutu **tsi**-Ø-funǰika
Np-fingernail **Sm**-small **Sm**-Tns-break
'The small fingernails were breaking.'

In classes 2, 7, 8, 14, 16 and 17, Np and Sm are homophonous; thus the status of the adjective concord is indeterminate.

(28) Cl 2: **wa**-ndu **wa**-wico n-**wa**-i-ca 'The bad people are coming'
2-person **2**-bad Foc-**2**-Tns-come

Cl 7: **ki**-te **ki**-tutu n-**ki**-ɬe-wa-funa 'The big dog chased them'
7-dog **7**-ɬeshi Foc-**7**-Tns-OM-chase

Cl 8: **shi**-te **shi**-tutu n-**shi**-ɬe-wa-funa 'The big dogs chased them'
8-dog **8**-ɬeshi Foc-**8**-Tns-OM-chase

Cl 14: **u**-ca **u**-ha n-**u**-ɬe-zreka 'The new goodness got lost
14-goodness **14**-new Foc-**14**-Tns-get lost

Cl 16: **ha**-ndu **ha**-tutu n-**ha**-Ø-ha 'A small place just burned'
16-thing **16**-small Foc-**16**-Tns-burn

Cl 17: **ku**-zru **ku**-tutu n-**ku**-Ø-ɬuwo 'The small ear was ailing'
17-ear **17**-small Foc-**17**-Tns-ail

Puzzle #3: asymmetries among adjective roots

Adjective roots also partition into two types. In addition to the adjectives we have dealt with thus far—termed 'versatile' adjectives—there is another class of adjective roots which systematically take the Sm even when modifying nouns whose noun class normally makes the Np available to adjectives. We term these 'rigid' adjective roots. Compare (29) ('rigid' adjective roots) and (30) ('versatile' adjective roots):

(29) cl 1 a. **m**-sodo **a**-ŋaɲi b. **m**-ana **a**-udeedee [> oʈeeʈee]
Np-man Sm-big Np-child Sm-frivolous

cl 3 c. mzri **u**-foi d. mra **u**-ŋaɲi
medicine Sm-much water gully Sm-big

cl 6 e. **ma**-kaŋgasi **gha**-faɲi f. **ma**-rina **gha**-foi
Np-roasting pan Sm-dirty Np-hole Sm-many

(30) cl 1 a. **m**-sodo **m**-ɬeshi b. **m**-ana **m**-kadamtsu
Np-man Np-tall Np-child Np-smart

cl 3 c. mzri **m**-ca d. mra **m**-tutu
medicine Np-good water gully Np-small

cl 6 e. **ma**-kaŋgasi **ma**-tutu f. **ma**-rina **ma**-ca
Np-roasting pan Np-small Np-name Np-good

(31) correlates noun class with adjective prefix for the two types of adjective root:

(31) Class		Prefix on versatile root	Prefix on rigid root
1	**mu-**	**Np a-**	**Sm**
2	wa-	Np (= Sm)	wa- Sm (= Np)
3	**mu-**	**Np u-**	**Sm**
5	lyi-	Sm lyi-	Sm
6	**ma-**	**Np gha-**	**Sm**
7	ki-	Np (= Sm)	ki- Sm (= Np)
8	shi-	Np (= Sm)	shi- Sm (= Np)
10	tsi-	Sm tsi-	Sm
11	łu-	Sm łu-	Sm
14	u-	Np (= Sm)	u- Sm (= Np)
16	ha-	Np (= Sm)	ha- Sm (= Np)
17	ku-	Np (= Sm)	ku- Sm (= Np)

Noun classes in which there is a distinction between restricted and unrestricted prefixes are shown in boldface. In each case, the restricted prefix appears on the versatile but not on the rigid adjective root.

Analysis of puzzles 2 and 3

We propose that the subconstituents of the noun are identified with one of three category types, arranged in a fixed hierarchy as shown in (32). Furthermore, we propose to identify each of the root types we have discussed with one of these three categories, as in (33):

(32)
C
|
B
|
A

(33)

[foi]$_C$	*'rigid adjective root'*
[tutu]$_B$	*'versatile adjective root'*
[usu]$_A$, [[ ] sodlo]$_A$	*'free, bound noun root'*

On this account, noun roots are category A, versatile adjective roots (e.g. *-tutu*) are category B, and rigid adjective roots (e.g. *-foi*) are category C.

This division of roots into hierarchically ordered categories now enables us to describe the prefix classes in related terms. (34a) shows those classes containing 'unrestricted' noun class prefixes. As these attach both to noun roots and to versatile adjective roots, we propose that the noun class prefixes may attach either to an 'A' or a 'B' category. By contrast, the subject markers in these noun classes go only on category 'C' forms. (34b) illustrates noun classes with 'restricted' noun class prefixes. These attach only to category 'A' forms, leaving the so-called subject marker to attach either to category 'B' or 'C' forms. Finally, (34c) depicts noun classes in which the same prefix attaches at all levels.

(34) a.

1	3	6
C a-	u-	gha-
B-A m-	m-	ma

b.

5	10	11
C-B lyi-	tsi-	łu-
A i-	ŋ-	u-

c.

2	7	8	14	16	17
C-B-A wa-	ki-	shi-	u-	ha-	ku-

Prefixes which may attach to more than one category of form are underspecified for level of attachment. This is clearly motivated in the case of the indeterminate

prefixes in (34c), which attach to forms of any category. They contrast with the 'A' and 'C' prefixes in (34a) and (34b) which attach to only one specific level:

(35) a. 'A' = [__ [ ]$_A$] (Restricted Np)
b. 'C' = [__ [ ]$_C$] (Restricted Sm)
c. 'ABC' [__ [ ]] (Unrestricted Np, Indeterminate prefix)

No distinct representation is needed for the 'two-level' prefixes in (34a,b). These are also completely unspecified; since they compete with more specific prefixes marked for attachment at a single level, the Elsewhere Condition ensure that the less specific prefix will be used only for the other two possible levels.

(36) 'AB' = 'BC' = 'ABC' [__ [ ]] (Unrestricted Np, Indeterminate prefix)

The following chart shows the featurally compatible prefix-stem combinations and further indicates which combinations are blocked (and by whom).

(37)

	i[ ]$_A$	gha[ ]$_C$	lyi[ ]	ma[ ]	ki[ ]
[kangasi/te]$_A$	[ikangasi]$_A$	* (A≠C)	**BLOCKED** by [ikangasi]$_A$	[makangasi]$_A$	[kite]$_A$
[tutu]$_B$	* (A≠B)	* (B≠C)	[lyitutu]$_B$	[matutu]$_B$	[kitutu]$_B$
[foi]$_C$	* (A≠C)	[ghafoi]$_C$	[lyifoi]$_C$	**BLOCKED** by [ghafoi]	[kifoi]$_C$

A possible alternative account of the versatile/rigid adjective root distinction would be to appeal to syntax, postulating e.g. that the former are nouns while the latter are verbs. This is borne out to some extent by the example in (38a). Certain rigid adjective roots, including *ŋaŋi* 'big', serve without modification as verb roots (cf. the true verb root in (b)):

(38) *Verbal adjectives (all nouns in class 1):*

a. Ohanyi n- a- ɬe- **ŋaŋi** Ndesambudlo
John FOC- Sm- Tns- **big** Ndesambudlo
'John was bigger than Ndesambudlo'

b. Ohanyi n- a- ɬe- **funa** Ndesambudlo
John FOC- Sm- Tns- **chase** Ndesambudlo
'John chased Ndesambudlo'

Versatile adjective roots may also serve as the base of a verb (39a), though they require a verbal extension suffix (cf. the verb in (b)).

(39) a. Ohanyi n- a- ɬe- **aŋgu** **-i** **-a** Ndesambudlo
John FOC- Sm- Tns- **light** **-ext** **-FV** Ndesambudlo
'John was lighter than Ndesambudlo'

b. Ohanyi n- a- ɬe- **kod** **-i** **-a** Ndesambudlo
John FOC- Sm- Tns- **cook** **-ext** **-FV** Ndesambudlo
'John cooked for Ndesambudlo'

The fact that certain adjective roots can function directly as verb roots while others require a verbal extension does suggest a syntactic difference. However, this distinction cannot be collapsed with that between rigid and versatile adjective roots. Within both rigid and versatile adjective categories, we find roots which cannot

function as the base of verbs. This is most clear in the case of color terms. As shown in (40), *maande* 'red' belongs to the rigid category. Modifying a class 6 noun in (a), *maande* takes verbal (Sm) instead of nominal (Np) concord. By contrast, *iwu* 'black' belongs to the versatile category; modifying the same class 6 noun (in (b)), it takes the Np, *ma-*.

(40) a. Ma- rinda **gha- maande**
Np- dress **Sm- red**
'red dress'

b. Ma- rinda **ma- iwu**
Np- dress **Np- black**
'black dress'

Further, neither of these adjective roots is capable of serving as the base of a verbal comparative of the kind illustrated in (38) or (39). The same is true of the other color terms in both rigid (41a) and versatile (b) adjective root lists, respectively. Clearly, it would be inaccurate to explain the behavior of rigid adjectives by categorizing them as verb roots.

(41) a. *Ma- rinda n- gha- ɬe- **maande** shiazru
Np- dress FOC- Sm- Tns- **red** shoes
'The dresses were redder than the shoes'

b. *Ma- rinda n- gha- ɬe- **iwu -i -a** shiazru
Np- dresses FOC- Sm- Tns **black -ext -FV** shoes
'The dresses were blacker than the shoes'

A different alternative might be to accept the idea of 'positions' but construe them in a strictly linear sense, i.e. as part of a flat linear template: D-C-B-A. Under this account, we could retain the insight that noun roots, versatile adjective roots and rigid adjective roots occupy distinct positions, by proposing that versatile roots occupy positions B-A while rigid roots occupy positions C-B-A. Noun roots would simply occupy position A. 'Restricted' Np's would occupy slot B while 'unrestricted' Np's would fill slot C. Sm's would belong to slot D.

Without working through the details, we note two serious problems for such an account. The first is that it predicts no recursion and the second is that it predicts that a slot 'B' prefix should never occur to the left of a slot 'C' prefix. Both predictions are falsified by the system of diminutive and augmentative formation. A small portion of this system suffices to prove that multiple prefixation occurs.

As we have already seen, augmentatives are formed by sending a noun root to class 3, as shown in (42b). However, what we have not yet seen is that just in case the noun root is itself monomoraic (42c), then it will take the nominal concord of its own base class prior to Augmentation. Such nouns will have two prefixes, the outer of which is the strictly 'B' level class 3 prefix, as in (42d).

(42) a. i- seyesa 'lizard'
Np5- lizard

b. m- seyesa 'lizard (Aug)'
Np3- lizard

c. i- dla 'leaf'
Np5- leaf

d. m- i- dla 'leaf (Aug)'
Np3- Np5- leaf

(43) a. ki- kumbi 'granary'
Np7- granary

b. m- kumbi 'granary (Aug)'
Np3- granary

c. ki- te 'dog'
Np7- dog

d. m- ki- te 'dog (Aug)'
Np3- Np7- dog

Although the noun in (42) happens to have its base in class 5, we find the same pattern obtaining in (43), where the nouns in question start off in class 7. In fact, it proves to be quite general: the class 3 prefix, strictly an 'B' slot prefix, is capable of occuring outside of any other nominal prefix in case the noun root is monomoraic. This attested recursion is fatal for a flat template approach, although it follows naturally from the hierarchical approach to levels we have advocated.

In summary, we stand by our conclusion that what distinguishes the versatile adjective roots is that they are level B constituents and thus able to take an (underspecified) Np.

Puzzle #4: allomorphy of Class 9 Np prefix

Adjectives in class 9 may take either of two prefixes, apparently in free variation. One is *ŋ-*; the other is *i-*, the Sm.

(44) a. numba **ŋgi**-tutu **i-Ø-**ha
house Np-small Sm-Tns-burn
'the small house was burning'

b. numba **i-**tutu **i-Ø-**ha
house Sm-small Sm-Tns-burn
'the small house was burning'

But neither of these prefixes has the same form as the nominal prefix that shows up on Augmentatives. As we saw earlier, the preprefix on plural Augmentative nouns surfaces as syllabic /m/, identical to the surface form of the singular class 3 Np. If we follow the simplest course and assume that the nonalternating surface form is the underlying form, then we arrive at the three-way prefix contrast given in (45) for class 9 — the only class with this complex a prefix paradigm.

(45)

C	i-	Sm
B	(ŋ-)	Ap (versatile only)
A	m-	Np

Although it would seem that the use of /ŋ-/ on adjectives is optional, the fact remains that /ŋ-/ surfaces neither on noun roots nor as a subject marker. When it is used, it is used exclusively on versatile adjective roots, suggesting an exclusive level B subcategorization.

The surface phonological form of /ŋ-/ has still more implications for our proposal of level ordering. As we have seen, in its function as the level B class 9 versatile adjective prefix, it has the invariant surface form [ŋgi]. Yet class 10 also has an /ŋ-/ prefix. We have noted that the class 10 /ŋ-/ is a category 'AB' prefix, showing up on noun roots and versatile adjective roots. The surface form of this prefix varies according to context. When it combines with vowel-initial noun roots, it surfaces as [ŋgi], taking the same surface form as the class 9 prefix:

(46) *Class 10 plurals of vowel-initial class 11 nouns:*

a. ŋ- uha → **ŋgy**uha
Np- palm of hand 'palms of hand'

b. ŋ- uango → **ŋgy**uwaŋgo
Np- cow barrier 'cow barriers'

(47) *Class 9 velar nasal prefix on (versatile) adjective roots:*

a.	pakudli	ŋ-tutu	→	pakudli **ŋgi**tutu
	bowl	Np-small		'small bowl'
b.	ndzina	ŋ-moso	→	ndzina **ŋgi**moso
	fist	Np-left		'left-handed fist'

However, when the class 10 /ŋ-/ prefix attaches to consonant-initial noun roots, it surfaces as a nasal homorganic to the initial consonant, as in (48):

(48) *Class 10 plurals of vowel-initial class 11 nouns:*

a.	ŋ-	tifo	→	**n**difo
	Np-	footprint		'footprints'
b.	ŋ-	wango	→	**m**baŋgo
	Np-	cow barrier		'cow barriers'

What causes these contrasting behaviors of /ŋ-/? We propose that when it combines with a level 'A' form — that is,with a noun root — /ŋ-/ simply assimilates in place to a following consonant. However, assimilation does not take place at level 'B'. Thus, when it combines with a (versatile) adjective root, /ŋ-/ instead triggers a rule of epenthesis, surfacing as [ŋgi]. Thus, the behavior of /ŋ-/ adduces some phonological support for the level ordering hypothesis that we motivated on the basis of morpheme ordering.

5 Level ordering revisited: an answer to the critics

Fabb 1988 has argued against level-ordering in English on the grounds that 'level-ordering does no extra work in ruling out suffix pairs beyond that done by independently needed selectional restrictions.' By 'selectional restriction' Fabb means selection for properties other than part of speech. Of course, in a representational model of level ordering like the hierarchical one adopted in this paper, level-ordering is accomplished by selectional restrictions. But we do not mean to trivialize Fabb's claim by redefining his terminology. Let us consider the specific selectional restrictions Fabb discusses:

(49) a. Suffix attaches only to unsuffixed stem (explains *person* + *ify* and *clar* + *ify* vs. **person* + *al* + *ify*.)
b. Suffix may follow only an unsuffixed stem or one of a small set of specific suffixes (explains *revolut* + *ion* + *ary* but **patron* + *age* + *ary*)
c. Suffix attaches freely

Although Fabb considers these selectional restrictions as a replacement for the theory of level ordering, another perspective is that (a) and (c) are exactly the kind of restrictions we expect to see in a theory of level ordering of the type advocated in this paper. Consider in particular category (a). Any reference to 'unsuffixed stem' is quite unexpected in a theory of morphology which restricts access to internal structure. Recognizing such a stem presupposes access by a affix to information about suffixation — even when potentially embedded inside layers of prefixation. This requires more than just a peek inside the rightmost bracket to make sure that the word doesn't end in a suffix. In fact, Fabb acknowledges his claim requires that "all internal brackets are visible to all derivational suffixes" (p. 533).

Fabb's approach makes it possible to describe a suffix which attaches to all forms containing exactly one suffix, or exactly two — or forms containing exactly one affix, whether suffix or prefix. These predictions are clearly undesirable. But what is Fabb really getting at here? His conclusion seems to be that once we exclude affix order and local morphological restrictions (e.g. of the kind just discussed by Hyman and Mchombo (this volume)), we are left with the observation that certain suffixes must immediately follow a stem. But this is exactly the kind of statement we expect to find in a *position class system.* And that, of course, is what I have claimed level ordering is well-suited to handle. We may interpret Fabb's proposal not as a rejection of level ordering theory but rather as the inspiration to divide up the suffixes in a different way. What was originally intended as an argument against level ordering in fact may turn out to be an argument in its favor — as long as level ordering operates in the new form suggested for it here.

(50) a. Retained: claim of ordered levels
b. Rejected: notion that each affix belongs to a single distinct level
c. Rejected: notion that each level has unique phonological correlate(s)

We have made extensive use of the notion of underspecification for level and that a given affix may change the level of the constituent to which it attaches. Neither idea is new; suggestions along both lines can be found in Selkirk 1982. However, the representational model, with its heavy reliance on affixal selection frames, is ideally suited to capture both possibilities.

In conclusion, exactly those phenomena problematic for a straightforward position class analysis can be handled with the levels of lexical phonology, if we jettison certain parts of level-ordering theory — to which objections had been raised in the past anyway (such as the correspondence between phonology and morphological ordering). Furthermore, we can relate position class systems to so-called 'layered' systems by manipulating the single parameter of level-internal recursion, thus bringing position class morphology into the mainstream of the theory of Lexical Phonology and Morphology.

Notes

*Thanks to Larry Hyman for many thought-provoking discussions of the issues dealt with in this paper.

[1]This work is part of a larger project on Kivunjo adjectival concord which I am undertaking with Lioba Moshi. There is some orthographic disagreement in the published literature on Kivunjo (see McHugh 1990 for an overview). In this paper we use 'gh' for [ɣ], 'zr' for [ʒ], 'sh' for [ʃ], 'c' for [č], and 'dl' for [ɬ]. However, we retain IPA symbols for the velar nasal [ŋ] and velarized lateral [ɬ].

[2]The slight differences between this paradigm and that in McHugh 1990 will not concern us here (see Inkelas and Moshi (in prep) for a full discussion)

[3]Kinship terms in class 1 also systematically fail to take prefixes (Inkelas and Moshi (in prep)).

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ON THE INTERACTION OF GRAMMAR COMPONENTS IN LAKHÓTA: EVIDENCE FROM SPLIT INTRANSITIVITY

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0. Introduction. Lakhóta is the most widely spoken variety of Sioux, a dialect continuum which extends over much of the plains of the northern United States and central Canada[1]. This language is often cited as a prototypical example of an "active" language: the subject person marker affixed to intransitive verbs varies depending on whether the verb is "active" or "stative". In transitives, the subject is cross-referenced by the active set while the direct object is cross-referenced by the stative set; cf. (1).

1. Person marking in Lakhóta:

	active	stative
'I'	wa-	ma-
'you'	ya-	ni-

Examples:

active	stative	transitive
wa-psíča	ma-xwá	ma-yá-kte 'you kill me'
I jumped'	'I am sleepy'	I (stative) you (active)-kill

In addition, there is a third person plural object morpheme *wičha*, which for our purposes can be said to occur only with transitive verbs, and a general plural enclitic *pi*, which (again for our purposes) can be said to occur with either animate third person subjects or second persons (subjects or objects). These morphological distribution statements are simplified to cover only the data used in this paper; cf. Rood and Taylor (to appear) for more details.

The split intransitivity pattern pervades the grammar of Lakhóta, affecting the phonology, the morphology, and the syntax, thus bearing on the issue of the interactions of these three components. Our purpose in this paper is to demonstrate that (1) some phonological rules are sensitive to the split intransitive distinction; (2) the determination of person marking class is not based on the semantics of the verb root or stem, but rather is sensitive to syntax, namely, whether or not the verb has an *initial* or deep subject or object. We will show that independently of split intransitivity, rules of person marking referring to grammatical relations are needed to account for reflexives, reciprocals, and verbs which take two stative arguments. The same rules, then, account for the differences among intransitive verbs. Finally, we will present evidence that the interpretation of a complement clause can depend on the syntactic distinction between embedded unaccusatives and unergatives.[2]

1. Phonological correlations with split intransitivity.

1.1. Correlation with velar palatalization. Lakhóta has a very ordinary velar palatalization rule of the form stated in (2) (Cf. Patterson 1990:150-156; Shaw 1980:192ff; Carter 1974:180; Boas and Deloria 1941:14; Boas and Deloria 1932:110; Riggs 1893:8):

2. k > č /i,e + ___V

The exact statement of the preceding context for the process is complex; affixes from different lexical levels have different effects (cf. Patterson 1990:150-156 for the most recent discussion of these problems in a Lexical Phonology framework). The rule may apply after certain affixes, or after initial elements of compounds, i.e. the context can be either inflectional or derivational. Moreover, palatalization applies equally to plain, aspirated, and glottalized stops:

3. a. k?ú 'to give'
nič?ú 'she gave it to you'

b. khuté 'to shoot at'
ničhúte kte 'he will shoot at you'

c. glí 'to arrive home coming'
kú 'to be on the way home, coming'
gličú 'to start out for home, coming'
cf. yaglíyaku 'you have started coming home'
(The medial -y- is epenthetic and the second -a- is a separate morpheme which occurs whenever the verb carries an inflectional prefix.)

However, as previous researchers have noted, this rule is suspended in several morphologically defined contexts. Significantly for our purposes, unaccusative verbs, such as the three in (4), regularly fail to palatalize:

4. a. kháta 'be warm'
nikháta[4] 'you are warm'

b. khúžA[3] 'be nauseous'
nikhúže 'you are nauseous'

c. okháyake 'to have stuff (burrs, leaves) stuck on'
oníkhayake 'you have stuff stuck on you'

Derived verbs behave rather unpredictably with respect to this rule. In particular, when the prefixes *ka-* 'by a blow or by outside force' or *ki-* 'become' derive new verbs, neither the class of the new stem nor the class of the unprefixed stem is a reliable indicator of whether or not the prefixal /k/ will palatalize. We have many forms, including minimal pairs like those in (5a), for which the class of the derived stem is determining:

5. a. kat?át?a 'fall down by accident' (unaccusative)
OR
'knock unconscious' (transitive) (from ka- + t?A 'die', itself unaccusative)
nikát?at?a 'you fell down by accident'
ničát?at?a 'she knocked you out'

b. kakíze 'to suffer' (unaccusative) (there is no underived stem *kíze)
nikákize 'you are suffering'

c. akísni 'to recover from illness' (unaccusative) (from sní, unaccusative, 'be cool')
aníkisni 'you are recovering'

d. kasótA 'to break, i.e. to use up the money of' (transitive)
(from sóta, unaccusative, 'to be used up')
ničásota he? 'Did she use up your money?'

It is also common, however, for an unaccusative stem to remain immune to palatalization even when it is derived to be transitive. Boas and Deloria (1941:14) give 4 examples, one of which (also cited by Shaw (1980:193)) is (6):

6. kíza 'to squeak' (unaccusative)
naníkíza 'he makes you squeak by stepping on you' (na- instrumental prefix 'by action with the foot')

The exceptions to palatalization are always in the direction of unexpected immunity to the rule; we have been unable to find examples of unaccusative stems that do palatalize. The appropriate generalization, then, is that the designation [unaccusative] will always predict the phonological rule constraint [-velar palatalization], although there are other phenomena which also invoke this constraint.

1.2. Correlations with stress under reduplication. Several researchers (Patterson 1990, Sietsma 1988, Marantz 1982, Carter 1974, Wilbur 1973, Boas and Deloria 1941, et al.) have studied reduplication in Lakhóta. The most recent analysis (Patterson 1990: 89-99) concludes that reduplication is a suffix, best thought of as a copy of the last maximum syllable (CCVC) of the stem. The final vowel of the citation forms of many stems is considered epenthetic, and there are several subsequent rules which modify the consonant clusters which the suffix produces. For our purposes, however, the most salient observation is that of Boas and Deloria (1941:36-38), repeated by Carter (1974:234-236), that unprefixed transitive and unaccusative verbs take stress on the second syllable, while unergative verbs stress the first syllable. Boas and Deloria (1941:38) give about 20 examples of reduplicated unaccusatives stressed on the second syllable, and derived unergative or adverbial forms with first syllable stress; two of these are in (7):

7. a. blebléčaha 'to be shattered to pieces' (-ha 'progressive')
blébleča 'to shake the body, as a dog does after swimming'
b. snisníza 'to be flat, as a tire'
snísnis (adv.) 'gradually deflating'

Other examples of both patterns are given in (8):

8.

Unccusatives	Unergatives
púzA 'dry' > puspúza	ǧópa 'snore' > ǧóbǧopa
sápA 'black' > sabsápa	psíča 'jump' > psípsiča
thó 'blue' > thothó	škáte 'play' > škáškate

Transitives
yúze 'to fish out' > yusyúze
khuté 'to shoot at' > khulkhúte

It should be noted that second syllable stress is the norm for the underlying forms in this language, although surface forms may have either first or second syllable stress. The addition of a prefix necessarily pulls the stress forward to conform with this constraint.[5] Consequently, it is difficult to test what happens to these stress patterns when an unergative becomes transitive. The only derivational suffix we can find is the causative auxiliary *-ya*, which can sometimes be added to a reduplicated form; when this happens, stress appears to be consistently on the second syllable of the resulting forms:

9. a. sabsápa 'black' (reduplicated unaccusative)
   sabsábya 'blacken'
   b. nášnaži 'stand' (reduplicated unergative)
   našnážiya 'cause to stand'

Thus it is the lexical class of the derived stem to which the phonological rule of stress placement in reduplicated forms must refer. In this case, however, the unergatives are the exceptional pattern: the designation [unergative] triggers the phonological exception [first syllable stress]. All other forms will be stressed correctly by the rule which works for everything else in the language. Utilizing constraints on phonological rules as evidence, then, we find we must isolate two sets of intransitive verbs. The unaccusative set provides the exceptions to the velar palatalization rule, while the unergative set provides the exceptions to the stress rule when the verb reduplicates.

2. Semantic correlations. The difficulty of characterizing the unaccusative and unergative classes purely in semantic terms has been commented upon by everyone attempting to do so. Yet Merlan (1985) concludes that the unergative (or active) class requires animate subjects which are sometimes but not always agentive (= volitional). She emphasizes, however, that the unaccusative (or stative) class--which comprises the largest number of verb stems in Lakhóta--cannot be characterized semantically. Mithun (1991) proposes that the unergative class be defined by the cover term "agency"--which is actually a disjunction of properties, including participants that perform, effect, instigate, or control the action (in other words, her notion of agency is not equal to volitionality).

Examination of data like those in (10) leads us to different conclusions.

10. Examples of intransitive verbs, morphologically defined:

Unergative/Active		Unaccusative/Stative	
máni	'walk'	khúžA	'be sick'
lową	'sing'	watúkha	'be tired'
?í	'arrive'	yazą	'be in pain
yÁ	'go'	šíčA	'be bad'
ȟpáyA	'lie down'	akísni	'get well'
náži	'stand up'	púzA	'be dry'
pšá	'sneeze'	ȟwą	'be sleepy'
glépA	'vomit'	t?Á	'die, be dead; faint'

hoȟpÁ	'cough'	wašté	'be good'
čhéyA	'cry'	ȟópeča	'be good looking'
athát?elyA	'be fed up'	čhą́zéka	'be angry'
nawízi	'be jealous'	iyókiphi	'be happy'
ní	'be alive'	kiní	'become alive, revive'
niyÁ	'breathe'	naphópho	'blow up in anger'
?ú	'be, exist'	kačékčekA	'stagger'
thí	'dwell'	hįȟpáyA	'fall (on purpose)'
iháblA	'dream'	tųwÁ	'open eyes'
íyąkA	'run to/in'	iȟá	'smile'
iȟát?A	'laugh'		

Note, first, that it is incorrect to claim that all unergative verbs require animate participants; some clearly do not, contra Merlan (1985):

11. mní wą ȟpáye 'a lake lies; there is a lake'
mahél íyą eyá ú 'there are rocks inside'
wówapi ki kiyé 'the paper/flag flies '
žožá ki náži 'the jar is standing'

Second, the meanings of some unaccusative verbs meet the definition of Mithun's agency notion, which she claims characterizes unergative verbs: 'blow up in anger', 'stagger', 'fall (on purpose or not)', 'open eyes' 'smile', 'make oneself be good-looking' (ma-kí-wašte)

Third, many other unaccusative verbs can occur in contexts where it is clear that the state or action is volitional; this never affects the morphological marking. For example, 'be good' and 'be bad' are morphologically stative, regardless of whether they characterize a natural disposition or a temporary one induced by a desire to obtain something or get some attention on the part of the subject.

Moreover, we note the following puzzling comparisons: (1) Unergative 'be alive'[6] is opposed to unaccusative 'be dead'. Here too, the difference can hardly be one of agency, in Mithun's sense. (2) 'Be fed up' and 'be jealous' are unergative but 'be angry', is unaccusative. (3) 'Vomit, sneeze, hiccough, yawn' are unergative, but 'faint' is unaccusative. (4) Finally, 'be alive' is unergative while 'become alive' in the sense of reviving after an illness, an operation, or fainting is unaccusative. This is the reverse of what would be expected semantically. But not all instances of change of state are unaccusative: 'lie down, stand up, sit down, arrive' are unergative.

So it seems clear to us that there is no consistent semantic criterion which characterizes the meanings of the stems of either class of intransitives.

Alternatively, one might want to look at an aspectually based classification, such as that of Van Valin (1990). Such a classification relies on syntactic/semantic tests originally proposed in Dowty 1979, as illustrated in the following table (from Van Valin 1991) (D = durative reading; P = punctual reading):

Criterion	States	Achievements	Accomplishments	Activities
1. Occurs with progressive	No	D:yes/P:No	Yes	Yes
2. Occurs with adverbs like vigorously, carefully, etc.	No	No	Yes	Yes
3. Occurs with ϕ for an hour, spend an hour ϕing	Yes	D:Yes/P:No	Yes	Yes
4. Occurs with ϕ in an hour, take an hour to ϕ	No	D:yes/P:No	Yes	No

Some problems immediately arise: First, progressive is not a good test to determine stativity in Lakhóta. Most unaccusative verbs can take the equivalent of the progressive, referring to something going on now. This is true in particular of 'be sick,' 'be cold', 'be in pain', 'be happy', 'be bad/good', 'be angry,' 'be crazy'.

Second, explicit mention of volitionality ("on purpose") is often accomplished by means of instrumental (or causative) and reflexive morphemes, with as a consequence, stative marking; cf. (12):

12. iglúhoȟpe 'he coughed on purpose' = 'He made himself cough'
(REFL-yu 'cause'-hoȟpA 'cough')

Third, while Lakhóta does not have temporal expressions based on our 24 hour system, it has a large number of temporal expressions that are ambiguous between durational and punctual readings, making the telicity test difficult to apply.

It would appear, though, that we did find equivalents for 'for 10 minutes', *10 minutes iwáhąhelya* and 'in 10 minutes', *10 minutes wahéhąlya*. Using these phrases, Ms. Catches expressed a whole range of acceptability judgments, regardless of whether individual verbs are unergative or unaccusative. See (13):

13. a. 10 minutes iwáhąhelya iglúȟope 'She made herself cough for ten minutes'
10 minutes wahéhąlya iglúȟope 'She made herself cough in ten minutes'(unaccusative)

b. 10 minutes iwáhąhelya kačékčeke 'He staggered for 10 minutes'
*10 minutes wahéhąlya kačékčeke '*He staggered in ten minutes' (unaccusative)

c. 10 minutes iwáhąhelya yazą 'He was in pain for 10 minutes'
?10 minutes wahéhąlya yazą 'She was in pain in ten minutes' (unaccusative)

d. 10 minutes iwáhąhelya iháble 'She dreamed for 10 minutes'
?10 minutes wahéhąlya iháble 'She dreamed in 10 minutes' (unergative)

e. 10 minutes iwáhąhelya nawízi 'He was jealous for 10 minutes'
10 minutes wahéhąlya nawízi 'He was jealous in 10 minutes' (unergative)

f. *10 minutes iwáhą̨helya hí *'He was arriving for 10 minutes (ok as 'In about 10 minutes he arrived')
10 minutes wahéhą̨lya hí 'It took him 10 minutes to get here' (unergative)

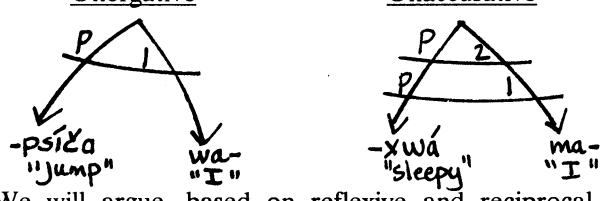
Moreover, many verbs appear in telic or atelic contexts, regardless of their morphological person marking class. A stative marked verb like 'be in pain' is atelic, but so is an active marked verb like 'dream'. That telicity is irrelevant can be further shown by the lack of morphological distinction between activities like 'walk in the forest' and accomplishments like 'walk to the forest' (See Dowty, 1979 and Van Valin, 1990 for further discussion of this distinction). In Lakhóta, both types of events are marked the same, i.e. active; see (14):

14. a. 10 minutes iwáhą̨helya cha̧máhel omawani he (preferred with progressive marking) 'I walked in the forest for 10 minutes'
b. 10 minutes wahéhą̨lya chúšake ektá omáwani 'I walked to the forest in 10 minutes'

We thus conclude that semantics is inadequate to predict Lakhóta morphological classes: we have tested for root meaning, characterized both as volitional and as employing agency, and we have tested for aspect and for telicity, and found no correlations.

3. Syntactic correlations. In this section, we present evidence for the syntactic distinction dubbed the Unaccusative Hypothesis in Perlmutter (1978) and made explicit in diagram 15. Unaccusatives select a deep object argument (= a 2) while unergatives select a deep subject (= a 1):

15.



We will argue, based on reflexive and reciprocal structures, that person marking rules must refer to deep grammatical relations; then we will show how these deep relations naturally account for the two classes of intransitives.

3.1. Reflexives vs. reciprocals. Observe the contrasts in (16):

16. a. aníč?iphe 'You hit yourself'
a-ni-ič?i-phA
LOC[7]-2STAT-REFL-hit
b. *a-ya-ič?i-phA
LOC-2ACT-REFL-hit

Clauses which contain two coreferential arguments contain a reflexive marker *ič?i* prefixed to the stem verb. As noted most recently by Williamson (1979), this causes a change in person marking: the subject 'you' must be marked with the stative morpheme and not with the active one.

Now observe that Lakhóta has a class of verbs--including 'try', 'be reluctant', 'pretend', etc.--which occur without a complementizer to mark the embedded clause. Williamson (1979:356-357) analyzes these as Equi verbs and claims that the Equi target must be a final subject in the embedded clause:

17. a. walówą 'I sing'
wa-lową
1ACT-sing

lową wa-čháme 'I try to sing'
sing 1ACT-try

b. mištíme 'I sleep'
ma-ištime
1STAT-sleep

ištíme wa-čháme 'I try to sleep'
sleep 1ACT-try

c. Bill awáphe 'I hit Bill'
Bill a-wa-phA
Bill LOC-1ACT-hit
Bill aphé wakápį 'I was reluctant to hit Bill'
Bill a-phA wa-kapį
Bill LOC-hit 1ACT-be reluctant

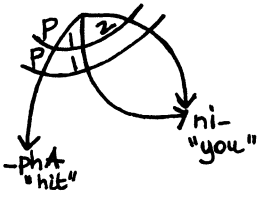
Note in particular that unergative as well as unaccusative verbs can be embedded under Equi verbs. This follows naturally from the Unaccusative Hypothesis, according to which unaccusative verbs take a deep direct object which advances to subject.

