

Proceedings of the Fifteenth Annual Meeting of the Berkeley Linguistics Society: General Session and Parasession on Theoretical Issues in Language Reconstruction (1989)

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OF THE
BERKELEY LINGUISTICS SOCIETY**

February 18-20, 1989

**GENERAL SESSION
and
PARASESSION
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THEORETICAL ISSUES
IN
LANGUAGE
RECONSTRUCTION**

**Berkeley Linguistics Society
Berkeley, California, USA**



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edited by

Kira Hall

Michael Meacham

Richard Shapiro

Berkeley Linguistics Society

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

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- 'Where are the Snows of Yesteryear?' The Proto-Indo-European Word for
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- Prosodic Systems and Prosodic Change
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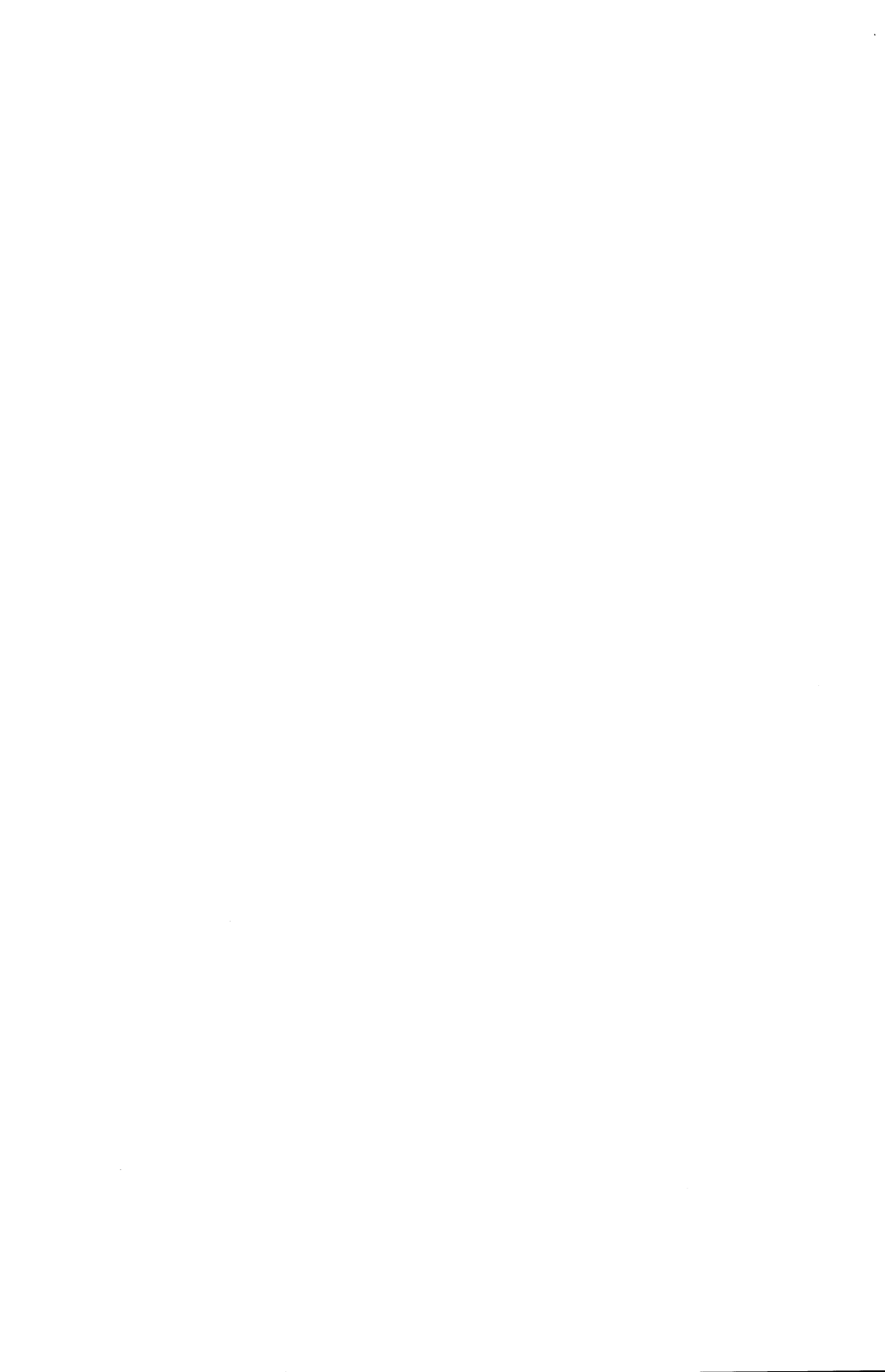
PREFACE

We are pleased to present the proceedings of the Fifteenth Annual Meeting. The February conference featured several fine papers on theoretical issues in language reconstruction and many provocative papers on a variety of linguistic topics. We are grateful to those who helped us with the planning and production of the conference, among them Selena Ellis, Mirjam Fried, Kathleen Hubbard, Annie Jaisser, Anita Liang, and especially Sondra Reinman. We are happy to say that all went well: no superstition, no cancellation, no plague, no misfortune, no bad weather, nothing to report. We hope you enjoy the volume.

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GENERAL SESSION

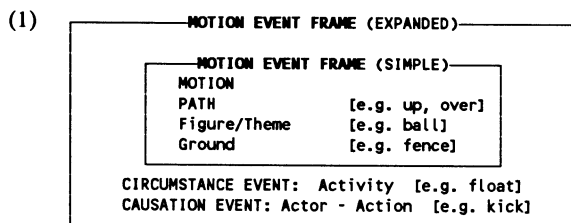


PATH PREDICATES IN ENGLISH AND SPANISH: A CLOSER LOOK*

Jon Aske
University of California, Berkeley

1. Motion event lexicalization patterns

Len Talmy (1985) has proposed a new typological parameter regarding the type of verbs a language uses in clauses coding motion and location events. He argues that different languages express or lexicalize different aspects of the motion/location situation on the verb. Concentrating on the motion event, the aspects or components that are relevant for its linguistic coding according to Talmy are {1} the (abstract) predicate of **MOTION**; {2} the moving entity, the **Figure** phrase (also known as **Theme** or **Trajector** in other frameworks); {3} the reference point for the movement, or **Ground** (**Landmark** in Langacker's framework); and {4} the **PATH** of the motion with respect to the Ground object. In addition to these factors, which can be schematized as the inner frame in (1), other optional coding factors are {5} the **circumstance event** of the motion event, typically the activity or manner that accompanies the motion, e.g. *rolling*, *running*, or *floating*; and {6} the event originating the motion or **causation event**, e.g. *kicking* or *rolling*. Talmy's point is that languages differ as to what aspect of the frame the main verb lexicalizes (in addition to the abstract idea of motion).



According to Talmy, three patterns are found across languages depending on whether either the **PATH**, a related **circumstance** and/or **cause event** (C-event), or the **Figure** are lexicalized (together with the abstract predicate of **MOTION**) in the main verb. These three types are illustrated in (2) with examples from English, though only the first pattern is typical and pervasive in English (the examples are from Talmy's paper):

- (2) A. **Manner/Cause + Motion**: Indo-European (except Romance), Chinese, etc.
 e.g. The smoke squeezed through the opening (Manner)
 I kicked the ball over the fence (Cause)
 B. **Path + Motion**: Romance, Semitic, etc.
 e.g. John entered the room
 C. **Figure + Motion**: Atsugewi (& most northern Hokan), Navajo
 e.g. It rained in through the bedroom window

Talmy has succeeded in identifying the different types of lexicalization found in motion verbs crosslinguistically. However, there still remain many questions to be answered about this problem. This paper builds on Talmy's work by addressing the question of why a language accepts, or fails to accept, motion lexicalization patterns other than its predominant one, in particular I will contrast the situation in Spanish, the language used by Talmy to exemplify Type B languages, and with the situation in English, which he uses to exemplify Type A languages.¹

We have already seen how English has freely borrowed Type B lexical patterns, e.g. enter, exit, ascend, descend, etc. Vietnamese also allows both patterns, as we can see in (2). Notice that Vietnamese uses 'co-verbs', a type of serial verb, as prepositions. Here, though, it's harder to tell which pattern, A or B, is more basic since co-verbs can also be used as main verbs.

- (3) a. **Con cóc vào trong nhà**
CLASSIFIER frog go-in be-in house
=b. **Con cóc đi vào nhà**
CLF frog go go-in house
"The frog went into the house"

Talmy has noticed, however, that Spanish cannot translate verbatim English sentences representing certain events of motion along a path, such as *John walked out of the room* and *Mary ran out of the room*. This, he suggests, is because Spanish manner (activity) verbs cannot lexicalize motion, or, in other words, because path in Spanish has to be expressed on the verb. The picture is more complicated, though, for there appear to be cases in which the English pattern is present in Spanish, such as *El libro se deslizó hasta el suelo*, 'The book slid down to the floor'.

2. Spanish counterexamples

Every student of Spanish has had the opportunity to notice that expressions of motion and result in Spanish tend to be the reverse of their English counterparts. For instance, in Spanish, *I jumped down* becomes *Bajé de un salto*, literally 'I went-down (descended) of a jump'. And you cannot translate *John floated out of the room* word-for-word, but rather you must say *Juan salió de la habitación flotando*, literally 'John exited the room floating'. Similarly, *John pushed the door closed* can only be translated as *Juan cerró la puerta de un empujón*, literally 'John closed the door of a push'. The same goes for other English expressions like *She asked me out*, *He helped me up*, *Johnny grew out of his shoes*, and *They talked me out of going*. Thus if we look at an English-Spanish dictionary we notice that often the parts of English complex predicates involving a verb plus an additional word or phrase (Talmy calls these 'satellites') are 'reversed', as it were, in their Spanish translations, as in (4).²

(4) <u>English expression</u>	<u>Spanish translation</u>	<u>Lit. translation</u>
Run out	Salir corriendo	go-out running
Rub in	Meter frotando	put-in rubbing
Drive away	Irse en coche	go-away in car
Scared to death	Muerto de miedo	dead of fright
Break open	Abrir por la fuerza	open by the force
Boil down	Reducir por cocción	reduce by boiling
Pull off	Quitar de un tirón	take-off of a pull
Float together	Juntarse flotando	join-RFLX floating
Sand off	Quitar lijando	take-off sanding

The fairly closed class of words like out and closed, which follow the verb in English, but which Spanish lacks, Talmy's satellites, can be of two types: path satellites and result satellites, as seen in (5) and (6).³

- (5) **English Path 'Satellites'**
in (to+), out (of+); on (to+), off (of+); up (+), down (+); above (+), below (+); back (from+), forth/forward (?of+); apart, together; through (+), across (+), over (+), along (+), around (+), past (+), by (+), away (from+)
- (6) **English Result 'Satellites'**
(cut) open, (flap) dry, (rust) stiff, (wear) thin, (freeze) stuck, under(fill), over(hang), re(fill), etc.⁴

Most path satellites can take a Ground complement (e.g. *out of the house*), and when one is not explicitly mentioned, some Ground entity can be reconstructed ('understood') from context, i.e. the Ground complement can be a Definite Null Complement (DNC), in Fillmore's (1988) Construction Grammar terminology.⁵

In spite of these facts, as we said earlier, we find that there are plenty of natural, colloquial examples in Spanish in which a manner-plus-motion verb such as run, swim, dance, etc., is used with a path phrase, as in examples (7-14).

- (7) **Juan bailó en círculos/de un lado para otro/hacia la puerta/hasta la puerta**
"John danced in circles(=around)/from one place to another(=about)/ towards the door/(all the way) to the door"
- (8) **La botella flotó hacia la cueva**
"The bottle floated towards the cave"
- (9) **El libro se deslizó hasta el suelo**
"The book slid down to the floor"
- (10) **Mi ejercicio consiste en caminar a la biblioteca dos veces al día**
"My exercise consists of walking to the library twice a day"
- (11) **La pelota rodó desde el tercer piso hasta el segundo**
"The ball rolled from the third floor to the second floor"
- (12) **La botella flotó por el canal**
"The bottle floated along/about the canal"
- (13) **Empujamos el coche cuesta arriba**
"We pushed the car up (the) hill"
- (14) **El globo flotó p'arriba, p'abajo, p'adentro y luego p'afuera**
"The balloon floated up, down, in, and then out"

These sentences contradict Talmy's formulation that Spanish doesn't have manner-plus-motion verbs with path complements. However, as we have seen, there are also plenty of cases for which Talmy's formulation seems to be accurate, that is, cases in which Spanish does not allow the English-like pattern. What could be influencing the availability of the English pattern in Spanish?

It could be that the restriction is lexically determined. The unavailability of a particular 'satellite' in Spanish might be a factor, for instance, since there are known to be lexical gaps of this sort in different English-type languages, according to Talmy (p.c.). I think that we can safely ignore this possibility in Spanish since there seems to be a path adverbial for just about every English path 'satellite' which could perform its function. Thus this does not seem to be where the problem lies. More important lexical determinants seem to be the verb and the basic prepositions, to which I turn next.

It seems that activity/manner verbs that strongly imply motion work best with the English-pattern, whether intransitive, e.g. correr, 'run', nadar, 'swim', rodar, 'roll', and even flotar, 'float', or transitive/causative, e.g. arrastrar, 'drag', empujar, 'push', rodar, 'roll'. Somewhat worse seem to be verbs in which the manner of the activity is more salient, e.g. cojear, 'limp', and saltar, 'jump', etc. Finally, verbs that do not imply motion do not seem to work at all. Thus we do not get in Spanish the equivalent of, e.g., *They squeezed through the crack*, *I twisted the cork out of the bottle*, or *I grabbed the book off the shelf*.

The Spanish prepositional system (like that of many languages) is known to make fewer distinctions than the rich system of English,⁶ and this might be seen as a handicap for the successful use of the English 'manner-verb plus path-phrase' construction. It doesn't seem however that this is the cause of our unmatchable sentences, for the distinctions can be made, as I will show in the next section, though it may a related phenomenon. Sometimes, however, the kind of preposition does seem to have something to do with the acceptability of the English-type pattern in

Spanish. Of the seven path prepositions in Spanish, all but a, 'to', and de, 'off', and sometimes para, 'to/for' (depending of whether it has an a sense or an hacia sense), produce good sentences with manner verbs.

(15) **Spanish prepositions**

- a) **Location:** en, in, ante, before, bajo, under, contra, against, entre, between/among, por, about, sobre, on, tras, behind.
- b) **Path:** hacia, towards, hasta, up-to, until, desde, from, por, through, *a, to, *de, off-of, ?para, towards.

Here I believe we have a major clue as to what is going on, but let's put off that discussion until we have taken a look at the Spanish system of locative/path phrases and path verbs to see that it is, or could be, sufficiently rich to do what English does.

3. **Spanish path verbs vs. English path 'satellites'**

As I said, one might argue that Spanish cannot do what English does because English has a rich set of path prepositions and adverbials (i.e. the path 'satellites' in (3) above), whereas Spanish and Spanish-type languages have rather impoverished systems of locative and path prepositions which cannot be used adverbially (i.e. without a prepositional object).⁷ This contrasts with the fact that Spanish and Spanish-like languages have a rich set of path verbs, i.e. verbs that indicate motion-plus-path (whereas the English path verbs are not native to English but are borrowings from Romance, e.g. enter = 'go in', ascend = 'go up'). The most basic of these path verbs can be seen in (16).

(16) **Spanish Path verbs**

INTRANSITIVE: ir, go, venir, come, irse, leave/take-off, entrar, go in, meterse, get in, salir, go out, salirse, get out, subir, go up, bajar, go down, bajarse, get off, caer, fall, caer(se), fall down/off, juntarse, get/come together, separarse, come apart, cruzar, go through, atravesar, go across, pasar, go by/past, avanzar, go forward/forth, retroceder, go back.

TRANSITIVE: poner, put (on), quitar, take off, meter, put in, introducir, put in, sacar, take out, extraer, take out, subir, take up, lift, raise, bajar, take down (lower), juntar, put together, separar, take apart, ...⁸

In view of the richness and basic nature of the path-verb system as opposed to the path-preposition/satellite system in Spanish (and vice versa for English), it is not too farfetched to conclude, as Talmy did, that Spanish is 'designed' to code path on the verb, and English on a path phrase. However, the deficiencies of the Spanish path preposition system cannot be the cause of these differences, for Spanish does have quite a rich set of locative/path adverbs, those in (16), which, just like the English path adverbs/prepositions can take a Ground complement (expanded from Whitley 1986).

- | | |
|----------------------------|----------------------------------------------|
| (17) Spanish | English |
| 1. fuera (de+), afuera | outside (of+) |
| 2. dentro (de+), adentro | inside (of+) |
| 3. arriba (de+) | up, above (+), on top (of+) |
| 4. debajo (de+), abajo | underneath (+), below (+) |
| 5. delante (de+), adelante | ahead (of+), in front (of+) |
| 6. detrás (de+), atrás | behind (+), in back (of+) |
| 7. a través (de+) | through (+) |
| 8. enfrente (de+) | in front (of+) |
| 9. al lado (de+) | on/to the side (of+); beside (+), next (to+) |
| 10. encima (de+) | above(+), over(head), on top (of+) |

- | | |
|----------------------|--------------------------|
| 11. lejos (de+) | far (away) (from+) |
| 12. cerca (de+) | near(by/+), close (to+) |
| 13. más allá (de+) | beyond (+) |
| 14. a lo largo (de+) | lengthwise; along (+) |
| 15. alrededor (de+) | around (+) |
| 16. juntos | together |
| 17. junto a/con + | next to+, together with+ |

All of these adverbials are locatives when used with non-path verbs, as in (18a), and most of them can be used as directionals with path verbs, as in (18b). With manner-plus-motion verbs, like run and swim, however, these adverbials have a default locative (non-path) interpretation, but a path interpretation is possible if the Ground is not expressed lexically but is rather contextually determined, as seen in (19) and (20).

- (18) a. **Están (a)dentro (de la casa)**
 "They are inside (the house)"
 b. **Fueron/entraron adentro (de la casa)**
 "They went inside (the house)"
- (19) a. **Nadaron (a)dentro (de la cueva)**
 "They swam inside (the cave)" (locative)
 b. ? **Nadaron adentro (* de la cueva)**
 "They swam in(to the cave)" (directional)
- (20) a. **Nadaron lejos**
 "The swam far away" (ambiguous: locative/directional)
 b. **Nadaron lejos de la orilla**
 "They swam far from the shore" (locative/?directional)

In addition, most of these locatives can be turned into path adverbials when joined to the path prepositions hacia, hasta, desde, para, por, as well as a and de, where not already cliticized. The result with respect to the availability of the manner-path construction is the same as for the simple prepositions: a and de work with path verbs (e.g. subir, 'go up') but not with manner-plus-motion verbs (e.g. nadar, 'swim'); hacia, hasta, and desde work for all cases, e.g. (21), and para, 'for', has the same interesting result as in (19-20), namely that the path phrase seems to work a lot better if the Ground is not lexically specified, but rather is provided by context, e.g. (22) and (23) (with para reduced to p).

- (21) **Corrieron hacia adentro (de la cueva)**
 "They ran towards the inside (of the cave)"
- (22) **El coche rodó p'alante/p'atrás**
 "The car rolled forward/back(wards)"
- (23) **Empujamos el coche p'adentro/p'afuera (? del garaje)**
 "We pushed the car in/out (to/of the garage)"

An interesting aspect of the list in (17) is that of the first six, the versions starting with a, 'to', and de, 'from', were originally composite path adverbials which have been reanalyzed as locatives, either in all cases, as with detrás, 'behind' (from *de* 'from' + *tras* 'behind'; it never means 'from behind' anymore) or with non-motion verbs such as abajo (from *a* 'to' + *bajo* 'below'; cf. ir abajo, 'go below', and estar abajo, 'be below'). This contrasts with English, where locative adverbs have been known to acquire a path interpretation with non-locative (motion) verbs, e.g. *he walked inside the house*, an ambiguous sentence in which a locative phrase can receive a path interpretation. Although this fact is probably connected to the differences between Spanish and English, I will leave its elucidation for a later date.⁹

4. Two types of path phrases

We have seen that Spanish has a rich system of locatives which can be used as path phrases under certain circumstances. It is obvious then that if Spanish had the 'inclination' it could adopt the English pattern and exploit this rich system of locatives by removing the restrictions on their use as directionals. Thus we have to explain what this 'inclination' consists of and why there are instances of the English pattern in Spanish (as well as, presumably, why there are instances of the Spanish-type pattern in English).

I believe that the solution lies in recognizing the existence of two types of directional or path phrases in English—one of which translates into Spanish and one which doesn't—according to the function each performs: one basically modifies the verb, or predicates a location of the whole proposition, while the other does something else, namely it predicates an end-point location of the Figure argument. The mere **locative path phrase** is basically a locative, a one-dimensional locative (1Dim-LOC) as it were, which adds the 'location' (i.e. the path or one-dimensional region) in which the activity took place, e.g. *Lou ran in the park* (0Dim-LOC), *Lou ran through the park* (1Dim-LOC = PATH), *Pat went up the ladder*. Spanish has no problem with this type of sentence. The telic (Vendler, 1967) **path phrase** on the other hand, though similar in form, acts semantically as a special type of non-verbal predicate (NVP) of the kind discussed by Fillmore (1988), in that it predicates, besides the path of motion, an end-of-path location/state of the Figure, e.g. *Pat swam into the cave* (IN THE CAVE), *The leaf blew off the table* (OFF THE TABLE). It is these which Spanish cannot replicate.¹⁰ Notice that telic path phrases are not merely those that indicate bounded unidimensional regions, for locative path phrases may also be bounded, e.g. *Juan nadó de la playa a la isla*, 'Juan swam from the beach to the island'. Rather the telic path phrase must predicate a location (or 'un-location', e.g. *off the table*) of the Figure argument.

Fillmore recognizes two types of NVPs in English, primary NVPs (1NVPs) and secondary non-verbal predicates (2NVPs), both of which can be either depictive (DNVPs) or resultative (RNVPs). Primary NVPs in English can be adjective phrases (e.g. 'afraid of Lou'), noun phrases (e.g. 'a fool'), and locative prepositional phrases (e.g. 'under the bridge'), all of which require a copula ('be', 'become', etc.) for their expression in English sentences. By a simple extension of this analysis we can see that in English, as well as in Spanish to some extent, path phrases can also be used as primary NVPs, which must be used with special motion 'copula' verbs such as come and go. Secondary non-verbal predicates (2NVPs) on the other hand are parasitic on an independent verb, e.g. *he ate the meat raw* (DEPICTIVE, object controlled), *John ate the meat naked* (DEPICTIVE, subject controlled), *It knocked me dizzy* (RESULTATIVE).

What I am suggesting is that path phrases have different distributions in Spanish than in English because of the fact that there are two types of path phrases, one of which is a mere locative, e.g. *along the fence*, and the other one of which, in addition to expressing a path, is a telic secondary NVP which predicates an end-state of the Figure argument, e.g. *into the house*, *off the table*. Spanish has the first type, but not the second. Why should this be so? It seems to me that the answer is related to the fact that Spanish doesn't have resultative non-verbal predicates at all, it only has depictive ones.¹¹ That is, Spanish has depictive NVPs comparable to those of English, e.g. *Juan comió la carne cruda*, 'Juan ate the meat raw', *El paquete llegó roto*, 'the package arrived broken', but it has nothing comparable to *Pat kicked the door open*, *We stood the pole erect*, or *She knocked the door down*.¹² It is easy to see that telic path predicates form a natural semantic class with resultative predicates (they both indicate an end state/location, a 'culmination point', which results from a previous

activity), a class which Spanish lacks.

In other words, path phrases in English can be used in a way that their Spanish counterparts cannot, namely as predicators of a location of the Figure with respect to the Ground. Sometimes the location is at the Ground itself (goal or telic path predicates, e.g. *into the house*), sometimes it is the end point of a path defined with respect to the Ground (derived goal/telic path predicates, e.g. *over the fence*), and yet other times it is 'negatively' defined with respect to the Ground (source path predicates, e.g. *off the table*). The plain locative path phrase, on the other hand, is identical in Spanish and English, and poses no problems. It doesn't appear that all English path satellites are telic, i.e. predicators of the Figure, e.g. *along*. Others, such as *around*, *over*, *up*, etc. may or may not be end-point predicators in addition to path modifiers/predicates. Yet others, such as *in(to)* and *out (of)*, seem to always predicate a location of the Figure.

In sum, it seems that in order to understand the distribution and the semantics of Talmy's typological observation about lexicalization patterns for motion events, we must keep in mind the distinction between primary and secondary telic/result predicates, and the fact that some languages, such as Spanish, do not have the second category, whereas other languages either prefer to express the 'culmination point' of an event or situation outside the main predicate, such as English, or allow both possibilities, such as Vietnamese.¹³ In Spanish the basic telic or accomplishment path predicate has to be a verb, it cannot be a non-verbal predicate. The goal/source location (the Ground) is expressed as a complement of the verb preceded by the prepositions *a*, 'to' (*para*, 'for', also may have a telic sense), or *de*, 'off/from', respectively. In English on the other hand, except for borrowings, the basic path predicate is a secondary predicate (2NVP). And in Vietnamese the telic path can be expressed either as a main predicate or as a secondary predicate (co-verb), as we saw in (2) above.

One piece of evidence for the claim that some path phrases are predicational and telic while others are modificational and atelic (even if bounded) comes from the behavior of telic-compatible and atelic-compatible temporal phrases, e.g. *in two hours* and *for two hours*, respectively. Thus, clauses with manner-plus-motion (activity) verbs and directionals do not take telic durational adverbials, as can be seen in (24a-b). Non-path activity verbs can only take atelic bounding durational adverbials, as can be seen in (24c). Telic durational are only sanctioned by path verbs, as in (24d), since only these verbs can have a telic interpretation. This is why the prepositions *de*, *a*, and *para*, which are characteristic of telic path verbs (and subcategorized only by them) clash with the atelic nature of activity manner-plus-motion verbs.¹⁴

- (24) a. **Juan caminó hasta la cima (?* en dos horas)**
 "Juan walked up to the top (in two hours)"
 b. **Juan caminó por/a-traves del tunel (?* en dos horas)**
 "Juan walked through the tunnel (in two hours)"
 c. **Juan caminó por/a-traves-de el tunel dos horas**
 "Juan walked through the tunnel for two hours"
 d. **Juan subió a/hasta la cima en dos horas**
 "Juan went to/up-to the top in two hours"

Thus the preposition *hasta*, 'up to', 'until', for instance, contrary to what one might have thought, is not telic and doesn't 'predicate' a final location of the Figure, that is, the final location is not asserted, though it certainly may be implied.¹⁵

This explanation also helps us see the relation between English path 'satellites' and the other type of satellite, the resultatives we saw in (5) above. In Talmy's formulation it is not clear why there should be two fairly closed classes of satellites, path satellites and resulting state satellites. Here I have argued that they are both

subtypes of the more general class of telic (telic-directional or resultative) non-verbal predicates (TNVPs). Thus, under this interpretation, the constructions exemplified by the sentences in (25) would be related semantically, or variants of each other, forming a family of constructions in the sense of Lakoff (1987) and Fillmore, Kay, & O'Connor (1988). It can also be seen in (25c-d) that sometimes a path satellite in English (out) can be used metaphorically as what is commonly seen as a result satellite.

- (25) a. I went out (of the house)
 b. I blew the paper out (of the box)
 c. The candle was/went out
 d. I blew the candle out
 e. The stick froze stuck (to the window)
 f. I sang the baby to sleep

Finally, this solution may also help account for the mysterious complex path phrases we saw earlier in (19-23), which work less well when the Ground object is lexically determined than when it is contextually determined. The reason for this would be similar to the one accounting for the fact that the same verbs do not readily take path phrases with the prepositions a, para, and de, namely that with an explicit Ground object this Source/Goal Ground object is foregrounded and the predicational nature of the path phrase is stronger. With a 'vague', contextually (pragmatically) determined Ground entity, the combination is more acceptable.

5. Complex path predicates: a case of restricted regularity

Although the goal of this paper is not to provide a detailed characterization of the English construction with TNVPs, I would like to make some comments on its status in the grammar. How should these (secondary) path and result 2TNVPs in English be dealt with by the grammar: as extensions of the valence of main verbs, as special constructions, or in some other way? It seems to me that the distribution of 2TNVPs is quite a bit more restricted than that of depictive ones or 2DNVPs. This suggests that although DNVPs might be seen as free additions (adjuncts) to clauses (cf. Fillmore, 1988) this solution would be less satisfactory for telic 2NVPs (cf. Goldberg, this volume).

The class of telic 2NVPs (2TNVPs) (both telic path and result 2NVPs) seems to be a rather closed class, with resistance to new additions, even if they fit the pattern. Also, the meaning of the resultative NVP is closely tied to that of the main verb (a cause-effect relation) and we find many fixed collocations in this category, e.g. *shoot someone dead*, but **shoot someone wounded*; *marry into the family*, but **divorce out of the family*; *bore someone to death*; *steal someone blind*; etc. This suggests that TNVPs and the constructions in which they participate should be seen as an intermediate case between a regular productive phenomenon and a lexically idiosyncratic, frozen, or idiomatic phenomenon. In other words, 2TNVPs are a type of semi-regular phenomenon which doesn't warrant a rule solution, but which is too regular for a mere listing of the patterns to be satisfactory. That is, this is something which traditional generative theories of grammar, which only have the rule-versus-list dichotomy available in their ontology (because of their commitment to the computer metaphor of language and mind) cannot easily account for. A closer look at language free of this prejudice reveals that little in language is totally regular or totally irregular, and that patterns vary a great deal in their degree of regularity. This suggests that we need a new model of language (and thus of the workings of language producing/processing minds), something along the lines proposed in the Construction Grammar framework as being worked out in Fillmore (1988), Fillmore,

Kay, & O'Connor (1988), and Lakoff (1987).