Given the generalization about Equi targets, the fact that the stative marked argument in reflexive structures can undergo Equi indicates that it is the final subject in the embedded clause:

18. a?íč?iphe yakápį 'you are reluctant to hit yourself'
a-ič?i-phA ya-kapį
LOC-REFL-hit 2ACT-be reluctant

We follow Williamson (1979:359) in positing a multiattachment analysis for reflexive structures in Lakhóta.

19.



We go further than Williamson (1979) by positing that the multiattachment is resolved by cancellation of the 2-relation, much like the

structure Legendre has posited elsewhere for the French reflexive *se* (Legendre 1986).[8]

Reflexivization in Lakhóta thus amounts to a detransitivization process. Structure (19) is the particular RG implementation of this idea, making explicit why the subject occurs with a stative rather than an active marker: it heads an initial 2-arc and a final 1-arc, just as do the participants in unaccusative structures. The generalization appears to be that a nominal heading a 2-arc (regardless of the level) determines stative marking on the verb.

An analysis that simply assumed that marking is lexical, without relating it to argument structure, would have to list reflexive verbs separately in the lexicon, and thus miss an important generalization.

Reciprocity is also marked by a prefix attached to the verb, *kičhi* 'each other'. Unlike the reflexive marker, the reciprocal does not require a change in person marking. In other words, *kičhi* 'each other' behaves like the object pronoun *wičha* 'them'.

20. a. awíčhayaphe 'you hit them'
a-wičha-ya-phA
LOC-them-2ACT-hit

b. ayéčhipha pi 'you (pl) hit each other'
a-ya-kičhi-phA pi
LOC-2ACT-each other-hit PL

c. aníč?ipha pi 'you (pl) hit yourselves'
a-ni-ič?i-phA pi
LOC-2STAT-REFL-hit PL

We propose that the reciprocal construction does not involve the detransitivization process found in the reflexive construction. In other words, the structure is simply transitive, with the bound morpheme *kičhi* 'each other' playing the role of direct object.

This difference of analysis, motivated by the difference in person marking, makes the prediction that processes that affect surface direct object arguments in Lakhóta ought to treat reflexive *ič?i* and reciprocal *kičhi* differently.

When certain embedded verbs take reciprocal markers, there are two possible structures: *kičhi* can occur on the embedded verb or on the main verb (where the main verb follows the embedded one) (cf. Boas and Deloria 1941:103); note that the embedded verb bears no person marking for its understood subject.

21. a. *kičhí*yus yąká pi
each other-hold sit PL
'they were sitting holding each other'

yús *kičhí*yąka hą pi
hold each other-sit PROG PL

b. ókičhiya[9] kúza pi
LOC-e. o.-help pretend PL
'they pretend to help each other'

ókiye *kičhí*kųza pi
help e. o.-pretend PL

When the direct object of the embedded verb is the pronominal bound morpheme *wičha* for animate 'them', movement is also possible:

22. a. ówičhakiye kúza pi
LOC-them-help pretend PL
ókiye *wičhá*kųza pi
help them-pretend PL
'they$_i$ pretend to help them$_j$'

b. *wičhá*yus yąká pi
them-hold sit PL
yús *wičhá*yąka pi
hold them-sit PL
'They are sitting holding them'

Interestingly enough, the reflexive marker *ič?i* cannot move from the embedded verb to the main verb:

23. a. ó?*ič?i*ye kúza pi
LOC-REFL-help pretend PL
'they pretend to help themselves'

*ókiye *ič?i*kųza pi
help REFL-pretend PL

b. iglús[10] yąká he 'she is sitting holding herself'
*yús ignąka he (also *ič?iyąka he)

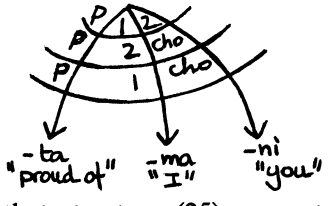
This shows that syntactically the reflexive marker is not the same kind of element as the reciprocal marker, despite the fact that morphologically both are bound morphemes. Under our analysis they should not be the same, since the reciprocal element is a surface argument of the verb while the reflexive marker is not (because of the detransitivization process). The generalization concerning this movement phenomenon appears to be that only a final 2 can move (optionally) to the main verb.

3.2. A special class of verbs: Boas and Deloria (1941:77) report the existence of a class they characterize as "neutral (= stative) with two objects". These are verbs which take two stative markers:

24. a. iyé-ni-ma-čheča 'I resemble you'
LOC-2STAT-1STAT-resemble
b. i-ní-ma-tą 'I am proud of you'
LOC-2STAT-1STAT-proud of

Although there is no space to motivate this conclusion completely here, let us just suppose that these are examples of the structures called Antipassive in RG, posited in particular for Choctaw by Davies (1984)[11]:

25.



Note that structure (25) accounts for the two instances of stative person marking if what determines stative marking is heading a 2-arc at some level, as we hypothesized earlier. Notice also that 'you' is a surface argument, though it is a chomeur, meaning it has lost its status as direct

object, but not its status as an argument. That argument can appear on the lower verb of an embedded structure, as (26a) shows, but it cannot move to the main verb (26b).

26. a. iyé-ni-ma-čheča wa-kúze 'I pretend to resemble you'
LOC-2STAT-1STAT-resemble 1ACT-pretend
b. *iyéčheča čhi-čúze (*čhi* is a portmanteau for expected wa-ni or ni-wa) 'I pretend to resemble you'
LOC-resemble -I/you-pretend

Under the Antipassive analysis, that object is a final chomeur, not a final 2; this confirms our earlier hypothesis that only a final 2 can move to the main verb.

Additional evidence for the Antipassive analysis of (25) comes from the fact that neither *wičha* nor *ič?i* can move to the main verb, the former because it is a final chomeur, the latter because it is not a final argument of the embedded verb.

27. a. a*wíčha*tą kúza pi
*atą *wičhá*kuza pi
'They pretend to be proud of themselves'
b. i?íč?itą kúza pi
*itą ič?íkuzapi
'They pretend to be proud of them'

To summarize the discussion of reflexive and reciprocals in Lakhóta, we have shown that reflexive structures involve a syntactic process of detransitivization, which explains why they uniquely end up with stative marking. Moreover, we have argued that a nominal heading a 2-arc at any level determines stative marking on the verb. Our analysis thus unifies reflexive, reciprocal, and doubly stative structures with unaccusative structures by making explicit what they have in common, a 2 at some level, responsible for a common morphological property, i.e. stative marking.

To account for the fact that stative marking takes precedence over active marking in Lakhóta, we propose (28), a strict dominance constraint hierarchy of the type proposed by Prince and Smolensky (in preparation) for phonology:

28. M: each surface argument contributes exactly one marker
A: a surface argument A's marker is ACTIVE if A bears the 1-relation at some level
S: a surface argument A's marker is STATIVE if A bears the 2-relation at some level
Strict dominance constraint hierarchy: M >> S >> A

Notice that constraint M -- which is absolute -- is "responsible" for the disjunctive ordering of S and A. Disjunctive orderings of morpho-syntactic rules have been documented in several languages, including Choctaw (Davies, 1984).

In Lakhóta, this preference for marking the presence of direct object correlates well with Merlan's 1985 observation of an imbalance among intransitives -- the active marked class is small in number, while the stative marked class is large.

3.3. Čha and the strength of presupposition. Main verbs like 'know' or 'realize', which presuppose the truth of their complement, take a complement clause which is introduced with complementizers of two kinds, either *ki* (in some dialects *kį*) with or without *hé* on the one hand, or *čha* on the other. When *čha* is used, the strength of the presupposition varies, depending on whether the embedded verb is unergative or unaccusative. When *hé* or *ki* is used, there is no such effect. While we do not understand exactly why this should be the case, we would like to report the facts (to our knowledge never noticed before) and suggest how they fit into our analysis.

29. a. Wamą́khašką kį čhą́máhel o?ú́yą pi *hé* slolwáye.
animals the forest they live COMP I-know
'I know that the animals live in the forest.' (unergative)

Wamą́khašką kį čhą́máhel o?ú́yą pi *čha* slolwáye.
animals the forest they live COMP I-know
'I know for sure that the animals live in the forest'

b. ñ?ą́híyu kaňápe *ki hé* wówičhakhe
slowly he-drive COMP it-is-true
'It is true that he was driving slowly.' (unergative)

ñ?ą́híyu kaňápa *čha* wówičhakhe
slowly he-drive COMP it-is-true
'It is absolutely true that he was driving slowly '

c. khúže *kį hé* wówičhakhe
she-sick COMP it-is-true
'It is true that she is sick (I'm sure of it)' (unaccusative)

khúža *čha* wówičhakhe
she-sick COMP it-is-true
'It is true that she was sick, but I'm not willing to stick my neck out about it.'

Transitive verbs behave like unergatives.

30. šú́ka wą ókiya *ki hé* slolwáye
dog a help COMP I-know
'I know that he helped a dog' (transitive)

šú́ka wą ókiya *čha hé* slolwáye
dog a help COMP I-know
'I know for sure that he helped a dog'

Structurally, transitive and unergative verbs have one thing in common: a deep subject; unaccusatives do not have such a subject. It would appear, then, that the strengthening of the presupposition occurs in parallel to the presence of a deep subject. But notice that this makes a prediction

concerning reflexives: under the multiattachment analysis, reflexive verbs take a deep subject like transitives, even though they are marked stative like unaccusatives. If the generalization has to do with the occurrence of a deep subject, then reflexives should allow strengthening of the presupposition. And they do, according to our consultant:

31. a. ó?ič?iya pi *ki* slolwáye
help-self PL COMP I-know
'I know that they helped themselves'

ó?ič?iya pi *čha* slolwáye
help-self PL COMP I-know
'I know for a fact that they helped themselves'

b. ksuyé?ič?iya pi *ki he* héčhetu.
hurt-self-cause PL COMP be the case
'It is the case that they hurt themselves'

ksuyé?ič?iya pi *čha* héčhetu.
hurt-self-cause PL COMP be the case
'It is for sure the case that they hurt themselves'

4. Conclusion. We conclude by returning to the main issue raised by split intransitivity in Lakhóta: Does the active vs. stative marking register a syntactic distinction or is it simply a lexical feature of each Lakhóta intransitive stem (with perhaps an original semantic basis lost through various grammaticalization processes)? Examining syntactic phenomena like reflexive, reciprocal, and doubly stative structures has led us to the conclusion that, independently of split intransitivity, we need to posit morpho-syntactic rules of person marking that are sensitive to grammatical relations like direct object and subject. These rules naturally extend to intransitives of both types under the Unaccusative Hypothesis. In the absence of positing that unaccusatives and unergatives differ syntactically, one would need at least two distinct rules of stative marking, with the consequence that the morphological identity of the unaccusatives and the reflexives would be a complete accident. We thus reject lexical marking in favor of a syntactic distinction feeding lexical formation. Phonological processes in Lakhóta are sensitive to lexical formation and thus indirectly to the syntactic history of a given stem.

NOTES

[1]In addition to the literature cited in the references and to Rood's previous 20 years of experience with this language, we have elicited data specifically for this paper from Ms. Violet Catches from the Cheyenne River reservation in South Dakota. We would like to express our profound gratitude to Ms. Catches for her cooperation and assistance. Support for this work has come in part from NSF grant no. BNS-8820025, and in part from the University of Colorado Institute for Cognitive Science, for which we are also grateful. Lakhóta examples are all cited in the University of Colorado orthography, which treats aspirated and glottalized consonants as clusters of consonant plus /h/ or /?/, respectively, and which writes [x] as *ȟ* and [ɣ] as *ǧ*.

[2]We use *active* and *unergative* interchangeably; likewise *stative* and *unaccusative*.

[3]Two comments on this form: (a) in Santee (Dakota) the meaning is 'lazy', and the word is therefore best avoided when possible. (b) the capital "A" (you may also see Ą) designates a vowel that ablauts from /a/ or /ą/ to /e/ or to /į/ depending on the following grammatical context.

[4]There are cultural restrictions on the use of this form for Ms. Catches and many other speakers, making it unidiomatic for them. Ms. Catches agrees, however, that if the word were to occur, this would be its proper shape. Other researchers, including Riggs (1893:8) have cited this form without comment.

[5]Thus 'you are all black' is *nisábsapapi*; compare *sabsápa* above.

[6]Historically, the older meaning seems to be 'breathe'.

[7]Many verbs begin with a vocalic prefix *a*, *o*, or *i*, which sometimes has a locative meaning and changes the valence of the verb, but often is simply a required part of the stem. We gloss these prefixes LOC; personal affixes follow them.

[8]See also Perlmutter (1989) for an analysis of Italian that unifies unaccusatives with reflexives, under the Unaccusative Hypothesis and a similar multiattachment analysis of reflexives.

[9]When inserted into a verb before the syllable -ki, the reciprocal *kičhi* and the reflexive *ič?i* always cause the deletion of the -ki- of the verb. Thus 'help' is *ókiyA*, but its reciprocal is *ókičhiyA*. Cf. the reflexive in (23).

[10]When it precedes a /y/, *ič?i* coalesces with the /y/ to give *igl*. If the following vowel is nasal, the /l/ becomes /n/.

[11]Williamson (1979) also discusses these verbs, proposing a different analysis.

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The preverb problem in German and Hungarian

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This study is an investigation into the phenomenon of 'tmesis' (lit. 'cutting', Matthews (1991: 99)) in contemporary German and Hungarian.[0] Both of these languages contain a wealth of preverb-verb combinations which exhibit many properties characteristic of compounds and yet which can be 'split' in the syntax. Preverbs, sometimes characterized as separable verbal prefixes, have a number of functions, including those of modification, aspectualization, argument-structure affecting, and derivation. They thus constitute the most productive means for creating new verbs in these languages. Current descriptive practice in German grammar names such preverbs *Verbzusätze* ('verb adjuncts', Helbig & Buscha (1989: 538)), whereas similar practice in Hungarian grammar names them *igekötők* ('verb binders', Rácz (1988: 65)). Some common examples are the following:[1]

(1) a. *an·fangen* 'begin', *auf·geben* 'give up', *zu·teilen* 'allot', *ab·machen* 'arrange', *bei·bringen* 'teach', *ein·führen* 'import' German
b. *el·kezd* 'begin', *be·fejez* 'finish', *meg·ismer* 'recognize', *ki·javít* 'correct', *le·szól* 'speak ill of' *vissza·hat* 'affect' Hungarian

In this paper, the term **complex verb** designates the linear combination 'preverb + verb', the term **simple verb** refers to any verb without a preverb immediately before it, and **PV** abbreviates 'preverb'.

The 'preverb problem', as I term it, is the problem of reconciling the lexical nature of complex verbs with their syntactic transparency. In particular, tmesis violates Weak Lexical Integrity:[2]

(2) **Weak Lexical Integrity**: A morphological object (i.e., an X° unit) cannot be discontinuous at surface syntactic structure.

Some version of (2) is widely held to be correct; and yet if it is taken seriously, then the question of what sort of object the complex verb is takes on a new urgency.

In movement theories, part of the complex verb must serve as a target for movement. In theories which recognize only one level of syntactic constituent structure, the complex verb must allow discontinuous lexical insertion. Resolutions of the preverb problem to achieve this result abound. For example, Booij 1990 and Simpson 1983 take the complex verb to be a lexical phrase of category V* and V', respectively, with the requirement that Bracket Erasure does not apply to the constituents of phrasal categories in the morphology. Such an analysis is also pursued by Ackerman (1987: 233) for Hungarian. The central difficulty for this type of solution is not only that lexical insertion must now be able to target phrasal categories V' in the lexicon, but also that derivational affixes must be able to attach to both V° (head) and V' (phrasal) categories in the lexicon. The issue is not whether this type of solution "works", but rather whether it is really warranted by the data.

Another type of solution is to maintain that the complex verb is of category V° but that it nevertheless is a systematic exception to Bracket Erasure, an analysis

proposed by É. Kiss (1987: 66) for Hungarian. This type of analysis is also 'radical' in that it globalizes the problem, for little understanding is won if the exceptional nature of complex verbs is transfigured into either a morphology which now creates V' objects or one which countenances systematic exceptions to Bracket Erasure.

I propose to localize the preverb problem by locating the exceptional behavior of complex verbs in an exceptional subcategorization property of verbal inflectional suffixes. Specifically, complex verbs are creatable by the morphology as V° constituents, but they are not inflectable as such: verbal inflection wants the simple verb. Once this selectional property of verbal inflectional suffixes is identified, little else about the grammar needs to be changed.

This paper has four central parts. §1 presents evidence for the lexical nature of complex verbs, emphasizing the parallelism between German and Hungarian. §2 reviews the conditions for separability and proposes a syntactic analysis for separation in both languages. Finally, §3 addresses the question of how the morphological integrity of complex verbs can be reconciled with their syntactic transparency.[3]

1. Lexical properties

Four major arguments can be adduced for the lexical status of complex verbs in German and Hungarian. These arguments do not support the view that such verbs are formed in the syntax.

√ Complex verbs can act as input to both deverbal word formation and compounding. Such examples provide strong evidence for the view that complex verbs are morphological objects from which new morphological objects can be derived.

(3) German

a. *an·fangen* 'begin'	*Anfänger* 'beginner'; *anfänglich* 'initial'; *Anfangsbuchstabe* 'initial letter'
b. *ein·schüchtern* 'intimidate'	*Einschüchterung* 'intimidation'; *Einschüchterungsversuch* 'intimidation attempt'

Hungarian

c. *el·mond* 'tell, narrate'	*elmondás* 'narration'; *elmondhatatlan* 'unspeakable'; *elmondható* 'tellable'
d. *ki·állít* 'put out, exhibit'	*kiállítás* 'exhibition'; *kiállító* 'exhibitor'; *kiállítási terem* 'showroom'; *képkiállítás* 'picture exhibition'

√ Complex verbs are frequently non-compositional units semantically. The meaning of the combination is often only partially motivated by the meaning of its parts. Given the various degrees of semantic unpredictability associated with the meaning of complex verbs, the consequence is that a great many such verbs will have to be listed in some way in the lexicon. Crucially, their meanings are not derivable compositionally in the syntax.

(4) German

a. *an* 'at, against, by' + *fangen* 'catch' = 'begin'

b. *ab* 'off, away, down' + *machen* 'make' = 'settle, arrange'
Hungarian
c. *le* 'down' + *fordít* 'turn' = 'translate'
d. *el* 'away, off' + *ismer* 'know' = 'acknowledge'

√ The PV often induces changes in the argument structure of the simple verb. Such changes can affect transitivity, case assignment, and selectional restrictions. The fact that PVs have access to a simple verb's argument structure lends further support to the claim that a good many complex verbs are lexical units of some kind. If PVs combined with simple verbs in the syntax, such changes in argument structure would not be expected.

(5) German
a. *geben* <NOM, DAT, ACC> 'give' BUT *auf·geben* <NOM, ACC> 'give up'
b. *laufen* <NOM> 'run' BUT *nach·laufen* <NOM, DAT> 'run after, pursue'
Hungarian
c. *ajándékoz* <NOM, DAT, ACC> 'present, donate' BUT *meg·ajándékoz* <NOM, ACC, NP + *-vel* 'with'> 'present sy. with sg.'
d. *beszél* <NOM> 'speak, talk' BUT *el·beszél* <NOM, ACC> 'tell, narrate'

√ PVs are like derivational morphemes in that the simple verb sometimes does not exist on its own. Examples like these are overwhelmingly denominalizations, and nonetheless the PV is no less separable than with any other complex verb. In German, such examples are comparatively rare with PVs; much more typical is an inseparable prefix occurring before a non-existent simple verb. In Hungarian, most examples occur with the PVs *meg* or *el*, these having become the least transparent with respect to their original directional meanings.

(6) German
a. *aus·bürgern* 'expatriate' BUT NO **bürgern* (cf. *Bürger* 'citizen')
b. *auf·heitern* 'cheer up' BUT NO **heitern* (cf. *heiter* 'cheerful')
c. *ein·deutschen* 'Germanize' BUT NO **deutschen* (cf. *Deutsch* 'German')
Hungarian
d. *be·fejez* 'finish' BUT NO **fejez* (cf. *fej* 'head')
e. *meg·hökkent* 'bewilder, startle' BUT NO **hökkent*
f. *el·néptelenít* 'depopulate' BUT NO **néptelenít* (cf. *néptelen* 'unpopulated')

In this section I have adduced four arguments for the lexical status of complex verbs. Complex verbs serve as input to deverbal word formation, are frequently semantically non-compositional units, the PV often induces a change in the argument structure of the simple verb, and the simple verb sometimes does not exist on its own; all these observations argue in support of a lexical morphological treatment of complex verbs. Though this is not to say that every single complex verb would resist a compositional, syntactic account, such an analysis would not work more generally.

2. Separability

Certain syntactic contexts require separation of the PV and the simple verb. The appearance of the complex verb in such contexts is ungrammatical. I begin with a comparison of these contexts in both languages.

2.1. Conditions for separation

√ Tensed main indicative clauses in German require the simple verb in second position; this is not so in Hungarian.

(7) German
a. Heute fäng-t Hans seine Arbeit an.
today begin-s Hans his work PV
'Today Hans begins his work'
b. *Heute Hans fängt seine Arbeit an.
c. *Heute an·fängt Hans seine Arbeit.
Hungarian
d. Ma János el·kezd-i a munkáját.
today John PV-begin-s the work.his
'Today John begins his work'
e. *Ma János kezdi el a munkáját. [on neutral reading]

√ Yes-no questions with inversion in German require the simple verb in first position;[4] Hungarian permits neither inversion nor separability here.

(8) German
a. Fängt Hans heute seine Arbeit an?
'Does Hans begin his work today?'
b. *An·fängt Hans heute seine Arbeit?
Hungarian
c. Ma János el·kezdi a munkáját?
'Does John begin his work today?'
d. *Kezdi el János ma a munkáját?

√ In the imperative the simple verb appears in first position; this is true for both German and Hungarian.

(9) German
a. Fang Deine Arbeit an!
begin.IMP your work PV
'Begin your work!'
b. *An·fang Deine Arbeit!

Hungarian
c. Kezdjed el a munkád!
begin.IMP PV the work.your
'Begin your work!'
d. *El·kezdjed a munkád!

√ In German separation of the PV is not possible in subordinate clauses with a complementizer; in fact, the complex verb must appear in final position. The main/subordinate distinction plays no role in separability of the PV in Hungarian.

(10) German
a. Ich weiß, daß Hans seine Arbeit an·fäng-t.
I know COMP Hans his work PV-begin-s
'I know that Hans is beginning his work'
b. *Ich weiß, daß Hans fängt seine Arbeit an.
Hungarian

c. Tudom, hogy János el·kezd-i a munkáját.
know.I COMP John PV-begin-s the work.his
d. *Tudom, hogy János kezdi el a munkáját. [on neutral reading]

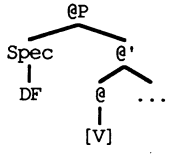
√ In Hungarian a focussed constituent[5] must occur immediately before the simple verb; in German the presence or absence of a focussed constituent has nothing to do with separability.

(11) Hungarian
a. Ma JANOS kezdi el a munkáját. [cf. (7e)]
today John begins PV the work.his
'Today it is John who begins his work'
b. *Ma JANOS el·kezdi a munkáját.
c. Tudom, hogy János MA kezdi el a munkáját. [cf. (7d)]
'I know that it is today that John is beginning his work'
d. *Tudom, hogy János MA el·kezdi a munkáját.

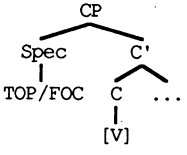
2.2. Analysis of separation

Although initial inspection of the five foregoing contexts suggests that the syntactic conditions for separation of the PV differ quite dramatically in German and Hungarian (they are alike only in the imperative), a significant common feature is nonetheless present. The idea is that the immediately preverbal position in both of these languages is utilized for a constituent bearing the discourse function of either **topic/focus** (German) or **focus** (Hungarian). The claim that the initial position in in German is for a topicalized constituent[6] is well-established (cf. Koster 1975, Haider 1985, Uszkoreit 1987, *inter alia*); that a focussed constituent must appear in immediately preverbal position in Hungarian is similarly uncontroversial (cf. Farkas 1986, Horvath 1986, É. Kiss 1987). The general structure in (12a), then, captures this commonality between German and Hungarian:

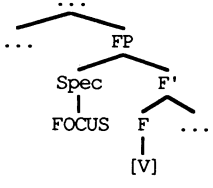
(12) a. DF = Discourse Function, @ = α



b. German



c. Hungarian



I assume, in agreement with the literature on German, that the simple verb occupies the complementizer position in tensed matrix clauses (cf. (7a)); the value of αP is thus CP, as in (12b). For Hungarian, while the exact categorial structure is more controversial, I follow Brody 1990 in postulating a F(ocus)P(hrase) for Hungarian, locating the focussed constituent in [Spec, FP]. This is shown in (12c).[7]

The difference between (12b) and (12c) accounts for the facts in (7). Since CP is the highest projection of the clause, only one constituent is permitted before the verb, thus ruling out (7b), where two constituents appear there. V in (12) is a

head position, hence V°, and the necessary hypothesis for ruling out (7c) is that the complex verb in German cannot be a morphologically created V°, i.e., it is not a word in the X'-theoretical sense. More explicitly, the required hypothesis is the following one:

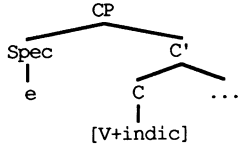
(13) The (finite) complex verb is not a morphologically created V°, hence it is not lexically insertable into a X° (head) position.

(13) is also necessary for Hungarian. Its effect is that the finite complex verb cannot appear in F°. To account for (7d, e) it is sufficient to state that FP is projected iff there is a focussed constituent in the clause. In (7d), a neutral sentence, there is no FP and so the complex verb remains in the VP, no separation resulting. (7e) is bad because the simple verb appears in F° without a focussed constituent occupying [Spec, FP], contra (12c).

The contrast exemplified in (8) can be attributed to the following difference between German and Hungarian:

(14) German: yes-no questions

a. **If**



then interpret as yes-no question.
['e' indicates that the node is empty, '[V+indic]' is a verb with indicative morphology]

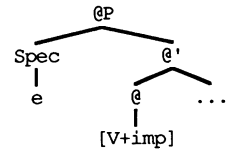
b. Hungarian lacks the equivalent of (14a) for the structure in (12c).

In German the topic/focus position can remain empty; (14a) simply states that the structure is then interpreted as a yes-no question. (8a) is therefore good, but (8b), in which the complex verb heads the sentence, does not instantiate (14a) and hence is ill-formed (the PV have to fill the Spec position). Hungarian lacks a syntactic correlate of yes-no questions, as stated in (14b): the syntax of declaratives and yes-no interrogatives does not differ. (8c), syntactically identical to (7d), remains well-formed, and there is no provision for deriving (8d), where [Spec, FP] is empty.

The facts in (9) illustrate a common ground between German and Hungarian. In both languages the relevant Spec position remains empty if the verb is imperative.

(15) German and Hungarian

If

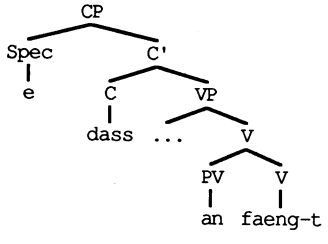


then interpret as imperative.
('[V+imp]' is a verb with imperative morphology)

Given (15), both (9b) and (9d) are ill-formed because the PV occupies [Spec, αP] and yet precisely this position should remain empty in the imperative mood.

The conventional analysis of German which posits a complementary distribution between the complementizer and the finite verb (cf. Haider 1985) accounts for (10a, b). A clause-final position is available for the complex verb in German, and the verb must appear there if a complementizer is present. In Hungarian there is no such complementary distribution with the complementizer. I attribute the following structure to (10a):[8]

(16) a. German: the subordinate clause[9]



complementizer in C°, simple verb in V°; PV syntactically (based) adjoined to V°, i.e.,

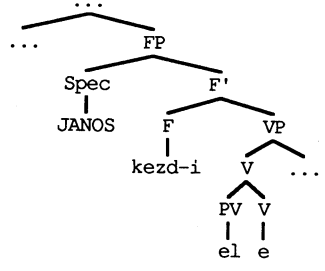


b. Hungarian: the simple verb displays no complementarity with the complementizer

The ungrammatical sentence (10b) is ruled out because there is no such position for the finite verb between its complements. In Hungarian (10c, d), separability of the PV does not depend on the presence or absence of a complementizer.

The Hungarian data in (11) are explained by the structure in (12c). (11b, d) are ill-formed because the PV intervenes between the focussed constituent and the simple verb, and yet there is no position for it in FP. In contrast to German, the VP is V initial in Hungarian. Consider the structure of the well-formed (11a):

(17) a. Hungarian: around FOCUS



focussed phrase in Spec, simple verb in F°; PV syntactically (base) adjoined to V°

b. German: there is no fixed syntactic position for a focussed constituent

(17a) indicates that Hungarian also shares the V° adjunction structure which German exhibits in (16a).

A comparative examination of the German and Hungarian data yields the following claims:

(18) a. The simple verb stands in Spec/Head relation with DF constituent.
b. The (finite) complex verb is not a morphologically created V° unit.
c. PV is base-adjoined to V°; no base adjunction to functional heads.

(18a-c) do not consist of an arbitrary grouping of properties. If the Spec/Head relation is indeed the correct syntactic characterization, then from (18b) it follows

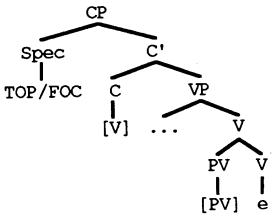
that only the simple verb can fill the head position, for the (finite) complex verb simply is not of category V°. Thus, if the morphology produces only X° objects, then the two parts of a complex verb must be discontinuously insertable. (18c) ensures that the PV and its host verb will combine immediately in the syntax under V°. Crucially, no such base adjunction to the functional heads C° and F° is available to yield [PV C° C°] and [PV F° F°], respectively.[10]

3. The complex verb

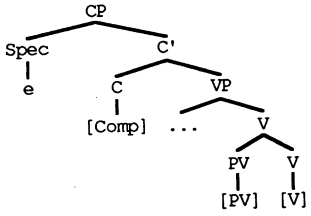
In the previous section I presented a syntactic analysis of separation in German and Hungarian. For explicitness, the configurations which I posit are repeated below:

(19) German

a. Main clause

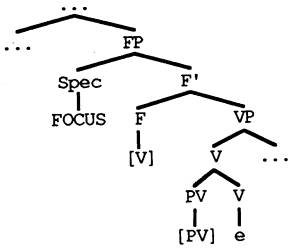


b. Subordinate clause

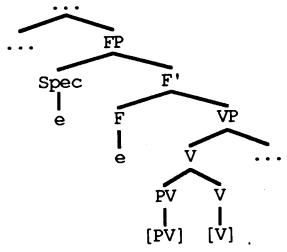


Hungarian

c. Clause with FOCUS



d. Clause without FOCUS



Although I give an empty FP in (19d) for clarity, I assume that technically it is not projected if it is not needed, as stated earlier.

The preverb problem, as described in the previous two sections, constitutes a paradox. §1 adduced evidence in support of a lexical analysis of complex verbs, emphasizing the prefixal behavior of the PV and the word nature of the complex verb. §2 reviewed the syntactic conditions which require a separation of the simple verb from the PV, illustrating the parallels and differences between German and Hungarian in this regard. Any satisfactory resolution of the preverb problem must account for both the morphological integrity and the syntactic transparency of complex verbs. By taking the subcategorizational requirements of verbal inflectional suffixes seriously, I will propose such a resolution.

If Weak Lexical Integrity (cf. (2)) is to respected, then the hypothesis in (13) that finite complex verbs do not constitute morphologically created V°s is necessary. In addition, I make a basic assumption, one required by the facts from German.

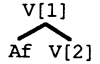
(20) In German, inseparable verbal compounds must be distinguished from separable verbal compounds (i.e., complex verbs).

The analogue of (20) is not necessary for Hungarian because all verbal compounds are separable; there are no true verbal prefixes. German inseparable compounds are clearly morphologically formed V°s, stressed on the verb stem, and lexically insertable into second position, thereby distinguishing themselves from separable compounds, which lack these characteristics.

Assumption (20) is accommodated in the present analysis through the X' theory of word structure. I make basic use of Selkirk's (1982) proposal for extending X' theory down into "word syntax", enabling a morphological head to have distinct projections. More specifically, I adopt the idea that there are two bar levels below X° (word level), namely X^{-1} (stem level) and X^{-2} (root level). The general word structure rules I posit and the structures they yield are as follows:

(21) i. $V^{-1} \rightarrow (Af)\ V^{-2}$
(An inseparable prefix is of category Af and combines with V^{-2})
ii. $V^{\circ} \rightarrow (PV)\ V^{-1}$ (a compounding rule)
(A preverb is of category PV and combines with V^{-1})

ia. ([1] = '-1')



ib. ([2] = '-2')



iia.



iib.



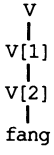
Whereas German has both the rules in (21), Hungarian has only (21i). Consider an example instantiation of each of these structures:

(22) German

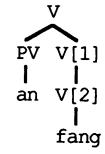
a. 'get entangled'



b. 'catch'

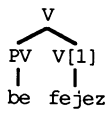


c. 'begin'



Hungarian

d. 'finish'



Independent support from German for the rules in (21) comes from the fact that while a number of verbs have both a prefix and a PV, the ordering between these two is not free. In particular, an old observation about German is that when a prefix and a PV cooccur, the PV is systematically the outermost (Curme (1905: 327)).

(23) *an·er-kennen* 'acknowledge', *ein·ver-leiben* 'incorporate',
vor·ent-halten 'withhold sg. from sy.', *aus·er-lesen* 'choose, select'

Since prefixes attach at the root level and PVs at the stem level, it follows that a prefix will be embedded more deeply than the PV and not vice versa.[11]

The structures in (22) remain uninflected forms. If lexically inserted as such into sentence structure, independent syntactic principles (e.g., agreement) will rule out the sentences they appear in precisely because such forms are neither finite nor infinitival verbs. In order to participate in well-formed syntactic structures, they must become inflected.

Suppose, however, that the following statement holds of German and Hungarian morphology:

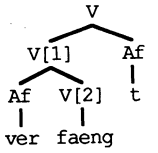
(24) Verbal suffixes for person, number, tense, and mood (i.e., verbal inflectional) subcategorize for V^{-1}. They combine with V^{-1} to yield V°:



Given (24), finite verbal inflectional suffixes cannot attach to the structures in (22), as these are all V°s. Rather, they must attach at the V^{-1} level, and yet this has the consequence that there is no way of creating a V° finite complex verb in the morphology. To see this, recall from (21) that PVs combine with V^{-1}s as well:

(25) German

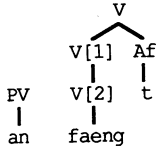
a. 'gets entangled'



b. 'catches'

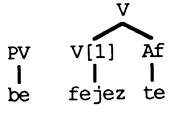


c. 'begins'



Hungarian

d. 'finished'

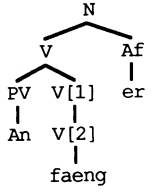


Given the rules in (21), the PV cannot combine with the finite simple verb in (25c, d) to create a V°. This, then, derives the result that the PV and finite simple verb must each be independently lexically inserted.

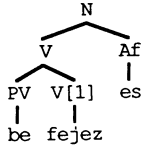
If there is no such morphological object as a finite complex verb, then no such object can ever be lexically inserted. But if no such object can be lexically inserted, then the question of why the finite complex verb cannot appear in a single head position such as C° (German) or F° (Hungarian) never arises. Both the PV and the finite simple verb must fill independent syntactic positions.

Nevertheless, note that nothing prevents the uninflected verb structures in (25) from undergoing derivational affixation in the usual manner. On the present account, derivational suffixes differ from inflectional ones in that they subcategorize for V°. For example, *Anfänger* 'beginner' and *befejezés* 'conclusion' have the structures in (26). From this it immediately follows that separation should be impossible with deverbal derivatives of complex verbs. This expectation is borne out. Such derivatives exhibit morphological integrity.