The class of path 2TNVPs seems to form a more regular pattern or subconstruction in this family of constructions, and we may want to offer a rather abstract schema (construction) of its inner workings. Oversimplifying quite a bit, the English construction that we have been looking at would look something like (26), where the main verb expresses the activity which is responsible for the final state or location of the Figure at the Ground, namely the causation event or the circumstance/manner event (C-event) of the motion frame in (1). Whatever is not explicitly mentioned in this schema follows from more general schemas or constructions, including the general schema for TNVPs. This construction is an abstraction from all the cases with path satellites/NVPs, and it is itself a member of a larger family of constructions with TNVPs.

(26) RESULTING STATE CONSTRUCTION (MOTION VERSION) (approximation)

Category	complex predicate: V TNVP							
Semantics	Motion frame: PATH, LOC, C-event							
...	<table border="1"><tr><td>cat V sem C-event</td></tr><tr><td>2/1 ø</td></tr></table>	cat V sem C-event	2/1 ø	<table border="1"><tr><td colspan="2">cat 2NVP sem Path, LOC</td></tr><tr><td>1 Fig ø(1)</td><td>[C] Ground</td></tr></table>	cat 2NVP sem Path, LOC		1 Fig ø(1)	[C] Ground
cat V sem C-event								
2/1 ø								
cat 2NVP sem Path, LOC								
1 Fig ø(1)	[C] Ground							

C-event: V expressing a C-event of the motion frame (see (1)).

2/1: object if there is one, otherwise subject.

ø(1): the upstairs ø phrase is the P-subject of this predicate.

[C]: omissible complement with a definite null interpretation.

A related problem in the statement of this construction is whether we will have to say something about the meaning (or semantic composition) of the manner verbs themselves, and how they differ when they are used in this construction from when they are used alone, which is what Talmy had in mind since his article is about lexicalization patterns. In his view a motion-plus-manner verb such as 'float₂' is derived from the manner verb 'float₁', which says nothing about motion and is equivalent to 'be afloat'. 'Float₂', on the other hand, adds the semantic component of MOTION. (In Fillmore's framework we might want to say that it adds a path or goal phrase to its valence.) It is because Talmy views the problem this way that he talks about different lexicalization patterns in different languages. Another way to look at this matter would be to say that, rather than two verbs 'float', there is just one activity verb which requires a motion interpretation in this construction with a path NVP. Talmy argues that his lexicalization solution accounts for the non-occurrence of some doublets, e.g. there is no such a thing as a motion version of lie (i.e. we cannot say **He lay down the hill*, meaning something like *He slid on his back down the hill*) or a non-motion version of drift and glide, which is a lexically based idiosyncrasy. Indeed there seem to be many idiosyncrasies of a lexical nature surrounding the phenomenon of TNVPs; however, the point does not seem to me to be whether the main verb has a motion interpretation or not. It seems odd to me to say for instance that squeeze in *We squeezed through the crack* has a motion interpretation, and that this is how it differs from the 'other' squeeze. That is why I think that perhaps we should say that it is the Path NVP predicate, and not an abstract MOTION component of the main verb, that contributes the motion sense to the construction.¹⁶

6. Some remarks on the typology and the ecology of Spanish

Finally I would like to make a speculative excursus into the reasons for and benefits of English and Spanish being the way they are, that is, about the ecology of these languages. First, as we already noticed, by borrowing path verbs like enter and separate, English has already become a lot more like Spanish. I do not know whether English resisted receiving these loans, but if my hypothesis is right there is no reason why this would have been so. Spanish, on the other hand, still strongly resists reinterpreting locative DNVPs as path TNVPs with motion verbs. In fact it totally rejects TNVPs altogether. Let us look at some possible reasons for why this is so.

6.1. The productivity of the pattern. One interesting observation in this respect is that the path TNVP construction in English relies heavily on the feeding action of a very productive process of English (which is practically non-existent in Spanish) by which denominal activity verbs, like sail, bicycle, etc., are produced which look like they are made specifically for this construction (*We sailed out of the harbor, I bicycled into town*). Spanish obviously would have less use for path 2TNVPs if they were adopted, since it lacks this morphological rule.

6.2. Interaction with information structure. Another interesting fact is that it seems to me that the English construction, if adopted into Spanish, would go against the preferred pattern of information structure in Spanish. English uses sentential stress to indicate the focus of new information, as in (27).

(27) A: How did you get to the island?

B: I SWAM (to the island/there)

In Spanish however the focus of new information is signaled by word order, that is, the new information tends to go in sentence final position.¹⁷ But manner information tends to be highly rhematic, meaning that when it is mentioned at all it tends to be new information, otherwise it is usually not mentioned (which is why often to Spanish speakers instances of the English construction sound redundant or overspecified). (28) is the Spanish version.

(28) A: ¿Cómo llegaste a la isla? how you-arrived to the island

B': Fui (a la isla) NADANDO I-went (to the island) swimming

B'': ¿NADANDO (fui a la isla)! swimming (I-went to the island)

B''': ?* NADÉ (a la isla) I-swam (to the island)

As we can see, the manner adverb must go at the end of the sentence if it is new information as in (28B'), or else in preverbal position in a special emphatic focus construction as in (28B''), but not on the verb as in (28B''').

6.3. Spanish manner adverbials. All of the relevant examples in Talmy's article have gerundial clauses indicating the manner in which a motion event takes place, as in (29).

(29) Metí el barril a/en la bodega rodándolo

I moved-in the keg to/in the cellar rolling-it

"I rolled the keg into the storeroom"

From this one gets the impression that Spanish uses two different clauses to express the same information that English packs into one two-predicate clause. However, the status of this manner adverbial in motion clauses in the Spanish system seems to be different from the status it would have in the English direct translation: in Spanish it is much more integrated into the clause, as manifested by the following phenomena:

1. Quite often in Spanish instead of a clausal adverbial we find instrumental or other simpler (non-clausal) adverbial phrases, often nominalizations. For instance de un

empujón, 'from a push', might be used instead of empujando(lo), 'pushing (it)'.

2. The ordering of the adverbial is much more free in Spanish than in English and, although it is true that when it is new information it goes at the end, as we saw above, when it is less in focus it tends to go next to the verb, which iconically reflects the semantic closeness of the two predicates, as seen in (30-31).

(30) Mettí de una patada el balón en la portería

I moved-in of one kick the ball in the goal

"I kicked the ball into the goal"

(31) La botella entró flotando en la cueva

the bottle entered floating in the cave

"The bottle floated into the cave"

3. Finally, notice that the integration of the path and the manner predicates is reflected in the ability to extract from the manner adverbial clause, e.g. (32), something one expects from complements of auxiliaries (e.g. the progressive) but not of adverbial clauses, which in general are islands. This suggests that, at least with basic path verbs, the accompanying adverbial clause is seen as more central to the meaning of the sentence than its English counterparts.

(32) ¿Qué entró comiendo/empujando Juan?

what he-entered eating/pushing Juan

"What was John eating/pushing when he came in?"

6.4. Redundant path phrases. It is worth noticing that there seems to be a preference in Spanish, at least in the vernacular, not to have path verbs expressing path all by themselves when the identity of the Ground object is contextually determined. Thus it seems to me that it is more natural in these cases to use redundant end-path phrases, e.g. *Juan subió arriba*, 'Juan went up (above)', *Juan bajó abajo*, 'Juan went down (below)', *Juan entró adentro*, 'Juan went in (inside)', *Juan salió afuera*, 'Juan went out (outside)', instead of the path verbs alone, though this would not be ungrammatical: *Juan subió*, *Juan bajó*, *Juan entró*, and *Juan salió*.¹⁸ With commands the verb *ir*, 'go', is probably even more common than the path verb, e.g. *vamos adentro*, 'let's go in' (= *entremos*). What the functional motivation for these extensions might be is not clear to me, but it may be related to the development of path NVPs.¹⁹

7. Conclusion

In this paper I hope to have refined the differences noticed by Talmy between Spanish and English (and hopefully also between Spanish-type languages and English-type languages) and to have made some humble advances toward explaining his typology. It is true, as Talmy says, that basic path predicates tend to be main verbs in Spanish and secondary non-verbal predicates in English. But the inability of Spanish to express path outside the verb is limited to telic path phrases, i.e. path phrases which also predicate an end-of-path location of the moving object. This is so because such telic path predicates, together with resultative secondary predicates, with which they form a class, are, for some reason, not allowed in Spanish.²⁰

Notes

* I would like to thank Len Talmy for the most stimulating seminar he offered in the Fall of 1988, out of which this paper developed. I also want to thank him especially for discussing the ideas in this paper with me and for his warm and communitarian spirit. Thanks are also due to Eve Sweetser and to Michael Meacham for comments on a late version and to Sondra Reinman for examples and comments. Thanks also

to Kim Hoang for the Vietnamese examples. A special mention should be made of Avi and Sandi who put up with me while working on this paper and who made it much more readable than it once was. Naturally, only I am to blame for the remaining flaws and inadequacies.

1. I will have nothing to say about Type C languages, other than that all of them are American Indian languages well known for the similarity between their word classes, to the point that it has been claimed that these languages only have verbs in their lexicon.

2. Sometimes Spanish has just one word to express what English expresses with verb plus satellite, and some other times the order is the same in English and Spanish, e.g. *mirar p'arriba*, 'look up', *tirar a la basura*, 'throw away'.

3. Talmy also talks about the possibility of there being Ground satellites in English, e.g. the home of I drove home, but I think this is mistaken and I think my analysis will show that all 'satellites' share a common semantics.

4. The class of result 'satellites' certainly seems to be a closed but growing class in English. Other examples are: pull loose (from+), scrub clean, close shut, shoot dead, beat to death, sing to sleep.

5. In Fillmore's (1988) CG framework, null complements, also known as non-instantiation of 'understood' complements, can be of one of two types: definite null complements (DNC), as in, e.g. *I won*, where it is 'understood' that something was won, and the identity of that something is recoverable by the hearer from context, etc.; and indefinite null complements (INC), as in *I ate*, where the identity of the 'understood' complement (whatever was eaten) is not recoverable, but rather is taken to be irrelevant.

6. For instance, the Spanish preposition en translates the English prepositions at, in, and on. Cf. Whitley 1986:211.

7. Three basic prepositions en, a, and de translate nine English prepositions: in, on, at, into, onto, to, out of, off (of), and from. This 'vagueness' seems to be related to the richness of the path verb system. But Spanish-like languages do have complex prepositions which can express a richer set of spatial relations.

8. Other verbs could be added, e.g. traer, 'bring', traerse, 'bring along', llevar, 'carry/take', llevarse, 'take away', 'take off with', empujar, 'push', tirar, 'pull', echar, 'throw', mandar, 'send', etc., but more and more these verbs could be said to imply manner as well as path, though it is not clear where to make the cut off point. All these verbs, which have simple English parallels, seem to be basic motion-causing verbs in Spanish, for they, unlike manner-plus-motion verbs like flotar, subcategorize for a and de phrases.

9. The phenomenon of path adverbials being reinterpreted as locative ones seems to have been going on for quite a long time in Spanish. The most dramatic example I have been able to find is that of M.Sp. donde, 'where', which comes from de + onde, 'from where, whence'. But onde itself meant 'whence' in Latin. So the cycle has repeated itself at least twice. On the other hand, English where (locative) is used as a directional (*Where are you going?*). To be honest though we must say that in Spanish, like in English, donde is often used in directional phrases (*¿Dónde vas?*), which goes in the opposite direction from the earlier changes.

10. In Construction Grammar (cf. Fillmore 1988) syntactic relations are seen as formal counterparts of more basic semantic relations, such as **modification**, **complementation**, and **predication**. The predication relation is that "holding between a predicate phrase and whatever it is that instantiates the P[predicate]-subject of its head." (Fillmore 1988:167) Fillmore views the verbal predicate of the subject-predicate construction as a primary predicate. When the primary predicator is not a verb, a copula is used in English. Fillmore distinguishes between depictive secondary predicators ('He ate the meat **raw/naked**') and resultative ones ('He shot the man **dead**', 'We stood the pole **erect**').

11. Steve Guémann has pointed out to me some seeming counterexamples to this generalization, such as *Corté la hierba muy corta*, 'I cut the grass very short', and *Lo apretaste muy apretado*, 'You tightened it very tight'. As far as I can see all the examples of result 2NVPs are cognates of the verb and the 'feel' of them is more that of a manner adverbial than of a telic result predicate. Of course, this could also be the seed of a future construction.

12. As Fillmore has noticed, one difference between RNVPs (resultative) and DNVPs (depictive) is that the former must be about the direct object, whereas the latter may be about either the subject or the direct object, the constraint on interpretation being semantic/pragmatic. The restrictions on (what can be) RNVPs in English are quite strict, and it is not a fully productive phenomenon by any means, the actual RNVPs being a rather closed class. Thus for instance we cannot say 'I chewed the meat soft', meaning that the meat got soft as a result of my chewing on it, although the pattern is the same as that of 'It knocked me dizzy' or 'I ate it all-gone'.

13. One can speculate as to which one of the two predicates of these complex predications (e.g. 'walk in') is semantically the main predicate. Talmy has suggested (p.c.) that the path predicate (2TNVP) is the main predicate. This is supported for instance by the fact that the complex predication is telic, i.e. an **accomplishment** predicate in Vendler's (1967) sense, like the NVP, whereas the main verb is usually an atelic and unbounded **activity** verb.

14. English complex predicates with manner verbs, at least the ones that cannot be expressed in Spanish, are always telic or accomplishment predicates, e.g. *He walked through the tunnel in two hours*, although they can also be bounded atelic like the Spanish ones, e.g. *He walked through the tunnel for two hours*. Telic compatible temporal phrases on the other hand are typically available for the English pattern, e.g. *Pat walked up the mountain in two hours*. (But ?*He walked in the house in two seconds*.)

15. The same thing is true of non-telic, non-predicational path phrases in English which have Spanish equivalents. Thus we cannot say *Lou read comics all the way to New York in two hours*, because in two hours is incompatible with reading comics (an atelic activity) and all the way to New York is not a telic predicate, but a time-bounding modifier, which cannot be modified with a telic temporal phrase. This sentence (without the telic time adverbial) is not an example of the English pattern we've been looking at, and thus Spanish has no problem with it: *Luis leyó tebeos hasta Nueva York*.

16. Perhaps the 'lie out of the room' example is a possible, but so far unattested collocation like the 'divorce out of the family' one, just waiting for the right context to become a fixed construction in English, a fantastic context in which lying down

is a distinctive way to go places (especially if it is contrastive with other ways to get places) (cf. *marry into the family* vs. *be born into the family*).

17. An exception to this is a special construction which indicates surprise or unexpectedness: here the focus of new information is in preverbal position with special intonation (cf. Silva-Corvalán 1983).

18. In French the same thing seems to be going on, as Eve Sweetser reminded me, e.g. monter en haut, descendre en bas, and so on.

19. There are at least a couple of other cases in which Spanish prefers to express path+motion outside the verb, like English. The verbs avanzar 'go forward' and retroceder 'go backward', in colloquial Spanish, at least in peninsular dialects, tend to be rendered as ir/tirar/echar p'alante, 'go/pull/throw forward(lit. towards the front)' and ir/tirar/echar p'atrás, 'go/pull/throw backward(lit. towards the back)', respectively. A major difference with most English path satellites, though, is that these are plain directionals with no Goal or Source motion implied.

20. The perceptive reader may have noticed that example (10) has a manner verb of locomotion and a telic prepositional phrase. This sentence seems to me to be quite good, though this might seem to contradict my hypothesis. However, one could say that it actually corroborates my hypothesis. That is because its imperfective nature downplays the telic aspect of the Goal phrase. Notice that this sentence is much better than the perfective ?* *Ayer caminé a la biblioteca*, 'Yesterday I walked to the library'.

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Flux
Dwight Bolinger
Harvard University and Stanford University

In 1971 Tim Shopen distributed a sprightly little piece that he titled 'Caught in the act', calling attention to the growing use of the verb go as an auxiliary, to make sentences like Go look at the fireworks. His point was that we don't have to wait until a revolution is over before we study it. For one thing, the causal factors are often in full view. For another, and for a change, we perhaps can be wise before the fact instead of after, and predict what the outcomes are likely to be. And for a third, it's simply fun to watch the passing scene. I think I had best put my remarks today in this last category, and invite you to sit back and relax as we poke some fun at the way we and our contemporaries play with the serious business of expressing ourselves. What I'm proposing to do is take you on a thirty-minute tour of some of the changes I've observed over a few decades of listening for trifles and noting them down in hopes they may add up to something.

You can't travel far along this road without encountering the pop grammarian--a redoubtable force who often promotes the very changes he is sworn to prevent. The war against bad grammar is like the war against drugs: you try to stop them, you manage to divert them, and you end up by ruining the economy of Peru. My first instance is just such a case of succeeding too well. But let me say first, by way of orientation, that I'm going to limit my discussion to just two broad conduits of change, hyperurbanism and what I'll call infantilism--I'll explain that later.

I begin with the fate of the objective pronouns in English. A good illustration of what pulls the puristic trigger that sets this off is a line from In These Times magazine (Nov. 16-22, 1988, p. 5) in which an editorial writer is reporting remarks made by a drug dealer about Dan Quayle. This person had said When him and Marilyn got married in 1972, I gave him a present of some Afghanistan hashish. The editor decorated this quotation with a bracketed [sic] after the word him. Now you can be sure that if the man had said I got some hashish for he and Marilyn, the editor would have left it that way or corrected it without comment. The hillbilly mistake is the one that gets flagged. Another straw in the wind was a

remark by a student who was asked why she wrote for John and I instead of for John and me. Her reply was, 'For John and me doesn't sound nice'.

When you get mistakes at that level of gut feeling, your cause is lost. The objective case of the pronoun gets associated with people who raid henhouses and when you ask Who's in there? say Ain't nobody here but us chickens. In fact, that use of us with an appositive noun is probably more stigmatized than any other combination in spite of being the traditionally correct form.

So what's the new rule, since I promised that we'd be wise before the fact? It seems to be the following: 'Use the objective case with prepositions only for single ungrouped pronouns.' This means that when the pronoun is in a coordination, or an apposition, or is postmodified (e.g. by an adverb or by a clause), then the subjective case will be used. It comes down to a virtual rule of prefixation: the preposition is bound tightly to just the single pronoun that comes after it. The upshot is that while you don't get *They're coming with I (or she or he or they), you nowadays pretty regularly get coordinations like

[The South African police were charged with]
torturing he and his co-defendants. (Jessica Gigi, KPFA)

I ran into he and his wife. (John Molinari)
Write your assemblyman or senator and urge
he or she to... (Terry Goggin)

or you get appositions like

...is bankrupting we the American people.
(Howard Jarvis)
...for they themselves. (Robert Owen)
...accusations against he, Blandón.
(Larry Bensky)

or you get postmodifications like

A very sad item--especially to we here at
Channel 7.

The appositional case is noteworthy when the second element of the combination is a clause, because it tells us something about the influence of register here. Thomas Middleton at the Los Angeles Times found that somewhere between his typewriter and the printed page at Harper's Magazine the line that he wrote which read maiden name of her who was willed had become maiden name of she who was willed. When he commented on it in his column, he got mail insisting that the change was correct. But the best evidence comes

from the self-corrections that speakers make. The talk-show host Lee Rogers a couple of years ago started out saying For us folks who like to flirt with danger, then paused, chuckled, and continued with WE who like to flirt with danger. More often the speaker is simply oblivious. Us folks who are fans of Rumpole of the Bailey will remember his unrepentant she who must be obeyed, which he inserted everywhere. The reason for the special status of the appositional clause is that it is not colloquial, so in order to match the elevated style you have to use the more elevated pronoun.

The only instance I have of someone overshooting the rule as I've stated it, and using a subjective pronoun in the ultimate situation, is one where the speaker said A lot of us, like I, who think... But like is exceptional in being synonymous with such as, so this probably doesn't count.

The force behind the change in the pronouns is the old familiar one of hyperurbanism. Speakers want to do the accepted thing but they are not grammarians and they confuse the accepted thing with some one superficial aspect of it. With the pronouns it's pretty clear how things are going. With certain other prescriptive edicts the outcome is harder to foresee. Take the word as and the normative rule that made headlines a couple of decades ago, with the ad for Winston cigarettes--you remember how it went, Winston tastes good like a cigarette should. Enough people took this seriously to start a reaction against using the word like at all, and now we have the radio newscaster Don Moseley saying things like Illinois, as California, has [similar traffic laws]. Jack Smith of the Los Angeles Times finds the same thing affecting other phrases with like, and he cites the sports reporter Dick Engberg's play-by-play description of a game where Engberg says, It looks as if a first down, and a few minutes later says, It looks to be a first down, twice avoiding a perfectly correct like. Smith observes that this is particularly true in sports, where such a degree of gentility strikes one as a bit surprising.

But as's problems don't stop with like. It has another rival in the shape of than. People are a little uneasy about than in part I suspect because of the normative rule affecting different from and different than--in any case, uneasy enough to hesitate a bit at the point where than collides with as in the comparison of inequality. We can express the same idea two ways:

Mine is three times longer than yours.

Mine is three times as long as yours.

So people who are uncertain about as and than cross them up and we hear things like

Strokes are up to twice as common in blacks than in whites. (KGO)

Hillsborough, Atherton, and Los Altos Hills, where videocassette recorders may be as common than washing machines. (SF Chronicle)

It works both ways, because you also find as construed with more:

Methadone...is three times more potent a stimulus as morphine. (Science Focus)

The determinant more often seems to be a kind of vague sense of equality for as and inequality for than, regardless of syntax, so if you can have same as you can also have similar as and exactly the other side of the coin as.

We can also see the instability of as in a number of collocational shifts, especially involving blends. As yet resembles as of now, and that gives rise to as of yet. As well as you can resembles as best you can so we get as best as you can. As for X resembles as far as X is concerned, so we get as far as X. The ties of as well as to the comparison of equality are loosened to the point that as well as displaces and as a correlative of both, and we get both John as well as Mary. And the same as well as takes on the function of besides. I have a lovely example of this from a Stanford phonologist:

As well as the strictly tonal aspects of the above three phenomena, there's a temporal aspect as well.

Here you see as well being pulled both ways, toward its traditional interior or final position and toward its new initial position equivalent to besides.

We can sympathize with anyone trying to prognosticate the outcomes with as. From where I stand it looks as if we're faced with accepting a flock of new idioms.

My two examples so far of hypercorrection, or gentrification as Michael Kernan of the Washington Post calls it, have both been from grammar--the new rule for the personal pronouns and the uncertain fate of as. Let's take a look now at the same phenomenon as it can be observed in pronunciation. What's happened and what is happening here is epitomized in an announcement

in May of last year that the San Francisco Mime Troupe was thenceforth to be known as the San Francisco [mim] troupe. What we're witnessing is the piecemeal adoption of Latin values for the vowel spellings whenever a speaker attempts to deal with a new word or a less familiar word that looks particularly dressy, or even with a familiar word if it has associations that are elevated enough to suggest that it ought to have a more dignified pronunciation. So we get [mim] for [maim], [haspis] for [haspes], and Dr. Dean Edell pronounces viands as [vianz]. The same avoidance of an i for an i accounts for divisive pronounced [devisi:v], which I've heard separately from Arthur Schlesinger and Daniel Schorr. Similarly with the letter a, which any vulgarian can pronounce [e] and therefore you need to upgrade it to [a]: Nanking becomes [nankɪŋ], uranium comes out [jeraniəm], talkshow host Bill Wattenberg says [bask] for Basque, a Grand Auto ad announces an [ikstravaganzəl], Aquatic Park becomes [ekwatik] Park, Sudan becomes [sudən], and I've even heard [oʃianik] for oceanic. Spellings with au are also Latinized, though this affects only a relatively few words: glaucoma becomes [glækoməl], traumatic becomes [traəmətik]. (This may be partly a reaction to the loss of the [a] - [ʔ] contrast.)

Spellings with o in unstressed position show a somewhat different tendency, which is that of rejecting a pronunciation with shwa. In fact, this is becoming so common that one observer--I forget who--was led to remark on a general shrinking of the territory of shwa as a result of spelling pronunciations. The most notable case is that of the agentive suffix -or, especially when the status of an object or an occupation demands something loftier than a humble shwa. So we get jurors and monitors, and I've even heard givers from a tax expert and talkshow host Owen Spann referring to sellors and cowardly slackors. The same treatment of -or shows up in non-agentives like condors and meteors. The or spelling also does its work when it's internal in a word, resulting in a shift of stress: most people now say mayoral for máyoral, and I've heard temporally for témporally and femoral for fémoral. The same treatment of o but not associated with r turns up in Akrón for [ækron] and havoc for [hævek]. Asbestos comes out asbestos about half the time, and our friend Dean Edell gives us the beautifully appropriate butt ox for buttocks.

What with all this and the misinterpretation of the Latin digraph ae, Judaea becomes [dʒədəeə] and the masculine and feminine plurals alumni and alumnae are

exactly reversed. Similar influences account for Harvard astronomer Owen Gingerich pronouncing Leviathan as if it were spelled like marathon.

If Latin confers dignity, Greek confers more, and people who learn that the plural of crisis and thesis is crises and theses now pluralize process as processes, and I've heard purposes as the plural of purpose, and the president of American University in an interview with Larry King speaking of sexual practices.

The element of malapropism that drives this whole machine shows its workings in the report of the woman who had her vagus nerve operated on and wrote it up as something wrong in Vegas, spelled you know how.

To finish off this dip into pronunciation I give you two quotations, one from Leonard Bloomfield and the other from Allen Walker Read. Bloomfield says (1961, 20), 'Writing is merely a device for recording speech. A person is much the same and looks the same whether he has ever had his picture taken or not. Only a vain beauty who sits for many photographs and carefully studies them may end by slightly changing her pose and expression. It is much the same with languages and their written recording.' Allen Walker Read says (1982, 88), 'In its extreme form [the belief in spelling pronunciations] holds that the oral form of a word is merely the degraded echo of its written form. Year by year the oral tradition is being eroded away. In my boyhood the word spelled k-i-l-n was everywhere pronounced [kɪl], but in recent years I have heard nothing but [kɪln]. I valiantly hold out for [kɪl] but I feel like a back number for doing so.' To add from my own experience, I cling just as stubbornly to margarine (with [g]) as the proper shortened form of oleo-margarine--what right does anyone have to pronounce g-a as [dʒə]?--but I have to be prepared for miscommunication. At one supermarket when I asked a clerk, Where's margarine? the answer was 'I don't think she works here'.

The English spelling system is ideally and almost uniquely situated to have a maximum effect on speech. It is just close enough to being reasonable to encourage people to guess, and just far enough to permit a lot of minor shifts, especially in vowel correspondences. Couple this with a highly print-minded generation that suffers from a deathly fear of sounding wrong, and the stage is set for some large-scale changes that have more respect for Murphy's law than for Grimm's.

So much for genteelism, hypercorrection, gentrification, or whatever you want to call it. Let's take a look now at some of the recent advances of infantilism, of the failure of children to confront some ad-

ditional rule that would prevent them from clinging to a generalization that they had formed earlier. I'll first cite some examples of leveling in pronunciation.

In general the native English suffixes get attached without altering the stem of a word. Law gives us lawful and lawfulness, but legal gives us legality; the native form tends to be transparent, like the word hairy for 'having hair'; the borrowed one is opaque, like hirsute. Children who internalize the set of native rules are going to say running from run, slowly from slow, funny from fun, and fighter from fight. They have learned, correctly, to keep the stem intact. But even with native words we have traditionally had a certain later rule that syncopates a syllable whose nucleus is a syllabic [l], for instance tick gives ticklish, fiddle gives fiddling, gobble gives gobbler. My impression is that starting a little over a decade ago this syncopating rule has been falling by the wayside, and now the majority of speakers that I hear are preserving the full stem, so that what for me is a minimal pair in peddling-pedaling, the one for itinerant salesmanship and the other for riding a bicycle, is now ped-l-ing for both. It seems to be -ing that is most affected, but I have twice heard the phrase to sit idle-ly by, and on radio I've heard George Bush's kinder, gentler America converted to kinder, gentle-er.

A more noticeable change along the same lines--in the preservation of the stem--has been occurring in Latinate words with the -able suffix, affecting their stress. If convért gives convertible, prefer should give preferable, not préferable, and that's what most younger speakers now seem to be saying. I've recorded comparable rather than cómparable, admirable rather than admirable, reparable rather than reparable, and revocable rather than révocable--I suspect that these days if you were to ask your lawyer for a révocable trust it might take him a moment to catch on. At the same time the negative, in a phrase like Their fate was irrévocable, is likely to produce the older pronunciation. Similarly comparable but incómparably good. It's obviously the transparent forms that are leveled--I doubt that anyone would be called disrepútable. I suspect that this tendency is tied in with a more general one, which is to reject the early stress on longer words if there's a motive for shifting it: résolute gives resolútely, ordínary gives ordinarily, possibly related to climax. We étricate, but things are inextricable; the older inexplicable similarly becomes inexplicable. And it's more effective to call something despicable than merely déspicable.