(26) a. German



b. Hungarian



Further lexical properties examined in §1 indicated that complex verbs are semantic units, even if not

always morphological ones. For example, frequent non-compositionality and PV induced changes on argument structure dictate that there is a level at which complex verbs are represented as semantic units. I propose that this level be argument structure, which is needed independently. More specifically, argument structure is a representation largely independent of structural constituency. A composite predicate at this level may be discontinuous; it need not correspond to a morphological constituent. Consider the foregoing examples in this light:

(27) a. *(sich) ver-fang* < x, y, z> 'get entangled'
b. *fang* < x, y > 'catch'
c. *an & fang* < x, y > 'begin'
d. *be & fejez* < x, y > 'finish'

What representations like (27c, d) indicate is that complex verbs like *an·fang* and *be·fejez* have a meaning and argument structure of their own, quite independent of any potential structural constituency. Although the PV and simple verb form a semantic unit, each part remains structurally independent in representations like (27c, d).

In a strict sense, then, complex verbs may violate the COMPOSITIONALITY requirement for words (cf. Pesetsky (1985: 201)). This is the requirement that semantic units correspond to morphological constituents. In the present analysis, while nothing prevents the PV and simple verb from combining to form a morphological constituent (cf. (21ii)), they are not be able to combine in the morphology if the simple verb is inflected. This means that the structural combination is delayed until the syntax, where the base adjunction rule ensures that the PV and the simple verb will be grouped together (cf. (16)).[12]

Recall from (6d) that the verb **fejez* does not exist on its own. I take this to indicate that **fejez* has no meaning and hence no argument structure representation of its own, unlike, e.g., *fang*. That is, although **fejez* is a well-formed morphological V^{-1}, it can be interpreted only in combination with a PV. Thus, there must be some semantic rule of combination which assigns a meaning to the discontinuous sequence *be & fejez*. An analogous account is proposed for the other examples in (6).[13]

The representations in (27c, d) presume some provision for interpreting them. The rule I propose is the following:

(28) If α is an element of morphological category V (i.e., V°, V^{-1}, V^{-2}) with meaning α', and β is an element of category PV with meaning β', then the combination α & β has the meaning $f^i(\beta', \alpha')$ iff there is a semantic function f^i which yields a composite interpretation for this pair.

Of course, (28) does not determine the full range of functions f available for any given PV & verb combination in the language. Many such combinations are uninterpretable precisely because there is no f^i defined for them. Many of the functions are also very idiosyncratic in that they are defined for only a specific PV in combination with a specific verb. In this case, the functions are highly "lexicalized", not being defined for more combinations. It is now clear that both the syntactic rule of base adjunction in (16) and the morphological compounding rule (21ii) conspire to ensure that the PV and simple verb will structurally always be "in combination" for the exigency of interpretation.

5. Conclusion

My fundamental contention is that the preverb problem arises out of the fact that verbal inflectional suffixes in German and Hungarian subcategorize for the verb at the stem and not the word level, as shown in (24). Such a proposal is awkward in conventional theories of morphology (Selkirk 1982, Mohanan 1986) where inflectional affixation applies at the word level, after derivation and compounding. On these views, complex verbs would constitute compound-like entities to which inflectional affixes could attach. And yet if this were so, the possibility of separation would appear totally anomalous and inexplicable. By 'lowering' verbal inflection to the stem level, I derive the fact that the morphological formation of complex verbs is in complementary distribution with verbal inflectional suffixation. Since finite complex verbs are not created in the morphology, there is no choice but to insert both the PV and the simple verb separately. Finally, (28) ensures that the combination PV & verb will be interpretable, even if there is no corresponding morphological constituent.

The analysis proposed is flexible enough to allow for the possibility that German PVs may (with time) come to attach at the root level, i.e., they may become inseparable. Contemporary German actually affords many doublets of this kind, e.g., *über·setzen* 'ferry sg. across' vs. *über-setzen* 'translate', *durch·dringen* 'get through' vs. *durch-dringen* 'pervade, imbue'.

The analysis also allows for the possibility that verbal inflection in both German and Hungarian will eventually 'normalize' by applying to the word level as opposed to the stem level. Once this happens across the board, separation will no longer be possible. I know of no examples from Hungarian that exhibit this. From German, however, some fluctuation in this realm is apparent with certain PV·prefix-verb combinations (cf. (23)):

(29) German

a. Hans er-kenn-t den Widerstreit der Meinungen an.
   Hans acknowledge-s the clash of.the opinions PV
   'Hans acknowledges the clash in opinions'

b. Hans an·er-kenn-t den Widerstreit der Meinungen.

One way of interpreting the fluctuation in examples like (29) is that the verbal inflectional suffixes optionally at the word level for certain forms. Such forms are invariably those with both a PV and a prefix. Why there should be separability fluctuation with exactly these more complex verbs remains an open question. Nonetheless, the present lexical analysis leads one to expect certain fluctuation, given that the exceptionality of the preverb problem resides in the exceptional subcategorization frames of verbal inflectional suffixes.

Endnotes

[0] I am grateful to Joan Bresnan, Eve Clark, Cleo Condoravdi, Peter Sells, Elizabeth Traugott, and Tom Wasow for useful comments on an earlier draft. This work was supported by a Dorothy Danforth Compton graduate fellowship.

[1] In (1) '·' separates the preverb from its host verb, contrary to orthographic practice which would writes them together. Though Dutch is like German in all the relevant

respects, I do not discuss the Dutch data in this paper (see Booij 1990). German, unlike Hungarian, also has inseparable prefix-verb combinations. These, where cited, are divided with a hyphen.

[2]There are various versions of the Lexical Integrity Hypothesis. The one I give is similar to Neeleman & Weerman's (1990: 2) statement, which they usefully contrast with Strong Lexical Integrity. For other statements, consider Selkirk's (1982: 70) Word Structure Autonomy Condition and Di Sciullo & Williams' (1987: 47) principle of 'syntactic atomicity'.

[3]Although I do not discuss English verb-particle combinations in this paper, I believe that the analysis to be presented can be extended to cover this phenomenon as well.

[4]Unintroduced conditional and concessive clauses as well as exclamations also trigger verb-initial order in German. Hungarian has no structural equivalents of these either.

[5]I mark focussed elements with SMALL CAPITALS. There are actually several types of elements which effect separation of the PV, e.g., Wh-phrases, the negative marker, exclusive adverbials, *only*-phrases, etc. (See É. Kiss 1987 for details.)

[6]The fact that the fronting process has become known as 'topicalization' does not mean that the fronted constituent is semantically always a topic. Indeed, inherently focussed phrases (e.g., *only*-phrases) can also occupy this position in German.

[7]It is not crucial that FP be chosen. The important parallel that I wish to emphasize is that the constituent bearing the discourse function immediately precedes the simple verb in both languages.

[8]I follow Haider 1989 in analyzing German as non-configurational, i.e., the subject is not external to the VP. I differ from him in not positing an IP in German; here I follow Neeleman & Weerman (1990: 8), who do not postulate an IP in Dutch. The crucial point is that the PV and (finite) simple verb form a V° constituent via syntactic (base) adjunction. In this latter detail I follow Groos' (1989) proposal for Dutch.

[9][Spec, CP] cannot be filled by a topic/focus in the presence of a complementizer. Syntactically, the position is there, but (12b) states that the verb must m-command the topicalized constituent, this being impossible if a complementizer fills C°.

[10]This statement should follow from the theory of base adjunction. For example, it would follow from a general prohibition against base adjunction to functional heads. For now, however, I have to stipulate this restriction.

[11]There are a few apparent counterexamples to this claim: *ver-ab·reden* 'agree upon', *be-auf·tragen* 'commission', etc. The first point to note is that these behave like inseparable compounds; the second point is that the prefix is most plausibly analyzed as deriving a verb from a noun, i.e., *Abrede* 'agreement', *Auftrag* 'orders, commission'. Thus, such cases are not real counterexamples.

[12]Since I assume a single-level syntax with direct lexical insertion, some mechanism has to guarantee that the separated simple verb locally combine with its PV. One can imagine how this might be acheived, either with filler/gap percolation features as in GPSG, or with functional uncertainty as in LFG. I leave such details open.

[13]Booij (1990: 10), in a study of complex verbs in Dutch, writes of the necessity to posit possible but non-existent verbs which have meaning only in conjunction with a PV.

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What is a Morpheme?
A View from Construction Grammar

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Preliminaries.[1] Fifteen years ago Aronoff, in his watershed monograph, *Word Formation in a Generative Grammar* (1976), argued that morphemes do not exist, or to the extent that they do, they are epiphenomenal. Aronoff, addressing examples of derivational morphology, argued that rather than morphemes there are only rules for turning one word into another. More recently in various works including one presented to this society, Anderson, addressing examples of inflectional morphology (1977, 1984, 1985, 1988, 1990, 1992), has argued that morphemes don't exist as representations but only as rules. In this paper I want to address the issue of what, if anything, a morpheme is. My approach will be to examine these two representative challenges to the traditional view of the morpheme, and draw out of them an overview of the class of phenomena that must be mapped together to account for the correlations between sound and meaning within the class of constructions that are traditionally called words, and suggest that it makes sense to call such mapping complexes MORPHEMES. The second point of this paper is more of an advertisement. I will point out that the correlations just mentioned have properties similar to the basic units of construction grammar and I will briefly survey the application of the basic notions of construction grammar to the basic problems of morphology. In line with the survey nature of this paper, I will not be attempting to give compelling arguments as to why one MUST use a constructional approach to morphology, rather I will show how to apply a constructional approach to morphology and show that certain useful, pre-theoretical notions in morphology have natural definitions in a constructional approach.

Let us start with a discussion of Aronoff. Some of the key points I want to make about morphology lie hidden in the assumptions behind his argument. Of course I need also to note that where a truth-value semantics might lead to his conclusions, a conception of semantics incorporating an understanding of the role of frames, categorization, and analogical reasoning, more widely called as metaphor, leads to quite different conclusions.

Aronoff's famous argument against the existence of the morpheme was based on the problems with the minimal sign approach commonly assumed by linguists from Saussure on. The basis of his argument is semantic. He rejects the morpheme as a mapping between form and meaning because of various problems in assigning meanings to forms. The first problem is that morphemes of a single occurrence can only be assigned a semantics circularly. The second is that idiomatic uses of morphemes cannot be assigned single meanings. And the last is that there is a class of morphemes in English of which he claims "there is no way in which members of this class can be said to have any meaning at all..." (pg. 7). But there are serious questions regarding his premises. For example, in order for the arguments based on his first two reasons to go through, one has to assume strict compositionality—a position relatively easy to argue against in light of current work on semantics, especially that on metaphor (Reddy, 1979; Lakoff and Johnson 1980; Lakoff, 1987; Lakoff and Turner, 1989). Assigning meanings to hapax legomena and idiom chunks is not a problem (cf. Brugman, 1983). But Aronoff's third argument regarding a class of putatively meaningless English morphemes is

instructive enough to warrant some closer examination. He presents the following paradigm.

(1) (= Aronoff's (5), pg. 12)

X=fer	*X=mit*	*X=sume*	*X=ceive*	*X=duce*
refer	remit	resume	receive	reduce
defer	demit		deceive	deduce
prefer		presume		
infer				induce
confer	commit	consume	conceive	conduce
transfer	transmit			transduce
suffer	submit	subsume		
	admit	assume		adduce
	permit		perceive	

In this aggregation of data he argues that one cannot find a common meaning for the morphemes at the head of each column, in spite of the fact that they show consistencies in allomorphy, as suggested by the corresponding forms in (2).

(2)

X=fér	*X=mit*	*X=sume*	*X=ceive*	*X=duce*
X=ference	*X=mission*	*X=sumption*	*X=ception*	*X=duction*
reference	remission	resumption	reception	reduction
deference	—		deception	deduction
preference		presumption		
inference				induction
conference	commission	consumption	conception	conduction
transference[2]	transmission			—
—	submission	subsumption		
	admission	assumption		—
	permission		perception	

The assumption behind his argument is that consistency in formal properties, in this case allomorphy, shows that there is a linguistic entity of some sort. But, he reasons, because there is no semantic analysis available, the entities do not involve any sort of mapping and therefore cannot be morphemes under a "minimal sign" definition of morpheme. But such an argument is flawed. First because of the fact that under modern semantic analysis, there *is* plenty of reason to think that each of these latinate roots and prefixes in (1) has a consistent meaning. For example, Sweetser (1987) presented an analysis to this society in which she showed how, at least in historical terms, it is sensible to think of *=fer* as meaning 'bear, carry', *=mit* as meaning 'send', *=ceive* as meaning 'take', and so on. I would argue it is also true synchronically. Second, independent of semantics there are consistent groupings of properties, phonological, morphological (as Aronoff explicitly notes in the case of allomorphy), and syntactic. These groupings are implicit in his organization of the paradigm repeated here as (1), most noticibly in his use of the = boundary.

To counter Aronoff's position let me start with the most prototypical case of what we would, prior to Aronoff, have unblinkingly called a morpheme. Let me show what other properties there may be which must be associated with the

phonologico-semantic mapping that constitutes the traditional definition of a morpheme.

In the most prototypical case are found four cooccurring properties that any theory must be treat as part and parcel of the same entity, E, regardless of what one calls E.

(3) (a) **Phonology**: Some phonological material.
(b) **Semantics**: Some semantics and/or pragmatics.
(c) **Internal syntax**: Considerations of how E fits in the construction of a whole word.
(d) **External syntax**: Considerations of how the presence of E affects the class of constructions into which whole words containing E may fit.

Consider the English word *lighten* 'make (s.t.) less heavy'. In traditional morphological analysis it consists of two mappings, given in (4).

(4)

	light	**-en**
phonological part:	***layt***	***ən***
semantic part:	'light (of weight)'	'(causative-)inchoative'

But the claim of this paper is that (4) gives only half the picture. Each of these entities consists not of two parts, phonological and semantic, but of the four parts shown in (3) as exemplified in (5).

(5)

	light	**-en**
phonological part:	***layt***	***ən***
semantic part:	'light (of weight)'	'(causative-)inchoative'
internal syntax:	*adjective stem*	*suffix on adjective stems*
external syntax:	*adjective*,frame:*patient*	*verb*, frame: (*agent*)

For exposition's sake I have simplified the facts within each entity here slightly. For example the *-ən* complex can only be added to obstruent final stems and there are further subtleties about the class of words to which it can be suffixed. None of these details affect the argument. All four types of information must be mapped as a single linguistic unit, regardless of whether one takes Aronoff's or Anderson's position and calls such mapping complexes rules or whether, as the present author prefers, one uses the traditional term *morpheme*. My choice to use the term *morpheme* also stems from substantive considerations. In a rule based approach, either a Halle/Aronoff type word formation rule (WFR) in derivation or an Andersonian morpholexical rule in inflection, there are inherent deficiencies. Primarily, I would argue as did Selkirk (1982) and Di Sciullo and Williams (1987), that below word level there exist constructions independent of individual WFRs or morpholexical rules. Any adequate theory will have to recognize this syntax and a rule-based theory is hard-pressed to do so. Beyond that, the conditions on internal syntax can be much more complex than either the proponents of WFRs or morpholexical rules seem ready to concede. In particular, the kinds of notations used by Anderson or Stump (1991, 1992) are inadequate to handle conditions that appear in the internal syntax which go beyond simple major word class information and include morphological classes, phonological conditioning, and even semantic

even semantic or pragmatic information. Two examples should suffice to demonstrate what I mean.

First, the English plural does not go on just any noun. It only goes on common, count nouns. Where it appears on nouns that are lexically either proper or mass the meanings of those nouns are distinct from that in their use as proper or count nouns respectively. Although semantically based, these are syntactic properties of nouns that need to be indicated in their lexical entry. To show this it should be sufficient simply to recall that the modern English count noun *pea* is descended from the early modern English mass noun *pease* of the same reference. A summary of the facts of English pluralization is given in (6).

(6)

	[- proper, + count]	[- proper, - count]	[+ proper, + count]
sg	car	milk	Philadelphia
pl	cars	*milks	*Philadelphias

But neither a WFR type notation as in (7a), nor a morpholexical rule notion like those in (7b) and (7c) have an obvious place to include this crucial information.

(7) (a) WFR $[N+s]_N$

(b) Morpholexical rule (Anderson) $/X/ \rightarrow /X+s/$ [+pl]

(c) Morpholexical rule (Stump) $MLR_{I,[NUMBER:plural]}([_N x]) = def[_N[_N x] \text{ -s }]$

The point of (7) is not to demonstrate that it would be impossible to incorporate this kind of information into a rule-based theory, after all Halle talks about the operation of WFRs as adding syntactic properties like [+abstract], but simply that syntactic information outside of major word class was believed by the developers of such theories to be so completely beside the point that the formalisms they developed have no place for most of the syntactic information that governs word structure.

The second example of a problem with the formalisms that ignore syntax in morphology is found in the Lakhota verb forms given in (8). The plural marker *pi* appears suffixed to verbs to mark the plurality of either subjects or objects, as in (8a). But in (8b) the plurality of third person objects is marked by *wicha*. When *wicha* is present it blocks the appearance of *pi* to mark object number, but not subject number. Note that in Lakhota the third person is generally zero. Also do not be distracted by the regular ablaut of the word final *a* to *e* in certain verb stems when they appear in simple declarative clauses.

(8) (a)

subject plural		object plural	
kaštake	'he strikes him'	***nikaštake***	'he strikes you *sg*'
kaštakapi	'they strike him'	***nikaštakapi***	'he/they strike(s) you *pl*'
makaštake	'he strikes me'	***makaštake***	'he strikes me'
makaštakapi	'they strike me'	***ųkaštakapi***	'he/they strike(s) us'

(b)

singular subject		plural subject	
wichawakaštake	'I strike them'	***wichųkaštakapi***	'we strike them'
wichayakaštake	'you *sg* strike them'	***wichayakaštakapi***	'you *pl* strike them'
wichakaštake	'he strikes them'	***wichakaštakapi***	'they strike them'

The implications of the data in (8) are that the rule supplying *wicha* cannot be disjunctively ordered with the rule supplying *pi* because both can be present in a single form. Therefore one must use a syntax sensitive device to know when the plurality of the object has been supplied by *wicha*. Anderson's device for encoding structural information by 'layering' features will not handle this problem without writing distinct morpholexical rules for subject plural *pi* and object plural *pi*, and have only the object plural *pi* rule disjunctively ordered with *wicha*, plus invoking the repeated morph constraint (Menn and MacWhinney, 1984) to avoid getting two *pi*'s when both subject and object are plural.

But I cannot simply accept the notion that there is word-internal syntax without at least addressing Anderson's position. In recent work (1990, 1991) Anderson rejects all syntactic structure within words on the grounds of the relative lack of phenomena in morphology which make crucial reference to word internal syntactic structure and on the grounds that there exist well-documented instances in which the apparent word level syntax contradicts either the scope or the morphological properties of the construction, e.g. the so-called bracketing paradoxes. Anderson proposes that this follows if there are only rules and no word-internal syntax. In his system all apparent word internal syntax falls out of the ordering of the rules which supply phonological material in certain morphological contexts. Although it is premature at this point to explain why, from a construction grammarian's point of view, Anderson's arguments are less than compelling, I will point out that both the $\bar{X}$ type of syntactic view of morphology and the rules-only view of morphology are extreme positions, forced on us by assumptions of modularity. Should the entities, whatever you call them, which provide lexical material also provide partial pieces of syntax at the same time, then the grounds of argument change radically. This is exactly what construction grammar does thereby allowing a middle ground between these extremes. Besides even in Anderson's own system he needs a device for encoding structural information by 'layering' features. This is already a backdoor admission of an important role for syntax in morphology.

A quick typology of morphemes. Once we recognize the inherent complexity of a prototypical morpheme, it is easy to find morphemes that are less prototypical in that they lack one or more of the parts shown in (5). The most common case being the lack of a phonological part, traditionally known as a *zero morpheme*. An example is given in (9).

(9)	**burn**	Ø
phonological part:	***bərn***	
semantic part:	'burn'	'causative'
internal syntax:	*verb stem*	*suffix(?) on verb stems*
external syntax:	*verb*, frame: *patient*	*verb*, frame: *agent*

Other analyses for instances of zero morph phenomena are also possible within the type of framework we are considering. And one can make good arguments for the need to distinguish various types of zero morphs, but this is not the time to go into detail. The point is only that because morphemes consist of four potential parts instead of two, it is less clear that one can argue against the existence of the morpheme as an entity by finding a class of morphemes lacking one of the parts. In spite of my vigorous defense of the meaningfulness of English latinate roots against

Aronoff's view, it is not particularly hard to find morphemes which actually do lack semantics. Take theme vowels for example. The -ī- in the Latin example in (10) is a case in point.

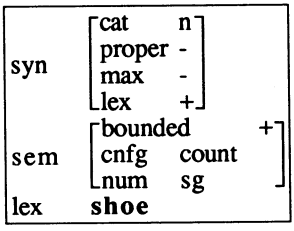
(10) 'serve' (Latin)

	serv	**ī**	**re**
phonological part:	***serw***	***ī***	***re***
semantic part:	'servant'		'PRO subject'
internal syntax:	*noun root*	*verb stem forming suffix on roots*	*nominal word forming suffix on verb stems*
external syntax:	*animate noun*	*verb*, frame: *agent* (*patient*)	*neuter noun*

From the morphologist's point of view morphemes that lack either of the syntactic properties are much less interesting, but they do exist. Morphemes that lack internal syntax are the mainstay of so-called isolating languages, they constitute words which cannot combine with any other forms either in inflection or derivation. And finally, morphemes lacking external syntax would be interjections, which seem not to fit into external constructions at all, or at most in very restricted ways.

A little about construction grammar. Now I would like to turn to a discussion of the similarity that a morpheme like that outlined in (5) has to a lexical construction in construction grammar. In construction grammar, Fillmore and Kay (1993), constructions are made up of smaller constructions, which each contribute properties to the larger construction and whose appearance in the larger construction may be sensitive to the properties of other participating constructions. But since the various types of properties, phonological, semantic, and syntactic are all equally part of a construction, morphemes, in the sense that I am using the term here, constitute entities of the construction type. Fillmore and Kay, themselves, propose that words are constructions. For example in (11) I have sketched the lexical entry for *shoe* following Fillmore and Kay (1993: Chap. 3, pg. 6).

(11)

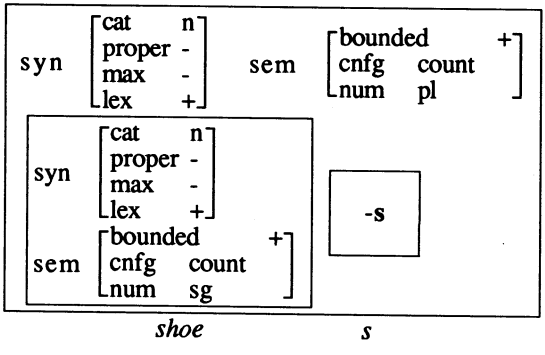


At this point I need to digress briefly to review some construction grammar terminology. The properties of a construction are represented by a hierarchically structured list of attributes and attribute values. As shown in (11) the value of an attribute can be a simple value, +, -, n (=noun), sg (= singular), etc. or it can be another attribute or list of attributes. So in (11) the value of the attribute *syn* is the list of attributes, *cat*, *proper*, *max*, *lex* and their respective values. Such a list of attributes is called an attribute value matrix and is symbolized by enclosure in square brackets. By convention the outermost set of square brackets is omitted and a box is used instead. Also, by convention, attributes are written to the left and their

values to the right. One final terminological note is that the word *shoe* which instantiates the construction in (11) is called a construct.

Kay and Fillmore also give an example of a construction involving morphology below the word level. It is the English plural and is repeated here as (12), (Chap. 3, pg. 9) with the construct *shoes* listed underneath to show how this construction lines up with tokens of phonological material.

(12)

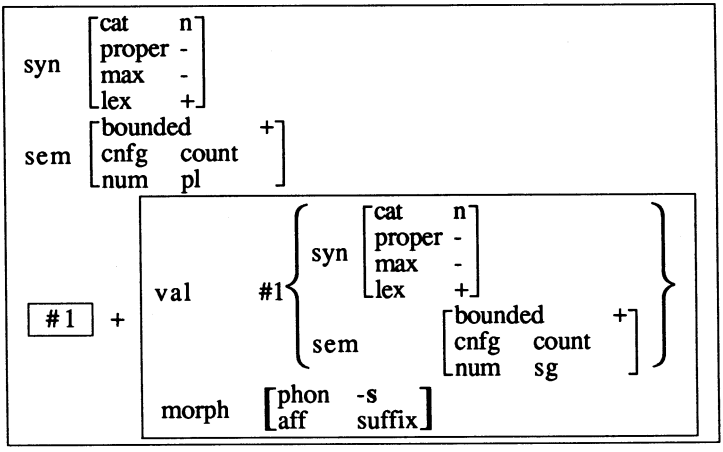


The construction in (12) indicates the syntactic constraints on the plural. The attribute value matrices in the box must match the corresponding attribute value matrices in contructions like that in (11). This matching is accompished by a process called unification. As we get more sophisticated about morphology in a construction grammar, a number of modifications will have to be made, but we will address them one at a time. First the inner box on the left in (12), the one that corresponds to the noun, is in effect the attribute value matrix for the valence of the plural. Henceforth we will so label it. However, there is a reason for putting the valence and the abstract phonological *-s* in boxes. These serve to show that the plural is added to the right of the noun. We will mention more complicated cases involving non-concatenative morphology in a moment, but suffice it to say that because of the existence of non-concatenative morphology, the specification of how morphemes attach to one another is more complex than the simple box notation in (12) can easily accommodate. Therefore we will specify the phonological content and the phonological boundary type (if any) of a morpheme separately from the means of concatenation. With these two revisions (12) becomes (12´) (on the next page).

Having established that there are congruences between the demands of morphology and the already extant means of construction grammar, I would like to step back for a moment and consider other ways that construction grammar seems particularly suited to morphology. Construction grammar was developed to deal as well with the linguistics of special cases as with that of general cases. Generalizations in construction grammar are related to special cases via inheritance. But morphology has always been the last refuge of special cases. Even when, in its insatiable quest for generalization instead of "mere facts", the field turned its collective back on the linguistics of the particular, it was still acceptable to acknowledge special cases and irregularity in lexicon. So a theory built to accommodate the syntax of special cases seems tailor made to account for the irregularity that has always been recognized in morphology.

The remainder of this paper will be devoted to exploring facets of morphology in a construction grammar framework to see 1) how to do it, and 2) what theoretical possibilities construction grammar affords morphology.

(12)



Housekeeping. The biggest single question in making construction grammar work in morphology is that of how to get the morphemes in a word to land in the right order. Unlike transformational theories, including those using WFR or morpholexical rules, construction grammar is not derivational. Therefore, the ordering of affixes can only be accomplished by use of the elsewhere condition, by the use of specialized attributes, or by the use of specialized constructions which directly encode morpheme order. In actuality the difference between using specialized attributes and developing specialized constructions is that specialized constructions require obligatory affixation in a way that attribute ordering systems don't. And because in many aspects construction grammar is a have-your-cake-and-eat-it-too theory, it is entirely possible to have all three approaches to morpheme order even within a single language. For the purposes of this brief paper, I will have to assume that elsewhere case analyses as a type are sufficiently familiar that I need not discuss them in the short time I have here. Similarly, since specialized constructions are theoretically trivial, I will pass over them with a mere mention and concentrate on the specialized attribute approach to morpheme order.

Although not widely acknowledged, there exists a cognitive mechanism that groups linguistic entities into units. Let me call this mechanism the GLOMMER. In construction grammar the action of the glommer is expressed through the values of a series of attributes, *lex*, *max*, and *hsbj* (=has subject) which mark the degree of inclusiveness of linguistic units, as shown in (13).

(13)

words	phrases	clauses
syn [max -, lex +]	syn [max +, lex [ ]]	syn [hsbj +, max +, lex -]

What I propose to do is simply to extend this approach below the word level. We will use attributes like *root*, *base*, *stem*, and *word* and put them in an attribute value

matrix as the value of *lex*. To show how this will give a slot-sequence effect in a language with multiple slots, consider the following forms from the Lakhota transitive verb paradigm.

(14) Lakhota transitive verbs

kaštake	'he strikes him'	*ų́kaštakapi*	{ 'we strike him' / 'he strikes us' }
***wa**kaštake*	'I strike him'	***ų́ya**kaštakapi*	'you strike us'
***ya**kaštake*	'you strike him'	***ų́ni**kaštakapi*	'we strike you'
***ma**kaštake*	'he strikes me'	***wicha**kaštake*	'he strikes them'
***ni**kaštake*	'he strikes you'	***wicha**wakaštake*	'I strike them'
***maya**kaštake*	'you strike me'	***wicha**yakaštake*	'you strike them'
***chi**kaštake*	'I strike you'	***wichų́**kaštakapi*	'we strike them'

In a slot-sequence diagram these facts could be summarized as in (15).

(15) Lakhota transitive verb prefixes

Slot A	Slot B	Slot C	Slot D
		ya '2 subj'	
wicha '3 pl obj'	*ų́* '1 pl participant'	*ni* '2 obj'	
	ma '1 sg obj'	*wa* '1 sg subj'	stem
		chi '1 sg subj on 2 obj'	

In actuality there are a few more complications than are evident here, some of them rather nasty.[3] But this will suffice for the purposes of demonstrating the use of attributes to encode morpheme order. Leaving out all the other attributes, the attribute value matrix for the morphemes in each of these slots is given in (16).

(16) Lakhota transitive verb prefix constructions

stems

$$\left[\text{syn}\left[\text{cat } \text{v};\ \text{lex}\left[\text{stem } +;\ \text{word } +\right]\right]\right]$$

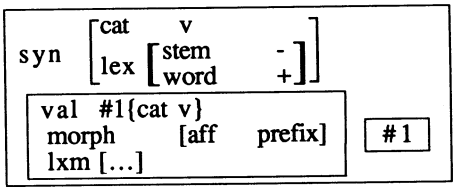
Slot C prefixes

$$\left[\text{syn}\left[\text{cat } \text{v};\ \text{lex}\left[\text{stem } +;\ \text{word } +\right]\right];\ \left[\text{val } \#1\left\{\text{cat } \text{v};\ \text{lex } [\text{stem } +]\right\};\ \text{morph } [\text{aff } \text{prefix}];\ \text{lxm } [\ldots]\right]\right] \quad \boxed{\#1}$$

Slot B prefixes

$$\left[\text{syn}\left[\text{cat } \text{v};\ \text{lex}\left[\text{stem } -;\ \text{word } +\right]\right];\ \left[\text{val } \#1\left\{\text{cat } \text{v};\ \text{lex } [\text{stem } +]\right\};\ \text{morph } [\text{aff } \text{prefix}];\ \text{lxm } [\ldots]\right]\right] \quad \boxed{\#1}$$

Slot A prefixes



Morpheme order in this system comes about by manipulating a list of attributes set aside for the purpose. In this case only one attribute is required, *stem*. The innermost layer of prefixes, Slot C prefixes, go on simple stems yielding a stem. The Slot B prefixes go on stems but return non-stems. The outermost layer, the Slot A prefixes, go on any verb construction and yield non-stems. So any of these prefixes can attach directly to a simple stem as shown in (14). And *wicha* '3 pl obj', the only Slot A prefix can go on any other combinations of stem and prefix, but since no other affix can go on non-stems, it always ends up as the outermost prefix. On the other hand Slot B affixes, *ɥ* '1 pl participant' and *ma* '1 sg obj', can go next to the simple stem or on the construction of a simple stem plus Slot C prefix because that combination is still a stem. However, Slot B prefixes cannot appear closer to the simple stem than a Slot C prefix, because the construction of a Slot B prefix with any V construction yields a non-stem to which Slot C prefixes cannot attach.

Notice that what is done here is to shift the syntax onto the morphemes. In effect each morpheme carries the relevant pieces of its syntax with it, thus avoiding many of the problems that Anderson (1990, 1992) and Stump (1992) attribute to syntactic theories of morphology over against morpholexical rules.

Morphology/phonology interface. Once we have recognized that constructions can carry phonological information along with syntactic and semantic information, some interesting possibilities open up. For example, ever since Halle's seminal paper (1973) it has been recognized by morphologists that morphemes (or the rules that spell out those chunks of phonology traditionally called morphemes) can carry extra phonological information in the form of boundaries. However the formalisms in use did not allow much more. In a constructional approach some very attractive possibilities become available. For example consider the fact that in Attic Greek noun inflection the *a* stems have an ablauted theme vowel in the singular, or that in Latin noun inflection where, except for *i*, the theme vowels are characteristically long wherever the sound pattern of Latin permits, the non-front theme vowels are irrationally short in the nominative and accusative singular. These two patterns are illustrated in (17). The theme vowels are given in boldface.

(17) (a) Attic Greek

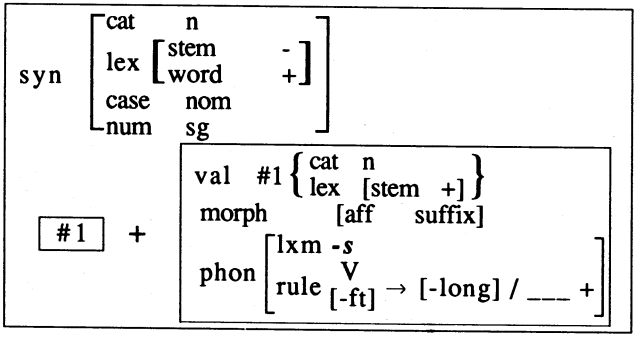
'town'	singular	plural
nominative	*kōm**ē***	*kōm**ay***
genitive	*kōm**ēs***	*kōm**ōn***
dative	*kōm**ē**(y)*	*kōm**ays***
accusative	*kōm**ēn***	*kōm**ās***

(17) (b) Latin

o-stem	'garden'	singular	plural
	nominative	*hortus*	*hortī*
	genitive	*hortī*	*hortōrum*
	dative	*hortō*	*hortīs*
	accusative	*hortum*	*hortōs*
	ablative	*hortō*	*hortīs*
a-stem	'girl'	singular	plural
	nominative	*puella*	*puellae*
	genitive	*puellae*	*puellārum*
	dative	*puellae*	*puellīs*
	accusative	*puellam*	*puellās*
	ablative	*puellā*	*puellīs*
u-stem	'hand'	singular	plural
	nominative	*manus*	*manūs*
	genitive	*manūs*	*manuum*
	dative	*manuī*	*manibus*
	accusative	*manum*	*manūs*
	ablative	*manū*	*manibus*

In a constructional approach it is possible to include these phonological rule-like generalizations in a construction. This allows one to accomplish what Anderson does by ordering his morpholexical rules among the phonological rules. But the constructional approach which can associate rules with particular constructions has the advantage that the fact that such rules are minor rules falls out without the need for any ad hoc theoretical mechanism to maintain their exceptional status. The Latin nominative singular would be sketched as follows:

(18) Latin Nominative Singular (partial)



In actuality the matter is somewhat more subtle because the phonological rules need to be listed separately and referred to. At first blush that looks like a notational variant on exception features. It isn't, however, because just such a mechanism of reference is used in developing inheritance and therefore is freely available to constructions in general rather than being a distinct theoretical entity.

Having taken the step of allowing rules to be referenced by constructions directly we can readily see that this will enable us to manage all morphologically driven phonology, independent of whether phonological stuff is affixed. Umlauts, ablauts, truncations are just one possible regular part of constructional morphemes.

The final step is even more radical. It is well known that there are many types of non-concatenative morphology, beyond those that can be treated as simple phonological rules, for example, the widely discussed templatic morphology of Semitic and Penutian. Our notation, unfortunately, was designed by syntacticians to represent syntax in which there is only concatenation[4]. In principle, the premises of construction grammar make it possible to specify manners of combining chunks of phonological stuff—linking of melodies with templates, creation of new tiers, copying of templates or melodies. Garden variety concatenation is just a special case. It is for this reason that I am including an attribute *morph* which specifies how the phonological material of a construction gets combined with the phonological material of other constructions. Its values will include other attributes to specify kinds of combining like *aff* to specify concatenation, *copy* for reduplication, and *inf* for infixation. These in turn will have values like *aff suff* for suffixes, *copy σ left* for reduplicating initial syllables, *inf o left* for infixing after the first onset, and so on.