My last example of infantilism is from the grammar, and is something that is having a much more drastic effect on the language. Let's take it through the learning stages and try to find the point where the learner comes to a fork in the road and takes a wrong turn. Children are exposed from the very beginning of the multi-word stage to model sentences like Daddy loves pancakes and Doggies bite. I think it's safe to say that at this stage all that the child is aware of is that there is a verb of a certain form preceded by a noun of a certain form--no nonsense about subjects and predicates. That purely mechanical relationship can be maintained indefinitely without interfering with understanding the meaning of most utterances, especially with the help of context. The result is that more speakers than ever before--I'm tempted to say a majority of speakers--are resorting to proximity agreement rather than subject-verb agreement. The grammatical status of the noun doesn't matter, only its nearness. If you haven't noticed this it is probably because with all simple sentences the output of the two rules is the same. The most numerous cases are of agreement with the noun in a prepositional phrase, like this recently from KQED in an interview with the commander of the USS Pueblo; the reference is to bumper stickers reading 'Remember the Pueblo', and the interviewer said, The intent of those bumper stickers were to remind us... The process is helped along by a vague sort of blending--the speaker could have said, with the same meaning, The bumper stickers were to remind us. But it happens even without that. I've recorded a medical doctor saying knowing that this is a response to changes in her body are helpful, and a radio announcer offering a report on what the medfly people say are going on, where the agreement is with the subject of a different verb. Even agreement with an object pronoun shows up, as in a remark by Owen Spann: The interest from them are exempt from state and local taxes. Also agreement with a parenthetical denial rather than with what the sentence actually affirms, as in this from one of our phonologists: the contour, not its starting and ending points, are the basic units of analysis. Also agreement with an appositional noun: everyone--liberals, conservatives, and the general public, are outraged by the arms-for-hostages deal. Most cases are plural agreement, but the singular shows up too, as when another talkshow host, Art Finley, said That's one thing America has that not too many countries in the world has. I think the favoring of the plural represents a convergence with another tendency, which is

to favor the plural whenever there is any doubt. This shows up most clearly when the speaker anticipates a predicate nominative, especially in pseudocleft sentences like

What we're going to see in the next few months
are all the candidates speaking out.

but the same happens with plural predicates generally. A speaker will head one way and then back off, as when a radio guest who makes birdcall whistles said

The wood we use is--are--the hardwoods.

or in another case where the speaker actually used both singular and plural:

What was thought to be sticks of dynamite were
only railroad flares.

Just the idea of a plural to come may be enough. The representative of the American Bar Association before the Senate hearings on the Kennedy nomination said

The only tactful thing I can say are as follows.

The uncertainty that still plagues this is visible in a philosophical observation by Congressman Lee Hamilton, who said

Methods and means is what the country are all
about.

Nevertheless, my prediction is that contact agreement will prevail. (see Francis [1986]), and when KQED says

Burning chemical wastes are no longer necessary.

I like to ponder what a future Chomsky will do with

Flying planes are dangerous.

I won't go on, simply because there's nowhere to stop. Genteelisms and infantilisms are only two of many forces for change, but they are enough to give you an idea of how the ground moves under our feet. Linguistics is a hazardous occupation.

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ALIENABILITY, INALIENABILITY AND NOMINAL CLASSIFICATION

Hilary Chappell and William McGregor
La Trobe University

1. INTRODUCTION

We have two main, closely related, purposes in writing this paper. Firstly, we attempt to account for the fact that inalienability in many languages is formally marked in the same way as nominal classification, frequently referred to in the literature by 'compounding'. Both construction types are typically zero marked.¹ Alienability, by contrast, seems to be always formally distinct from classification, and is normally realized by overt morphological marking, typically on the dependent constituent. And secondly, we wish to argue that formal identity notwithstanding, inalienability must be regarded as grammatically and semantically distinct from classification.

As to the first point, we suggest that it correlates with two important variables: (i) the degree of referentiality or individuation of the modifying noun; and (ii) the conceptual distance (q.v. Haiman 1985) between the referents of the head and dependent noun. These features are iconically represented by the formal characteristics, of (a) status as independent phrases or words, and (b) overt, mediating morphological marking respectively. Two implicational scales are proposed which account for the facts represented in our sample of languages.² These scales relate degree of referentiality and conceptual distance to the grammatical phenomena of alienable possession, inalienability and nominal classification in such a way that the greater values of referentiality and conceptual distance correlate with alienable possession while the lesser values correspond to inalienability and classification.

Our second point is a suggestion that in languages which do not distinguish formally between inalienability and classification, the distinction is nevertheless present but covert (Whorf 1956). This appears to hold in the languages of our sample, and we present some arguments which may have cross-linguistic validity.

Our argument is organized as follows. Sections 2.1, 2.2 and 2.3 define and exemplify each of the three main types of relationship under investigation, respectively alienability, inalienability and classification. These sections form the main body of the paper, presenting a cross-linguistic analysis with data from a corpus of 20 languages from 15 different language families. These are Sino-Tibetan (Mandarin Chinese, Burmese); Austronesian (Manam, Tolai, Paamese); Altaic (Turkish, Mongolian); Africa (Ewe (Tano-Congo), Acholi (West Nilotic), Kpelle (Mande, Niger-Congo)); Australia (Gooniyandi (Bunuban), Nyulnyul (Nyulnyulan), Yidiñ and Jaru (Pama-Nyungan)); Papua New Guinea (Fore (East Central Highlands), Maisin (of uncertain family membership), Amele (Gum)); America (Imbabura Quechua (Quechuan), Tzutujil (Mayan)), Kiowa (Kiowa-Tanoan)); and Indo-European (English).³ Section 3 elucidates the connection between inalienability and classification, and presents an overview of the data by means of two implicational hierarchies. We conclude (in section 4) with a brief summary which attempts to show the wider relevance of our arguments and findings.

2. SEMANTIC AND SYNTACTIC DESCRIPTION

2.1. Alienability

Alienability is realized by various construction types which we will refer to collectively as genitives. In many languages, the genitive construction is the morphologically and syntactically marked member of the three types of relationship, and has the possessor realized by an NP which

is separated from the possessed constituent by an overt linking marker. This may be either attached to the possessor NP (e.g. English, Gooniyandi, Mandarin Chinese and Jaru), be attached to a possessive classifier (Austronesian languages), or may constitute a separate word (e.g. Nyulnyul, Ewe and Acholi). Less frequently, the marker occurs as a morpheme bound to the possessed constituent (e.g. Kiowa and Tzutujil).

The common pattern of morpho-syntactic separation iconically reflects, we suggest, the 'alienable' semantic relation of non-inherent association between the referents of the two nominal constituents, a relationship established solely through the construction itself, and not necessarily through any real world circumstances (Kay & Zimmer 1976:29). We put this forward as a first approximation to the core meaning of the genitive.

Although they appear to be the marked member of the set from a grammatical point of view, genitives are semantically unmarked, and encode a broad range of specific interpretations, which are contextualizations of the above mentioned core meaning (cf. Kay & Zimmer 1976, who mention many of the senses, without attempting to relate them as contextualizations of a single core meaning). The specific senses include, among others, temporary ownership, voluntary association, all kinds of transitory possession and the use and disposal of objects. For example, the English genitive, *Harriet's red nose*, apart from referring to a part of Harriet's face, could also refer to the plastic nose she bought for a masquerade (and hence is owner of), the paper one she was given to play 'pin the nose on the clown' with (a case of transient possession), or the one she drew herself and cut out to give away to a child (where Harriet is the fabricator). Similarly the English expression *my bus* need not only refer to a bus exclusively in the speaker's possession, that is, one s/he bought and owns, but also to the bus s/he catches every day to work and by extension, to any bus on the habitual route. It may even refer to the bus a person ought to take to reach their destination, including, for example, the bus just missed:

- (1) *That's your bus pulling out right now.*

Thus the genitive does not express strict 'ownership' or 'possession', but rather a freely-made association between two referents (q.v. also Welmers 1973:212). The possibilities just described for English are also available interpretations for genitive constructions in many other unrelated languages. In Tolai, for example, Mosel (1984:36) describes the common denominator of the alienable possessive construction coded by the possessive classifier *-ka* as being an 'active voluntary or controlling relationship such as temporary ownership' which 'implies acquisition and the possibility of disposal, or as personal relationships other than kinship' which 'presuppose selection'. For example, 'wife' (alienable) as opposed to 'brother' (inalienable) and 'adopted child' (alienable) versus 'own child by birth' (inalienable) in Tolai:⁴

- | | | | | |
|-----|------------------------------|----------------------|-----------------------|-------------|
| (2) | Possessive classifier | Pronominal Possessor | Possessed N | (alienable) |
| | <i>kau</i> | <i>-gu</i> | <i>vavina / mumum</i> | |
| | poss ⁵ | <i>-my</i> | woman / adopted:child | |
| | 'my wife / adopted children' | | | |
| (3) | Possessed N | Pronominal Possessor | (inalienable) | |
| | <i>ura / natu</i> | <i>-gu</i> | | |
| | brother / son | <i>-my</i> | | |
| | 'my brother / son' | | | |

The genitive construction typically contains two referential NPs, both of which permit modification by means of, for example, adjectives, determiners, demonstratives, numeral classifiers

and adverbials. (The particulars vary from language to language.) For example, in Mandarin Chinese,

- (4)

Possessor NP

GEN

Possessed N

zhèi zuò miào de qiáng

this CL temple GEN wall

'the walls of this temple'
- (5)

jiù shèhuì de hěn duō fēngsù

old society GEN very many custom

'very many customs of the old society'.

Before leaving this topic, it is worth mentioning that some languages, notably many from the Austronesian family, manifest a formal distinction between different types of alienability. Paamese, spoken on Vanuatu, is such a language, distinguishing four types of alienability, depending on the choice of possessive classifier — see Crowley (1982:219). These possessive classifiers distinguish according to the purpose or use of the alienable 'possession'. (Note, however, that they are all instances of alienability, as distinct from inalienability, which does not employ a possessive classifier — see below.)

(6) Possessed N	Possessive Classifier	-Pronominal Possessor	
<i>ani</i>	<i>ʔ</i>	-k	'my green coconut for eating'
<i>ani</i>	<i>ma</i>	-k	'my green coconut for drinking'
<i>ani</i>	<i>sa</i>	-k	'green coconut growing on my land'
<i>ani</i>	<i>ona</i>	-k	'my green coconut used for any purpose' (e.g. as door stopper, weapon)

2.2 Inalienable constructions

Nominal constructions expressing inalienability represent a halfway house between genitives and nominal classification. Cross-linguistically, it has been found that inalienable nominal constructions are of two main types: (a) In many languages they are zero-marked (cf. Haiman 1985, Hopper & Thompson 1985, Seiler 1983, Fox 1981; Chappell & McGregor (in prep.)), the nominal referring to the possessor being juxtaposed to the nominal referring to the possessed, without the intervention of morphological markers. Languages of this type include: Jaru, Yidjn, Mandarin Chinese, Acholi, and Ewe. (b) An equally frequent pattern is for the inalienably possessed item to be marked by a bound morpheme, normally a pronominal cross-referencing the possessor. Languages of this type include Paamese, Nyulnyul, Manam, and many Amerindian languages (see Nichols 1988). In terms of Nichols' parameters, then, inalienability is associated with head marking or non-marking, whilst alienability (as we have seen) is typically associated with dependent marking.

In both (a) and (b) the morphological marking is iconic to the semantic relationship of 'inherence' being encoded. In type (a) there is a lack of any 'morpho-syntactic mediation' between the two nominals (q.v. Mosel 1984, Seiler 1983), whilst in type (b) a single word refers to the two referent entities.

Inalienability covers a variety of semantic fields, which vary from language to language. However, in almost all languages which have a distinct inalienable construction, this encodes at least the body-part to whole relation and/or kinterms (see Nichols 1988). For example:

(7) Yidin:

<i>jaja</i>	<i>ngumbar</i>	<i>wungul</i>	<i>gambil</i>
child	face	carpet:snake	tail
'child's face'		'carpet snake's tail'	

(8) Paamese:

<i>ah ā-n</i>	<i>v Tvi-n</i>
brain-3sg	cheek-3sg
'his/her brain'	'his/her cheek'

In some languages, the inalienable relationship may also be extended to parts of inanimate entities. Acholi is such a language:

(9) Animates

<i>wang</i>	<i>dako</i>	<i>pyen</i>	<i>lagwa</i>
eye/face	woman	skin	zebra
'woman's eyes/face'		'zebra's skin'	

(10) Inanimates

<i>wen</i>	<i>agwata</i>	<i>pok</i>	<i>lemun</i>
handle	calabash:scoop	skin	orange
'handle of a calabash scoop'		'skin of an orange'	

However, more frequently, it seems that the part-whole relation for inanimates is treated as classification (q.v. section 2.3).

Other semantic fields frequently covered by inalienability include exuviae such as blood, sweat and tears; aspects of the personality including emotions; forms of personal representation such as terms for soul, reputation and name; and concepts involving images of the person such as footprints, shadow, photograph, story or song. (Inalienability in most languages covers only a subset of this range.) Some examples are:

(11) Manam

<i>taburí</i>	-gu
fear	-1sg
'my fear'	

(12) Nyulnyul

<i>nga</i>	-marraj	<i>nga</i>	-lawirl	<i>nga</i>	-ginbal
1sg	-shadow	1sg	-name	1sg	-appearance
'my shadow, my reflection'		'my name'		'my appearance'	

(13) Paamese

<i>v ʔ</i>	-n
footprint	-3sg
'his/her footprints'	

Finally, in many languages, important cultural concepts and objects of value can or must be encoded by an inalienable construction when being related to a second noun (see Bally 1926; Chappell & McGregor (eds.) in prep.). Examples of this category would be traditional items of clothing and terms for 'home', including the place where one sleeps:

(14) Manam

<i>tamōata</i>	<i>mālo</i>	-ø
man	breech:clout	-3sg:ad

'the man's breech clout' (but only when he is wearing it)

(15) Paamese

vuli

-n

sleeping:place -3sg

'his/her regular sleeping place/hole'

Hence, we choose not to define the inalienable relation in terms of 'a part of (the whole)'. Our research (e.g. Chappell & McGregor 1988, Chappell 1986, McGregor 1985) has shown clearly that the inalienable relationship is more centrally concerned with the idea of two entities being inextricably linked than the part-whole relation — clearly footprints, souls and clothing are not parts of a person in the normal sense of that word, and on the other hand, in many languages (e.g. Nyulnyul), terms for hair and fingernails are not treated as inalienables, even though they are physically parts of the body. By this we mean that one thing is so closely related to another as to be 'inseparable' from it in a particular referent context, in regard to a particular referent event or process. We do not mean that one of the items cannot be detached from the other. The noteworthy feature of the inalienable construction is that it does not encode ownership nor establish any kind of voluntary or transitory association between the two nouns, but rather expresses a closely bound relationship.

In nominal constructions encoding inalienability, it seems to be the case that both nouns are referential in nature — that is, they refer to particular entities, rather than generically to classes of entities. As we have already suggested, inalienability represents a point midway between alienability and classification. Although both nouns are referential, in many languages the head noun referring to the inalienable possession may not permit modification without recourse to other morphological strategies, if at all. (This is particularly clear in the case of clause-level coding of inalienability, for example, dative constructions in French and German where the body part may only be marked by the definite article and not by any adjectives — see Wierzbicka 1979.) Consider the following examples from Mandarin: The first example, (16), with an inalienable construction, is well-formed syntactically with a pronominal possessor and possessed noun in apposition (see Chappell 1988). Upon adjectival modification of *tuǐ* 'leg', a construction with the genitive marker *de* must be used as in (17), otherwise an ungrammatical sentence results (18):

- (16) *Wǒ kànjian tā tuǐ le*
I see 3sg leg INC
'I caught sight of his leg.'

- (17) *Wǒ kànjian tā máo-rōng-rōng de tuǐ le*
I see 3sg hairy GEN leg INC
'I caught sight of his hairy leg.'

- (18) **Wǒ kànjian tā máo-rōng-rōng tuǐ le.*

Hence the two nominals of inalienable constructions do not have an equal pragmatic status as they do in the genitive and in this respect behave more like classificatory constructions.

2.3 Classification

Classification refers to the phenomenon whereby the dependent nominal indicates the type of entity that is being referred to by the head nominal. That is, it is the embodiment of the type-token relation within the nominal phrase. Nearly all of the languages in our example used apposition, that is, simple juxtaposition of two nouns as the mode of realization of compounding:⁶

- | | | |
|------------------------------|----------------|--------------------|
| (19) <u>Imbabura Quechua</u> | <u>Amele</u> | <u>Maisin</u> |
| <i>yura uma</i> | <i>na ahul</i> | <i>taru foyang</i> |
| tree head | tree coconut | dog tail |
| 'treetop' | 'coconut tree' | 'dog's tail' |

In all of the languages of our sample the head nominal and dependent classifier occur next to one another, with the classifier almost always preceding the head nominal. Amele is the only exception: as the above example shows, the head typically occurs first. It should be noted that there is a grammatical difference between classification on the one hand and genitives and inalienable constructions on the other. It is that the classifier may not be realized by a pronominal. Both classifier and head must be filled by substantives. In the genitive and inalienable constructions, the dependent role may be discharged by a pronominal.

There are many different ways in which classification contextualizes in particular instances, including generic-specific, function-form, use-item, status-holder, slot-filler, and role-occupant (cf. Halliday 1985:115). Most of these senses occur in nominal classification both across languages and within individual languages. The first relation, generic-specific, is the one almost always found encoded by classification. For instance, in Gooniyandi:

- (20) *girili mandaadda*
 tree Leichhardt:tree
 'Leichhardt tree'

In classification there is only one referential noun, the head noun; the other acts as its dependent, specifying the class or type to which the head noun belongs, and is thus not referential. Compare, for example, the following two examples from Manam:

- (21) *bōesa moarēpi*
 Boesa sweet:potato
 'Boesa sweet potato' (i.e. a variety of sweet potato — regardless of whether or not they are grown on Boesa Island)
- (22) *boēsa nīū nē -di*
 Boesa coconut gen:poss 3pl
 'Boesa coconuts' (i.e. coconuts of the Boesa people, coconuts that grow on Boesa)

Similarly, in Turkish:

- (23) *çoban -ın kız -ı* (Genitive)
 shepherd -3sg:GEN girl -3sg:GEN
 'the shepherd's daughter'

vs:

- (24) *çoban kız -ı* (Classification)
 shepherd girl -3sg:GEN
 'the shepherd girl'

It seems to hold as a cross-linguistic generalization that no material may come between the classifying and head noun to further modify the head noun. In this way classification contrasts grammatically with the genitive construction in many languages. In Turkish, genitives (Lewis's 'definite *izafet*' 1967) may be modified but compounds do not permit any material to intervene between the two nouns.

- (25) Possessor N -Gen. Possessed N -3sg Gen.
İstanbul -'un *tarihî cami* -ler -i
 Istanbul -3sg:GEN historic mosque 3PL -3sg:GEN
 'the historic mosques of Istanbul'
- (26) N₁ -Ø N₂ -3sg:GEN (invariant)
İstanbul -Ø *camii* -ler -i
 Istanbul mosque -PL -3sg:GEN
 'the Istanbul mosques'
- (27) **İstanbul tarihî cami-ler-i*

And in Ewe, if either of the nouns is modified, the genitive construction with *Øe* must be used, as shown by the following examples:

- (28) *gbo fɔ*
 goat leg
 'goat leg'
- (29) *gbo vévé má *(Øe) a-fò ngéngě lá*
 goat smelly DEM poss. leg broken DEF
 'the smelly goat's broken leg'

These facts iconically reflect both the close relation between the two nouns and the lower degree of referentiality of the classifying noun.

3. RELATIONSHIP BETWEEN ALIENABILITY, INALIENABILITY AND CLASSIFICATION

We now attempt to account for the close connection between classification and inalienability. Restricting attention to the part-whole subtype, the whole naturally contextualizes as a generic, the part as a specific, at least in those circumstances in which the whole is not specific and identifiable. In other words, given the inalienable possessor as a nominal with non-specific reference, it is at the same time a good candidate for indicating the type of thing that the part is, in contrast to parts of other wholes. Indeed, when it comes to inanimates, and lesser animates, the fact that these are treated as non-individuated (or less individuated than human beings) in many circumstances means that they are good candidates for classifiers of their parts, as shown by the examples from Yidiɲ:

- (30) *wungul gambil*
 carpet:snake tail
 'carpet snake's tail' (inalienable)
- (31) *minya gangu:l*
 animal wallaby
 'wallaby' (classifier + noun)
- (32) *minya wungul gambil*
 animal carpet:snake tail
 'carpet snake's tail' (classifier + inalienable construction)

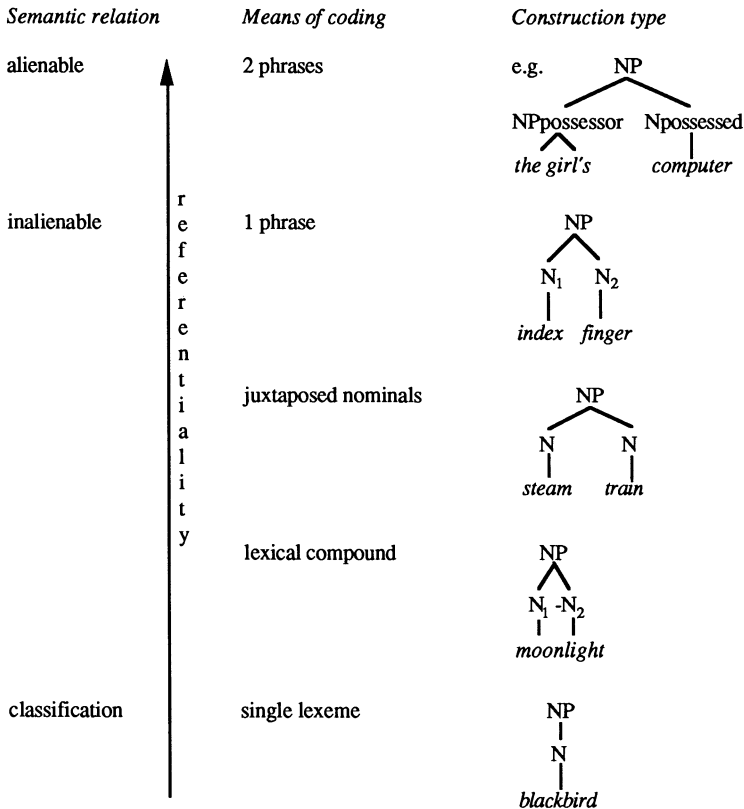
It is perhaps worth remarking here that it is the fact that the relation is of the part-whole type, rather than the fact that the relation is one of inalienability that makes it suitable for interpretation as classification. We have seen that inalienability needs to be defined in terms of inextricable linkage.

In sharp contrast to this, alienable possessors do not in general suit either the general semantic description of type, or any of the more specific descriptions associated with type, given the fact

that they are high on the scale of referentiality. Thus, it is not surprising that cross-linguistically, alienable possession is rarely treated formally in the same way as classification; nor do alienable possessions frequently function as classifiers.

A number of other analyses have noted a connection between inalienability and classification (e.g. Seiler 1983, Ameka 1988, Reh, Heine & Lamberti 1981), although few attempt an explanation. All agree that they are subtypes of a general type; the disagreement concerns the nature of the general type. For example, Ameka (1988), using Wierzbicka's framework of natural language semantics (1978, 1982), shows how both of these relations in Ewe share some, but not all, components of meaning. (Cf. also Evans 1988.)

Hierarchy 1: *Constituent status*



Our findings may be summarized in terms of two implicational hierarchies which associate alienability, inalienability and classification with constituent status on the one hand and morphological marking on the other. According to these scales, if one of these relations is realized formally by a certain construction, then no semantic relations below it on the hierarchy may be realized by a construction that is higher than the first construction. Likewise, if a particular

construction encodes a semantic relation of a certain type, then no construction below it will encode a semantic relation higher on the scale than the first construction. (For convenience our hierarchies have been rotated from the horizontal to the vertical.)

Remarks on hierarchy 1:

(1) Words and constituents have been ordered here for convenience of representation only; there is no suggestion that this corresponds to their typical order in any particular language.

(2) It is difficult to distinguish between N₁-N₂ constructions involving classification that constitute compounds and those which constitute single lexemes, and even to distinguish these from constructions which do not form compounds or lexemes. Moreover, the criteria are likely to differ from language to language. These differences are not important to our present purposes, as we are concerned with the relationship encoded of classification.

Hierarchy 2: *Morphological marking*

semantic relation	morphological marking			example languages
	Dependent	Marker	Head	
alienable	NP	{PossPro PossMarker}	N	Nyulnyul (al)
	NP	PossClassifier + ProAffix	N	Paamese (al)
	{NP PossPro}	+ Oblique marker	N	English, Gooniyandi (al, inal) Yidiny (al)
inalienable	N	ProAffix	+ N	Paamese (inal)
		ProAffix	+ N	Nyulnyul (inal)
classification	N-∅		N-∅	Yidiny (inal, class) English, Gooniyandi (class) Chinese

Remarks on hierarchy 2:

(1) Hierarchy 2 shows only the predominant realizations of the different formal possibilities for each language; to indicate all the possibilities would be confusing.

(2) It might be objected that since this hierarchy involves both morphological information and information of word/constituent boundaries, hierarchy 1 and hierarchy 2 could be combined into a single hierarchy. However, to do this would miss the point that it is necessary to include information on where the bound morpheme (if any) occurs, and so it is not possible to strictly separate morphological form from morphological syntax. And to confuse the two would fail to bring to light significant generalizations. Note, in this connection, that the final line of the hierarchy, N-∅ N-∅ does not distinguish among the various word-boundary possibilities — for this information, see hierarchy 1.

(3) The genitive, as the semantically unmarked construction, often allows substitution of semantic categories found below it on the continuum. That is, categories typically encoded by the

inalienable or classifying constructions may sometimes also be encoded by the genitive, with a concomitant change of meaning. For example, in some languages with the alienable/inalienable distinction, (some) parts of the body and some other items typically treated as inalienable may be encoded by the genitive instead of the inalienable construction. For instance, this obtains in both Yidiñ (Dixon 1976) and Jaru (Tsunoda 1981), for parts of the human being — though not for inanimates. In such circumstances we hypothesize that the body part is conceived of as an individuated entity in its own right or as physically separate from the body. This may happen, for instance, in detailed descriptions of a person's appearance, in metaphor, epithets and avoidance language, or even in the case of reference to physically separated parts of the body (cf. Bally 1926). Consider two examples from Paamese:

- (33) *Ametemau, avu!*
 eye:extent grandmother (free form)
 'What big eyes you have, grandmother!'
- (34) *Asa, ao?!*
 what, penis (free form)
 'What is it, prick?!' (cf. *ōn* 'his penis (inal)')

On the other hand, terms which occur in the genitive are not normally able to occur in the inalienable construction (see also Seiler 1983). Nor are they usually able to occur in classification — except when the genitive relation is also marked.

4. CONCLUSION

In this paper we have discussed the connection between classification and inalienability in a number of different languages, from diverse genetic families; we attempted to account for this connection by means of a pair of implicational scales relating to the two variables of formal separateness of the nominals as phrases or words, which we suggest to be iconic of the degree of referentiality of the nominals; and secondly, morphological marking, which we suggest reflects the proximity or otherwise of the connection between the nominals. On both counts inalienability is closer to classification than is alienable possession.

We have also suggested that while these three types of relationship are not always formally distinct at the level of the phrase, there is convincing support cross-linguistically for treating the relationships of inalienability and classification as in fact different, indeed both semantically and grammatically different, and thus instances of covert categories. It is possible also that inalienability should be distinguished from alienability in all languages, whether or not there is a formal contrast. We have not had the space to explore this possibility here — but see e.g. Kay & Zimmer (1976:34) for suggestive comments in this direction.

To conclude the paper, we draw attention to the wider significance of our findings. The formal similarity between inalienability and classification we have been investigating within the noun phrase finds interesting parallels elsewhere. For instance, according to Welmers (1973:279), the formal distinction between alienable and inalienable in some of the Mande languages (Niger-Congo), generally non-noun class languages, is isomorphic to the use of noun classes in the Bantu language family, particularly with respect to the opposition of noun classes containing kinship terms versus all others. For example, the marker for alienable genitive constructions in many Mande languages is claimed by Welmers to be cognate to the noun class marker for classes other than those including kin terms in Bantu languages. More interestingly, there are languages which incorporate nominals into the verbal complex, in which inalienable possessions are treated in the

same way as generic-specific classifiers. For example, consider the following two Mayali examples (from Evans 1988):

- (35) *ka* *-yaw* *-karm* *-e* *al* *-daluk*
 3minA+3minO -baby -have -PAST ClassII -female
 'She has a baby girl'
- (36) *ngan* *-karre+mok* *-bukka* *-ng*
 3minA+1minO -calf+sore -show -PastPerfective
 'He showed me his sore calf.'

Clearly, our hypotheses account for this formal collapse.