The good news about inheritance. One of the most theoretically intriguing properties of construction grammar is inheritance. Inheritance allows for closely related constructions to be treated as belonging to the same general construction type. Each of the specific constructions inherits all of the properties of the more general construction. In this way one can still achieve generalization in spite of needing to list special cases.

This approach to linguistic generalization has two very interesting implications for morphology. The first is that it sheds new light on allomorphy; the second is that it provides a natural grounds for the definition of the important morphological notion of paradigm. I'll discuss allomorphy first.

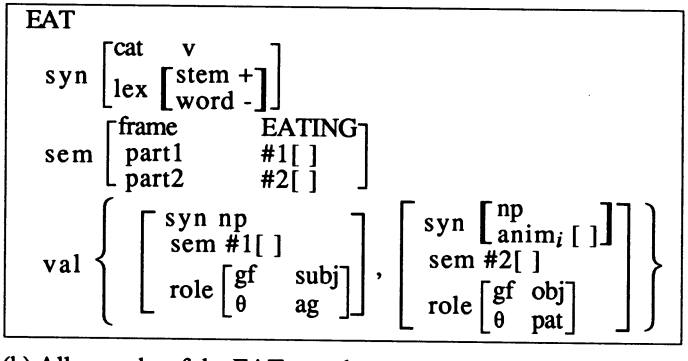
In all previous theories of morphology, suppletive allomorphy, the kind of allomorphy that one chooses not to eliminate by the use of phonology, requires a special kind of treatment—a theoretical extension, in effect. For example, in a structural approach to a statement of the distribution of allomorphs one requires special clauses specifying the phonological content of each allomorph and conditions under which it appears. These clauses are disjunctively ordered among themselves and are linked to the general statement of the morpheme which specifies the semantics and word-internal tactic properties. WFR systems require special allomorphy rules e.g. Aronoff (1973, section 5.3, pg. 98ff). On the other hand a morpholexical rule system like Stump's (1991, 1992) requires no special type of rule to get allomorphy but at the cost of making allomorphy an epiphenomenon, accessible only by reference to the disjunction imposed by the semantics.

However, in constructional morphology one can use inheritance to get allomorphy without either positing a special type of rule or giving up the basic notion. In spirit this approach is like Stump's, but because of inheritance we can, once again, have our cake and eat it, too. Allomorphs are those constructions which inherit the properties of lexical constructions that lack explicit mention of phonological content. One example should suffice. In Ojibwa, as in most Algonquian languages, there are two suppletive allomorphs for the transitive verb meaning 'eat', *amw-* for animate comestibles, and *miiji-* for inanimate. A representation of this allomorphy is given by the general EAT construction,

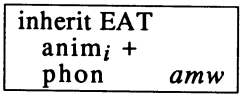
sketched in (19a) from which the two allomorphs, given in (19b), inherit all but their animacy valence.

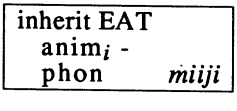
(19) Ojibwa

(a) EAT morpheme (general construction)



(b) Allomorphs of the EAT morpheme

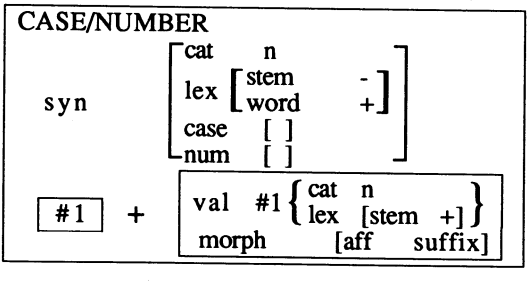




In (19) the two allomorphs of the transitive stem for 'eat' inherit all the properties of the construction EAT, but differ in whether the notional object is animate or not.[5] This approach allows one to say that very straightforwardly.

The second implication of inheritance is that it provides the grounds for the definition of paradigms and subparadigms. A complete paradigm for any lexical stem will consist of all the constructs that simultaneously inherit the properties of that stem and the properties of all the constructions which realize the categories of inflection for the major class that stem belongs to. Thus the paradigm of a Latin noun stem consists of all the constructs containing that stem fulfilling the valence of the construction in (20).

(20)



This example is only a simple case, but it should suffice to suggest how one can define the notion paradigm. Other useful related notions, like that of subparadigm are gotten by simply restricting the class of inflectional categories whose properties a construct must inherit to belong to the set.

Conclusion. In this brief overview I have argued that it is sensible to use the traditional term *morpheme* to refer to linguistic entities. I further showed that the kinds of entities one needs to posit to account for the basic facts of morphology are of the same kind as constructions in construction grammar. Then by examining some of the most basic phenomena in morphology in the light of construction grammar I argued that such an approach provides natural accounts for minor rules, allomorphy, and paradigms.

One final matter, however, should be addressed. The class of constructions that arise out of the analysis of inflection, derivation, and compounding are in all but minor ways identical. This is not surprising, given the radical anti-modular stance of construction grammar in the first place. Many morphologists are likely to be minded to reject a constructional approach out of hand because of this lack of analytic distinction. But let me conclude with this thought. It has long been recognized that the very real distinctions between inflection and derivation and between derivation and compounding are potentially quite fuzzy. If those distinctions arise from formal criteria that fuzziness is hard to account for. But if on the other hand those distinctions arise from other considerations, e.g. semantic transparency, productivity, and the like, the fuzziness is readily explicable. Construction morphology fills that bill.

There are certainly more morphological phenomena than I have covered here. Some of them, like defective paradigms, have very natural accounts in construction morphology (see Rhodes, 1992). Others, like cooccurrence constraints (e.g. Hyman and Mchombo, 1993), do not yet appear to have such clearly natural accounts.

NOTES

[1]I would like to thank Larry Hyman, Pay Kay, Chuck Fillmore, Sharon Inkelas, and Aaron Halpern for the various discussions that have contributed significantly to this paper. The usual disclaimers apply.

[2]*Transfer*, of course, has initial stress and might therefore not strictly be part of this derivational paradigm.

[3]Kay (n.d.) has used instances of rare verbs (cited in Legendre and Rood, 1993) that take two slot B prefixes to argue that a role-based analysis of Lakhota prefixes is more insightful, and the present author is inclined to agree. But for the purposes of exemplification, we will use this analysis here anyway.

[4]Actually there are non-concatenative aspects of syntax, especially in suprasegmental material, which tends to get ignored or treated as if there were no special problem in connecting it to the segmental representation.

[5]There are a number of complications that have to do with the syntax of the so-called inverse forms which I am simply ignoring here.

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Enclitic Pronouns in Caribbean Spanish

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1.1 Presentation of the problem

I will propose that pronominal enclitics in Caribbean Spanish are suffixes, not clitics. Most of the evidence support the claim that enclitics accommodate to word-internal rules of stress and other requirements on phonemic sequences in words. Data from Caribbean, Peninsular, and New Mexican Spanish will be used to sustain these claims.

Our research describes prosodic and syntactic phenomena characteristic of monosyllabic unstressed oblique/reflexive pronouns (i.e., pronominal clitics), which in Spanish seem to satisfy, on their own, subcategorization requirements of verbs (see Ojeda (1989) for detailed description of the paradigm)

I will argue that each of these clitics has a twofold representation in the grammar: a clitic form, and an affixal form. Moreover, affixal forms appear in a fixed position in the word, to the right of the verbal stem (or root), or as they have been called: enclitic. Clitic forms precede the verb (proclitic) and usually -using the criteria that every word should have primary stress assigned- constitute a word with it. Examples from Caribbean Spanish for both kinds are shown in (1). The enclitic case occurs in paroxitonic commands (1) and in proparoxitonic commands (2):

	proclitic:			enclitic:		
(1)	**me #**	dé	+n	dé	+ **me**	+n
	procl-dat	V-give	-pl2nd	V-comm	encl-dat	pl2nd
	"You (plural) give me..."			"Give (you) me!"		
(2)	proclitic:			enclitic:		
	le #	tráiga	+n	tráiga	+ **le**	+n
	procl-dat	V-bring	-pl2nd	V-comm	encl-dat	-pl2nd
	"You (plural) bring to him/her..."			"Bring it to him/her!"		

Evidence for the status of enclitics as affixes comes from command + pronoun "sequences." Generally, Modern Spanish allows pronominal clitics only to precede finite forms of the verb (proclisis), or only to follow non-finite forms (enclisis), as seen in (3):

(3)	a)	me	lo	puede	traer
		me-dat	it-acc.	can	bring-inf.
		"He/she/you can bring it to me".			
	b)	puede	traer	-me	-lo
		can	bring-inf-	me-dat	it-acc.
		"He/she/you can bring it to me".			

The only morphologically finite forms that require enclisis are commands.

Unstressed pronouns with commands behave differently according to dialect.[1] Evidence for the suffixal status of enclitics in Caribbean Spanish does not come from normal phonological (and phonetic) rearrangements across word boundaries,

such as resyllabification; or from contraction of the second element in a phonosyntactic unit -postlexical phonology- as seen in Old Spanish cases such as:

(4) nol < no le
no-adv him-dat
"Don't X to him."

Our evidence relies mainly on word-internal and morpheme boundary phonology.

Wanner (1987: 462) and Zwicky (1980) have proposed criteria to distinguish affixes from words. According to these criteria, pronominal enclitics and inflectional affixes are similar or even identical in many respects. Proclitics have only some of these characteristics, while enclitics have most of them. They differ from enclitics because they: a) do not have a fixed location (there is room for stylistic reorderings--> proclitic to finite forms, enclitic to adverbs; and "enclitic" to other pronouns with which they cluster); b) are not subject to specific morphological conditions on distribution, including template restrictions (at least, not templatic conditions related to verbal morphology).[2]

Proclitics are probably "bound words," according to Nevis' (1986) taxonomy for Finnish particles. These have parallel behavior to that of full words, except for their distribution in the sentence; and that they attach to their host word by a phonological liaison process.

2.1. Syntactic evidence for the affixal status of pronominal enclitics with Commands:

Cases of "conjunction reduction" in Caribbean Spanish show different syntactic behavior of enclitics (5 b) vs. proclitics (5 a):

(5) a) Yo **lo** envuelvo y traigo a casa hoy.
I it-acc wrap-I and bring-I to home today
"I 'll wrap it and bring it home today".

b) *Trae a casa hoy y envuélve**lo**.
Bring-comm to home today and wrap-comm-it.
"Wrap (it) and bring it home today".

c) **Lo** traes y envuelves rápido.
It-acc bring-you and wrap-you fast
"You bring it and wrap it".

d) *Envuelve y tráe**lo** rápido.
Wrap-comm and bring-comm-it. fast
"Wrap (it) and bring it fast".

In (5 a), lo can be absent from the second conjunct because it is proclitic, but the same situation with a commmand and "enclitic" pronoun (5 b) disallows the "reduction" in the first clause. If enclitics are suffixes, then syntax has no access to word-internal information and a morpheme cannot be "absent" from a member of a conjoined structure (**Figure 2**) as with the case of words (**Figure 1**). This fact follows from assumptions on the independence of grammatical components.

FIGURE 1

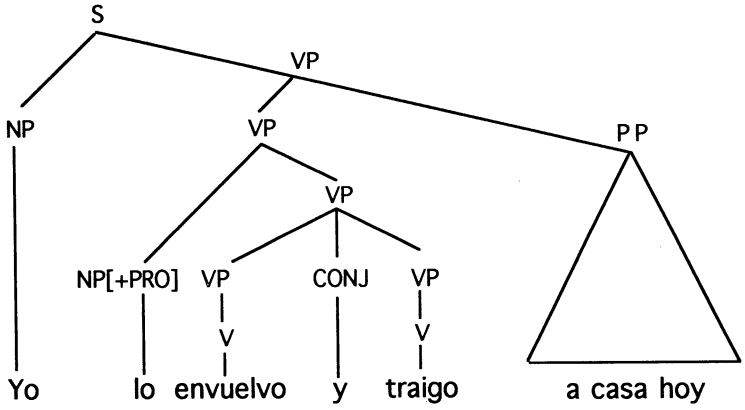
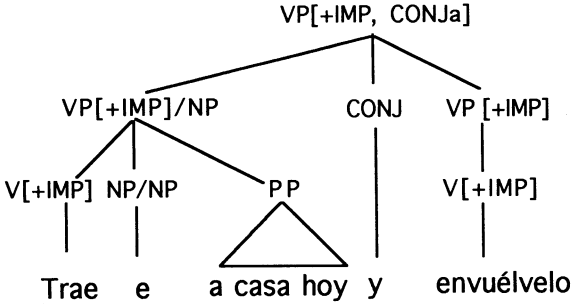


FIGURE 2



It is possible that the explanation is related to the presence of a category which does not fullfil the requirements of the syntactic structure in which it is (SLASH is not in each conjunct of the conjoined structure), or to the presence of a verb whose subcategorisation requirements are not satisfied as in **Figure 2**. Besides, the proclitic can combine by itself with the conjoined elements as full words, as seen in **Figure 1**. Example (*infra*, 5 b) would be good if traelo substitutes trae; or if a proclitic lo is used in the first clause (non-command verbs):

(6)	Lo traes	a casa	hoy	y	envuélvelo.
	It bring-you	to home	today	and	wrap-comm-it.

"You bring it home today and wrap it".

2.2. Arguments from morphology

Some indications from the conformation of enclitics behavior to conditions on the morphological shape of uninflected vs. inflected forms, reveal intriguing differences. Uninflected forms -like infinitives and gerunds- with enclitics, show little of the peculiar phonological behavior of such with commands. The explanation could be that, if no verbal inflection is present, then no case inflection should be present either (for it goes against the morphological nature of uninflected

forms). Nevertheless, there are some attested forms of "inflected" infinitives in some dialects of Spanish (Espinosa 1949: 231):

(7)	ir-	se-	n	(ellos quieren	irse	-n)
	go-inf-	3rdat-	3rdpl	(they want-3rdpl	go-3rddat	-3rdpl)
	"to go (they/you)"			"They want to go".		

Besides, obligatory enclitic forms in Spanish are exceptional: if unstressed pronouns are all clitics; and if inflected forms require proclisis, what can justify the presence of enclitics with morphologically inflected forms of a defective paradigm such as the imperative?

On the other hand, it is a characteristic of clitics to be ordered outside inflectional morphemes. In fact, affixes cannot attach to bases containing clitics in English (Bauer 1988: 100). Spanish pronominal "enclitics" to commmand forms would be an exception if they are treated as clitics.

Besides, Spanish inflection goes to the right of the root or stem. This is significant, since verbal inflection is not an exception to this rule. In Caribbean Spanish, enclitics occur to the right of the verb, outside the thematic vowel sometimes; outside the root of monosyllabic verbs in other cases; but inside third person plural endings in many instances (*infra* (1) and (2)). Our hypothesis is that their precedence to personal endings is conditioned by phonological as well as morphological rules.

3.1. Evidence from syllabification (phonology) in paroxitones

Syllablic structure in Caribbean Spanish allows very few consonants as codas: /s/, /n/, /r/, and /l/[3]. All are alveolars, and [+anterior, -dent, +coronal]. Some oxitonic commmands have these consonants as codas in their stressed syllable. Except for the second person singular pronoun, unstressed pronouns that "attach" to these commands have /n/, /m/, /l/, and /s/ as onset consonants, which all are [+anterior, -dent, -instantaneous] consonants. The following set of commands with stress in their last (or unique) syllable (oxitones) will be part of the discussion:

(8) a) second person singular cases:

hás	pón	vén	tén	sál
"do"	"put"	"come"	"have"	"get out"

b) monosyllabic second person plural:

dé-n
"give"

c) bisyllabic second person plural

esté-n
"be"

The command + the "enclitic", form a paroxitonic word. In "Standard" Spanish (SS), if an affix-pronoun attaches to a base ending in a stressed syllable with a coda [+anterior] nasal consonant, the pronoun that follows can have an onset [+anterior] nasal consonant. In Caribbean Spanish, such sequence of nasals after a stressed vocoid is not allowed.

	Caribbean Sp.			"Standard" Sp.	
(9)	póN+	e	+**Me**	póN	+**Me**
	V-comm		encl	V-comm	encl
	"Put X for me"				
(10)	dé+	**Me**	+N	dé	+N +**Me**
	V-comm	encl-	pl2nd	V -commpl	-pl2nd -encl
	"Give-me (pl)."				

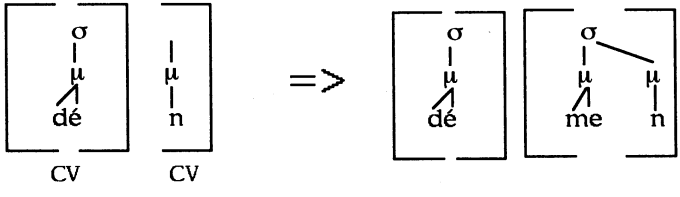
Except for commands+enclitics, contiguous nasal sequences cannot be found in Standard Spanish after a stressed vocoid. In fact, all SS cases in which this sequence appears (after an unstressed vocoid), are "created" by affixation; no roots have such sequence[4]. In CS, syllabification rules that produce examples like (9) and (10) indicate that clitics after a stressed syllable (primary stress) count as another syllable in the prosodic structure of the word. The word-internal rule that seems to be operating is: no nasal sequences after a stressed vocoid.

Also, the phenomenon in (9) above occurs with other cases of [+anterior, -dental] coda consonants followed by an [+anterior, -dental] onset of the suffix pronoun (given that they don't have identical melodic specification, and that no problems with harmonic vowels arise). The rule will extend to cases in which the affix pronoun begins with /t/ (second person singular cases).

In (9) and (10), morphological rules operate, and new sequences of phonemes result from new morpheme boundaries. Word-internal configuration must follow certain rules (which are phonological as well as syllabification rules); rules that are sensitive to the morphological structure of the word. Caribbean Spanish rules on affixation of pronominal suffixes to commands respect more general rules on word-internal phonemic sequences. Compared to SS, CS has:

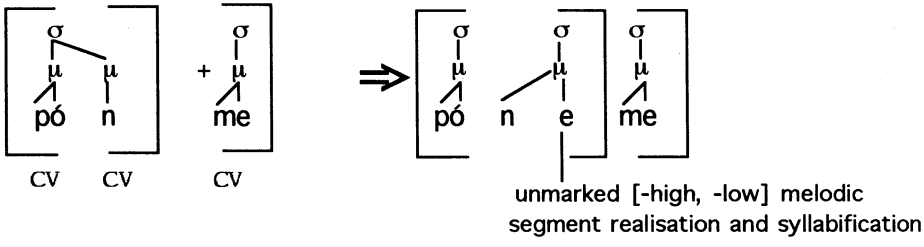
I. Order of morphemes: Different order of morpheme sequences with respect to SS to accomodate to rules on adjacency of slots associated to [-syllabic] melodic segments with identical [+nasal, +anterior] or [+anterior, -dental] specification after a stressed vocoid. A similar generalization has been proposed for identical morpheme-internal adjacent elements (Obligatory Countour Principle): at the melodic level, adjacent identical elements are prohibited (Goldsmith 1990: 313-315) -tier conflation (**Figure 3**):

FIGURE 3



II. Arrangements in the phonological shape of syllables: Rules of phonological realisation of a [-high, -low] unmarked vocoid to fullfil syllable structure requirements, to associate a skeletal unattached V slot (insertion or epenthesis is the traditional name) (see **Figure 4**):

FIGURE 4



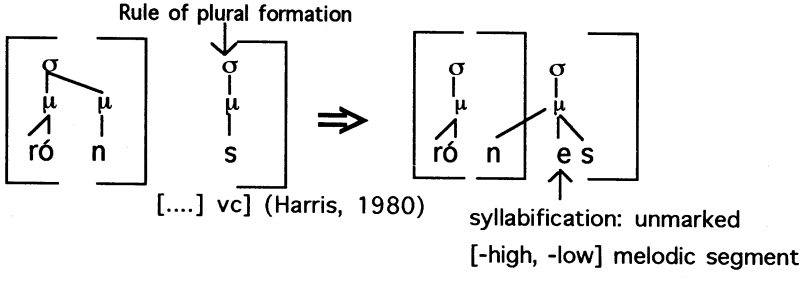
These rules are sensitive to the morphological structure of the word; since they cannot be applied arbitrarily:

(11) *déneme
(12) *pómen

The differences between these cases result from the fact that **-n** is a plural morpheme in den and simply a coda consonant in pon. It is also true that the minimal word, the base to which the pronominal morpheme attaches, is different in each case; so different rules apply. Syllabification by realisation of an /e/ (epenthesis) in (11) would make the inflectional affix impossible to recognize as a verbal ending.

Word-internal behavior similar to example (*supra,* 9), can be found in Spanish plural formation: "epenthesis" of /e/ is necessary when the stem/root last syllable has an onset consonant (it is heavy) (**Figure 5**).

FIGURE 5



It also occurs in French: faqueteur vs. facteur ,"mailman" (Vendryes 1951: 59), with the "insertion" of a mute /e/. The explanation follows from the presence of a [+syllabic] slot in the tier that lacks melodic specification associated to it. Harris (1980) suggests that all plural adjectives and nouns fullfil the requirements of a constraint on their prosodic template:

Spanish Plural Formation Constraint: $[[.....]\ VC]_a$ where a = noun or adjective.

Syllabic rearrangements of this sort cannot occur when there is a word boundary, when resyllabification occurs.

Other cases of phenomena similar to that of (10) in Caribbean Spanish, occur inside words (with a prefix) with historical metathesis or conflation: conmesal > comensal, "table companion"; conmesalía > conmensalía, "fellowship of house and table"; conmilitón > comilitón, "great eater". Though these are not sequences after stressed syllables, the syllables are heavy and [-syllabic] melodic segments with almost identical melodic specification are adjacent.

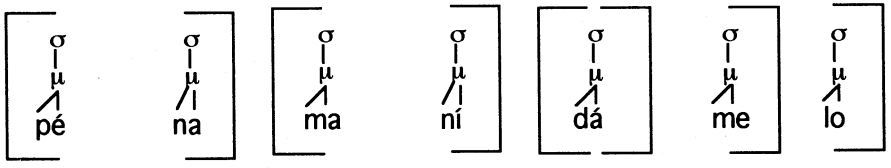
Historical evidence suggests that a more general principle is operating regarding the basic syllabic structure of Spanish. The coda consonant of a monosyllabic command (stressed syllable) with a [+instantaneous] feature and the onset consonant of the next syllable historically reordered (metathetical) in Old Spanish (like buscá**lde**,"find him"):

(13) dá +**d** +le > dá**l**de
Give-comm. 2nd-pl him-dat-pro
"Give (you-plur) X to him/her."

This phenomena occurred word-internally in the evolution from Latin words into Spanish: SPATULA > spa**d la** > espá**l**da, "back". It was probably because Spanish through its history generally allows only codas that are sonorants and/or [-instantaneous] consonants (CVV or CVC_S). This can be linked to other facts, like the dominance of light syllables (CV sequences); the unmarkedness in Spanish of open syllables.

3.2. Evidence from syllabification (phonology) in proparoxitones:
Primary stress in Spanish has been traditionally thought as having been assigned by counting syllables from right to left such that most words have primary stress in the second syllable (**Figure 6**). But many exceptions to this rule show that another way of assigning stress is operating in the language. Two sets of exceptions occur: a) those stressed in the first syllable (from right to left) (**Figure 7**); b) and those stressed in the third (**Figure 8**).

FIGURE 6 **FIGURE 7** **FIGURE 8**



Most words in this last and smaller group are Command+pron suffixes phonological words, with a single primary stress assigned. But non-inflected items in the latter group (proparoxitones-most of which are learned words or derived forms) share one characteristic (Harris 1983: 88): they never have a second heavy syllable (counting from the end). That is, words as the following do not exist in Spanish: *tá **car** do. Harris (1983: 88) gives the example of: *atá**pam**ba. Apparently, stress placement is sensitive to weight in the penultimate syllable. But

this generalization seems to have exceptions among inflected forms of Commands+pron suffixes in "Standard" Spanish: <u>bús **quen** lo</u>, "find him."

Standard Spanish Commands+Clitic "words" do not share this important characteristic with proparoxitones. When pronominal clitics attach to a paroxitonic command, it becomes trisyllabic and proparoxitonic. Caribbean Spanish has a different configuration for these forms (14); and it is stress placement, not the number of syllables, that conditions it (15):

(14) a) <u>tráiga +**me** +N</u> --> <u>tráiga**me**N</u>
bring- me- 2nd pl
"Bring X to me"

b) <u>búsque+**lo** +N</u>
find- it-acc- 2nd pl

c) <u>dé +**me** +**lo** +N</u> (vs. déNmelo & démeNlo)
give- me-dat it-acc 2ndpl
"Give it/him to me."

(15) <u>estéN +**se**</u> (Standard Spanish) <--> <u>estéseN</u> (Caribbean Spanish)
stay-you you-reflex
"Stay!"

Dialectal variation in these cases probably responds to differences in the domain of application of the rule: verbal vs. nominal forms (which in SS apply to words like <u>público</u>, "public"; but not to cases like <u>bús **quen** lo</u>).

Cases in which the coda consonant of the penultimate syllable is <u>not</u> a morpheme, undergo a different solution to fit the syllabic structure requirements on proparoxitones. Commands with primary stress in penultimate position fail to phonologically generate their extrametrical consonant under clitic attachment, even in Standard Spanish.

(16) <u>vámoS</u> <--> <u>**nos**</u> <u>vámoS</u> (proc) <--><u>vámo**nos**</u> ("enclitic")
go-comm-1rstpl 1rstpl-us go go-comm-1rstpl-us-reflex
"Let's go!"

(17) <u>sentémo**nos**</u>
sit-comm-1rstpl-us-refl
"Let's sit down."

In both cases, the key element is stress placement in the word.

These commands, even when they are not stressed in their last syllable, show parallel behavior to those analyzed in section 3.1 (oxitones):

I. <u>Order of morphemes</u>: Different order of morpheme/phoneme sequences with respect to "Standard Spanish" to accomodate to requirements on syllable structure of proparoxitones (template requirements):

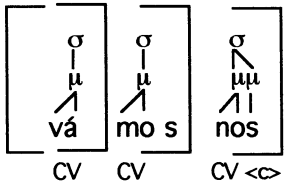
Rule of proparoxitones: W ---> $\sigma'_x \ \sigma_\mu \ \sigma_y$; x , y ---> μ or $\mu\mu$

An ungrammatical sequence would be: *$[\sigma'_\mu \sigma_{\mu\mu} \sigma_\mu]$

II. <u>Arrangements in the phonological shape of syllables</u>: Null realisation of a coda segment (a consonant) that cannot be associated

to any position in the syllablic structure (though the phoneme is part of the melodic tier of the personal ending morpheme for the first person plural) (Linkage Condition) (**Figure 9**).

FIGURE 9



Finally, there is a clear analogy between the case of póneme and vámonos: the solutions respond to the fact that the problematic coda consonants are parts of a morpheme, not morphemes by themselves. The difference between the cases of póneme and vámonos is that the "insertion" occurs after a stressed syllable; but the null realisation of /s/occurs a syllable to the right of the stressed syllable (both related to stress position). In both cases, a basic CV syllabic structure is the result (if assumed that word final consonants are extrametrical). In the cases of démen and dálde and tráigamen, the dialectally reordered elements are inflectional morphemes.[5] In these, the same CV basic syllabic structure is obtained or a CVC_S results in case that other solutions would keep a [+instantaneous] consonant in coda position (dadle --> *daled)

4.2. New Mexican Spanish:
Evidence of "alternations" between verbal personal inflection and "enclitics" when a proparoxitonic word results from inflection, are available from New Mexican Spanish. The first person plural verbal ending in General Spanish is **-mos**; and the unstressed pronominal form is **-nos**. New Mexican Spanish (NM) cases suggest that stress rules are sensitive to the presence of any first person plural morpheme independently of its agreement status. It is possible to say that in NM only alveolar nasals are realised in a first person plural morpheme that attaches to a paroxitonic base. It must be pressuposed that the nasal specification in the melodic tier (Morpheme Tier Hypothesis) of each morpheme (the personal ending (18 b) and the case ending (18 a)) is underspecified[6] for "point of articulation."

(18) a) trabajábanos (New Mexican Spanish[7])
b) trabajábamos (General Spanish)
(19) a) íbanos
b) estábanos
(20) *esténos (estemos)
(21) pásenos (<pasémos)

This explanation for NM cases could only work on the presumption that "enclitics" are actually suffixes. In fact, this stress related conditions on the phonological make-up of morphemes should not operate across word boundaries (unless a very weak position is assumed on modularity). Example (21) is particularly significant since, to fit the word-internal prosodic structure to the requirements for the attachment of the clitic, there is a difference in stress position

compared to all other dialects of Spanish. On the other hand, it is meaningful that through its history Spanish has shown other cases of this alternation: Unstressed proclitic pronoun--> NOS / MOS (10th and 11th century Castillian)

6. Conclusions:

One consequence of this analysis is that it simplifies the explanation of cases like *démen* (*supra,* 1); because, if pronominal enclitics are neither words nor clitics, no conflicts arise to explain why they switch positions with verbal inflection in different dialects. The analysis also simplifies the representation of command+clitic sequences at a morphological level. Furthermore, we can explain dialectal data from Argentinian and Peninsular Spanish command+ clitic words stressed in the "clitic" (dimeló, buscaló,...), by saying that stress is assigned at a word level.

It can be concluded that two sets of oblique pronouns coexist in Spanish: clitics (proclitics) and suffixes ("enclitics"). A particular phenomenon (a sequence of two nasals cannot follow a stressed syllable in Spanish) has created dialectal differences that support this claim. Both syllabification by generation of /e/ or displacement of a coda consonant after a stressed syllable are conditioned by the fact that the consonant constitutes or not a morpheme by itself (e.g., dádle, démen).

Finally, the reason why oblique pronouns have evolved as affixes, particularly in sequences with commands, can be traced to the possibility that in early Romance they were only "Wakernagel clitics" that followed the first stressed word. Since commands did not generally allow a subject, the command was always the first word in the VP.

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[1]Anderson (1984) indicates that marking differences in the phonological behavior of enclitics and proclitics is possible in other languages, such as Buryat and Middle English (with evolution of proclitic ne-): nolde > didn't want to, nat > didn't know, nis > isn't

[2]Zwicky describes some common types for clitics on the assumption that clitic's properties are a combination of properties of words and properties of affixes. Nevertheless, some have recognized that clitics themselves have properties different from any property of either affixes or words; as in Spanish: ungrammatical phonological sequences for clitics, not words (*lelo (selo) vs. paralelo); and the ability of Pron clitics to cluster (CS: nolas vs. SS: nosla)).

[3]/l/ and /r/ are [l] in that position, /n/ becomes a velar , and /s/ becomes an aspirated /h/.

[4]Apparent exceptions to the **nm** and **nl** sequence are those words with the prefixes **con-, en-,** or **in-**: enmendár, enlodár, inmúndo, enloquecér, ect. These are only apparent because the syllable is unstressed.

[5]In another Caribbean Spanish dialect- Papiamento-, there is a reassignment of stress when an unstressed pronoun is enclitic to a verb: [dún`a] + [mi] = [dun`ámi]; dun`am`i `un b`uki = ('give me a book).

[6]Nasals in coda position, when there is no adjacent melodic segment to whose point of articulation they can associate (becoming homorganic), are generated as alveolars or velars (according to dialect); but they don't have any distinctive value. It is more difficult to state such possibility with nasals in an onset position, since this feature is distinctive in this case. Nevertheless, cases from Caribbean Spanish phonological "reductions" of words indicate that the following vowel (in this case

[+high]) can affect the nasal "point of articulation": nudo -> ñu; Eugenio -> Geño. Also, variation occurs with derivation: año vs. anual.

[7]Similar cases have been attested for Caribbean Spanish.

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DERIVATIONAL RULES IN APHASIA

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In this paper we present evidence from aphasic speech that people possess both knowledge of derivationally complex words and knowledge of the rules for constructing such words. This may not be surprising, but it has proved remarkably difficult to demonstrate this separation by the methods of linguistic analysis or by the methods of normal psycholinguistics.(See Butterworth, 1983, for a review of this issue). For the psycholinguist, when a word is produced as part of normal discourse, or, indeed, in response to some experimental manipulation, it is unclear how one can tell whether it was retrieved as a whole from a mental lexicon or constructed on-line according to rules. The mere fact of rule-like regularities in the lexicon does not of itself distinguish between the separate status of the rules from rules as emergent properties (as connectionists have suggested). Experiments on normals designed to elicit rule-governed nonce-formations can at best show that some (productive) patterns can be exploited in special cases.

Neuropsychological methods, on the other hand, may allow us to slash through this gordian knot with the sword of selective impairments. If it can be shown that brain-damage may selectively impair knowledge of words, for example, while leaving knowledge of rules intact, then this would be the first half of a strong case for the separate representation in the brain of the two kinds of representation. The second half is to find patients with spared vocabulary but impaired knowledge of rules. Neuropsychological phenomena enjoy a particular epistemological status because they are neutral with respect to the expectations of the observer and indeed sometimes counterintuitive. It has been shown for example, that the production of different categories of nouns can be selectively affected in a way that leaves only one category intact; the same category selectively impaired in one patient may be selectively spared in another.

The clearest and cleanest instance is that of proper names: Patients have been described with extremely severe proper name anomia while the use of common nouns has been spared (Semenza and Zettin, 1988; 1989); at the same time, other patients have demonstrated the sparing of proper names in various naming conditions and in otherwise entirely meaningless spontaneous speech (Semenza and Sgaramella, 1991). This sort of phenomenon forces us to seek explanations in independent processes for different categories of words. More relevant to the present issue is the support for the independence of stems and inflections shown by patients correctly inflecting nonce-forms according to the grammatical context (e.g. Caplan, Kellar and Locke, 1972); and, as is well known, some, so-called "agrammatic", patients show the opposite pattern

where the deficit afflicted inflections but not stems (e.g. Goodglass, Gleason, Ackerman-Bernholtz and Hide, 1972).

We present here some evidence for the sparing of two types of derivational process in patients where wordfinding is severely impaired. The first type is the spared use of derivational affixation in nonce-formation in the spontaneous speech of Italian jargonaphasics. The second type is the experimental elicitation of compounds in German patients, also with severe word-finding problems.

Derivational affixation in nonce-formation in spontaneous speech

In the first systematic analysis of derivational morphology in aphasic speech, we showed that three patients were able to construct nonce-forms using a wide variety of derivational rules. (Previous works provided some support for the separability of derivational and inflectional morphology in comprehension, e.g. Tyler and Cobb, 1987). After suffering an injury to the posterior portions of their left hemisphere they had fluent, well articulated but unintelligible speech, containing semantic errors and neologisms. Neologisms were constructed in three distinct ways:

First, like other aphasics, they used legal concatenations of phonemes to form neologistic stems, which were then inflected according to the context.

(1) *misecca* italiana (Italian, f.s. adjective)

a in *misecca* is the ending marking an f.s. noun. (We collected overall 152 items of this kind.)

Second, they used real roots in combination with real derivational suffixes and/or prefixes, as well as inflections that were typically appropriate (63 items).

(2) *fratellismo*
a compound of the real stem *fratell(o)* [brother] and the real suffix *-ismo*. There exists the real word *fratellanza* [brotherhood].

(3) *migliarie*
a compound of the real stem *migli(a)* [miles] and the real suffix *arie*.

(4) *affuocato*
a real root, *fuoc(o)* [fire], with a real prefix, *a-*, and a real suffix, *-ato*. The doubling of *f* is rule-governed and hearable by Italian subjects.

In the third, they used a neologistic root in combination with a real derivational affix (83 items).

(5) tutto il [all the] *ternessico* che mi aspetta [that waits for me]
terness(o) is a neologistic root which, coupled with the real suffix *-ico* fits the grammatical structure of the sentence.

In these patients, sensitivity to the grammatical category was largely spared: of the derivational neologisms whose intended category was uniquely determinable from the context, 91% were appropriate: so a verb would be constructed where a verb was needed in the current sentence context, a noun when a noun was needed, and so on.

Productivity

We analysed the range and type of morphological affixes. Affixation types in the real words used by the patients was compared with the affixation types used to form neologisms: similar ranges were found in the two cases:

Suffixation:

(6) *assaggiamento* noun forming
assaggi(are) [to taste] + *mento* [+ment]

(7) *sogillare* verb forming
[neologistic root] + *are* [infinitive]

(8) *macchinarico* adjective forming
macchinari(o) [machinery] + *ico*

(9) *atamente* adverb forming
[neologistic root] + *mente* [+ly]

Prefixation:

(10) *bilungo*
bi [bi] + *lungo* [long]

We also compared the use of affixes traditionally classified as more productive with those classified as less productive in Italian. If the patients had retained control only of rules for forming new words, then a great preponderance of affixation types in neologisms should be productive; on the other hand , if they retained control of rules for analyzing the whole of the language vocabulary, then there should be no such preponderance.

The incidence of a group of affixes considered as the most productive in Italian (see Dardano, 1978) over all affixes used by each patient in the production of both neologisms and real words was therefore calculated. In all patients the majority of affixations were classified as *non-productive* and, in two out of three, the proportion of productive types in neologisms was statistically indistinguishable from the proportion used in real words (for further information see Semenza, Butterworth, Panzeri and Ferreri, 1990: Panzeri, Semenza, Ferreri and Butterworth, 1990).

Compounding

We present here some preliminary evidence that German speaking aphasics can use compounding rules to produce nonce-forms when they are unable to find the target words. Compound words are much more frequent in German than in English or Italian. Therefore we sought evidence for compounding rules from German speaking aphasics. Rather than use spontaneous speech, an experimental task was administered to elicit compounds. A picture naming task was given to fifteen German speaking aphasics. The test included items whose name was either a compound or a monomorphemic word. (Further information is available in Hittmair-Delazer, Andree, Semenza, De Bleser and Benke, in preparation).

The analysis of the different error types indicates that the patients often retain control of morphological knowledge despite disrupted lexical abilities. An interesting finding was that pictures whose normal name was a compound tended to elicit compound neologisms. There was no apparent reason in the pictures themselves, since these pictures may well have monomorphemic names in other languages. It seemed that, paradoxically, the patients could often retrieve information that the target was a compound, though the word itself was inaccessible. These compounds came in four main varieties :

Neologistic noun-noun compounds

	Target	Response
(11)	*Taschenlampe* pocket light [torch]	*Lichtflamme* light flame
(12)	*Rosenkranz* roses crown [rosary]	*Herzkreuz* heart cross

Neologistic compounds with one part of the target

Here one component of the target is substituted, the other named correctly. First and second part of the compound are equally often substituted. The correct part keeps its position in the paraphasia.

(13)	*Schneemann* snowman	*Schneefrau* snow woman
(14)	*Windmühle* windmill	*Schneemühle* snow mill

Verb-noun compounds
Patients seem to construct or choose their compounds so as to respect the grammatical and morphological character of the components in the target word.

(15)	*Rollschuh*	*Tretkarren*
	roll [V] shoe[N]	tread[V] carriage[N]
	[a roller skate]	[neologism]
(16)	*Dosenöffner*	*Schraubenzieher*
	cans[Npl] open[V+er]	screws[Npl]pull[V+er]
		[screwdriver]

Semantic paraphasias
These are real words that respect the compound nature of the target.

(17)	*Eichkatzl*	*Haselnuss*
	oak kitten	hazel nut
	[squirrel]	
(18)	*Salzstreuer*	*Zuckerdose*
	salt spreader	sugar jar
	[salt cellar]	
(19)	*Aschenbecher*	*Feuerzeug*
	ash bowl [ashtray]	fire stuff [lighter]

Conclusion:

These data suggest that brain damage can selectively impair word-finding such that patients will resort to derivational rules to construct a substitute for the intended word. This, of course, is possible for the speakers only if the rules have a neural implementation that is separable from the implementation of words. Of course the data presented here is at best fragmentary but it does illustrate the way in which neuropsychological methods can be focussed on issues of concern to linguists interested in morphology.

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The Adjacency Condition and the Formation of Diminutives in Mwera and Kikuyu*

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Among the principles that may determine the distribution of an affix are restrictions on the phonological properties of the base to which the affix attaches. There is abundant evidence that restrictions of this sort are subject to the Adjacency Condition (Allen 1978:49; cf. Siegel 1978):

(1) THE ADJACENCY CONDITION: No WFR can involve X and Y, unless Y is uniquely contained in the cycle adjacent to X.

Thus, suppose that prefix_b is to be attached to an expression X of the form $[_X\ \text{prefix}_a\ [\ \text{root}\ ]]$. According to the Adjacency Condition, the rule which attaches prefix_b to X should not be sensitive to phonological properties of the root independently of those of X as a whole; one would, for example, be surprised to find that the applicability of this rule to X depended strictly on whether the root began with a vowel, regardless of whether X itself did. Surprisingly, though, an apparent example of exactly this sort can be found in the Mwera language of Tanzania.

In Mwera, as in Bantu generally, nouns fall into a number of different genders, each distinguished by a characteristic pair of singular and plural noun class prefixes; for instance, members of gender I take the prefixes *m-* and *ŵa-* (e.g. *m-jeni* 'stranger', plural *ŵa-jeni*). Diminutive nouns belong to gender VII and therefore take the prefixes *ka-* and *tu-*. When a noun belonging to some other gender is diminutivized, it may either take the gender VII prefixes in place of its original gender prefixes (as in the examples in (2a)), or it may take the gender VII prefixes in addition to its original gender prefixes (as in the examples in (2b)). Whether a noun participates in pattern (2a) or pattern (2b) depends on whether the nominal root has an initial consonant or an initial vowel, respectively (Harries 1950:33); that is, whether or not a gender VII prefix can join with a noun of the form $[\ \text{prefix}_{\text{gender } n}\ [\ \text{root}\ ]]$ depends entirely on the phonological properties of the root, in apparent conflict with the predictions of the Adjacency Condition. Thus, the formation of Mwera diminutives raises three important questions: **(A)** What prevents *ka-* and *tu-* from attaching directly to nominal roots beginning with vowels? **(B)** What prevents *ka-* and *tu-* from attaching to nouns of the form $[\ \text{prefix}_{\text{gender } n}\ [\ \text{root}\ ]]$ when the root begins with a consonant? **(C)** Are the rules of *ka-* and *tu-* prefixation genuine counterexamples to the Adjacency Condition?

(2) Some Mwera nouns and their diminutives:

	GENDER	SG.	PL.	DIMINUTIVES (GENDER VII): SG.	PL.
a.					
-jeni 'stranger'	I	mjeni	ŵajeni	kajeni	tujeni
-kono 'hand'	II	mkono	mikono	kakono	tukono
-kuti 'ear'	III	likuti	makuti	kakuti	tukuti
-ndu 'thing'	IV	cindu	indu	kandu	tundu
-jumba 'house'	V	nyumba	nyumba	kajumba	tujumba
-ŵeju 'seed'	VI	luŵeju	mbeju, mmeju	kaŵeju	tuŵeju
b.					
-oto 'fire'	II	mōto	myoto	kamōto	tumyoto
-anja 'journey'	II	mwānja	myanja	kamwānja	tumyanja
-ino 'tooth'	III	līno	mēno	kalīno	tumēno
-ūci 'river'	VI	lūci	nūci	kalūci	tunūci
-ūŋgwe 'string of bow'	VI	lūŋgwe	nūŋgwe	kalūŋgwe	tunūŋgwe

These problems are not unique to Mwera but arise elsewhere in Bantu as well. In Kikuyu, as in Mwera, diminutives constitute a separate gender (gender 13/12, in the traditional numeration) into which nominal roots from other genders may be shifted, and as the examples in (3a,b) show, roots with class 9 singulars and identical class 10 plurals retain the gender 9/10 prefix *n-* under diminutivization just in case they begin with a vowel. Thus, diminutives of gender 9/10 nouns in Kikuyu present a set of problems closely analogous to **(A)**-**(C)**.

(3) Some Kikuyu nouns and their diminutives:

		GENDER	SG.	PL.	DIMINUTIVES (GENDER 13/12): SG.	PL.
a.	-bũri 'goat'	9/10	mbũri	mbũri	kabũri	tũbũri
	-gombe 'cow'	9/10	ng'ombe	ng'ombe	kagombe	tũgombe
b.	-ũmba 'house'	9/10	nyũmba	nyũmba	kanyũmba	tũnyũmba
	-ũngũ 'pot'	9/10	nyũngũ	nyũngũ	kanyũngũ	tũnyũngũ
c.	-ara 'finger'	7/10	kĩara	ciara	kaara	tũara
	-ng'ang'i 'crocodile'	7/10	kĩng'ang'i	ing'ang'i	kang'ang'i	tũng'ang'i
	-nya 'calabash'	7/10	kĩnya	inya	kanya	tũnya
	-ũra 'frog'	7/10	kĩũra	ciũra	koora (ka-ũra)	tũũra
d.	-aki 'fire'	3/4	mũaki	mĩaki	kamũaki	tũmĩaki
	-ĩrĩ 'body'	3/4	mũĩrĩ	mĩĩrĩ	kamũĩrĩ	tũmĩĩrĩ
	-rũũthi 'lion'	3/4	mũrũũthi	mĩrũũthi	kamũrũũthi	tũmĩrũũthi
	-tĩ 'tree'	3/4	mũtĩ	mĩtĩ	kamũtĩ	tũmĩtĩ

Note that problems (**A**)-(**C**) can't be explained away simply by assuming that the rules which attach the diminutive gender prefixes are restricted so as never to apply to forms which begin with vowels. Even if it were true, this assumption wouldn't solve problem (**B**), nor (therefore) problem (**C**); and this assumption is observationally inaccurate in any event. When the Mwera gender VII prefixes *ka-* and *tu-* serve as pronominal concords, they join freely with pronominal roots beginning with vowels: the first demonstrative pronoun *-ene* 'this/these' has the gender VII forms *kene*, *twene* (← *ka-ene*, *tu-ene*); the quantitative pronoun *-ōwe* 'whole, all' has the gender VII forms *kōwe*, *tōwe* (← *ka-ōwe*, *tu-ōwe*); the interrogative pronoun *-ayi* 'which' has the gender VII forms *kayi*, *twayi* (← *ka-ayi*, *tu-ayi*); and so on.[1]

How, then, are problems (**A**)-(**C**) to be resolved? In what follows, I shall demonstrate that all three problems are easily resolved within the paradigm function theory of morphology, a theory for which I have presented numerous independent arguments elsewhere (Stump 1990; 1991a-c; 1992; to appear a,b); in particular, I shall demonstrate that three fundamental assumptions underlying the paradigm function theory afford an account of Mwera diminutives that is in full conformity with the Adjacency Condition. Before examining the specifics of this account, it will be useful to consider these three assumptions in detail; for concreteness, I shall use some simple data from Breton to illustrate their effects.

First assumption: morphological rules are of two distinct sorts. MORPHOLEXICAL RULES specify the individual operations of inflection, derivation, or compounding by which a complex morphological expression is built up from its parts; examples are the four rules in (4), which generate regular inflected plurals, derived diminutives, denominal privative adjectives, and loose compounds in Breton. PARADIGM FUNCTIONS, by contrast, are functions from the root of a paradigm to the various words constituting that paradigm; for instance, Breton morphology is assumed to include the paradigm function $PF_{[NUM:pl]}$ exemplified in (5), which applies to any nominal root in the language to yield the plural member of its paradigm. Paradigm functions are defined in terms of morpholexical rules. For instance, the plural paradigm function exemplified in (5) has, as part of its definition, the default clause in (6), according to which its default value for some argument is simply the result of applying the plural morpholexical rule in (4a); it is this clause which determines the value of the plural paradigm function for the argument *bag* 'boat' in (5a). For certain arguments, however, this default clause is overridden; for instance, when the plural paradigm function applies to a nominal root associated with a suppletive paradigm, the resulting value is simply lexically listed, as in the case of the noun *bioc'h* 'cow' in (5b).

(4) Four Breton morpholexical rules:

a. Inflectional: $MLR_{[NUM:pl]}([_N\ x\ ]) =_{def} [_N[_N\ x\ ]$ -où]
(e.g. *bag-où* 'boats', *tok-où* 'hats')

b. Derivational: $MLR_{diminutive}([_X\ x\ ]) =_{def} [_X[_X\ x\ ]$ -ig]
(e.g. *bag-ig* 'little boat')

c. Derivational: $MLR_{privative}([_N\ x\ ]) =_{def} [_A$ di- $[_N\ x\ ]]$
(e.g. *di-gomz* 'without a word')

d. Compounding: $MLR_{compound}([_X\ x\ ],[_Y\ y\ ]) =_{def} [_X[_X\ x\ ][_Y\ y\ ]]$
(e.g. *tok-kolo* 'straw hat')

(5)	ROOT OF PARADIGM	PLURAL MEMBER OF PARADIGM
a.	$[_N$ bag] 'boat'	$PF_{[NUM:pl]}([_N$ bag $]) = [_N$ bagoù]
b.	$[_N$ bioc'h] 'cow'	$PF_{[NUM:pl]}([_N$ bioc'h $]) = [_N$ saout]
c.	$[_N$ tok-kolo] 'straw hat'	$PF_{[NUM:pl]}([_N$ tok-kolo $]) = [_N$ tokoù-kolo]
d.	$[_N$ bagig] 'little boat'	$PF_{[NUM:pl]}([_N$ bagig $]) = [_N$ bagoùigoù]

(6) Default clause in the definition of $PF_{[NUM:pl]}([_N\ x\ ])$ [= 'the plural form of $[_N\ x\ ]$']:

$$PF_{[NUM:pl]}([_N\ x\ ]) =_{def} MLR_{[NUM:pl]}([_N\ x\ ])$$

In other work, I have argued that a systematic distinction between morpholexical rules and paradigm functions is motivated by two independent considerations. On the one hand, I have shown that this distinction affords a better account of position class morphology than is furnished by theories incorporating no such distinction (Stump 1991b; 1992); on the other hand, I have shown that this distinction affords a better account of the mismatches between a word's morphological structure and its logical representation than do theories in which no such distinction is drawn (Stump 1991a,c).

Second assumption: morpholexical rules of derivation/compounding are of two types. CATEGORY-CHANGING rules impose fresh specifications for categorial, morphosyntactic, and purely morphological features on their output; an example is the morpholexical rule in (4c), which produces privative adjectives none of whose feature specifications is inherited from the nominal base. CATEGORY-PRESERVING rules, by contrast, produce structures whose feature specifications are at least partly inherited from the bases from which they arise; examples are the morpholexical rules (4b,d) for diminutives and loose compounds. The diminutive derivatives produced by (4b) inherit both their syntactic category and--in the case of nouns--their gender from their nominal base: *bihan* 'little' (adj.) → *bihanig* 'very little' (adj.), *potr* 'boy' (masc.) → *potrig* 'little boy' (masc.), *merc'h* 'girl' (fem.) → *merc'hig* 'little girl' (fem.). Similarly, the loose compounds produced

by rule (4d) inherit all of their feature specifications from their left-hand member: *yac'h* 'healthy' (adj.) + *pesk* 'fish' (masc.) → *yac'h-pesk* 'in fine health' (adj.), *tok* 'hat' (masc.) + *kolo* 'straw' (coll.) → *tok-kolo* 'straw hat' (masc.), *mamm* 'mother' (fem.) + *kozh* 'old' (adj.) → *mamm-gozh* 'grandmother' (fem.). I assume that the only headed structures in morphology are those arising as the output of a category-preserving rule.

Third assumption: In the inflection of a root with an outermost layer of category-preserving derivation/compounding, the inflection tends to be morphologically realized 'inside of' this layer, on the root's head. Among the many examples that might be cited of this tendency is the pluralization of loose compounds in Breton; thus, because the loose compound *tok-kolo* 'straw hat' in (5c) arises as the output of the category-preserving compounding rule in (4d), its plural form *tokoù-kolo* is inflected on its head rather than at its periphery. In the paradigm function theory, this universal tendency is formulated as the H-APPLICATION DEFAULT, a default principle for the evaluation of paradigm functions whose definition (8) draws upon the relation of H-APPLICATION defined in (7).

(7) Definition of H-application:

If MLR is a morpholexical rule such that x = MLR(... z ...) and z is the head of x, then the H-APPLICATION OF $PF_{[\sigma]}$ TO x (abbreviated as '$H_{PF_{[\sigma]}}(x)$') is MLR(... $PF_{[\sigma]}(z)$ ...) if this is defined.

(8) The H-application Default (Stump 1991a):

Where $PF_{[\sigma]}$ is a paradigm function and x is a complex headed structure (i.e. is generated by a category-preserving rule), the default value of $PF_{[\sigma]}(x)$ is $H_{PF_{[\sigma]}}(x)$ if this is defined.

To see the effect of introducing the H-application Default, consider the pair of examples in (9). Because the noun *bag* 'boat' is unheaded, the default clause (6) in the definition of $PF_{[NUM:pl]}([_N\ x\ ])$ determines the plural form of *bag*, as in (9a). On the other hand, because the loose compound *tok-kolo* 'straw hat' is headed, the H-application Default overrides (6) in determining its plural form, as in (9b). This override needn't be stipulated but is guaranteed by the Elsewhere Condition, since the H-application of $PF_{[NUM:pl]}$ is defined for a narrower class of arguments than the default plural morpholexical rule in (4a).

(9)a. By (6), $PF_{[NUM:pl]}([_N$ bag $])$ = $MLR_{[NUM:pl]}([_N$ bag $])$
= $[_N\ [_N$ bag $]$ -où $]$, as in (5a)

(9)b. By (8), $PF_{[NUM:pl]}([_N\ [_N$ tok $][_N$ kolo $]])$

$= H_{PF_{[NUM:pl]}}([_N\ [_N$ tok $][_N$ kolo $]])$

$= MLR_{compound}(PF_{[NUM:pl]}([_N$ tok $]),[_N$ kolo $])$

$= MLR_{compound}(MLR_{[NUM:pl]}([_N$ tok $]),[_N$ kolo $])$

$= [_N\ [_N\ [_N$ tok $]$ -où $][_N$ kolo $]]$, as in (5c)

Although the H-application Default overrides clause (6) in determining the value of $PF_{[NUM:pl]}$ for headed arguments, it is a default which may itself be overridden. For instance, when $PF_{[NUM:pl]}$ has a diminutive noun as its argument, its value is determined by (10). Thus, even though *bagig* 'little boat' is headed, its plural form is not simply determined by the H-application Default; because it is a diminutive noun, its plural form is instead determined by the overriding clause (10) as in (11). Here again, the override relation needn't be stipulated, since it is predicted by the Elsewhere Condition.

(10) Overriding clause in the definition of $PF_{[NUM:pl]}([_N\ x\ ])$:

$$PF_{[NUM:pl]}([_N\ x\ ]) =_{def} MLR_{[NUM:pl]}(H_{PF_{[NUM:pl]}}([_N\ x\ ])) \quad \text{if } [_N\ x\ ] = MLR_{diminutive}([_N\ y\ ])$$

(11) By (10), $PF_{[NUM:pl]}([_N\ [_N$ bag $]$ -ig $])$

$= MLR_{[NUM:pl]}(H_{PF_{[NUM:pl]}}([_N\ [_N$ bag $]$ -ig $]))$

$= MLR_{[NUM:pl]}(MLR_{diminutive}(PF_{[NUM:pl]}([_N$ bag $])))$

$= MLR_{[NUM:pl]}(MLR_{diminutive}(MLR_{[NUM:pl]}([_N$ bag $])))$

$= [_N\ [_N\ [_N\ [_N$ bag $]$ -où $]$ -ig $]$ -où $]$, as in (5d)

These examples should suffice as an illustration of the three relevant assumptions underlying the paradigm function theory. Given these assumptions, the structure of Mwera diminutive nouns can be easily brought into conformity with the Adjacency Condition, as I now show.

I assume that the Mwera noun class prefixes are spelled out by means of the morpholexical rules in (12). (As they are stated, these rules are general enough to apply not only to nouns but also to verbs, adjectives, determiners, and so on, since some of the prefixes introduced by these rules serve not only as nominal prefixes but also as noun class concords on expressions in these other categories; the precise extent to which these rules apply in the inflection of such expressions ultimately depends on the statement of the paradigm functions defining their paradigms.) I further assume that diminutivization is effected by the pair of derivational rules in (13), which shift nouns into gender VII but don't add any affixes (so that the diminutive prefixes are purely inflectional in function); note that rule (13a) is category-changing and therefore produces unheaded diminutives from consonant-initial roots, while rule (13b) is category-preserving and therefore

produces headed diminutives from vowel-initial roots. Finally, I assume that a nominal root is linked to both the singular and the plural member of its paradigm by the paradigm function schema (14); as this schema is stated, the overriding clause (b) determines the singular and plural forms of headed roots, while those of headless roots are determined by the default clause (a). Note, in passing, how closely (14) parallels the paradigm function for Breton plurals defined earlier in (6) and (10).

(12) Some Mwera inflectional rules (partial):

a. $MLR_{[GEN:i,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ m- $[_X\ x\ ]]$
b. $MLR_{[GEN:i,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ ŵa- $[_X\ x\ ]]$
c. $MLR_{[GEN:ii,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ m- $[_X\ x\ ]]$
d. $MLR_{[GEN:ii,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ mi- $[_X\ x\ ]]$
e. $MLR_{[GEN:iii,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ li- $[_X\ x\ ]]$
f. $MLR_{[GEN:iii,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ ma- $[_X\ x\ ]]$
g. $MLR_{[GEN:iv,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ ci- $[_X\ x\ ]]$
h. $MLR_{[GEN:iv,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ i- $[_X\ x\ ]]$
i. $MLR_{[GEN:v,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ n- $[_X\ x\ ]]$
j. $MLR_{[GEN:v,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ n- $[_X\ x\ ]]$
k. $MLR_{[GEN:vi,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ lu- $[_X\ x\ ]]$
l. $MLR_{[GEN:vi,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ n- $[_X\ x\ ]]$
m. $MLR_{[GEN:vii,\ NUM:sg]}([_X\ x\ ]) =_{def} [_X$ ka- $[_X\ x\ ]]$
n. $MLR_{[GEN:vii,\ NUM:pl]}([_X\ x\ ]) =_{def} [_X$ tu- $[_X\ x\ ]]$

(13) Two Mwera derivational rules:

a. Category-changing: $MLR1_{diminutive}([_{N[GEN:\pi]}\ x\ ]) =_{def} [_{N[GEN:vii]}\ x\ ]$
Condition: $[_N\ x\ ]$ is a consonant-initial root.

b. Category-preserving: $MLR2_{diminutive}([_{N[GEN:\pi]}\ x\ ]) =_{def} [_{N[GEN:vii]}\ x\ ]$
Condition: $[_N\ x\ ]$ is vowel-initial if it is a root.

(14) Paradigm function schema for singular and plural nouns in Mwera:

Where $[_N\ x\ ] \in$ [GEN:β],

a. Default: $PF_{[NUM:\alpha]}([_N\ x\ ]) =_{def} MLR_{[GEN:\beta,\ NUM:\alpha]}([_N\ x\ ])$;

b. Override: $PF_{[NUM:\alpha]}([_N\ x\ ]) =_{def} MLR_{[GEN:\beta,\ NUM:\alpha]}(H_{PF_{[NUM:\alpha]}}([_N\ x\ ]))$ if this is defined.

To see how this analysis works, consider a pair of examples, beginning with the root *kono* 'hand' in (15a). Because *kono* is consonant-initial, its diminutive

derivative arises through the application of the category-changing rule (13a) (as in (15b)) and is therefore unheaded. Given this fact, the inflected singular and plural forms of this derivative must be determined by clause (a) of the paradigm function schema (14), as in (15c,d).

(15) a. 'hand': $[_N \text{ kono }]_{ii}$ ($\in$ [GEN:ii])

b. $MLR1_{diminutive}([_N \text{ kono }]_{ii}) = [_N \text{ kono }]_{vii}$ ($\in$ [GEN:vii])

c. $PF_{[NUM:sg]}([_N \text{ kono }]_{vii})$
$= MLR_{[GEN:vii, NUM:sg]}([_N \text{ kono }]_{vii})$
$= [_N \text{ ka- } [_N \text{ kono }]_{vii}]$

d. $PF_{[NUM:pl]}([_N \text{ kono }]_{vii})$
$= MLR_{[GEN:vii, NUM:pl]}([_N \text{ kono }]_{vii})$
$= [_N \text{ tu- } [_N \text{ kono }]_{vii}]$

Turn now to the contrasting case of a vowel-initial root such as *oto* 'fire' in (16a). Because *oto* is vowel-initial, its diminutive derivative arises through the application of the category-preserving rule (13b) (as in (16b)) and is therefore headed (by the root $[_N \text{ oto }]_{ii}$ itself). In view of this fact, the inflected singular and plural forms of this derivative are determined by clause (b) of the paradigm function schema (14), as in (16c,d).

(16) a. 'fire': $[_N \text{ oto }]_{ii}$ ($\in$ [GEN:ii])

b. $MLR2_{diminutive}([_N \text{ oto }]_{ii}) = [_N \text{ oto }]_{vii}$ ($\in$ [GEN:vii]) [Head: $[_N \text{ oto }]_{ii}$]

c. $PF_{[NUM:sg]}([_N \text{ oto }]_{vii})$
$= MLR_{[GEN:vii, NUM:sg]}(H_{PF_{[NUM:sg]}}([_N \text{ oto }]_{vii}))$
$= MLR_{[GEN:vii, NUM:sg]}(MLR2_{diminutive}(PF_{[NUM:sg]}([_N \text{ oto }]_{ii})))$
$= MLR_{[GEN:vii, NUM:sg]}(MLR2_{diminutive}(MLR_{[GEN:ii, NUM:sg]}([_N \text{ oto }]_{ii})))$
$= [_N \text{ ka- } [_N \text{ m- } [_N \text{ oto }]_{ii}]]$

d. $PF_{[NUM:pl]}([_N \text{ oto }]_{vii})$
$= MLR_{[GEN:vii, NUM:pl]}(H_{PF_{[NUM:pl]}}([_N \text{ oto }]_{vii}))$
$= MLR_{[GEN:vii, NUM:pl]}(MLR2_{diminutive}(PF_{[NUM:pl]}([_N \text{ oto }]_{ii})))$
$= MLR_{[GEN:vii, NUM:pl]}(MLR2_{diminutive}(MLR_{[GEN:ii, NUM:pl]}([_N \text{ oto }]_{ii})))$
$= [_N \text{ tu- } [_N \text{ mi- } [_N \text{ oto }]_{ii}]]$

In this analysis, the inner noun class prefix in a number-inflected diminutive of the form [$prefix_{gender\ VII}$ [$prefix_{gender\ n}$ [root]]] appears as an effect of H-application--that is, it appears whenever the root's diminutive derivative is headed and never otherwise. Thus, the question (A) raised earlier can now be straightforwardly answered as follows: *ka-* and *tu-* do not attach directly to diminutivized roots beginning with vowels because roots of this sort are headed and

therefore exhibit H-application when they inflect for number, in accordance with the overriding clause (b) of the paradigm function schema (14). Question (**B**) is similarly resolved: because diminutivized roots beginning with consonants are unheaded, their number-inflected forms never exhibit H-application; thus, in the singular and plural forms of such a root, *ka-* and *tu-* are not accompanied by an inner noun class prefix but simply attach to the root itself, in accordance with the default clause (a) of the paradigm function schema (14). Finally, this analysis makes it possible to answer question (**C**) in the negative: the Mwera facts do not counterexemplify the Adjacency Condition, since none of the morpholexical rules in (12) and (13) needs to peek at the root-initial segment when applying to an expression of the form [$\text{prefix}_{\text{gender } n}$ [root]]; on the contrary, the only time the initial segment of a root is even checked is when one of the diminutivization rules in (13) applies directly to that root.

One controversial aspect of this analysis is the postulation of a pair of diminutivization rules whose definitions are similar but which differ in that one is category-changing while the other is category-preserving. There is, however, clear independent evidence for comparable rule pairs in other languages. Consider again the formation of diminutives in Kikuyu, where--as in Mwera--diminutivization amounts to a simple shift in gender. As noted earlier, the diminutive derivatives of Kikuyu nouns belonging to gender 9/10 vary in their formation in a manner parallel to those of Mwera nouns. Interestingly, the diminutive derivatives of Kikuyu nouns belonging to genders other than 9/10 also vary in their formation, but in a somewhat different way: whether the diminutive derivatives of a nominal root *x* exhibit an inner noun class prefix depends not on whether *x* begins with a vowel or a consonant, but on the gender to which *x* belongs. Thus, diminutive nouns converted from gender 7/10 do not exhibit an inner prefix, while those converted from gender 3/4 do; the examples given earlier in (3c,d) illustrate.

The paradigm function framework makes it possible to account for these additional Kikuyu facts with a system of rules just like (12)-(14); in this system, the diminutives of roots in gender 7/10 (and several other genders) would arise by means of a category-changing rule, while the diminutives of roots in gender 3/4 would arise by means of a category-preserving rule. It is a virtue of the paradigm function approach that it allows both the Mwera facts and these Kikuyu facts to be regarded as instances of the same phenomenon.

English provides another apparent example of a pair of similar derivational rules one of whose members is category-changing and the other of which is category-preserving. When it attaches to an adjective or a noun, the derivational prefix *be-* is clearly category-changing (e.g. *becalm*, *befoul*, *belittle*; *befriend*, *bejewel*, *bewitch*). When it attaches to a verb, however, it is more plausibly regarded as category-preserving: on this view, the fact that the deverbal derivatives *befall*, *behold*, and *bespeak* have the irregular past tense forms *befell*, *beheld*, and *bespoke* follows automatically from the H-application Default, given

that *fall*, *hold*, and *speak* have the irregular past tense forms *fell*, *held*, and *spoke*.

One objection that might be raised to the analysis proposed here is that it doesn't explain why vowel-initial roots should be the ones which coincide with the appearance of the inner noun class prefix in Mwera diminutives of the form [$\text{prefix}_{\text{gender VII}}$ [$\text{prefix}_{\text{gender } n}$ [root]]]. The explanation is, of course, ultimately phonological in nature: the inclusion of $\text{prefix}_{\text{gender } n}$ makes it possible to avoid the vowel hiatus that might otherwise exist between $\text{prefix}_{\text{gender VII}}$ and a vowel-initial root, and thus to head off the application of rules of vowel elision and coalescence that might otherwise diminish the morphological transparency of the word as a whole. But even if such phonological considerations were responsible for the evolution of the pattern of diminutive morphology in Mwera, it does not follow that the processes by which number-inflected diminutive structures of the form [$\text{prefix}_{\text{gender VII}}$ [$\text{prefix}_{\text{gender } n}$ [root]]] are synchronically derived recapitulate the processes of their evolution; indeed, independent evidence suggests that synchronically, the appearance of the inner noun class prefix should simply be viewed as an effect of H-application. Note first that H-application is the only reasonable explanation for the appearance of the inner prefix in number-inflected diminutives of gender 3/4 nouns in Kikuyu, since there is no plausible phonological explanation for its appearance in this class of cases. For that matter, there is no plausible SYNCHRONIC phonological explanation for its appearance in the number-inflected diminutives of vowel-initial nominal roots of gender 9/10 in Kikuyu, since these roots appear in second-degree diminutive structures of the form [$\text{prefix}_{\text{gender VII}}$ [root]] as well as in first-degree diminutive structures of the form [$\text{prefix}_{\text{gender VII}}$ [$\text{prefix}_{\text{gender } n}$ [root]]]; for instance, *ny-ūmba* 'house' and *ny-ūngũ* 'pot' have *ka-ny-ūmba* 'small house' and *ka-ny-ūngũ* 'small pot' as their first-degree diminutives (cf. (3b)) but *komba* (← *ka-ūmba*) 'tiny house' and *kongũ* (← *ka-ūngũ*) 'tiny pot' as their second-degree diminutives (Barlow 1960:260).[2] Thus, assuming that the formal similarity between the number-inflected diminutive structures in (2b), (3b), and (3d) is not just coincidental but follows from a fundamental similarity in their synchronic derivation, an analysis which attributes the appearance of the inner noun class prefix in a number-inflected diminutive to the H-application of $\text{PF}_{[\text{NUM:}\alpha]}$ is superior to an analysis which treats it as a response to phonological exigencies.

In the context of the paradigm function theory, the Adjacency Condition is a prohibition on references to the proper subparts of an expression in the definition of a morpholexical rule applying to that expression. This prohibition rules out an analysis of Mwera diminutives in which the morpholexical rules of *ka-* and *tu-* prefixation check to see whether the noun to which they apply properly contains a vowel-initial root, as in (17).

(17) ILLICIT CONDITION ON RULES (12m,n): When $[_{\text{N}}\ x\ ] = [_{\text{N}}\ z\ [_{\text{N}}\ y\ ]]$, $\text{MLR}_{[\text{GEN:vii, NUM:}\alpha]}([_{\text{N}}\ x\ ])$ is defined only if $[_{\text{N}}\ y\ ]$ begins with a vowel.

I would like to suggest, however, that the definitions of morpholexical rules are subject to an even stronger constraint which prevents them from referring to the derivational history of the expressions to which they apply; this constraint might be stated as in (18).

(18) CONSTRAINT ON MORPHOLEXICAL RULES: Where M_1 and M_2 are morpholexical rules and x and y are expressions such that $x = M_2(y)$, the definition of $M_1(x)$ cannot make specific reference to M_2 or y.

Unlike the Adjacency Condition, (18) entails that the applicability of a morpholexical rule to an expression x cannot be sensitive to the identity of the morpholexical rule which generates x. This constraint rules out an analysis of Mwera diminutives in which the morpholexical rules of *ka-* and *tu-* prefixation check to see whether the noun to which they apply arises through the application of a rule of number inflection to a vowel-initial root, as in (19).

(19) ILLICIT CONDITION ON RULES (12m,n): When $[_N\ x\ ] = \text{MLR}_{[\text{GEN:}\beta,\ \text{NUM:}\alpha]}([_N\ y\ ])$, $\text{MLR}_{[\text{GEN:vii},\ \text{NUM:}\alpha]}([_N\ x\ ])$ is defined only if $[_N\ y\ ]$ begins with a vowel.

One might reasonably ask whether the constraint in (18) should be extended so as to restrict not only the definitions of morpholexical rules but those of paradigm functions as well. But given that paradigm functions are not "word formation rules" at all (cf. e.g. (5b)), there is no reason, a priori, why they should obey a constraint analogous to (18). And in fact, the value of a paradigm function for a given root x MUST in some cases be conditioned by the identity of the morpholexical rules generating x; this is most obviously necessary in those cases in which the value of the paradigm function is recursively defined in terms of its H-application to x (as e.g. in (10) and (14b)).[3] Nevertheless, I know of no cases where the definition of a paradigm function has to look more than one rule deep into the derivational history of its argument; I presume that this fact reflects a general restriction on paradigm functions which is at least akin to the constraint in (18).

Notes

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1. The Kikuyu gender 13/12 prefixes *ka-* and *tũ-* join freely with vowel-initial forms belonging to genders other than 9/10: the gender 1/2 noun *mũirĩĩtu/airĩĩtu* 'girl/s' has the diminutive forms *kairĩĩtu/mũirĩĩtu*; the gender 3/6 noun *ũthiũ/moothiũ* 'face/s' has the diminutive forms *goothiũ* (←

ka-ūthiū)/tūūthiū; and so on. Note also the formation of second-degree diminutives mentioned below.

2. In the paradigm function theory, all such second-degree diminutive derivatives would arise through the application of a category-changing diminutivization rule, accounting for the absence of H-application in forms such as *komba* and *kongū*.
3. Recursive paradigm functions are not the only ones that apparently need to look one rule deep into the derivational history of their arguments; see, for example, the nonrecursive Sanskrit paradigm function $f_{[VFORM:gerund]}$ proposed by Stump (1991a:704).

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Noun Incorporation from a Semantic Point of View *

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0 Introduction

The fact that indefinite NP's are discourse transparent, as shown in (1), was one of the reasons for many semanticists (Heim (1982), Kamp (1981)) to believe that indefinite NP's are referential rather than quantificational expressions, as shown in (1)'s Discourse Representation Structure (DRS) under (2).

(1) Frederik owns a horse$_i$. It$_i$ is a Hanoveraner.