Furthermore, some nominal-incorporating languages permit the incorporation of secondary predicates (Nichols 1978) or attributes which are central to the referent process, as well as inalienables. This is the case in Rembarrnga (see McKay 1975):

- (37) *parr* *-tumu* *-mirri* *-ya*
 3min.IMPL+3min.A -small:of:back -spear -PAST:PUNCT
 'He speared him in the small of the back.' (McKay 1975:299)
- (38) *kalij* *-ø* *-ma* *pantu* *yarra* *-turra* *-ra* *-ø*
 others -NOM -ma here 1.aug.S -alive -ra -PRES
 'Others of us are still (getting around) alive.' (McKay 1975:292)

This suggests the possibility of further extension of our hypotheses to include not just classification, but also attribution, thus accounting for the fact that some languages (e.g. Ungarinyin and Wunambal (Northern Kimberley, Australia) use the same set of prefixes to mark inalienables as are used to mark carriers of certain attributes. For example, compare *gurr-ornarr* 'your bones' and *gurr-arnerr* 'you (pl) are great' in Ungarinyin (Rumsey 1982:43, 54).

NOTES

¹ We use the terms 'possessor', 'possessed' and 'possession' merely as convenient labels as opposed to Ultan (1978), Seiler (1983) and Nichols (1988), amongst others, who regard the label as indicating some general aspect of meaning, shared by the constructions they investigate. Although we use these terms as labels, the purely semantic notion of 'possession' is regarded in this paper as being expressed by the genitive construction - see section 2.1.

² Seiler (1983) also uses the construct of a continuum. The scope of his analysis is broader than ours in that it treats, for example, verbs of having and existence amongst a wide range of morphological and syntactic means for expressing 'possession'. Consequently, a markedly different continuum to ours representing 'the dimension of possession' is set up. Note also that in Seiler (1983) inalienability and alienability are subsumed under the rubric 'possession' as two possible points on this scale. In our analysis, 'possession' is a semantic feature restricted to encoding by genitive constructions which refers to a non-inherent, often temporary relationship between the two referents - see section 2.1 for a more detailed discussion. Haiman (1985:103) also proposes a scale of linguistic distance corresponding to the conceptual distance between notions represented.

³ The data and examples are obtained from the reference grammars and articles listed below.

⁴ Mosel points out (1984:34) that 'the bride is bought by the relatives of the bridegroom and becomes the property of the man' and that upon divorce, 'the family of the woman has to pay back the bride price'. Note that the terms for both 'husband' and 'spouse' are also treated as alienables.

⁵ The following abbreviations are used: A = subject of transitive clause; al = alienable; ART = article; aug = augmented; class/CLF = classifier; GEN = genitive; IMPL = implicated; inal = inalienable; INC = inceptive aspect marker; min = minimal; N = noun;) = object of transitive clause; PL = plural; pro = pronoun; poss = possessive; S = subject of intransitive clause; and sg = singular.

⁶ We will mainly consider the type of classification represented by compounds formed by a double nominal in this analysis with some reference to other types of classification encoded by means of noun class markers or by nominal incorporation

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**THE SYNTAX-PHONOLOGY INTERFACE
AND VARIABLE DATA: THE CASE OF
FRENCH LIAISON***

DAAN DE JONG

UNIVERSITY OF MONTREAL / FREE UNIVERSITY OF
AMSTERDAM

In French, many word-final consonants are phonetically realized only when followed by a vowel-initial word. When followed by a consonant-initial word, they are erased. Hence, the opposition between *chez eux* and *chez lui*: in the first example the /z/ of *chez* is phonetically realized, in the second it is not. This phenomenon is currently known as French Liaison (henceforth FL). A brief discussion of the formal account of liaison is given in section 1 of this paper, where I will also discuss my assumptions about the organization of phonological rules (I will assume the theory of Lexical Phonology).

A first complicating factor about liaison is that it only occurs in specific syntactic or prosodic configurations. In section 2 of this paper I will argue that if liaison usage is to be accounted for in terms of a syntax-derived prosodic structure (of the type proposed in Selkirk 1986), a three-layered prosodic hierarchy must be assumed.

Another complicating factor is that liaison is a highly variable phenomenon. An advantage of our three layered account is that it can deal with at least a part of the variation pattern in liaison usage. In section 3 we will show, however, that other factors, such as syntactic category, word length and morphological information must be taken into account as well. We will explicitly take into account the possibility that the variation in liaison usage is lexical and due to lexical diffusion. It will be concluded that the influence of the prosodic hierarchy on the variation in liaison is a global one: it determines where lexicalization in liaison usage can take place.

A final complicating factor about French Liaison is that the data are not always clear (cf. Kaisse 1985: 163 and Morin 1987 for a discussion of this problem). Where necessary, we will use real speech data to corroborate our claims. Our data come from forty-five socially stratified interviews of the Orléans corpus (see Blanc & Biggs 1971 and Mullineaux & Blanc 1982) and are described in full detail in De Jong (1988) and De Jong (to appear).

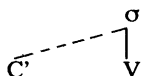
1. Theoretical assumptions

I will follow Clements & Keyser's (1983) and Booij's (1984) proposal that liaison consonants in French must underlyingly be marked as 'extrasyllabic'. In Clements & Keyser's analysis *chez lui* and *chez eux* are represented as follows:

- (1)
- | | | | | | | |
|----------|---|----------|---|----------|---|----------|
| σ | | σ | | σ | | σ |
| ↙ | | ↙ | | ↙ | | ↙ |
| C | V | C | C | V | C | V |
| ↙ | ↘ | ↙ | ↘ | ↙ | ↘ | ↘ |
| f | e | z | l | u | | |

In this representation the /z/ of *chez* is not linked to a syllable tier (σ). When the second word is vowel-initial (as in *chez eux*), the phonetic realization of the extrasyllabic consonant is formalized via a convention which 'syllabifies' the extrasyllabic consonant by linking it to the following syllable tier. This linking rule is stated as follows:

(2) French Liaison (FL)



where C' stands for 'extrasyllabic consonant', and the dotted line indicates the association of C' with the following syllable node (σ). After the application of (2), the /z/ of *chez* is linked to the following syllable tier and will be phonetically realized. If the second word is consonant initial (as in the case of *chez lui*), the rule does not apply, the latent consonant does not surface phonetically and is erased at the end of phonological derivation.

I will assume the frameworks of Lexical Phonology (Kiparsky 1982, 1985, Mohanan 1986) and especially that of non-linear prosodic phonology (Kaisse 1985, Selkirk 1986, Nespor & Vogel 1986, Hale & Selkirk 1987). According to the former theory, at least two types of phonological rules must be distinguished: lexical rules that apply in the lexicon and postlexical rules that apply after the lexicon. Furthermore, lexical rules are subdivided in two types: cyclic rules and non-cyclic rules. The former interact with morphology, and the latter do not: they apply 'across-the-board', as the saying goes.

The organization of postlexical rules is elaborated in the theory of non-linear prosodic phonology. Postlexical rules too can be subdivided in (at least) two types of rules: rules that interact with the syntax and rules that do not. The former type of rules applies only in certain syntactic or prosodic configurations, whereas the latter applies, once again, across-the-board. FL is a rule of the former type: it interacts with the syntax. A first question to be answered is how such interactions can be formally represented. That is: what does the syntax-phonology interface look like?

2. Prosodic Domains

Selkirk (1986) formulates the domain of external sandhi rules like FL in terms of prosodic constituents. The latter are derived from the syntactic surface structure via a set of syntax-sensitive mapping rules. These mapping rules pick out the end of some kind of syntactic category as the end of a prosodic domain.

I will follow Selkirk's (1986: 385) claim that the relevant syntactic categories are those of the X-bar theory. More precisely, the *right* ends of syntactic categories are prosodic domain ends.¹ The important question, then, is which category or categories are designated as relevant in the syntax - phonology mapping of French.

Selkirk (1986) assumes that the right ends of major category phrasal heads (X) are the end of a prosodic domain in French. Within this domain liaison is obligatorily used. Selkirk (1986: 396) gives the following examples:

- (3) a. on m'a souvent **amené**] dans_un_énorme wagon]
 b. ces très_aimables_ **enfants**] en_ont_avalé]

In the examples under (3) a mapping rule picks out the (bold-faced) phrasal heads as prosodic domain ends, and inserts an end-setting (symbolized as “J”) after each of them. All material between two end-settings, then, is in a prosodic constituent (which Selkirk 1986 calls the Small Phonological Phrase) within which FL applies obligatorily (predicted liaisons are symbolized by “_”).

Two remarks are in order. First, though adjectives are usually considered as phrasal heads, prenominal adjectives are not. Independent motivation for this claim is given in Selkirk (1986: 395) and Nespor & Vogel (1986). My data corroborate this claim in the sense that liaison is indeed (almost) always used after prenominal adjectives. I will follow this analysis of adjectives here.

The second remark concerns the fact that only nouns, full verbs and adjectives (the non-prenominal ones) count as phrasal heads. This follows from the independently motivated (Selkirk 1984: 337) *Principle of the Categorical Invisibility of Function Words* (henceforth the *PCI*), according to which all function words are always 'invisible' for the phonological rules that are subject to it.

A problematic aspect of this analysis is that our data from the Orléans corpus show that liaison is not obligatory after all function words. Variable liaison is found (1) after prepositions, (2) after copulas, (3) after the passive auxiliary *être*, (4) after the perfective auxiliaries and (5) after the modal auxiliaries. After all other function words liaison applies obligatorily. This shows that the SPP is not the domain of obligatory liaison.

The five word categories after which liaison occurred variably within the SPP have a striking fact in common. On the one hand they are all function words and belong to closed syntactic categories (categories containing a small number of words only). In this respect they resemble the other function words. On the other hand, they can also all be analysed as phrasal heads. This is well known for the prepositions. For example, Jackendoff (1977) analyzes prepositions as heads that subcategorize for a nominal complement. This analysis also holds true for copulas, which can be considered as verbal heads that subcategorize for an XP complement. Recently, Guéron & Hoekstra (1988) have demonstrated that in French the passive auxiliary and the perfective auxiliaries must be analyzed as verbal heads that subcategorize for a VP-complement, and the modal auxiliaries as heads that subcategorize for a CP-complement.

The five syntactic categories after which FL applies variably have in common that they are all 'minor category heads'. In this respect they are syntactically different from the other function words (henceforth referred to as real function words), which are never phrasal heads and cannot take a complement. They are also different from major category heads (nouns, 'full' verbs and non-prenominal adjectives) in the sense that they belong to a closed syntactic category. These syntactic differences are reflected in phonological differences with respect to liaison usage: after real function words within an SPP FL applies obligatorily, after minor heads within SPP FL applies frequently, and after major heads followed by a complement FL can also apply, but does so quite rarely (frequency data from the Orléans corpus will be given below).

Under an analysis in terms of prosodic constituents, the observed differences in behavior can only be accounted for when several prosodic levels are distinguished. A first level, P1, can be derived via a mapping rule that picks out the right end of *every* head

(4) a. (ils_ont)(été)(aidés)(par)(des_enseignants)(admirables)
b. (tu_sais)(quand)(ils_inviteront)(un autre grand artiste)

(5) a. (ils_ont_été **aidés**)(par des **enseignants**)(**admirables**)
b. (tu **sais**)(quand ils **inviteront**)(un autre grand **artiste**)

Finally, there must be a third level of prosodic structure, P3, where liaison is also used, but much less often than at level P2 (in the Orléans corpus liaison was used in about 54.8% of the contexts at level P2, but in only 3.6% of the contexts at level P3 (see De Jong 1989: 43-5). Level P3 concerns inflected head - complement sequences (cf. Selkirk's 1974 X-Comp Rule). This domain can be derived via a mapping rule that picks out the right end of every maximal projection as the end of a domain (for further details of this mapping rule I refer to Selkirk (1986) and to De Jong (1989). Examples are:

(6) a. (ils_ont_été **aïdés**)(par des_enseignants_**admirables**)
b. (tu **sais**)(quand ils inviteront un autre grand **artiste**)

In summary, the frequency data from the Orléans-corpus indicate that three levels of derivation must be distinguished: FL applies more frequently at level P1 than at level P2, where it applies more frequently than at P3, thus yielding the implicational pattern $P1 > P2 > P3$. The full prosodic structure for both of our examples, then, is:

(7) a. ils ont été aidés par des enseignants admirables

P1:	(X)	()	()	()
P2:	()	()	()
P3:	()	())

b. tu sais quand ils inviteront un autre grand artiste

P1:	()	(X)	()
P2:	()	()	())
P3:	()	())))

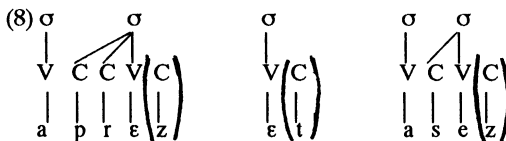
This three-layered prosodic structure² is based on the variation pattern for liaison as found in the Orléans-corpus as a whole, but it also holds good for individual data (see De Jong 1989). That is, for each individual we find the same implicational pattern $P1 > P2 > P3$. In other words, the prosodic hierarchy seems to determine at least a part of the variation in liaison usage.³

Nevertheless, the prosodic hierarchy is certainly not the only factor responsible for the variation in liaison usage. Things are quite a bit more complex than that, as I will try to show in some more detail in the next section. I will argue that the difference between the three prosodic levels is not only reflected in frequency differences in the application of FL, but also in varying degrees of syntactization, morphologization and lexicalization of liaison. At level P3 liaison applies only in some very specific contexts for which reference has to be made to syntactic, morphological and lexical information. This holds true for level P2 as well, but to a much lesser degree, whereas these tendencies are completely absent at level P1.

3. Variation

An as yet unanswered question is what exactly is varying when for one and the same word, all other things being equal, a speaker sometimes uses liaison and at other times does not. There are at least two possibilities. The first one is that the variation is postlexical. In that case it must be FL that applies variably on levels P2 and P3.

The other possibility is that the variation is lexical. In that case variation in liaison usage must be (1) a matter of variation in lexical entries or (2) in word-formation rules when the extrasyllabic consonant is a suffix. The former possibility must be interpreted in the sense that a speaker sometimes considers that one and the same word ends in an extrasyllabic consonant, and at other times that it does not. In other words, the speaker is not sure whether a specific word ends in an extrasyllabic consonant or not. The consequence of this uncertainty is that the extrasyllabic consonant is variably present. This can be notated as follows (for *après*, *est* and *assez*):



In (8) the brackets around the word-final extrasyllabic consonants indicate that it is a variable extrasyllabic consonant.⁴ If the speaker 'decides' that a word ends in an extrasyllabic consonant, it will be obligatorily realized at level P2 or P3. If the speaker makes the opposite choice, FL does not apply at level P2 or P3, simply because there is no extrasyllabic consonant to which it can apply.

The question thus is whether the variation in liaison is (a) a matter of postlexical variation in the application of FL, (b) a matter of lexical variation in the underlying form, or (c) a matter of both lexical and postlexical variation. I will try to provide some arguments showing that the variation is both lexical and postlexical.