(2) $\exists x\, \exists y$ [horse(x) & own(f, x) & y = x & Hanoveraner(y)] [1]

Postal (1969) observes that words that are embedded into more complex words are not discourse transparent and that therefore incorporated nouns (INs) are anaphoric islands.

(3) Emily had bought fresh dog food$_i$, but it$_?$ didn't eat it$_i$.

The question mark index on the definite pronoun *it* in (3) indicates that *it* cannot be coindexed with any NP in this piece of discourse. Although *dog* appears to be the most obvious antecedent candidate of *it*, it is incorporated in the compound *dog food* and therefore it does not have an independent referential meaning which can be used as a potential antecedent for anaphoric expressions. This is made explicit by the unsolved equation in DRS (4).

(4) $\exists x\, \exists u\, \exists y$[**dog**-food(x) & buy(e, x) & u = **?** & y = x & ¬[eat(u, y)]]

From Sadock (1980) we learn that in West Greenlandic Eskimo personal suffixes on verbal affixes play much the same role as definite pronouns in English. His example (Sadock (1980): 311):

(5) Suulut timmisartuliorpoq. Suluusaqar**poq** aquuteqarl**lu**ni**lu**
Søren(ABS) airplane-made-INDIC-3sg wing-have-INDIC-**3sg**
rudder-have-INF-**4sg**-and.
'Søren made an airplane. It has wings and a rudder'.

According to Sadock the incorporated object 'airplane' is to be understood as an indefinite NP. A semantic representation of (5) along the lines of Discourse Representation Theory (DRT) would yield (6).

(6) $\exists x\, \exists Y\, \exists y\, \exists u\, \exists z$ [airplane(x) & make(s, x) & wing*(Y) & have(y,Y)
& y = x & rudder(z) & have(u,z) & u = x]

This paper is an attempt to capture the anaphoric potential of INs in some polysynthetic languages in the formal semantic framework of Discourse Representation Theory (DRT).[2] In this perspective, there are two questions that need to be answered. First, if word internal elements are discourse transparent, *what* is their semantic contribution, what do they *denote*? My answer to this question is that INs with anaphoric potential are referential expressions. On top of that, one has to think about *how* incorporated referents can be made *accessible* in the process of semantic construction. To make this second question more concrete: how do I get the semantic representation (6) out of (5)'s surface syntactic representation in the same way as I get (2) out of (1)? The view advocated in this paper is that apart from surface syntactic phrasal structures also word-level configurations have to be considered as triggering information for DRS construction.

Before I get to answering these two questions, I point at yet another issue related to discourse transparency. Discourse transparency has often been regarded as a valid argument in favor of a syntactic approach to noun incorporation (NI) in

polysynthetic languages (Sadock (1980), Baker (1988)). However, Ward and Sproat (1987) show that in English compounds word internal elements are often discourse transparent. Given that English compounding is commonly taken to be a lexical phenomenon, I will conclude that discourse transparency in itself is too weak to be a convincing argument in favor of a syntactic analysis of NI.

1 INs and Discourse Transparency: the Validity of the Argument

The fact that INs in polysynthetic languages have anaphoric potential, i.e. that they introduce discourse referents as in (5), is one of the main arguments to treat incorporation as a syntactic rather than a lexical phenomenon (Baker (1988), Sadock (1980), (1986)). In this section I want to question the validity of this argument, i.e. is the semantic transparency of word formation processes a convincing argument that these processes are syntactic?

In a recent paper, Ward, Sproat and McKoon (1991) discuss the anaphoric potential of nominal expressions that are embedded in English compounds. Although I am not convinced that all of their examples are acceptable, I borrow a subset of them to show that some word formation processes in English appear to be transparent as well (Examples from Ward, Sproat and McKoon (1991).

(7) Museum$_i$ visitors can see through its$_i$ big windows the 900-year-old Tower of London and the modern office blocks of the City financial district.

(8) At the same time as coffee beans were introduced, the Arabs made changes in the coffee$_i$ preparations, that greatly improved its$_i$ flavor.

(9) Bush$_i$ supporters would stay home figuring he$_i$'d already won.

Ward, Sproat and McKoon's account for the correct coindexing in (7), (8) and (9) is that the relation between the head and its left hand member in the respective compounds *museum visitor*, *coffee preparations* and *Bush supporters* is easily decomposable. A set of pragmatic principles - contrast, topicalization - is responsible for this decomposition process. Despite the fact that English compounds appear to be discourse transparent, this does not affect the standard view that English compounding is a lexical phenomenon rather than a syntactic, because the transparency is only partially present and the semantic relation in a compound between its head and its left hand member is often idiosyncratic.[3] I take this to be an indication that the discourse transparency of an IN is not one-to-one related to its being an instance of syntactic word-formation.

Nevertheless, the fact that the lexical semantics of English compounds is often transparent when it is used in a piece of discourse is important if one wants to make Ward, Sproat and McKoon's pragmatic principles visible in a formal semantic approach to discourse semantics, such as DRT. If the semantic decomposition of a compound is present in the lexicon, then its semantic representation will be inserted as a complex DRS condition into the DRS of the sentence of which it is used. I will illustrate this in giving the lexical semantic translation of the compound *museum visitor*.

(10) $\lambda\eta\, \exists x$ [museum(x) & visitor*(η, x)] [4]

In this DRS condition I have assigned the referent *x* existential force because one can infer from the extensionality of the verbal stem *visit-* that its object can get a de re reading if the context makes such a reading plausible.[5] When we now introduce (10) as a complex DRS condition into the DRS of (7) the referent of *museum*, i.e. *y*, will be in a position that is subordinated to the positions of the other referents. Given that in DRT accessibility is defined in terms of subordination, it becomes clear that *y* is still unaccessible as the antecedent of the pronoun *it*.

(11) $\exists X \exists Y \exists u$ [$\exists y$ [museum (y) & visitor*(X,y)] & big-windows*(Y) & u = ? & POSS(u, Y) & see-through(X,t,Y) ...]

Still a separate story has to be told to explain how *y* escapes its embedded position, because we do want to set *u* equal to it. The only way this explanation can go is to say that the referent *y* is accommodated to a level that is accessible for the referent *u* introduced by the pronoun *its*. Notice, that such an accommodation mechanism does not apply systematically, i.e. one would not want it to be at work for a DRS of (12).

(12) Museum visitors always wish that it? would be open on mondays too.

The fact that this accommodation mechanism does not apply systematically is the main reason why I have assigned a narrow scope reading to the lexically embedded *museum* in (10), since if I would have treated it as a free variable, sentences like (12) would automatically come out as semantically well-formed.

Notice also that without a separate accommodation mechanism any lexicalist approach to NI in polysynthetic languages (Di Sciullo and Williams (1987), Mithun (1984); (1986) and Rosen (1989)) is unable to treat discourse transparency in a straightforward way. I repeat (5) to illustrate into what DRS the lexical semantic decomposition of the complex words *timmisartulior-*, *suluusaqar-* and *aquuteqarl-* under (13) would be inserted.

(5) Suulut timmisartuliorpoq. Suluusaqar**poq** aquuteqarll**uni**lu
Søren(ABS) airplane-made-INDIC-3sg. wing-have-INDIC-**3sg**
rudder-have-INF-**4sg**-and.
'Søren made an airplane. It has wings and a rudder'.

(13) $\lambda\eta$[$\exists u$ [airplane(u) & make(η,u)]]
$\lambda\eta$[$\exists U$ [wing*(U) & have(η,U)]]
$\lambda\eta$[$\exists u$ [rudder(u) & have(η,u)]]

Even with all of (13) available in the lexicon, the resulting DRS (14) shows that the airplane referent *u* is in a subordinated position and therefore unaccessible for anaphoric reference. This again follows from the simple reason that a lexicalist approach treats *timmisartulior-* as one lexical unit.

(14) $\exists x \exists y$ [$\exists$**u** [airplane(u) & make(s, u)] & $\exists Y$ [wing*(Y) & have(x,Y)] & x = ? & $\exists z$ [rudder(z) & have(y,z)] & y = ?]

As for (11) we would have to stipulate a separate accommodation mechanism in the semantic component in order to let *u* escape its embedded position. The mechanism would yield the desired DRS (6) repeated here as (14').

(14') $\exists x \exists Y \exists y \exists u \exists z$ [airplane(u) & make(s, u) & wing*(Y) & have(x,Y) & x = u & rudder(z) & have(y,z) & y = u]

However, since in Greenlandic Eskimo INs appear to be systematically discourse transparent, the question arises whether accommodation really is the best explanation to represent this systematicity. In a syntactic treatment of NI one would not expect to encounter this problem, because there word formation is not lexically pre-processed but runs parallel with phrase construction. A syntactic approach makes it possible to keep DRS construction compositional and it would yield (14') without any further stipulation.

Another point of interest with regard to the notion of discourse transparency is that the object required by an anaphoric expression is not per definition an individual object. Nominal expressions can be discourse transparent in different ways. In example (1) the pronoun *it* requires an antecedent that denotes an individual.

(1) Frederik owns a horse. *It* is a Hanoveraner.

In (15) the definite pronoun *them* refers to a kind antecedent, and the CN-anaphor *some* in (16) takes a nominal sense as it antecedent.[6]

(15) If at least one chicken of Ottilie has laid an egg, she has had a nice breakfast. *They* are very good to eat. (Example from Kamp and Reyle (1991))

(16) Most books have been returned to the library. Unfortunately, *some* were damaged.

Also incorporated nominal expressions can establish a kind discourse referent.

(17) I'm a mystery-story buff, and I read a lot of *them*.

(18) I also have a paper on the interaction of child morphology with *their* phonological skills, ... (Examples from Ward e.a. (1991))

It has become a common assumption that word internal elements in English-like language name kinds (Sproat and Ward (1987), Hoeksema (1984)). There is also a point of general agreement among incorporationists who are working on polysynthetic languages, that in many of these languages INs often have a non-specific or generic meaning, or to put it slightly differently, that they name kinds as well. In what follows I will bring INs in nonpolysynthetic and polysynthetic languages under the same semantic type denominator.

2 The Semantic Contribution of Incorporated Nouns

2.1 Incorporated Nouns denote Properties

A standard work on reference to kinds is Carlson (1977). In his ontology kinds are objects just like individuals. In this paper, I take kinds to be properties, or in type-theoretic terms, intensions of sets. This view is also mentioned by Carlson as yet another non-quantificational way to look at kinds in a possible world semantic setting, but he raises two objections against it (cf. Carlson (1977): 161). Carlson argues that since in Montague Semantics all NPs are taken to denote sets of properties one would need an extra complication to turn a property into a set of properties. This first objection does not hold in the DRT framework in which I am presently at work: bare plurals are indefinite NPs and in DRT semantics these are referential expressions. His second objection is that in the "property view" the extension of a property differs when different extensional predicates are predicated of it.

(19) Dogs are barking at me.

(20) Dogs are mammals.

In (19) *dogs* reads as 'some dogs', whereas in (20) it reads as 'all dogs'. Also this is not a real objection to the view that kinds denote properties for I would not treat the predicates *are barking at me* and *are mammals* on a par. To call *are mammals* an "extensional" predicate is based on how our actual world happens to be, i.e. a world in which all instances of the kind dogs are mammals. The extensionality of *are barking at me* is related to what is going on at a particular time-location point in the actual world.[7]

Is there any evidence that kind naming INs denote properties? From the common belief that through the resolution of anaphors we can learn more about the semantic types of their antecedents, it seems plausible that INs do denote properties. I advocate the view that CN anaphors need a property as their antecedent and that the relation between such an anaphor and its antecedent is sense identity. To interpret (21) and (22) we are supposed to extract that sense from the context or, as in (23) and (24), from the preceding discourse.

(21) Isabel ate *two*.

(22) Benjamin needs *one* too.

(23) Jonas had five sardines for dinner and I ate *one*.
(24) Ten books have been returned to the library. *Five* got lost.

Indefinite CN anaphors have a double role in discourse semantics. Therefore, I propose that, on the one hand, they introduce a (set of) discourse referent(s) and, on the other, they introduce a DRS condition variable that holds of the latter. It is this variable that displays the anaphoric role of CN anaphors in that it has to be set equal to some other condition that has been introduced before (or that is known from the context as for (21) and (22)).

(25) $\exists X\ \exists Y\ \exists C\ [C = \text{sardine}^* \ \&\ \text{sardine}^*(X) \ \&\ |X| = 5 \ \&$ have-for-dinner(j,X) & $C(Y) \ \&\ |Y| = 1 \ \&\ \text{ate}(I,Y)]$

(26) $\exists X\ \exists u\ \exists Y\ \exists C\ [C = \text{book}^* \ \&\ \text{book}^*(X) \ \&\ |X| = 10 \ \&\ \text{library}(u) \ \&$ return-to(X,u) & $C(Y) \ \&\ |Y| = 5 \ \&\ \text{lost}(Y)]$

In (25) and (26) the CN anaphors *five* and *one* take up a property or a DRS condition in stead of a set, simply because such a set is neither available nor can its existence be presupposed.[8] Also in (27) and (28) the CN anaphor *some* and *one* can be read as 'some elephants' and 'one rabbit' respectively.

(27) Timu went on an elephant hunt. When he caught sight of *some*, he leveled his rifle to shoot them.
(28) Joe saw a fresh rabbit track, so he knew that there had to be *one* around.

That also here there is no actual (set of) individual referent(s) available in these cases is clear from the impossibility to use a definite pronoun in the respective second parts of these pieces of discourse.

(29) Timu went on an elephant hunt. When he caught sight of **them*, he leveled his rifle to shoot them.
(30) Joe was following a rabbit track, so he knew that **it* had to be around.[9]

The fact that properties or intensions of sets seem to escape lexical embedding whereas I claimed before that this is impossible for their extensions can be explained in a very straightforward way. Nouns stand to their semantic value, i.e. an intension, in the same way as proper names to the bearers of these names. We can therefore assume that every noun's denotation is rigid and that they are modally closed.[10]

The fact that an IN denotes a property relates directly to what I regard to be the meaning of an n-place predicate. Standard Montague semantics treats the meaning of a transitive predicate as a two-place relation between an individual and a quantifier. To account for the obligatorily referentially transparent reading of the object of an extensional transitive verb ('to find', 'to make', 'to kiss', ...) Montague postulates a necessary meaning shift that turns the quantifier denotation of its internal argument into an individual object denotation. Zimmermann (1991) argues against Montague's view and treats referentially opaque verbs as relations between an individual and a property. I take over Zimmermann's alternative and claim that every transitive predicate's basic meaning is a relation between an individual and a property. Again, the denotation of the object of an extensional predicate will, by postulation, be a (set of) individual object(s).[11] The denotation of its subject, i.e. the external argument, depends on whether the predicate is episodic or stative. In the former case, the subject is a (set of) individual(s), whereas in the latter it is a property.

Many arguments of Carlson's findings about kinds are based on the semantic behaviour of the bare plural construction in English. I said before that in DRT bare plurals are referential expressions or terms. From that perspective, it is rather straigthforward to regard all kind naming nominal expressions - the

indefinite NP, the bare plural, the IN - as denoting properties. In other words, INs can be the word-level counterpart of the indefinite NP construction. In nonpolysynthetic languages an IN can be the lexical word-level counterpart of indefinite NPs, in polysynthetic languages it can be its syntactic alternative. Evidence that supports this view is that in none of the literature about NI I know of, I encountered an example in which a quantificational NP was incorporated.[12]

2.2 An External Quantificational Source

Referential expressions get their quantificational force from an external source. In Carlson (1977) a distinction between two types of predicates, i.e. the individual-level and the stage-level predicate, accounts for the distinction between the 'genuine' *de dicto* or generic and the *de re* or existential reading that a bare plural in subject position can have. This is illustrated in (31) and (32).

(31) Horses are nice animals.
(32) Horses are galopping in Jim's meadow.

are nice animals is an individual-level predicate: it holds as a property of the kind 'horse', regardless whether some or even a lot of the instances of this kind are not so nice. The predicate *are galopping in Jim's meadow* is a stage-level predicate: it holds for some instances of the kind 'horse' at a particular time-place location. This explains why the bare plural in (32) gets an existential reading, whereas it gets a generic reading in (31).[13]

Also in object position, indefinites can have either a generic or an existential reading. This depends on the extensionality of the verbal predicate.

(33) Joachim wants a horse/horses.
(34) Rob bought a horse/horses.

Because *to want* is an intensional verb, the indefinite NP/bare plural in (33) has a de dicto or generic reading. This is not the case in (34). Here the indefinite NP/bare plural object gets an existential reading since the verb *to buy* forces its object to be extensional. Hence, *a horse/horses* in (30) denotes (an) instance(s) of the kind 'horse'.

I already pointed out that in English-like languages INs often have an infered existential reading (cf. *museum visitor* in (7)) which I take to come from an external source. In (7) the pronoun can be resolved with a linguistically expressed but incorporated antecedent only when the addressed subject, i.e. a museum visitor, really is in a museum (or reads a brochure about a museum of which she is a potential visitor) and we therefore are able to infer the existence of the latter from the context. In some polysynthetic languages we apparently have a systematic use of INs as referential expressions with an existential reading. According to Sadock, the reason that incorporated nominals in Greenlandic Eskimo can so easily introduce discourse topics is "that, in many cases, the language provides no nonincorporated form of equal or lesser complexity and idiomaticity" (cf. Sadock (1986): 25). I assume that like the bare plural construction and the indefinite NP in English, the existential reading of INs derives from an external source as well. The most obvious candidate is the kind of predicate in which the IN is embedded (Examples (19) and (27) from Sadock (1980)).

(35) Sapangarsivoq.
'He bought beads'
(36) Kusanartumik sapangarsivoq.
'He bought a beautiful bead'

In the Eskimo example (35) the noun *sapangaq* ('bead') is incorporated in an extensional transitive verbal affix *-gar-* ('to have'). Even if the meaning of an IN is

taken to be nonspecific - it could have been any set of beads - the transparency of the verb forces a de re reading of the IN. In (36) where the IN *sapangaq* is modified through an external modifier *kusanartumik* the former also gets an existential reading from the very same affix. An example in which the IN does not have to get an existential reading is (37) (Example (88) from Sadock (1985)).

(37) Kaali illoqarumavoq.
Kaali illu-qar-uma-voq.
Karl(ABS) house-have-want-INDIC/3s
'Karl wants to have a house'

Here the modal operator 'want', realized in Eskimo as the affix *-uma-*, has the property 'to have a house' in its scope. The IN *illu* ('a house') can have either an existential reading or a generic reading. Anaphoric reference with a definite pronoun to the modally embedded noun can only be resolved in the former case.

(38) Karl wants to have a house$_i$. It$_{i/?}$ is too expensive.

Apart from the incorporated object's referential transparency that is forced by an extensional transitive verb it would be interesting to see how other external sources - quantifiers, temporal and local adverbs, ... - are realized in Eskimo, that could give rise to an existential reading of an incorporated referential expression.

Apart from object incorporation, there are also languages in which we encounter subject incorporation. I borrow a Caddo example from Mithun (1984):

(39) Ná: kan-núh-'a'.
that water-run.out-will
'That water will run out.'

The incorporated subject *kan* ('water') is a referential expression that gets its existential reading from the temporal inflection on the predicate *nuh* ('run out'). This reading is also enforced by the 'stranded' demonstrative determiner *na* ('that').

Now that the semantic denotation of INs with anaphoric potential is said to be a referential expression, we can start to think about the question how to construct DRSs for incorporating configurations in polysynthetic languages. Although it was said that discourse transparency as such is not a valid argument in favor of the syntacticity of NI in polysynthetic languages, there appears to be a systematic referential transparency of objects incorporated in extensional transitive verbs, a systematicity that is missing in complex words in English-like language. I also showed that a lexicalist approach to NI is not able to cover this systematicity, unless a rather ad hoc accommodation mechanism is introduced.

3 DRS Construction of Object Incorporating Languages

Within the framework of DRT many attempts have been made to define construction procedures that yield semantic representations which have to be interpreted along the findings of DRT philosophy (cf. Kamp and Reyle (1991)). One way in which these algorithms can be set up is that they take surface syntactic structure configurations as their input from which stepwise DRSs are constructed. The DRS construction trigger in English indefinite NPs is the determiner *a(n)* for the singular case and the lack of a determiner for the plural one. When in a syntactic tree an occurrence of the determiner *a(n)* is encountered in an NP, a discourse referent will be introduced in the discourse universe and the nominal head of that NP will be translated into a DRS condition that holds of that referent.

In the foregoing I have argued that object INs in polysynthetic languages play much the same semantic role as indefinite NPs, in that they are referential expressions. We now need a structural trigger that yields the same result in DRS

construction as the indefinite determiner *a(n)* in my sketch above. The most obvious candidate for this task is the NI configuration itself and I therefore need a surface syntactic parse that does justice to that configuration. At this point the question arises in how far I can take advantage of existing syntactic approaches to NI. One would expect that surface syntactic parses of incorporating configurations based on the incorporation theories of Sadock (1985), (1991) and Baker (1988) can be used as the input of a DRS construction algorithm. However, I will show that this expectation is wrong and give an answer as to why it is wrong. I will then sketch how an alternative syntactic approach to object NI could be set up.

3.1 Existing Syntactic Analyses

3.1.1 Autolexical Syntax (Sadock (1985), (1991))

Sadock's (1985) auto-lexical model consists of a word-level and a phrase-level component that are set up in parallel as two autonomous combinatorial systems. In his view, morphological structure and syntactic structure are independent to the extent that the leaves of syntactic trees need not correspond to the roots of morphological trees (Sadock (1985): 387). An interface grammar has to link the two structural systems. From the perspective of the semanticist who wants to construct the semantic representation of NI configurations, it is somehow disappointing to read that of the two syntactic modules only the phrase-level syntax is claimed to be relevant for semantic interpretation. Hence, morphological information is doomed to be lost for interpretation.

The first thing we seem to lose is inflectional information. The double tree under (37) shows that the inflectional morpheme *-poq* is not present in the syntactic tree. It has been argued at length by Bach (1983) that inflection does have to be considered for interpretation. Putting the phonological aspect aside for now, Bach's grammar picture shows that semantic interpretation is not a privilege for phrasal syntax (Bach (1983): 65).

Word-grammar	*Phrase-grammar*
syntax	syntax
phonology	phonology
semantics	semantics

Sadock is aware of this and he claims that although inflectional affixes have no lexemic representation in the syntactic tree, the inflectional information of a word can be reflected by means of features on the syntactic tree (Sadock (1985): 403).

But in the (1985) autolexical model the syntactic tree doesn't involve morphological configurational information either. At the syntactic level an incorporated object argument gets the same representation as its non-incorporated version, i.e. one in which the argument is a maximal projection. Given that in an autolexical model only the syntactic trees are relevant for semantic interpretation we will get one and the same DRS for both configurations with incorporated arguments and their nonincorporated versions. However, many languages show meaning differences between incorporated structures and their nonincorporated counterparts, differences that are found in what they denote. Sadock (1980) himself gives us evidence for such a meaning difference in Greenlandic Eskimo (Examples (19) and (25) from Sadock (1980)).

(40) Sapangarsivoq.
'He bought beads'

(41) Sapanngamik pisivoq.
'He bought a bead'

(40) gives us the incorporated version of (41). Sadock notes that the incorporated versions of *sapangaq* ('bead') is always to be understood as an indefinite and that the incorporated version is also neutral with respect to number. Other denotational differences between incorporated and nonincorporated configurations we find in the Micronesian language Mokilese (Examples (3a) and (3b) from Mithun (1984)).

(42) Ngoah kohkoa oaring-kai.
I grind coconut-these
'I am grinding these coconuts'

(43) Ngoah ko oaring.
I grind coconut
'I am coconut-grinding'

Mithun notes that the incorporated coconuts in (43) are not refering to specific coconuts, but that they modify the activity of grinding. In Sadock's approach the incorporated and the non-incorporated versions of these Eskimo and Mokilesean examples will be assigned the same syntactic, downward tree structure. From his claim that only the latter delivers input to the semantic component, it follows that they will also be assigned the same truth conditions, which of course is an undesired result.

It is not clear to me whether Sadock wants his syntactic trees to be a S- or D-structural representation. What is systematically missing in the autolexical model is the surface syntactic parse of a sentence in which the incorporation configuration is present. The morphological trees stand all on their own, i.e. they are not interrelated. Hence, we would expect that the surface syntax is dekivered by the syntactic module, but this is neither the case. The part of the autolexical syntax model that I have left unmentioned till now is the interface grammar. In Sadock's (1991) model this interface component plays a central role in that it fixes the respective two-way connections between the syntactic, the morphological and the semantic component. The semantic component interacts with the morphological and the syntactic component in a similar but autonomous way. It is therefore unclear to me how the semantic representation that correlates with the morphological structures of the words of a particular sentence and the semantic representation that correlates with the syntactic tree of that sentence can be unified into one and the same semantic representation that contains the truth conditions of that sentence.

3.1.2 A Transformational Approach (Baker(1988))

Also Baker (1988) advocates the view that NI in polysynthetic languages is a syntactic phenomenon. Amongst his arguments in favor of a syntactic approach discourse transparency is a convincing argument that incorporation is a syntactic operation.[14] But, if we take a closer semantic look at Bakers's approach to incorporation it is clear that we encounter a situation that is very similar to the autolexical one that I have decribed above.

Baker explains incorporation in terms of thematic paraphrasability, which alludes to the fact that an IN can be paraphrased as a maximal projection. To illustrate his view I take one of his examples from Onondaga (Examples from Baker (1988)).

(44) Pet wa-ha-hwist-ahtu-t-a.
Pat PAST-3ms/3N-money-lost-CAUS-ASP
'Pat lost money.'

(45) Pet wa-ha-htu-t-a ne o-hwist-a.
Pat PAST-3ms/3N-lost-CAUS-ASP the PRE-money-SUF
'Pat lost the money.'

Example (44) contains a nominal expression *hwist* ('money') that is incorporated in the verbal expression *ahtu* ('to loose') of which it is the object argument. (45) contains the same expression but now it is realized as the nominal head of a free NP argument. It is also (45) that is the D-structural source of (44) since Baker defines NI as a structure dependent operation, i.e. a word-level version of move-α:

(46) [... [VP [V][*NP* [N]]] ...] ⇒ [... [VP [V [N_i V]][NP [t_i]]] ...]

Although he recognizes the discourse transparency of INs in polysynthetic languages, according to his view an IN N_i in (46) does not have an independent referential meaning, but receives that meanig from its D-structural *NP* source via the N-chain. This means that if we take a Bakerian surface structure level as the input for DRS construction we will have to reconstruct its D-structural representation in order to interprete that chain. But it is not difficult to see that we get again the wrong result in that the incorporated version, e.g. (44), and the nonincorporated one, e.g. (45), are then assigned the same truth conditions. The syntactic representation that is relevant for interpretation is, as in Sadock's approach, the same for both the incorporated version of a verbal argument and its nonincorporated counterpart.

Although Sadock's and Baker's views of grammar modelling are conceivably distinct, the identification of their respective weak points in the treatment of NI can be brought under the same denominator, which is the mistaken view that thematic paraphrasibility equals truthconditional paraphrasibility. At the grammar level that is relevant for interpretation, neither Sadock nor Baker distinguish between the incorporated and the nonincorporated realization of a nominal expression. In what follows I regard NI in polysynthetic languages as being a part of an independent word-formation operation that is syntactically real.

3.2 A Monostratally Syntactic Approach to NI

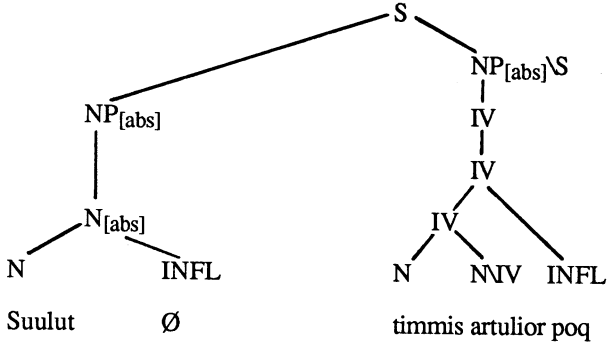
For my purposes, I will only borrow from the syntactic principles of Categorial Grammar and Categorial Morphology (Hoeksema 1984, Moortgat 1983). Traditional categorial systems mostly adapt a strict Montagovian framework for its interpretation. I'd rather translate the syntactic categories into building blocks for DRS construction. The reason that I borrow from CG syntax lies in the fact that this monostratal syntactic framework draws a useful distinction between linguistic operations and grammar rules. Dowty (1979) makes this distinction even more finegrained in that, on the one hand, operations are either word-level or phrase-level and, on the other, grammar rules are either syntactic or lexical. Given this crossclassification one is not forced to think of NI as being either a syntactic or a lexical phenomenon because word-level and phrase-level operations can show up both in syntactic and in lexical rules. In Hoeksema (1984) we find a thorough analysis in a Dowty-like CG framework of relational and synthetic compounds in English-like languages that involves incorporation. In these languages, NI is part of partially productive word-level operations and it therefore shows up in lexical rules. This is a purely language specific matter and it does not imply that word-level operations are lexical per se. To ascribe affixation and compounding in polysynthetic languages a syntactic status, we need syntactic rules that are defined in terms of word-level operations. Notice that the discussion as to whether NI is a lexical or a syntactic phenomenon ends up being a purely language specific issue.

A test whether a particular instance of NI is syntactic rather than lexical is to check whether it is systematically transparent or not. Notice also, that in this monostratally syntactic approach incorporation is a descriptive term which has no procedural meaning.

In the second section, I have pointed at a semantic parallelism between the English indefinite NP and INs. I have also suggested that in order to make this parallelism explicit in DRS construction a syntactic NI configuration itself would be assigned the same role as the indefinite NP configuration. Whereas in (1) the presence of the determiner *a* in the NP *a horse* triggers the introduction of a discourse referent, in (47) the fact that the N *airplane* is strictly adjacent to its head *made* triggers essentially the same thing. In this way, the lack of a syntactic determiner is intercepted: although INs in a polysynthetic language as Eskimo are word parts, their word part status is exactly what accounts for their systematic transparency.

(47) Suulut timmisartuliorpoq.
Søren(ABS) airplane-made-INDIC-3sg
'Søren made an airplane'

(47')

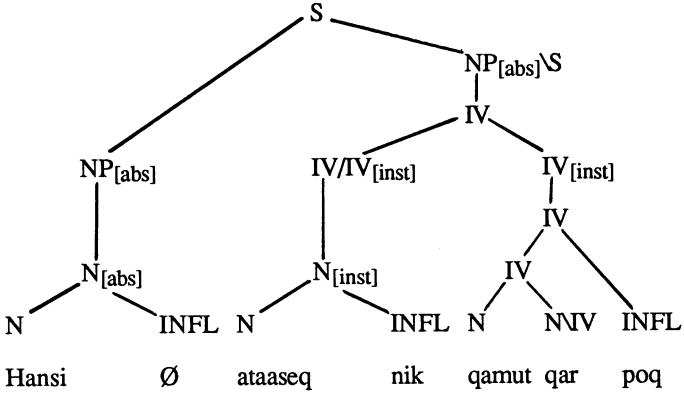


The syntactic tree (47') is the result of a bottom up parsing strategy along the following lines: every (complex) word is checked whether it appears in the lexicon. If so, the lexical semantic and syntactic information is brought into the parse. If not, the word is parsed on line. For that purpose there has to be a separate stem-and-affixes lexicon available that delivers the lexical semantic and combinatorial properties of its entries.

One last problem that I want to comment on is the treatment of external modifiers in Eskimo. I treat them as VP modifiers, but simultaneously I want to keep track of the fact that semantically they modify an IN. Following Gazdar (1982) I use categories labeled with features. The case feature [inst] on IV indicates the fact that every IV assigns to its nonincorporated "arguments" the instrumental case. Since *gar* becomes an IV after it has combined with the N *qamut* this feature shows up only in the phrasal domain of the tree.

(48) Hansi ataatsinik qamuteqarpoq.
Hansi-ø ataaseq-nik qamut-qar-poq
Hans-(ABS) one-INST/pl sled-have-INDIC/3s
'Hans has one sled'

(48')



The semantic contribution of *ataaseq-* manifests its status of a nominal modifier. It introduces a DRS condition variable *C* that has to be set equal to the condition introduced by the IN; it also introduces a set variable *Y* of which *C* holds (|Y| = 1) that has to be set equal to the set discourse referent introduced by the IN. All of this can be read of from DRS (49).

(49) $\exists X \exists Y \exists C [C = \text{sled}^* \& \text{sled}^*(X) \& C(Y) \& |Y| = 1 \& Y = X \& \text{have}(h,X)]$

4 Concluding remarks

In this paper I have argued that INs in some polysynthetic languages, among which is Greenlandic Eskimo, are referential expressions that get quantificational force from an external source. Moreover, from the perspective of DRS construction, incorporated referents can be made accessible in a systematic way only if the syntactic/semantic parse of complex words runs simultaneously with the syntactic/semantic parse of phrases. The hypothesis that INs are referential expressions is based on few examples and it needs a lot more further investigation to check whether INs in other but extensional contexts can still be treated as being semantically parallel to indefinites.

Another interesting point that falls out of this discussion is the observation that incorporation is part of a word-level operation that can show up both as a lexicalized and as a syntactic phenomenon. The question whether incorporation is lexical or syntactic is therefore reduced to a language specific question rather than a language universal one.

5 Footnotes

[*] The construction of this piece of discourse draws upon the accessibility of the following referents: Franz Beil, Hans Kamp, Manfred Krifka, Ede Zimmermann. All unresolved errors are my own.

[1] Because I have to save space, I will not use 'boxese' to write down Discourse Semantic Representations, but rather its predicate logic translation (cf. Kamp and Reyle (1991)). The DRSs are underspecified with respect to tense and agreement information.

[2] In Mithun (1984) we also find languages (e.g. Koryak, Huahtla Nahuatl) in which the incorporated noun itself plays the role of an anaphoric expression. I will not bring these cases into the present discussion.

[3] The compound *dog food* has at least two readings, i.e. 'food for dogs' and 'food made of dog meat'.

[4] The *-index on DRS conditions indicates that these conditions are applicable both to sets of discourse referents and to individual ones. The variable η ranges over sets and individuals.

[5] I will get to the importance of an external quantificational source for de re readings of INs further on in this paper.

[6] I borrow the term 'CN anaphor' from Nerbonne, Iida and Ladusaw (1990). These authors elaborate an analysis of the extensional cases of CN anaphora in Situation Semantics (see also Webber (1978)). In my view all cases of CN anaphora are cases of sense identity. Moreover, in what follows nominal senses and kinds will have the same semantic type.

[7] Carlson also distinguishes these two types of predicates as individual-level and stage-level predicates. *are mammals* is a special kind of individual-level predicate, in that it holds of all individuals of the kind of dogs without any exception. *are barking at me* is a stage-level predicate. I get to Carlson's distinction later on in the paper.

[8] Notice that in DRT numerals are treated as indefinite determiners and since these are not quantifiers they do not trigger the presupposition of a set that is quantified over.

[9] Given the fact that the relational noun *track* presupposes the existence of an agent who makes the track, some people don't have a problem with the use of *it* in (30). However, I would not regard that as a case of coreference between that pronoun and the incorporated *rabbit*, but rather explain it in terms of inferencing based on our world knowledge about tracks.

[10] I thank Ede Zimmermann for pointing this out to me.

[11] Notice that this view is related to an operation on n-place relations (n>1) formulated by Jacobson (1991), i.e. the z-operation, that turns every relation between n individuals into an n-place relation between an individual and n-1 properties. The need for this type shift follows from her variable-free semantic account of the Bach-Peeters sentences. Whereas I take the view that the individual object meaning of internal arguments is the "postulated" one, Jacobson takes it to be the basic one.

[12] Sadock reports the existence of incorporated quantifiers in Westgreenlandic Eskimo (Sadock (1991): 94-95). However, the apparent quantifiers in his examples are numerals and the weak "quantifier" *many*, and I consider neither of those to be true quantifiers.

[13] The distinction between these two sorts of predicates in particular has been criticized as being inadequate to explain particular generic readings (for discussion cf. Carlson (1988)). Although I am aware of the correctness of these criticisms, my point here is that any treatment of the bare plural has to make explicit the external source that it takes to be responsible for the bare plural's existential reading. For now, I take that source to be Carlson-like, stage-level predicates, since I only want to describe the *fact* that there is a distinction between the existential and the generic reading of an indefinite NP without making any real theoretical assumptions about its *source*.

[14] From the perspective of the theoretical approach in which Baker works out his syntactic analysis and in which the autonomy of syntax is a central concern, it is somehow strange that Baker takes discourse transparency, which is a semantic phenomenon, as a valid argument for his approach.

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Lexical and Postlexical Word Formation[1]

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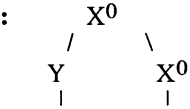
O. Abstract: This study is intended to lend support to the modular approach to word formation (e.g. Wong-opasi 1987, 1991; Shibatani & Kageyama 1988). Contrary to the strong lexicalist view (e.g. Di Sciullo and Williams 1987) which excludes word formation (WF) outside the lexicon and the extreme nonlexicalist position (e.g. Lieber 1988) which advocates entire WF from syntactic principles, it will be proposed that both theories must be relaxed to allow word formation both inside and outside the morphological component. Evidence will be drawn from compounding and derivation in Romance languages and Thai. Section 1 deals with the structure of words. In the treatment of words as morphological objects, researchers have singled out "headedness" as a basic criterion in the characterization of word structure. However, missing generalizations related to headship in current theories of WF will be pointed out. In particular, it will be shown that D&W's "universal" Right-hand Head Rule (RHR) must remain language-specific. The problems encountered are the directionality of headedness, left vs. right, which differs cross-linguistically and within the same language, as well as various productive Romance compounds which are headless on the surface. Nor can the extreme nonlexicalists handle the complex concord system--internal and external--to the construct, or the exclusion of internal inflection by advocating entire WF from purely syntactic principles. The proposal advanced in this paper is to account for mixed headship and surface headless structure by combined morphological, phonological, and syntactic principles. The interactive principles of morphology, phonology, and syntax during WF are illustrated in sections 2 and 3 through the formations of composite and derived forms, respectively. The autonomy of morphology in words composed of syntactic constituents discussed in section 4 provides strong arguments against exclusive WF in the lexicon or postlexicon. In section 5, a revised version of the theory of Lexical Phonology and Morphology (LPM) is proposed as a model for a modular approach to word formation as it provides comprehensive explanations for synchronic and diachronic data. A wide range of complex data show a continuum of words formed by either morphological, phonological, or syntactic principles separately or a combination of any of the three principles. The last section concludes the present study and offers issues of interest for future research.

1. Morphosyntax of words:

1.1. D&W's HEAD criterion: In the description of the structure of a word, for example in D&W 1987, the notion of "head" is employed to denote a constituent that structurally "dominates" its co-constituent and so "determines" the category of the construct. Thus, D&W's (1987: 23) conception of morphological heads is an extension of the notion of HEAD from syntax into morphology through a general principle called "Percolation". By assigning a lexical category to a suffix, or the "head", and through Percolation, the morphosyntactic features of the head are percolated or encoded onto the whole construct. In this fashion, the category of a construct and the category of its head plus complete agreement in morphosyntactic features between the head and the whole are maintained. Moreover, from the observation that lexical derivation is uniformly carried out through suffixation in English and the Romance languages, D&W proposed a

"universal" Right-hand Head Rule (D&W 1987: 24). According to D&W, only suffixes can change the lexical category of the base form, e.g. (E.) *liberate* (V) -> *liberator* (N), *love* (V) -> *lovable* (A), *gentle* (A) - >*gentleness* (N); (Sp.) *libertar* (V) -> *libertador* (N), *amar* (V) -> *amable* (A), *gentil* (A) -> *gentileza* (N). Prefixes, such as *counter-* , on the other hand, not only fail to change the category of the base but also inherit the category of the base instead, e.g. (E.) *attack* (V) -> *counterattack* (V); *balance* (N) -> *counterbalance* (N), *revolutionary* (A) -> *counterrevolutionary* (A); (Sp.) *atacar* (V) -> *contraatacar* (V), *balanza* (N) -> *contrabalanza* (N), *revolucionario* (A) -> *contrarevolucionario* (A)(cf. (1)).

(1) **The Right-hand Head Rule (RHR):**



(for derivational affixation)	Word	aff
(for compound word formation)	Word	Word

The RHR also holds in English endocentric compounds. The category of the right-hand head determines the category of the whole compound and all inflectional marks are placed on the rightmost element. Thus, a combination of N+V has the outcome of a V (e.g.*bar+**tend***) and N+A -> A (*jet+**black***). Likewise, the second noun of the N+N sequence is the head of the compound by virtue of the RHR, e.g. an *apple+**pie*** is a 'kind of pie'. Moreover, only the plural number on the right-hand member marks the plurality of the compound (*part (sg.)+**suppliers** (pl.)* -> pl.) while the plural morpheme on the left-hand member does not imply that the compound is plural (*parts (pl.)+supplier (sg.)* -> sg.).

Notwithstanding, difficulties for the RHR arise from counterexamples to the RHR. For instance, Spanish diminutive suffix and its variants ***((e)c)ito/-a(s)*** can attach to almost any part of speech and the resulting word belongs to the same category as the base form (Jaeggli 1980), e.g. *poco* (A) -> *poquito* (dim.A) 'little'; *chica* (N) -> *chiquita* (dim.N) 'woman'; ahora (Adv.) -> ahor**ita** (dim.Adv.) 'now'. Additionally, plural suffix with plural meaning is reported to dock on the left-hand member of French compounds such as *timbres-poste* (stamps+post) 'postage stamps'. Finally, Romance V+C(omplement) compounds, e.g. (Fr.) *essuie+glace* (wipes+glass) 'windshield wiper', are headless because the compound is neither a verb nor does it denote 'a kind of glass'.

To circumvent these problems, firstly, D&W introduced the notion of a **"relativized"** head to account for the apparent left-headed structure in Spanish diminutives (D&W 1987: 26):

(2) Definition of "head$_F$" (read: head with respect to the feature F):
The head$_F$ of a word is the rightmost element of the word marked for the feature F.

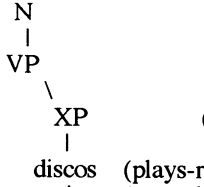
That is, because the rightmost diminutive suffix is not marked for the categorial features, by default, the left-hand element becomes the rightmost element with respect to the "head$_{category}$" feature. Obviously, this modification weakens the RHR considerably. Moreover, the property of "a relativized head" which permits

the possiblity that words could have two heads, a $head_{F1}$ and a $head_{F2}$,where F_1 and F_2 are different features, does not rest on any independent grounds except to enable the RHR to work. It also implies that the mixed headship property must be recorded in the lexicon on specific lexical categories such as the diminutives but not on derivational prefixes. Thus, this move towards understanding the phenomenon is rather unsatisfactory, as admitted by D&W that the "relativized head" is a "peculiar" notion, unidentifiable by an intrinsic feature, unlike the headship in syntax which is defined as "a nonmaximal projection." Alternatively, I propose an intervention from syntax in generating a left-headed structure in Spanish diminutives (cf. section 3).

Secondly, to account for left-headed and headless Romance compounds which are challenges to the RHR, D&W had to dismiss these constructs from being compounds. Thus, D&W claimed that forms like *timbres-poste* (<- timbres, n.m.pl.+poste, n.m.) 'postage stamps' are not compounds at all but are "**fixed syntactic phrases (idioms)**" due to their $N_{(pl.)}+N_{(sg.)} \rightarrow N_{(pl.)}$ structure with the plural marker appearing on the left, not on the right member, contrary to the RHR. Likewise, V+C compounds in Romance, e.g. (Fr.) *essuie-glace* (<- essuie, v. 3sg.+glace, n.f.) 'windshield wiper'; (It.) *rompi-testa* (<- rompi, v. 3sg.+testa, n.f.) 'puzzle', whose heads are clearly not the right-hand member, are merely "**phrases reanalyzed as words (syntactic words)**". The "**reanalysis rule**", formulated as in (3) generates the structure in (4), where XP=phrasal constituents.

(3) **Reanalysis:** N -> VP

(4)



(XP = NP, AP, AdvP, or PP)

Sp:	NP:	toca	discos	(plays-records)	'record player'
Fr:	AP:	gagne	petit	(earns-little)	'low-salaried (person)'
	AdvP:	couche	tard	(sleeps-late)	'late nighter'
	PP:	frappe	devant	(covers-front)	'apron'

Rule (3) is needed to explain the fact that the semantics of the dominated N (the lower N) does not percolate onto the dominating N (the upper N) since *tocadiscos* is not a type of *discos*. Instead, rule (3) forcefully assigns the VP to be the head of N, except that this head must be "**featurally atomic**" to rule out plural markers on the V (**essuient-glace*) as a means to signify plurality of the construct. Reactions to D&W's claims that undermine the exclusive WF in the lexicon are in order. Rule (3) is, in D&W's own words, not a morphology-proper rule. The morphological status of this rule is assigned "**by fiat**". Thus, D&W must relax their restrictions to allow marginal WF outside the morphological component. By disqualifying these two types of compounds, D&W concluded that "Romance languages lack compounding altogether." (D&W 1987: 83)

By and large, a strong lexicalist view like D&W's maintains that all WF processes are accountable exclusively by morphological principles, operative in the lexicon. Therefore, Romance compounding must remain exceptional processes in the periphery of grammar. Another consequence is that the issues of

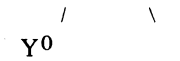
gender and number agreement in compounds were left unexamined. My data, on the other hand, indicate that the majority of Romance compounds are of the types *timbres-poste* and *essuie-glace*. Contreras 1985, for example, speculates that V+C compounds are perhaps the most productive type in Spanish. The productivity of English phrasal compounds is also unrefutable as defended by Lieber. In addition, WF in isolating languages (e.g. Thai and Chinese) is realized primarily through compounding, rather than affixation since most derivational affixes in these languages are arguably free-morphemes. In fact, the Thai equivalents of various English bound-derivational affixes, e.g. the nominalizers *-er, -ist, -ation, -ness;* the adjectival suffixes *-ble, -ed;* the adverbializer *-ly* can function as independent lexical words, and not bound-morphemes (see Wong-opasi, in preparation). Hence, most derived lexical items in isolating languages can be argued to contain phrasal constituents and, thus, the highly productive compounding processes involving phrasal elements are expected. In effect, the major part of the Thai and Chinese lexicons (Chao 1968) comprise compound lexical items. To attribute syntactic compounding to the periphery of grammar is, then, counter-intuitive since the core is reduced to a handful of derivational processes.

Another controversial issue generated by D&W's strong lexicalist position concerns the universal application of the RHR in lexical derivation. If headship is determined by adding a category-changing affix, then a priori, either a LHR or RHR can apply to derive words by affixation on either end of a construct (or in the case of infixation, in the middle of a word). Thus, contrary to English head-final affixal derivation, for languages which derive their lexical categories by prefixation, such as Thai, morphological heads are located on the left.

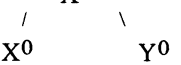
(5)	plɔ̀t + plɤ̀ɤy	**phu^u** + plɔ̀t + plɤ̀ɤy	'liberat**or**'
	(undo+release)	(agent. nominalizer+undo+release)	
	ra&k	**na^a** + ra&k	'love**able**'
	(love)	(adjectivizing prefix+love)	
	nu^m + nuan	**khwaam** + nu^m + nuan	'gentle**ness**'
	(soft+nicety)	(stative nominalizer+soft+nicety)	

1.2. Lieber's Generalized Phrase Structure Principles: The other extremist theory of WF is advocated in Lieber 1988, among others. For extreme nonlexicalists, all word formations are executable solely by syntactic principles which can replace morphological WF principles altogether. Hence, Lieber (1988: 211-213) proposes the structures in (6a) for right-headed affixed forms and Modifier+Head compounds as found in English and (6b) for their left-headed counterparts in Breton, Tagalog, and Vietnamese.[2] The abundance of phrasal compounds in English is explained in Lieber 1988 by the structure in (6c) where YP covers all phrasal modifier constituents in phrasal compounds. (6d), on the other hand, shows only a slight variation in the direction of the head, as evidenced in postlexical compounds in Spanish (examples in (7)) and Thai.

(6) a.



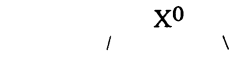
b.



Eng:	revolution (N)	**ary** (Aaff)	Tag:	**taga** (Naff)	bili (A) 'buy**er**'
Sp:	gentil (A)	**eza** (Naff)	Th:	**na^a** (Aaff)	ra&k (V) 'lov**able**'
Eng:	ice (N)	**cold** (A)	Bre:	**korn** (N)	boud (A) 'low-pitched **horn**'

Sp: mus (N) **araña** (N) Th: **kaa** (N) na&am (N) 'water **pot** = kettle'

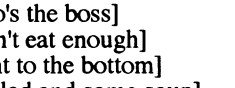
c.



CP: [a [who's the boss] **wink**]
VP: [a [didn't eat enough] **look**]
PP: [a [right to the bottom] **plunge**]
NP: *[those [a salad and some soup] **suppers**]
cf. [those [salad and soup] **suppers**]

Note: According to Lieber (1988: 206), the absence of determiners in the NPs of phrasal compounds is because of some independent reason.

d.



(Examples are from Thai compounds exhibiting phrasal forms.)

CP: [**s$^a** 'shirt' [twa (classifier) k**ø/œ** 'good, capable']] 'favorite shirt'
VP: [**khr$^œ** 'machine' [la&aœ 'wash' caan 'dish']] 'dishwasher'
PP: [**khon** 'fellow' [kha^aœ 'beside' ba^an 'house']] 'neighbor'
NP: [**raaœ wan** 'prize' [kha§n 'dipper' na¶am 'water' phaan 'long-stemmed tray' th**øø**œ 'gold']] 'prize of gold-plated water dipper and long-stemmed tray'

(7) (examples (7a, b, d) from Vallbona 1982: 21, 24, 22; (7e) from travel ads.)

VP: a. [su 'her' **e** [limpia-casa] 'cleans-house', [barre-suelos] 'sweeps-floors', [cambia-pañales] 'changes-diapers', [**lavaplatos**] '**washes-dishes**', [marido-en-la-cama] 'husband-in-(the)-bed', y [final-de-día-vacío-rota-toda-por-dentro]] 'end-of-day-empty (i.e. 'an empty day')-crushed-completely-(by)-inside' (all of these composite forms describe the wearisome chores of a housewife) 'her house cleaning, floor sweeping, diaper changing, **dish washing**, husband-in-(the)-bed, and empty and wearisome day'

PP: b. [una 'a' sarta 'series/string' [de 'of' no-se-puede 'one-cannot-do-it', no-se-hace 'one-does-not-do-it', no-se-tiene 'one-does-not-have-it', no-no-no-no.....'no-no-no-no'.....]] 'a series/string of one-cannot-do-it, ...'

c. [marido 'husband' [en-la-cama 'in-(the)-bed']] 'in-bed husband'

AP d [la nave-[soñada-hacia-el-paraíso]] 'the dreamed-(to)-paradise-ship'

NP: e. [traslado [aeropuerto-hotel-aeropuerto]] 'airport-hotel-airport transfer'

The rules that generate structures in (6) are as outlined in (8). (8a) is a modified version of X-bar theory, one which allows recursion at the lexical level while (8b) shows the options of having either a phrase or a word as a base constituent. (8c) replaces the usual language-specific Head initial/Head final parameter with more explicit parameters, i.e., the setting whether complements, as well as specifiers and modifiers, precede or follow their heads.

(8) **Lieber's Generalized Structural Principles:** (Lieber 1988: 209)

a. X^n -> ..... X^{n-1} ..... , recursion at least for n=0
b. Pre- and post-head position can contain Y^{max} or Y^0
c. Licensing: i) All and only complements are final/initial
All specifiers and modifiers precede/follow the head

All complements are Y^{max} , but not all Y^{max} are complements

ii) Case assignment right/left;
case assigned only to maximal projections under adjacency

One strength in Lieber's theory is to capture WF processes from syntactic constructs by a UNIFIED set of principles that applies also to WF from single syntactic elements. However, my data argue for an irreduceable autonomy of morphology in WF as evidenced in surface headless compounds in Spanish.

1.3. A compromise: I propose that the "mixed head parameter" is explained when words are generated by different sets of morphological and syntactic principles. That is, lexical compounds are right-headed whereas postlexical composite forms show a left-headed structure following Zwicky's MORPHOSYNTACTIC LOCUS, where inflectional morphemes are located, and MORPHOLOGICAL DETERMINANT, the determining constituent of the resulting category of the construct, criteria for headship, namely, both the morphological loci and morphological determinants MAY be found to coincide on the right-edge of lexical compounds as opposed to the left-hand member of postlexical compounds. Such a distinction could well be suggested to be accommodated in Lieber's theory by claiming these lexical constructs to be "listed" or "memorized" items. Nevertheless, the fact that lexical compounds do manifest word-internal concord is not accounted for by claiming listedness alone. If syntactic principles were ruled out in the formation of lexical compounds, it would be accidental that ill-formed constructs showing no internal concord, e.g. **hierba+bueno* (cf. *hierba+buena*), are never listed. Additionally, Spanish compounds with word-internal concord are counterexamples to Zwicky's claim that the determinant of concord inside a word is not required "because parts of words do not exhibit concord with one another" (Zwicky 1985: 15). The mixed head parameter is most obvious in the assignment of external morphosyntactic agreement to lexical compounds, e.g. *hierbabuena* has an overall feminine gender following the gender of the left-hand member but plurality is only assigned to the right-hand member *hierbabuenas* (**hierbasbuena*). Zwicky's provision that morphological determinant is a property of RULES, and thus not necessarily localizable on a constituent, while correctly captures the discontinuous affixation, infixation, and process morphology, cannot explain this split morphosyntactic agreement, either. Again, we may say that these lexical items are frozen, unanalyzable units. Still, in the same way that plural agreement is prohibited in **hierbasbuena*, plural verbal inflection in Romance V+C compounds is barred, e.g. **tocandiscos* 'record-players' (<- *toca+discos* plays+records), yet the V+C compounds are the most productive compounding process in Spanish. Nor does the listedness argument hold for Spanish diminutives provided that the diminutive formation is extremely productive as well. Furthermore, on the assumption that Romance V+C compounds have an underlying head which may be deleted on the surface, neither syntactic nor morphological principles alone can account for the absence of plural agreement on the V, with or without concomitant spelling out of an overt head on the surface, or the ungrammaticality of deleting the head from similar underlying composite structures in other pro-drop languages like Thai and Chinese. The final point is that the derivation of Spanish specifiers will not be complete without provisions for morpho-phono-syntax interface which should replace Zwicky's 1985a referral rules. In all, my main concern is the shortcomings found in the extreme lexicalist and nonlexicalist positions in advocating WF in

ONE single component in view of the complexity in my data which fosters a modular approach to WF to which I now turn.

2. A modular analysis of Spanish compounds: Lexical compounds differ from postlexical compounds according to their semantic, morphological, and phonological properties. We outline the structures shared by both lexical and postlexical endocentric compounds in (9) and (10).

2.1. Shared composite word structure:

(9) Right-headed or Lexical Compounds: (accent marks denote prosodic stress)

a. N+N musaráña, f. 'shrewmouse; bug, worm; foggy illusion'
(mus, n.m. 'mouse' + araña, n.f. 'spider')

b. N+N aspaviénto, m. 'exaggerated gestures or feelings'
(aspa, n.f. 'hand (of windmill)[3] + viento, n.m. 'wind')

c. N+N bocamánga, f. 'cuff, wristband'
(boca, n.f. 'mouth' + manga, n.f. 'sleeve')

d. N+N carricóche, m. 'rickshaw, covered wagon'
(carro, n.m. 'cart' + coche, n.m. 'car')

e. Head+Modifier[4] hierbabuéna 'mint'
(hierba, n.f. 'grass' + buena, adj.f. 'good')

f. Head+Modifier tiovívo 'merry-go-round, carousel'
tío, n.m. 'uncle' + vivo, adj.m. 'alive'

g. V+C lavaplátos, n.m. 'dishwasher
(lava, v. 3sg. 'washes' + platos, n.m.pl. 'plates')

h. V+C cuentagótas, n.m. 'eye-dropper'
(cuenta, v. 3sg. 'counts' + gotas, n.f.pl. 'drops')

(10) Left-headed or Postlexical Compounds:

a. N+N hómbre-aráña, m. 'spider-man'
(hombre, n.m. 'man' + araña, n.f. 'spider')

b. N+N fálda-pantalón, f. 'culotte'
(falda, n.f. 'skirt' + pantalón, n.m. 'pants')

c. N+N búque-escuéla 'training ship'
(buque, n.m. 'ship' + escuela, n.f. 'school')

d. N+N diós-héroe, m. 'hero-god'
(dios, n.m. 'god' + héroe, n.m. 'hero')

e. Head+Modifier tarjéta-vérde 'green card'
(tarjeta, n.f. 'card' + verde, adj.f. 'green')

f. Head+Modifier cárro-usádo 'used car'
(carro, n.m. 'car' + usado, adj.m. 'used')

g. V+C lávaplátos, n.m. 'dishwashing (chore)'
(lava, v. 3sg. 'washes' + platos, n.m.pl. 'plates')

h. V+C árma líos, n.m. 'trouble maker'
(arma, v. 3sg. 'starts, stirs up' + líos, n.m.pl. 'mess')

2.2. Semantic interpretation: On semantic grounds, postlexical compounds unanimously retain the meaning of the head which is on the left while lexical compounds may no longer contain a visible semantic head since lexical compounds may have acquired a non-compositional meaning. The right-headedness of lexical compounds and the left-hand headship of postlexical compounds are reflected by morphological processes such as gender assignment and suffixations of plural and diminutive morphemes.[5] For example, lexical compounds such as *musaraña* contrast sharply with postlexical compounds like

hombre-araña in that the right-hand member determines the overall gender of lexical compounds, e.g. ***una*** *musaráña* (****un*** *musaráña*), while the resulting gender of postlexical compounds follows that of the left-hand member, e.g. ***un*** *hómbre-aráña* (****una*** *hómbre-aráña*). Likewise, the plural marker attaches to the right edge in lexical compounds, e.g. *musaráña****s***[6] (**musesaráña*) but to the left-hand member in postlexical compounds, e.g. *hómbre****s****-aráña* (**hómbre-aráña****s***). Regarding diminutive formation, the diminutive suffix attaches in a similar contrasting fashion as well, e.g. *bocamanguíta* (**boquitamánga*) vs. *hombre****cíto****-aráña* (**hómbre-arañíta*).

2.3. Phonology of compounds: Turning to phonological distinctions, lexical compounds carry only one primary stress whereas postlexical compounds possess two, one on each composing constituent, as indicated by the prosodic accent marks, suggesting, thereby, that they should be treated as two phonological words. However, despite their double phonological word status, postlexical compounds like *timbre****s****-poste* are single morphological words since they undergo morphological processes as a coherent unit. Although Spanish speakers may have uncertainty in determining the locus of pluralization and diminutivization in postlexical compounds, as they may place a given morpheme on both members of the compounds (Wong-opasi 1987), the majority of speakers suffix the plural marker and the diminutive morpheme onto the left-hand member. In contrast, such options are not available in syntax since all pluralization and diminutivization is governed by syntactic principles and the semantics of each syntactic element. That is, *sofa****cito****-cama; sofá-cami****ta****; sofa****cito****-cami****ta*** are all interpreted as 'a little sofa-bed' while *perri****to*** *y gata* can only denote 'a little dog and a (regular) cat'. In the same vein, *perro y gati****ta*** just means 'a dog and a little cat'. The same is true for pluralization, i.e., *perro****s*** *y gata* is not equivalent to *perro y gata****s***. Consequently, words like *timbre****s****-poste* cannot be simplistically analyzed as syntactic phrases, as postulated by D&W.

Another morphophonological rule operative solely in the Spanish lexicon is the spelling out of the **terminal element** (TE) of a lexical item. All Spanish lexical entries can be claimed to contain an overt or null ending. For nonverb forms, the TE is the **word marker** (WM) containing such morphosyntactic features as N, V, A, etc., including gender for nouns and adjectives (but excluding the plural morpheme which follows the word marker). According to Harris 1985, Spanish WMs are floating morphemes which is realized by a morphophonological rule spelling out all and only the (universally) accessible WMs, namely-- only one WM for simple nouns, and two for compound lexical items. (11) illustrates the spelling out of only the last WM in simple derived lexical words.

(11) [sed) + **a**]$_N$ -> [sed)+ a]$_N$ os) + **o**]$_A$ -> [sed)+ a]$_N$ os) + o]$_A$ idad) + **0**]$_N$
'[silk)]$_N$' -> '[silk)]$_N$ y)]$_A$' -> '[silk)]$_N$ i)]$_A$ ness)]$_N$'

Wong-opasi 1987 proposes a uniform morphological structure for all Spanish lexical items[7]--verbs and nonverbs--as in (12) where the derivational stem(DS) can be the bare root morpheme or be affixed further by one or more derivational stems to derive new words and ends with a TE. (For verbs, the TE is the tense/mood/aspect morpheme, excluding the subsequent person/number marker which may be phonetically filled or zero as well.) (13) shows the morphological analysis of both verbal and nonverbal forms.

(12) [DS)$_1$ DS)$_2$ DS)$_n$ + TE]$_X$

(13)

Nonverbs:	Verbs:
[metál)$_{DS1}$ + °]$_N$	[habl)$_{DS1}$ á)$_{DSn}$ + **mos**]$_V$
[metál)$_{DS1}$ {ic})$_{DSn}$ + **o**]$_A$	[habl)$_{DS1}$ á)$_{DS2}$ {ba})$_{DSn}$ + **is**]$_V$
[metal)$_{DS1}$ íst)$_{DSn}$ + **a**]$_N$	[habl)$_{DS1}$ á)$_{DS2}$ r)$_{DSn}$ + °]$_V$
[metal)$_{DS1}$ ist)$_{DS2}$ erí)$_{DSn}$ + **a**]$_N$	[habl)$_{DS1}$ a)$_{DS2}$ r)$_{DS3}$ í{a})$_{DSn}$ + **n**]$_V$

With respect to WMs in compounds, certain lexical compounds are distinguished from postlexical compounds by the replacement of the internal WM with an *-i-* infix , e.g. *carricoche* (cf. (9d)) vs. * *carri-usado* (cf. (10f)); *verdinegro* 'dark green' (<-*verde*, adj.m. 'green' + *negro*, adj.m. 'black') vs. *(televisor) *blanquinegro* 'black and white (T.V. set)' (<-*blanco*, adj.m. 'white' + *y* 'and' + *negro,* adj.m. 'black'); *patituerto* 'bow-legged' (<-pat**a**, n.f. 'foot' +tuerto, adj.m. 'crooked'). Neither can the internal WM of lexical compounds be inflected for gender whereas such a restriction does not apply to postlexical compounds, e.g. **sordamud**a* (cf. *sordomuda*), adj.f. 'deaf-mute' vs. *sord**a** y tonta.* 'deaf and dumb'. Conversely, only postlexical compounds, but not lexical compounds, undergo postlexical phonological rules, formulated in accordance with Kiparsky's Structure Preservation Hypothesis which requires that rules creating allophones be operative only in the postlexicon. In effect, the aspiration of the phoneme [s] to yield [h], the velarization of the nasal [n], among other rules do not entail a change in meaning. For example, *dios*, pronounced as *dio[s]* or *dio[h]* equally denotes 'god'. Similarly, both *pa[n]* and *pa[œ]* mean 'bread'. Thus, we conclude that compounds exhibiting postlexical phonological phenomena are postlexical compounds whereas the absence thereof confirms the lexical status, e.g. postlexical compounds *dio[s]-(h)éroe* (initial *h-* is silent in Spanish)-> *dio[h]-éroe* vs. lexical compounds *mu[s]araña* -> **mu[h]araña*; and *pa[n] y queso* -> [*una merienda de*] *pa[œ] i queso* 'a bread and cheese snack' vs. *pa[n]iqueso* -> **pa[œ]iqueso* 'a kind of dish'.

3. Morpho-phono-syntactic interface in derivation:

3.1. Derivational vs. diminutive affixation: In D&W, lexical derivation is described as the addition of a category-changing suffix which produces a head-final structure and is purported to be correctly captured by the RHR. However, we have seen that neither the RHR nor Zwicky's morphological determinant criterion is obtained in the case of Spanish diminutive suffixation. Alternatively we would like to suggest treating lexical derivation and diminutive formation as distinct processes. The goals are, on the one hand, to find independent explantions for the "relativized head" phenomenon, and, on the other, to expand Zwicky's notion of morphosyntactic loci to include distinctions between inflection which exhibit word-internal concord as opposed to word-external agreement for a better description of WF in Spanish. That is, such morphosyntactic information as inherent gender must be separate from gender and number received from external morphosyntactic sources in so far as Spanish is concerned. The differentiation between derivational and diminutive suffixes is similar, but not limited, to Sproat's 1985 STEM-level vs. WORD-level affixation distinction.[8] On morphological grounds, we have seen in the preceding section that derivational suffixes are right-hand heads while the diminutive suffix and its variants generate head-initial structures. Also, initial headship in diminutives differs crucially from

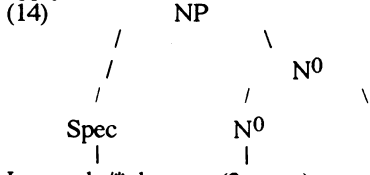
right-headed derivation in that derivational suffixes may alter both the category and the gender of the derived words, e.g. ***seda*** (n.**f.**) 'silk' -> ***sedoso*** (ad**j.m.**) 'silky' -> ***sedosidad*** (n.**f.**) 'silkiness' and neither the base nor the suffix trigger word-internal morphosyntactic concord whereas the diminutives must agree in gender with their base forms, e.g. ***chico*** (n.m.sg.) -> ***chiquito*** (dim.n.m.sg.) vs. ***chica*** (n.f.sg.)-> ***chiquita*** (dim.n.f.sg.). This finding counterclaims Zwicky's dismissal of relevance of determinant of concord in morphology. Moreover, while derivational suffixes have semantic correlates of semantic arguments, diminutive suffixes, on the other hand, do not change the semantic features of the head. The only semantic feature that the diminutive suffix carries is to modify the base, thereby, assuming the role of a semantic functor. Thus, the structure and the relations between the left-element and the diminutive suffix are those of the Head+Modifier, in an order parallel to regular Head+Modifier sequence in Spanish noun phrases. The only parallelism between derivational and diminutive suffixes is that diminutives pattern like derivational suffixes in locating the external gender (and number) marker(s) on the rightmost elements, e.g. ***poco(s)*** (adj.m.sg.,pl.) -> ***poquito(s)*** (dim.adj.m.sg.,pl.) vs. ***poca(s)*** (adj.f.sg.,pl.) -> ***poquita(s)*** (dim.adj.f.sg.,pl.).

On phonological grounds, we find that derivational affixes attach to stems whereas diminutive suffixes only affix onto word bases and never to a stem. The criteria distinguishing a STEM-base from a WORD-base include two phonological rules. At the stem-level or within the derivational domain in Lexical Phonology's terms, we find alternations between vowels and diphthongs (i.e. [e] -> [ye] and [o] -> [we]). Such alternations are conditioned by stress on the vowel. In effect, alternating mid vowels are diphthongized when stressed, e.g. the stem ***herb)*** -> [***hyérb)*** *+a*] 'grass' (n.f.) vs. -> [***herb)*** *ós) +o*] 'grassy' (adj.) which can be derived further -> [***herb)*** *os) idád)+0*] 'grassiness' (n.f.); the stem ***cont)*** -> [***cwént)*** *+ o*] 'story' (n.m.) or -> [***cwént)*** *+ a*] 'account' (n.f.) vs. -> [***cont)*** *á) r)+0*] 'count, tell' (v.) -> or [***cont)*** *ábl)+e*] 'countable' (adj.) and further derivation -> [***cont)*** *abil) idád)* *+ 0*] 'accounting' (n.f.). On the contrary, the diminutive suffix is added **after** words are derived. Therefore, it follows that when the base forms which have undergone diphthongization are diminutivized, the diphthongizing effect is carried over even when the vowel in question is no longer in stressed position, e.g. [***hyérb)*** *+a*] 'grass' (n.f.) -> [***hyerb)*** *+ecít)* *+ a*] 'little grass' (dim.n.f.); [***cwént)*** *+ o*] 'story' (n.m.) ->[***cwent)*** *ecít)* *+ o*] 'story' (dim.n.m.); [***cwént)*** *+ a*] 'account' (n.f.) -> [***cwent)*** *ecít)* *+ a*] 'account' (dim.n.f.). Another phonological process which differentiates stems from words is the desyllabification of a high vowel at the edge of a stem during lexical derivation, when it is unstressed (i.e. [i] -> [y] and [u] -> [w]) as in [***Perú)*** *+ 0*] 'Peru' -> [***perw)*** *án)* *+ o*] 'Peruvian'. However, these high vowels never desyllabify at the edge preceding the diminutive suffix, e.g. [***rí)*** *+ o*] 'river'-> [***ri)*** *ít)* *+ o*] 'small river'. Furthermore, diminutive suffixes are unlike derivational suffixes in that the former, but not the latter, have a more predictable correspondence between the gender and the vocalic shape of the final morpheme. That is, diminutives have a fixed two-way gender distinction with **-o** predominantly indicating the masculine gender while **-a** signals feminine lexical items.[9] Derivational suffixes, in contrast, are more idiosyncratic in allowing an optimal number of 3 genders:--masculine, feminine, and neuter, unpredictable from the phonetic shape of the final vowels, e.g. ***lino***, **m.** 'flax vs. ***mano***, **f.** 'hand' vs. ***esto***, **ntr.** (demonstrative pronoun) 'this (matter, stuff)'; ***poeta***, **m.** 'poet' vs.

plata, **f.**; *padre*, **m.** 'father' vs. *madre*, **f.** 'mother'; *marroquí*, **m.**, **f.** 'Morrocan'; *tabú*, **m.** 'taboo' vs. *tribu*, **f.** 'tribe'. Suffixes ending with a consonant also show similar idiosyncrasies.

3.2. Derivation of specifiers: Last, but not least, the derivation of the whole class of Spanish specifiers which include determiners, quantifiers, and certain adjectives in the Specifier position is shown to reflect a morpho-phono-syntax interface. (Wong-opasi 1991).The allomorphic variants of specifiers such as the definite article *el, la, los, las* for m.sg., f.sg., m.pl., and f.pl., in that order, plus the neuter form *lo* as well as strong pronouns and clitics are argued to be derivable from a single source. Of interest here is that one can debate whether these allomorphs should be listed in the lexicon and are associated with lexical items by morpholexical rules. However, the clear distinction between the masculine definite article *el* and its neuter counterpart *lo* and the applicability and nonapplicability of the rule that changes the feminine definite article *la* to *el* in front of a stress [á] can only be explained on the basis of interactive morpho-phono-syntactic processes during WF, and not accountable for by Zwicky's 1985a "referral rules". Specifically, *lo* is the derived masculine singular form in front of an underlyingly null head of a noun or noun phrase. While the presence of an underlying head yields *el* as a result of apocope which elides the final [o] and the epenthesis of the default vowel [e] to compensate for lack of syllabicity after apocope. The apparent switch in form (*la-> el*), due to a vowel truncation rule which deletes the final [a] preceding a f.sg. head of a noun or noun phrase and beginning with a stressed [á] and a subsequent [e] epenthesis, occurs without affecting the inherent feminine gender of the base form, i.e. *el* is still used in the context requiring a f.sg.def.art. (*el alma* (n.f.sg.)). The postulation of an underlying head N is supported by an identical head deletion phenomenon in noun phrases. The suppression of overt heads is effected by coindexing the features such as [CASE, NUMBER, GENDER] of the heads onto the determiners. (14) shows the morpho-syntactic structure for these two morpho-phonological rules to apply.

(14)

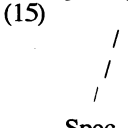


I.	a.	lo/*el	**pro** (3 sg.m.)	maravilloso (A)/maravilloso y puro (AP)
	b.	el/*lo	**chico** (m.sg.) 'guy'	maravilloso (A)/maravilloso y puro (AP)
	c.	la/*el	**chica** (f.sg.) 'girl'	álta (A) 'tall/high'/ álta y religiosa (AP)
	d.	el/*la	**álma** (f.sg.) 'soul'	(pura) (A) /(pura y generosa) (AP)
	e.	la/*el	**álma** (f.sg.) 'soul'	álta (A) 'tall/high'/ álta y religiosa (AP)
	f.	los/las	**chicos/-as** (m./f.pl.)	áltos/-as / áltos/-as y religiosos/-as
II.	g.	el	**vaso** (m.sg.) 'glass'	lleno de agua (AP) 'filled with water'
	h.	la	**chica** (f.sg.) 'girl'	de uñas rojas (PP) 'with red nails'
	i.	los/las	**turistas** (m./f.pl.)	que llegaron (S) 'who arrived'
			|/	
			e	

4. The autonomy of morphology in phrasal compounds: Contrary to Contreras 1987, I propose that V+C compounds have an underlying head which can be deleted from the surface or left intact. Examples with filled heads are taken

from newsbroadcasts from Spain (via SCOLA):-- *la **máquina** quitanieve* (the machine removes-snow) 'snow-plow' and *la **ministra** portavoz* (the ministress carries-voice) 'spokeswoman minister'. The head deletion is licensed by feature coindexation between the deleted heads and the determiners in essentially the same way as head deletion discussed above. Similarly, Contreras 1987 has proven that determiners in Spanish, but not English, are functional heads which license the absence of the heads of an NP. Given this distinction, it follows that the V+C compounds are less productive in English. It also accounts for the ungrammaticality of deleting the head nouns in Thai phrasal compounds despite the fact that Thai is a pro-drop language, e.g. **khr$^œ** la&aœ caan (machine wash dish) 'dishwasher' -> *la&aœ caan. The head-omission option is excluded in Thai due to the lack of determiners in Thai in the general sense and as functional heads. Finally, postulation of a surface deleted head is the most effective solution to account for the lack of internal agreement in compounds like *patituerto* (e leg-crooked) 'bow-legged man'. On the assumption that the ***-i*** infix replaces the internal word marker of these compounds, thereby erasing the inherent gender of the base noun and enabling it to be encoded with the morphological features of the null head. Consequently, we can extend the unified structure in (14) to Romance V+C compounds and Spanish surface headless compounds. Thus, V+C compounds with gender variants like *el/la limpiabotas* (e cleans+boots) 'shoe-shine (boy/girl)' as well as headless compounds such as *el/la patituerto/-a* 'bow-legged (man, woman)' plus the choice of definite articles are accounted for by the same principles.

(15)



a.	*lo	**pro**	limpia+botas	(correctly ruled out as ill-formed)
b.	el/la	**chico/-a**	limpia+botas	'shoe-shine boy/girl'
c.	el/la	**chico/-a**	árma+líos	'trouble maker'
d.	el/la	**chico/-a**	pati+tuerto/-a	'bow-legged man/woman'
e.	el/la	**chico/-a**	sordo+mudo/-a	'deaf-mute'
f.	los/las	**chicos/-as**	sordo+mudo/-as	'deaf-mute'
		|/		
		e		

Despite the syntactic origin of these compounds, the fact that inflectional morphemes appear on the right edge only lends very strong support to the morphological status of these constructs since all WF must precede inflection as shown in Diagram 1 (Kiparsky 1982; Zwicky 1985; Wong-opasi 1987).

5. A "modular" approach to word formation via a revised model of Lexical Phonology and Morphology: Wong-opasi (1987, 1991, in preparation) and Shibatani & Kageyama 1988 independently advanced a theory of word formation across the three major linguistic modules, namely--the morphological, the phonological, and the syntactic components. Diagram 1, a revised model of Lexical Phonology, demonstrates the interactions between the three linguistic components. Specifically, not all derivational processes are limited to the confinement of the lexical component. In the same fashion, neither is

compounding found exclusively in the lexical or postlexical components. Moreover, historical data, e.g. *un no-sé-qué* 'a je ne sais quoi' (cf. details in Wong-opasi 1987); (Italian) *un nonsoche* (Zuffi 1981: 23) as well as recursion of compounding and further affixation on fully-lexicalized composite forms are allowed in our modular model of word formation. I find examples of recursion such as *limpiaparabrisas* (cleans-stops-winds) 'windshield-wiper', a compound on a composite V+C base form *parabrisas* (stops-winds) 'windshield'; su gente-buitre-come-entrañas (his/her people-vulture-eat(s)-bowels) (Vallbona 1982: 17), which mirrors superimposed N+N and V+C structures; affixation on compounds: *paracaídas* (stops-falls) 'parachute'-> ***paracaidista*** 'parachutist'. Finally, the "relativized head" and the "featural atomic head" of V+C compounds are accounted for by the overlapping effects of morphology, phonology, and syntax in WF. These generalizations are inevitably missed in an exclusivist lexicalist or nonlexicalist theory of D&W and Lieber, respectively.

6. Conclusion and direction for future research: I have proposed, in this study, a modular approach to account for various aspects of word construction and illustrated how the proposal can be accommodated by the universal theory. That is, the generalized X-bar schema can be revised to license both single lexical words and phrasal strings as base forms for WF and to permit recursion at the lexical level while the directionality of the head of a lexical item follows the parametric settings for individual languages. I found that Spanish is head-final in the morphological component which is consistent with Spanish language-specific morphological criteria while left-headedness follows Spanish syntactic principles. The mixed head parameter in Spanish compounds is due to interactions between morphological, phonological, and syntactic properties as expected when WF involves materials from more than one module. Recursion that brings syntactic WF processes back into the lexicon is facilitated by the lexicalization process through time with and without concomitant sound change, resulting in the opacity in the internal structure of lexicalized words. Synchronic WF principles are most evident in erroneous translation, e.g. an English head-final compound such as ***dealer's maintenance*** is interpreted as having an initial head by speakers with less exposure to English and is rendered as * ***el dealer*** *de mantenimiento* instead of the correct ***el mantenimiento*** *de dealer*. It is my hope that the theory of Lexical Phonology is complemented by a thorough study on interventions from syntax, in addition to morphology and phonology, during word formation in this paper. Additionally, along this line of proposals, Shibatani & Kageyama 1988 postulate four characteristic properties which mark postlexical/postsyntactic compounds, from lexical compounds, namely:--referentiality, non-registry, semantic compositionality, and lack of lexical status. Although the last three criteria seem to hold in our analysis of word formation, particularly in Romance and Thai, I would like to add that natural languages may differ in the degrees of conformity to these four criteria, and further studies are encouraged to refine the proposals. For example: the referentiality criterion may apply to only Japanese postsyntactic compounds while Thai lexical compounds are found to violate the anaphoric islandhood, with the use of an empty category (instead of an overt pronoun) to refer to part of a compound, i.e. 'tea' in 'teapot', as in. *kha§w*$_i$ *yo&k* ***kaa+na&m+chaa***$_j$ *kh$^n l£&£w* e_i*thee* e_j*loœ nay thu^ay* (he_i lift pot+water+tea_j up then e_i pour e_j down in cup) 'he lifted the teapot and poured (it) into the cup'.

Notes

[1] An earlier version of the present study was presented at BLS. I wish to thank Michael Kenstowicz, Dieter Wanner, and Hye Suk James Yoon for their insightful comments. Special gratitude goes to Chin-Woo Kim, Jerry Morgan, H-S James Yoon, the Advisory Committee of the UIUC Dept. of Linguistics, and Kevin F. Miller for their support during the writing of this article. Also, thanks to W. Curtis Blaylock for editing an earlier version of this paper. All errors of interpretation are the author's.

[2] Left-headedness in English is pointed out in Lieber (1988: 214). The prefix *en-* creates verbs from nouns and adjectives, e.g. ***en**case, **en**rage, **en**able, **en**dear, etc.*, though *en-* prefixation is an unproductive WF process in current English.

[3] The etymology of *aspaviento* is disputed in two sources. According to the *Diccionario etimológico de la Real Academia Española* (1983: 141), it is derived from the infinitive *aspaventar*, (from Latin **expaventa:re*, which in turn, is from *expa:vens, -entis*, meaning, 'one who fears'). Corominas (1981: 381), in contrast, claims an Italian origin, i.e. It. *spavento* -> Old Sp. *espaviento* -> Modern Sp. *aspaviento* 'exaggerated gestures or feelings'. The Italian *spavento* also gives rise to Modern Sp. *espanto* 'fear' and is derived from inf. *spaventare* yielding Sp. inf. *espantar* 'to fear'. The change of the initial vowel from *e-* to *a-* was said to be contaminated by the Spanish infinitive *aspar* 'to torment', the form which caused reinterpretaion in Spanish as a compound of *aspa+viento* (with the first element taken as meaning the hand of a windmill).

[4] The reversed order is more rare. Examples are *gentilhombre* 'gentle-man', (from *gentil+hombre*, equivalently 'gentle+man'); *buenaventura* 'good luck' (from *buena+aventura*, lit. 'good+adventure/daring enterprise'). These compounds have the structures: Adj.+N alongside *bienvenida* 'welcome' (from *bien* (adv.) *+venida* (n.f.), lit. 'well+coming'), and Adv.+N/Inf. such as *bienestar* 'well-being, welfare', among others.

[5] Apart from the diminutive suffix *-(e(c))itV*, and such regional variants as *-ikV; -ín/a,* we also find augmentative suffixes, e.g. *-ote/a; -ón/a,* with the same morphological and phonological behaviors. In Wong-opasi 1987, the covered term employed for word-level suffixation of this nature is "productive formation".

[6] The correct gender and number assignment is confirmed by the use of the word in the feminine plural form to mean 'foggy illusions' as in *mirar a las musarañas* (coll) to stare vacantly (literally, to look at foggy illusions)' (Williams 1986: 243).

[7] The morphological plane is given in this form, following Wong-opasi 1987, primarily for the purpose of stress assignment where prefixation is permitted, although it plays no role in stress placement since stress is predictably allocated on the last syllable of the rightmost derivational stem, unless the said syllable is lexically marked as extrametrical, as shown here in curly brackets.

[8] Wong-opasi 1987 argues for more-constrained distinctions between stem- and word-level affixations than the one Sproat proposed. That is, the lexicon of Spanish is stratified into the Derivation, Compounding, Productive Formation (including Diminutives), and Pluralization strata (cf.Diagram 1). The diminutives exhibit word-level suffixation behaviors despite their apparent single WM which might suggest a stem-level process (see also Wong-opasi (1992)).

[9] Exceptions to this generalization are also predictable. Diminutives inherit the idiosyncrasies of the base derivational forms in two systematic ways. Either

retaining the gender and the final vowel of the base, e.g. *poema*, **m.** -> *poemita*, **m.**, e.g. *radio*, **f.** -> *radiecita*, **f.**; *mano*, **f.** -> *manito*, **f.**, or the gender alone, e.g. *mano*, **f.** -> *manita*, **f.**

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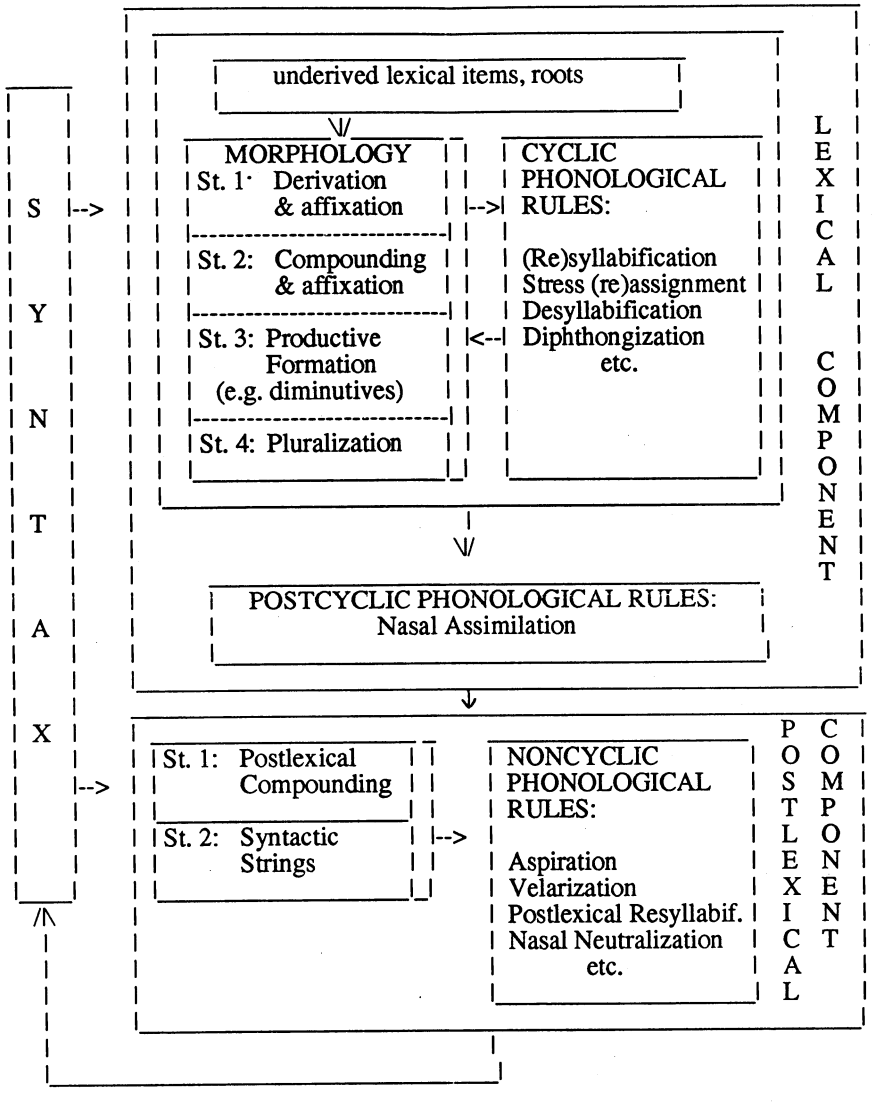


Diagram 1: Revised Model of Lexical Phonology

PAPER REPRINTED FROM

BLS 17
PARASESSION

ON
THE GRAMMAR OF
EVENT STRUCTURE

DUE TO EDITORIAL OVERSIGHTS, THE VERSION OF MICHELE EMANATIAN'S PAPER WHICH APPEARED IN BLS 17 LACKED CRUCIAL PHONETIC SYMBOLS. THIS IS A CORRECTED AND UPDATED VERSION OF THAT PAPER. WE APOLOGIZE FOR ANY CONFUSION THIS MAY HAVE CAUSED.

Point of View & Prospective Aspect

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0. Introduction

Speaker point of view (vantage point, perspective) is known to be important in a variety of linguistic phenomena. It seems reasonable to assume that taking alternate points of view is a basic cognitive ability. In Chafe's words, "people are able to imagine themselves seeing the world through the eyes of others as well as from their own point of view, and...this ability has an effect on the use of language" (1976:54).

We know, from Talmy's and Langacker's work, that vantage point is central to the meanings of many relational expressions, such as in front of and after (Talmy 1978/88, 1983; Langacker 1987). Whether I say

(1) The bong is behind the lava lamp. or
The lava lamp is behind the bong.

depends on, among other things, my vantage point in the room.

Shifts in point of view account for non-canonical choices of deictic elements in utterances about location or motion (Fillmore 1975; Traugott 1978). Either of the following sentences is felicitous when uttered by a speaker located in Berkeley addressing someone in Boston over the phone:

(2) So, I'm going to New York next week.
So, I'm coming to New York next week.

Certainly the 'going' sentence is the unmarked one, but the 'coming' sentence is acceptable when the viewpoint taken is the addressee's (or perhaps the speaker's own future vantage point).

Languages apparently vary in where speakers can shift their point of view to the addressee's. Bátori (1982) reports that in several instances where English and German require or at least allow a shift to the addressee's perspective, Hungarian requires that the speaker perspective be maintained. (3) lists English renderings of 3 Hungarian examples: the speaker's vantage point stays anchored to his location in space.

(3) Hungarian

a. J: Come here!
K: I'm going!

b. J: When do you come?
K: I can't go before 8:00.

c. J: Bring the lamp here!
K: I take it. (Bátori 1982)

The perspective assumed needn't be that of either speaker or hearer, of course. Fillmore 1975 describes appropriateness conditions for establishing or assuming various perspectives in discourse. For instance, come may be used in expressions of accompaniment, such as in

(4) I'll come with you. ,
where speaker viewpoint has been dislocated to the destination or endpoint of the motion (that is, providing the speaker and addressee are making the same trip) (cf. Radden 1988).

A speaker can take the perspective of a participant in a communicative act she's referring to, as when I say
(5) She called Alvie in the middle of the night to come over and kill a spider.
Here I've taken the perspective of the desperate caller in the communicative act I'm reporting on; hence, the use of come.

Another possibility open to a speaker is to assume the point of view of, in Fillmore's terms, "the subject-of-consciousness identified via ... an 'inner world' predicator of the type THINK, WONDER, WISH, etc." (1975:377-78; cf. Rubba 1989). In the sentence
(6) Mark's probably thinkin' the package'll never come.
the speaker takes the point of view of Mark, the cogitator she's speculating about. As Fillmore points out, this is akin to the relative freedom a narrator has to select a point of view in "pure 3rd-person discourse". Witness the difference between
(7) The men came into her bedroom. and
The men entered her bedroom. (Fillmore 1975:377)
The occurrence of come in the first sentence shows that the narrator's "focus of empathy" (Kuno 1976) is with the woman whose bedroom was entered.

Talmy (1986) discusses the Yiddish Historical Present as a case of "de-coupling" of the speaker's vantage point from the *temporal* deictic center: it is a "presentation of the event as it would appear to a viewer concurrently on the scene of the event"; that is, the speaker's perspective moves back in time.

Banfield (1982) has shown in depth that a writer's point of view and related degree of empathy may affect formal characteristics of a literary work, notably the distribution of tense-aspect forms.

Reinhart's essay on point of view in parentheticals (1983) shows that whether the point of view taken is the speaker's or the subject's can have an impact on the formal, semantic, and pragmatic properties of the parenthetical.

Speakers are able to detach their perspective from its natural location in the speech event, to the point where they themselves are objects of conceptualization. When a mother says to her kid
(8) Don't lie to your mother!
we have an example of what Langacker (1987) calls "mental transfer": the speaker dissociates herself from her actual perspective point as a Speech Act Participant, to some other location, for expressive purposes.

Notice that for some of these examples the term "viewpoint" is being used metaphorically - we aren't talking about motion or location anymore (cf. DeLancey 1981). In fact, a range of things is meant by terms like "point of view" and "perspective"; I will not attempt a unified characterization here.

Viewpoint is a determining factor in the selection of voice and in so-

called inverse-person marking (DeLancey 1981; Van Oosten 1984), and in the contrast between proximate and obviative in languages with deictic 4th-person systems (Foley & Van Valin 1984). DeLancey argues that the "Empathy (or Animacy) Hierarchy can be interpreted in terms of relative eligibility for viewpoint placement" (1981:645). Thus

(9) A woman was struck by lightning. is more natural than
Lightning struck a woman.

The subject position is the position of natural viewpoint in English, all else being equal. But in the second sentence it is the object NP which is higher on the Hierarchy, and therefore the best candidate for empathy focus by that criterion. Therefore in this case the active sentence requires more context to make it plausible.

The present paper adds to the catalog of ways in which point of view is linguistically significant. In the situation I describe, flexibility of speaker perspective is part of what enables deictic motion verbs to be used metaphorically to express future-like meaning; and that, in turn, is part of what is allowing grammaticalization to prospective aspect to take place.

The paper describes the semantic changes that the Chagga verbs 'go' and 'come' are undergoing as they are increasingly employed to talk about future events. I explore budding aspectual uses of these verbs as they occur in what I call "the infinitival complement construction". My focus is on the relationship between the aspectual and motion interpretations of the construction, a relationship which is transparently metaphorical. I propose that:

a) the metaphorical uses of these verbs establish a connection between the present situation and some future happening, and thereby instantiate the meaning "prospective aspect"; however, grammatical status as aspect markers has not yet been attained;

b) the seeming anomaly of a verb meaning 'come' acquiring future-like semantics is *not* an anomaly, given the deictic properties of such a verb, namely, its allowing a shift in speaker perspective; and

c) the near-aspectual use of both 'go' and 'come' can be accounted for with a single, simple conceptualization of temporal relations, the "moving-ego model".

1. Chagga 'come' and 'go'

In this section I present a brief and oversimplified sketch of 'go' and 'come' in Chagga.[1] (10) is an example of ienda 'to go to' in the infinitival complement construction:

(10) lukóshika fúlí
SM.1pl-COND-arrive-IND (season)

núúndeɻino
nu-i-enda-i-ɻin-w-a
FOC.SM.2sg-PROG-go.to-INF-circumcise-PASS-IND

'When fuli comes, you're going to be circumcised.'
(lit., when we arrive at fuli,...)

This construction can express physical motion through space, but also allows an interpretation whereby the event encoded by the complement verb of -enda (the verb in the "infinitive"[2], -ino 'be circumcised') takes place in the future relative to the time of going, and no actual motion takes place. Likewise (11) is an example of this use of icha 'to come'.

(11) ni í'ndí ú'chéngíkoɽíá mmbe ?
u-i-cha-i-ngi-koɽ-i-a (term of respect
COP when SM.2sg-PROG-come-INF for older male)
-OM.1sg-cook-APPL-IND
'When are you gonna cook for me, Gramps?'
(lit., when are you coming to cook for me?)

(11) similarly could have either a motion interpretation, or a future-like interpretation, of metaphorical "motion".

Ienda and icha are basic motion verbs, used all the time to express physical motion through space. This use is exemplified in the simplex sentences given in (12) and (13). Motion is directed to or from physical locations or entities located in space, encoded as NPs or locational adverbs.

(12) basí ngá'méní ngaenda
well morning-LOC SM.1sg.CONSEC-go.to-IND

shuúlé ngakoóya mshíki óko
school SM.1sg.CONSEC-find-IND sister my

'Then in the morning I went to school and found my sister.'

(13) káchá wá'kákeehá
SM.3sg.CONSEC-come-IND SM.3pl-CONSEC-stay-IND-here

dyúma tsiwi kámɻâ
week two SM.3sg.CONSEC-OM.3sg-leave-IND

'(and then) he came, and they stayed here for two weeks, and then she left him.'

In the infinitival complement construction, as in (10) and (11), the two verbs take action and state predicates in the infinitive as 'goal' complements. The i- infinitive marker coalesces with the final vowels of -enda and -cha, and the stem-initial e of -enda is lost, giving the forms -nde- and -che-.

As mentioned, examples like (10) and (11) can express motion through space on the part of the subject, or not. (11), for instance, can be a question

about when the addressee will travel to where the speaker is (or will be) and then proceed to cook for her. Or, it can be a question about - in fact, this is what it was about when it was uttered - when it will come to pass that the addressee (who already is located where the speaker is) will cook for the speaker. This interpretation, of course, involves no actual coming.

Without -enda, (10) would be 'When we arrive at fuli, you are circumcised', which is not a viable Chagga sentence. (11) without -cha is still coherent. It would mean 'When are you cooking for me?', which is also a question about the future (as it is in English), but about the very near future, or the "stretched present", as one of my informants put it. With -cha (i.e., 11) the passing of time is emphasized. (14) is offered to show that the presence or absence of -che- or -nde- can have truth-conditional effects.

(14) a. káendelea inyo wárí
SM.3sg.CONSEC-continue-IND INF-drink beer

kuɲo naí'chépfa
that way FOC.SM.3sg-PROG-come-INF-die-IND

'If he continues drinking that way, he's gonna die.'
(lit., ...he's coming to die)

b. naípfa
FOC.SM.3sg-PROG-die-IND
'He's dying.'

With -nde- or -che- sentences like (10), (11) and (14) get a future-like meaning: the action or state expressed by the complement verb is understood as unrealized and is expected to happen after the moment of speech.

Strictly speaking -nde- and -che- do not mark futurity. Their appearance in an infinitival complement construction with the Progressive does not make the utterance an assertion or prediction about the complement clause event or situation occurring in the future. Instead utterances like this are used to assert that the subject of 'come' or 'go' is *at present on a certain path* which, if followed, potentially leads to a certain state of affairs in the future. This, of course, is spatio-temporal metaphor, the means by which -nde- and -che- conventionally implicate 'future' meaning in this construction.

The non-motion meanings that -nde- and -che- express in this construction strongly resemble what Fleischman has called "prospective aspect", or prospection (cf. Comrie 1976). Prospective aspect is a future-oriented type of present relevance, a subjective psychological linking of a future event to the present.

(15) "the future action or event...is viewed by the speaker as growing out of or somehow related to the present world state" (Fleischman 1982a:96). Prospective aspect is a "[way] of viewing an event in which a non-chronological or not primarily chronological connection is established between the event and the reference point, in the case of 'present' relevance, between the event and 'now'" (Fleischman 1983:192).

The meanings of -che- and -nde- examples in the Progressive correspond closely to this concept of future-oriented present relevance. (16), for instance, is a statement about some kids' increasing tolerance for vegetables. It is the speaker's judgment of the kids' present trajectory toward a state of liking (to eat) vegetables. It is a statement about a present situation which holds potential for a possible future situation.

(16) waí'chéshíkúnda
FOC.SM.3pl-PROG-come-INF-OM.8-like/INCHO
'They're coming to like them.'

At this point in time, this construction is transparent to Chagga speakers - they recognize -nde- and -che- as 'go' and 'come'. But the whole complex of phonological and morphosyntactic properties (see Emanatian forthcoming) indicates that -nde- and -che- are neither fully lexical nor fully grammatical, but somewhere in-between. A number of factors are conspiring toward the re-analysis of -enda and -cha as grammatical markers of prospective aspect - *in this construction*. It wouldn't be surprising if they continued developing into full-fledged aspectuals and maybe eventually into grammatical 'futures'.[3]

2. The Anomaly of 'Come' Acquiring FUTURE Semantics

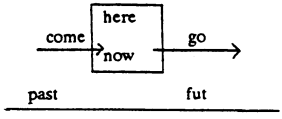
It is interesting that in Chagga both verbs, which after all are opposite in their direction of motion relative to deictic center, are acquiring future-like semantics. 'Come', for motion towards the deictic center, has acquired a past tense meaning in various languages (e.g., French), but in others (e.g., Sicilian), a future meaning. 'Go', for motion away from the deictic center, has acquired a future meaning in some languages (e.g., Spanish), while in others (e.g., Catalan), it has developed a past meaning (Fleischman 1982b, 1983; Bybee, Pagliuca & Perkins 1988ms). There are some languages in which both 'go' and 'come' have become grammatical markers of futurity; for example, Lotuko, a Nilotic language of Sudan (Heine & Reh 1984).

How is it that both verbs can come to mean 'future', when only 'go' is for motion *away from* the here and now? In other words, a 'come' future looks odd: if events proceed from past, to present, to future, how can 'come' be used to express metaphorical motion away from now, toward the future, when its basic use is for physical motion *toward* the deictic center?

Fleischman (1982b) offers an answer. She argues that 'come' futures and 'go' futures each involve a different "model" of temporal relations. 'Go'

involves a "moving-ego" model, where we actors move into the future, which is a stationary medium; see Figure 1.

Figure 1



Moving-Ego Model

Figure 2



Moving-Time Model

(based on Fleischman 1982b)

'Come' involves an alternative model, of "moving-time", as in Figure 2; in this model, the future moves, toward us, anchored at the present moment. This seems to be a reasonable and elegant solution to the puzzle, particularly since the two models have linguistic manifestations beyond grammatical futures from 'go' or 'come'. For instance, as many people have noted, English has expressions like in the weeks to come, in which the future moves, in addition to expressions like as we approach the turn of the century, which is based in the "moving-ego" model. There are similar examples from Spanish: de aquí en adelante 'from now/here to ahead' (i.e., 'henceforth') vs. en los tiempos venideros 'in time to come'.

It is not clear however that this hypothesis actually works for grammatical futurity.[4] It does not in any case account for the polysemy of 'come' in Chagga. I have a different proposal, which uses only the "moving-ego" model for both verbs, plus a shift in speaker vantage point with 'come'. What I'd like to argue is that in this construction 'come' *and* 'go' may implicate a 'future' interpretation of their complement verb through metaphor; specifically, by expressing present "motion" of the actor on a path of events through time, directed toward the future. This, of course, is the "moving-ego" model.

With -nde- 'go to', movement is directed away from the deictic center, which, temporally, is the moment of speaking. The subject "moves" along a conceived time line, from the present toward the future. Example (17) for instance, is a statement about the subject's present motion toward a future state, death.

(17)	mndu	chu	naindelupfiia
			na-i-enda-i-lu-pfi-i-a
	person	this	FOC.SM.3sg-PROG-go.to-INF
			-OM.1pl-die-APPL-IND

'This person is going to die on us.'

Figure 3 is a graphic representation of the metaphorical temporal use of -nde- for cases where it occurs with the Progressive (as it does in 17).

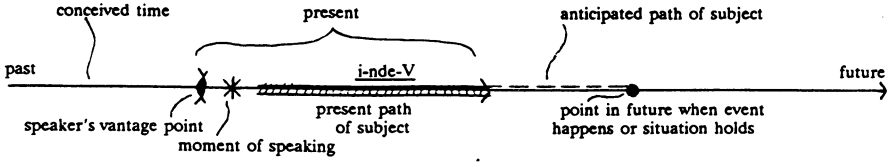


Figure 3: i-nde- 'PROG-go.to'

The viewpoint of the speaker is anchored to the speech event. The speaker, as we can see from her utterance, conceives the subject as moving away from her, heading toward the future. -nde- can be used as long as the subject's location is anywhere along a path between present location (now) and the time in the future when the proposition will be true. The subject's further motion along the path must be anticipated, and the path itself must be projected to end at or pass through a point where the situation expressed by the complement verb will hold.

-che-, as we have seen, can also indicate futurity through metaphorical motion. In the metaphorical reading of (16), the subject referents are moving toward some point in time, after the moment of speech, when it will be the case that they like vegetables if they continue on their present course. 'Come' of course expresses movement toward the deictic center. For -che- to have this future-like interpretation, it is necessary to conceive the speaker's perspective to be at some point in the future. The point that the subject referent 'comes' toward is the point at which the proposition expressed by the complement will be true. In other words, I am claiming that in examples like (16), the speaker's viewpoint is shifted toward the future, and no longer coincides with the default, the deictic center. The speaker takes the perspective of someone located in the future, observing the subject's progress, 'coming to' that point where they will like vegetables.

In Figure 4, which depicts cases of -che- with the PROG, the speaker's viewpoint is coupled to that future location (or point in time) where the proposition is realized.

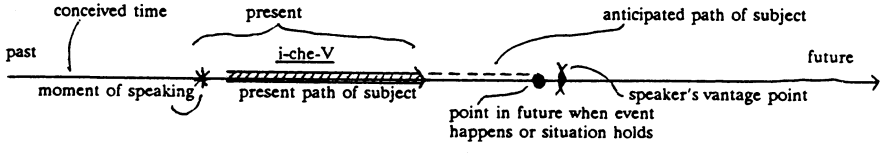


Figure 4: i-che- 'PROG-come.to'

The subject is conceived as moving *toward* the speaker, which is to say, *toward* that future realization point: in (16) it is the 3rd p pl (human) subject that 'comes'.

In other words, I am saying it is **not** the case that the temporal use of Chagga 'come' has as its basis the "moving-time" model, of Figure 2.

Several examples show that it is not time that comes toward the speaker, but rather the subject who does the moving. In (18), the mover, the subject of -cha 'come', is 'I', as indicated by the 1st p sg subject marker prefix on the verb ngilechemwia.

(18) lakíní máa kúɲó ngí'léchémwíá
but even that way FOC.SM.1sg-P.PFTV-come-INF
-OM.3sg-tell-IND

kwámbá rédíóɲ kúkékáa mndú pfo
that radio-LOC SM.17-CONT-stay-IND person NEG

'But even so I came to tell him that there were no people in the radio.'

(See also 10, 11, & 16.) It is not the future that moves. Instead, 'come', like 'go', involves the conceptualization captured by the "moving-ego" model, but unlike 'go' also utilizes a shifted speaker perspective. Perspectival shifting is common in Chagga speech about *physical* motion events. In the infinitival complement construction with -che- we see the potential shiftability which is characteristic of deictic verbs of motion carrying over to the metaphorical domain of events in time.

3. Summary

I have presented a snapshot view of a change in progress. Looking at morphemes which are 'on the verge' of becoming grammatical allows us to make deeper semantic observations than are usually offered in the grammaticalization literature. There is abundant evidence that using language entails taking a point of view, and that the location of that point of view has linguistic significance. The use of Chagga motion verbs to conventionally implicate 'future' takes place through metaphor: the expression of an actor's present 'motion' on some path potentially leads to a certain event or state. "Prospective aspect" is an appropriate label for this linking between possible future event and present situation holding potential for that event. Yet -nde- and -che- do not have grammatical status as aspectuals. Both -nde- and -che- predicate metaphorical motion of their *subjects*. 'Go' does this straightforwardly, but 'come' in Chagga requires a shift in speaker's vantage point, away from the default case of deictic center. On the shifting account, it becomes unnecessary to attribute the temporal uses of 'go' and 'come' to two different models of temporal relations.

Finally, this story sheds some light on the nature of semantic change in the grammaticalization of tense-aspect. In a recent study about where grammatical markers of futurity come from, Bybee, Pagliuca & Perkins (1988ms) find that cross-linguistically, motion verbs are the most common lexical origin of futures. They observe that in such verbs the meaning element 'movement' in itself is not enough to support development into a grammatical future. 'Movement towards' is indispensable for the semantic change to take

place (non-perfective aspect of the source construction has also been identified as necessary). A striking pattern in their data is that, of all the conceivable motion verbs that meet this criterion (like 'arrive at', 'enter', 'move to', 'approach'), by far the most common sources of futures are 'go' and 'come'. Of course these are basic verbs, and extremely common in their spatial uses. Another feature which distinguishes them from these other verbs is that they are deictic. Why should it be that among motion verbs, it is the deictic verbs that are the most common sources of futures?

The Chagga situation presents us with a clue. The fact that the motion is deictically anchored gives a single point of location in both space and time. And this provides a take-off point for metaphorical usage. Perhaps more importantly, deictic elements have the unique property of being employable when the speaker's vantage point is decoupled from the deictic center. The flexibility this gives speakers appears to be as communicatively useful in the domain of time as in the domain of space.

Notes

1. Chagga (Chaga, KiChaga, KiChaka) is an Eastern Bantu language of Tanzania. The data for this study comes from text analysis and elicitation with speakers of the KiVunjo dialect of Central Kilimanjaro.

Orthographic conventions include: sh [ʃ]; ch [tʃ]; y [j]; j [dʒ]; ɽ retroflex flap; r alveolar trill; and ɹ slightly fricated alveolar approximant. High tone ´, falling tone ^ , and downstep ' are marked; low tone is left unmarked.

Abbreviations include:

APPL	Applicative	INCHO	Inchoative
CONSEC	Consecutive	OM	Object Marker
CONT	Continuous	SM	Subject Marker
FOC	Focus		

Numbers following SM or OM in examples refer to Noun Class.

2. "Infinitive" is the conventional term for what more accurately is a Class 5 nominal prefix, or a verb nominalized by this prefix. In the construction focussed on in this paper, a verb marked with the "infinitive" i- (a form unique to Chagga - Nurse 1979) serves as object complement of 'go' or 'come'.

3. In fact there is some evidence from Proto-Bantu that this may have already happened. The regular inflectional Future in KiVunjo Chagga is -chi-. -chi- comes from Proto-Bantu *yij 'come', and has the reflexes -che- or -she- in the other Chagga dialects (Nurse 1979). We therefore appear to have a case of renewal.

4. The examples of grammatical 'come' Futures adduced in support of Fleischman's moving-time analysis do not in fact support it. In Luganda and Efik for example, the subject prefixes on 'come' are Noun Class 1, 2, or 3, human: they refer to the actor, and not to the future itself nor any temporal unit. The actor 'comes' to do X, not the "highway of time".

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