I will first present some more frequency data on liaison. At level P2, liaison occurred in 54.8% of the contexts. Prosodic domains are cross-categorially derived from syntactic structure, so that, as said above, there should not be any significant differences in liaison usage after minor heads belonging to different syntactic categories. This cross-categorial aspect of the domain derivation, however, is strongly contradicted by our data, as is shown by the following table:

Category	L	N	%
1.Prep.	257	301	85.1
2.Etre	981	1728	56.8
3.Modals	41	132	31.1
4.Avoir	9	190	4.7
total	1288	2351	54.8

Table 1. *Liaison frequencies at level P2. L: absolute number of realized liaison consonants; N: total number of liaison contexts; %: percentage realized liaison consonants (adapted from De Jong 1988: 78).*

The data in table 1 show that liaison usage is highly dependent on the syntactic category of the liaison word. If Selkirk’s (1986) model is assumed, such specific syntactic information is no longer available after the application of the mapping rules. Mapping rules as formulated by Selkirk cannot account for this cross-categorial variation, because after the application of the mapping rules, all syntactic information has disappeared.

But things are even worse than that: within each syntactic category we also find a high degree of variability in liaison usage between different words. This is illustrated by the following data for the prepositions:

Monosyllabic				Polysyllabic			
item	L	N	%	item	L	N	%
<i>sans</i>	17	18	94.4	<i>après</i>	2	5	40.0
<i>dans</i>	187	199	93.9	<i>pendant</i>	1	11	9.1
<i>chez</i>	50	55	90.9	<i>devant</i>	0	3	0.0
				<i>depuis</i>	0	10	0.0
total	254	272	93.4	total	3	29	10.3

Table 2. *Liaison frequencies after prepositions (see table 1 for L, N and %) (from De Jong 1988: 88).*

These data show that liaison is very frequent after some prepositions, and quite rare after others. The display of the data suggests that liaison usage is dependent on word length, as has been claimed by several researchers (Encrevé 1983, Malécot 1979, Selkirk 1974). This effect of word length exists not only for the prepositions, but also for the other word categories at level P2, as shown in table 3:

Category	Monosyllabic			Polysyllabic		
	L	N	%	L	N	%
1.Prep.	254	272	93.4	3	29	10.3
2.Etre	934	1498	62.3	47	230	20.4
3.Avoir	9	80	11.3	0	110	0.0
4.Modal	35	98	35.7	6	34	17.6
Total	1232	1948	63.2	56	403	13.9

Table 3. *Liaison frequencies after monosyllabic and polysyllabic words after 4 word categories at level P2 (adapted from De Jong 1988: 75).*

Word category and word length are not the only factors interfering with the prosodic hierarchy. This becomes apparent from table 4, which provides information on liaison usage after the forms of the auxiliary / copula *être*:

item	Monosyllabic			item	Polysyllabic		
	L	N	%		L	N	%
<i>sommes</i>	21	29	72.4	<i>étaient</i>	6	20	30.0
<i>est</i>	784	1109	70.7	<i>était</i>	35	143	24.5
<i>sont</i>	76	153	49.7	<i>serait</i>	1	9	11.1
<i>suis</i>	47	156	30.1	<i>étais</i>	5	49	10.2
<i>soient</i>	2	7	28.6	<i>étions</i>	0	4	0.0
<i>êtes</i>	2	14	14.3	<i>seraient</i>	0	2	0.0
<i>soit</i>	2	28	7.1	<i>étiez</i>	0	1	0.0
<i>sois</i>	0	1	0.0	<i>serais</i>	0	1	0.0
				<i>seront</i>	0	1	0.0
total	934	1497	62.4	total	47	230	20.4

Table 4. *Liaison frequencies after the forms of être (from De Jong 1988: 92).*

Both within the subtables of the monosyllabic and polysyllabic items, we find a great deal of variation between the different forms of *être*. A part of this variation can be ascribed to the often noticed difference in behaviour between /t/ and /z/ liaison (Delattre 1966, Malécot

1979, Encrevé 1983). It should be noted that for verbs /t/-liaison marks third persons, and /z/-liaison first and second persons (see Morin & Kaye 1982, De Jong 1988), so that it can be argued that the variation has a morphological rather than a phonological status. On the whole, /t/-liaison is more frequent than /z/-liaison (see table 5).

Verb	%/t/	%/z/
être	61.2	36.5
modal	33.9	0.0
avoir1	16.9	0.0
avoir2	7.1	0.0
total	54.0	23.1

Table 5. *Liaison frequencies after verbs: /t/ vs. /z/-liaison. avoir1: main verb avoir; avoir2: perfective auxiliary avoir (adapted from De Jong 1988: 95).*

It is hard to see how the influence of such factors can be accounted for postlexically by Selkirk's model, where all syntactic information (Selkirk 1986: 373), but also all morphological and lexical information (as is claimed in Mohanan 1986, Kiparsky 1982, 1985) is erased after the application of the mapping rules. So after the mapping rules FL can no longer be restricted by lexical, morphological or syntactic factors. A possible way out is to set up a whole series of different mapping rules for each syntactic category, for monosyllabic and polysyllabic words, for first/second persons versus third persons, and maybe also for individual words. This, however, would be very much ad hoc and would yield an arbitrary and unwieldy number of mapping rules.

Another way out, however, is to relegate the variation to the lexicon. This is a not unattractive solution, because a closer look at the data allows for the hypothesis that at least a part of the variation in liaison usage is due to lexical diffusion. It has quite often been hypothesized that lexical diffusion is somehow related to word frequency (Phillips 1984). This seems to be the case for liaison as well, especially when it is realized that the often observed difference between monosyllables and polysyllables, and between /t/-/z/ liaison may reflect word frequency differences. Word length is closely related to word frequency: monosyllabic words are more frequent than polysyllabic words. Furthermore, third persons are much more frequent than first and second persons. In other words, in the more frequent (monosyllabic) words, word-final extrasyllabic consonants are maintained more often than the less frequent (polysyllabic) words, and the more frequent verbal suffix (the /t/) is maintained more frequently than the less frequent verbal suffix (the /z/).

I conclude that at least a part of the variation in liaison usage takes place in the lexicon, and has to do either (1) with variation in the lexical entry of a word or (2) with variation in the application of the word-formation rules that add the first, second or third person suffixes to the verb. On the one hand, speakers can have a variable underlying extrasyllabic consonant in the underlying representation of many words (see above). On the other hand, speakers variably suffix verbs for first, second and third person. The choice the speakers thus have is not a choice between the postlexical application of FL or not, but rather a

choice (1) between the presence / absence of an extrasyllabic consonant in the underlying form or (2) between the application or non-application of a word-formation rule in the lexicon.

But can all variation be lexical? Probably not. At level P2, this becomes apparent from the fact that after for instance the preposition *chez* the realization of the extrasyllabic *z* is dependent on the following word(s): it is categorical when *eux* or *elles* follow, but variable when an NP follows. Whatever the precise explanation for this phenomenon is, it clearly must be a postlexical one, because it refers to the syntax.

At level P3 a part of the variation must be postlexical too. This becomes apparent from the fact that liaison does occur after plural nouns when followed by an adjective, but not when followed by something else. Furthermore, liaison occurs after adjectives when they are prenominal, but not when they are in another syntactic position. In other words, there are some indications that the variation is both lexical (related to variation in underlying forms and word-formation rules) and postlexical (related to variation in the rate of application of FL).

In the light of the frequency data presented in this section, the role of the prosodic hierarchy seems to be more limited than can be concluded from section 2. It is only at level P1 that liaison is a truly prosodic rule: a rule applying in a prosodic domain. At that level the application of FL is exceptionless and truly cross-categorical. At level P3, however, liaison is highly syntacticized (for instance, applying in noun - adjective sequences, but not in adjective - PP sequences; i.e., reference has to be made to specific syntactic categories of various types), morphologized (FL applying only after *inflected* heads, for example after plural nouns) and lexicalized (for example in the Orléans corpus the only main verb after which FL applies at level P3 is the main verb *avoir*). At level P2, syntacticization, morphologization and lexicalization also occur (as shown by the data presented in this section), but to a much lesser extent than at level P3. This implies that at level P3, liaison is no longer a rule applying in a prosodic domain. The same is true for level P2, but to a lesser degree. In this sense, the role of the three-layered prosodic hierarchy seems to be limited.

It must be noted, however, that the prosodic hierarchy makes a very strong prediction about where, in what order and to what extent liaison usage syntacticizes, morphologizes and lexicalizes. Such processes will first (most often) occur at level P3 (where liaison also is the least frequent), then at level P2 (where liaison is much more frequent) and finally at level P1 (where liaison is most frequent). Thus the prosodic hierarchy is responsible for (at least a part of) the lexicalization and syntacticization pattern in liaison usage, and thereby for a part of its variation pattern. This is a not uninteresting claim, which certainly merits further research on the basis of related external sandhi phenomena in other languages (for instance Raddoppiamento Sintattico in Italian, see Nespor & Vogel 1986). Another area of research is historical linguistics. It is well known that variation patterns often reflect language change. If the proposed multi-layered prosodic hierarchy is of any value, then it predicts that changes in external sandhi rules will follow the prosodic hierarchy: they will first take place at the lowest level, and then gradually work themselves up to higher levels. This prediction is of importance for the patterns of change and variation in FL and Raddoppiamento Sintattico, but also for that of many syntax-sensitive 'variable rules' like /d/-deletion in English (Guy 1980) and Dutch (Van Hout 1989).

4. Conclusion

On the basis of frequency data on liaison usage in the Orléans corpus, I have proposed a three-layered prosodic hierarchy. This hierarchy accounts for at least a part of the variation pattern (and maybe also of the change) in liaison usage. Unfortunately, the proposed prosodic hierarchy cannot explain all variation. Another part of the variation in liaison usage is most likely due to processes of syntactization, morphologization and lexicalization of liaison usage. It appeared, however, that it is the prosodic hierarchy that determines where such processes take place.

NOTES

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1. The choice for a specific syntactic category as the end of a prosodic domain is set for each language by the Designated Category Parameter. The choice for left or right is set by the End Parameter (see Hale & Selkirk 1987).

2. The prosodic constituent at level P1 is very similar to Selkirk's (1986) Prosodic Word, that at level P2 to the Small Phonological Phrase, and that at level P3 to the Maximal Phonological Phrase. Furthermore, the representation in this example obeys the Strict Layer Hypothesis (cf. Selkirk 1984).

3. I assume that FL first applies at level P1. On the next cycle, P2, FL applies once again, and on the final cycle, P3, FL applies another time. In other words, our data provide an indication that syntax-sensitive, postlexical rules apply in a cyclic fashion.

4. This analysis is certainly not equivalent to Rotenberg's (1978) analysis of liaison in terms of 'partial suppletion' (see Encrevé 1988 for some discussion). Rotenberg notates a word like *les* as *le(s)*. The brackets around the final *s* of *les* indicate that for this word the long allomorph with *z* is used before vowel-initial words and the short one before consonant-initial words. Rotenberg's brackets do not refer to variability. Words showing categorical liaison (like *les*) are notated in the same way as words showing variable liaison (like *est*, *après*, *assez*).

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Real-Time Morphology: Symbolic Rules or Analogical Networks?

Bruce L. Derwing
University of Alberta

and

Royal Skousen
Brigham Young University

1. Introduction

Some time ago, in describing to one of us the main theme of H.G. Wells' novel, 'The War of the Worlds', a friend explained that a group of powerful alien beings had invaded the earth and found ordinary earthlings to be relatively easy pickings; luckily for us, however, the microbes of our planet were a different kettle of fish and, having no suitable defences against them, these alien monsters '*succame* to our diseases' and the planet was saved.

As is well known, the child language literature is replete with anecdotes of this kind. To cite just three such examples (all coincidentally involving numbers): if four airplanes can be said to fly in *formation*, then two must fly in *twomation* (Sturtevant 1947); if it can be *too hot* in one place, why not *three hot* in another? (Jespersen 1922, cited by Hockett 1970:89); and if *forty-four*, *sixty-six*, and *seventy-seven* are all good number names, why not *fifty-five* or even *onety-one* (for 11) (Derwing 1976).

Surely no linguist would want to attribute such isolated examples as these to knowledge of 'rules', i.e., one for each individual case. In fact, as Householder (1971:63) has pointed out, the 'only candidate so far proposed for this job is analogy', the identification of a sameness of similarities (or differences) with other forms in the lexicon: *become:became::succumb:succame*, etc. Interestingly, such giants of earlier linguistic eras as Hermann Paul and Leonard Bloomfield (who, of course, were both acutely aware that 'analogical change' was also a well-documented historical process) linked all of what is now called 'linguistic creativity' to this notion: the process of 'freely creating' novel forms, says Paul, 'we call formation by analogy' (1891:97), while Bloomfield argues that 'a regular analogy permits a speaker to utter speech-forms which he has not heard; we say that he utters them on the analogy of similar forms which he has heard' (1933:275).

For all of this, few generative grammarians have ever paused in their own rush to theory to take the notion of analogy very seriously; one might say, in fact, that one of the fundamental tenets of the 'Chomskian revolution' was the implicit (or not so implicit) rejection of such a simple and relatively straightforward notion in favor of more abstract and convoluted approaches to the problem of making 'infinite use of finite means' (cf. Chomsky 1965:8). Kiparsky's brief (two-page) dismissal is a fairly typical one, which ends with the

conclusion that 'at the point at which ... analogies begin to make the right generalizations, they are indistinguishable from rules' (1975:189).

Needless to say, the recent emergence of 'connectionist' models from psychology is gradually forcing upon the linguistic community a re-assessment of this position, a renewal of interest in the very old idea that there is more to analogy than the mere cataloguing of a few anecdotal examples of the kind that appeared in our introduction above (see, for example, Bybee 1988, as good evidence of this). This is not a paper about 'connectionism', however, at least not about the specific model that most people currently associate with this term, viz., the theory of 'parallel distributed processing' [PDP] currently under development by David Rumelhart, Jay McClelland, and their research associates (see Rumelhart & McClelland 1986 [R&M]). This is, however, a paper about a whole class of possible models (including PDP) that can all reasonably be referred to as 'analogical' and that can be sharply differentiated from the kind of 'symbolic' or rule-based approaches that are exemplified by generative grammars in linguistics (cf. Pinker & Prince 1988).

In brief, therefore, this paper will attempt to (1) elucidate some of the key features that differentiate the 'analogical' approach from the generative or rule-based one and then (2) proceed to consider some evidence, based on psycholinguistic research carried out over quite a number of years, which lends, as we see it, sufficient *prima facie* support in favor of the analogical approach to (re-)establish it as a candidate worthy of a much more careful hearing by linguists than has been afforded in recent years.

2. Rule-based vs. Analogy-based Theories

How, then, can analogy-based theories be distinguished from the kind of rule-based theories we now find almost exclusively represented in linguistics? Some important hints can be found in a rather musty old (unpublished) paper by John Ohala (1972), written way back in those medieval times when duplication was still being performed by means of 'ditto machines'. In the context of trying to find some more satisfactory explanation for certain morphological regularities in English than that prescribed in classical generative phonology [CGP] (as codified especially in Chomsky & Halle 1968), Ohala lists several important differences in the requirements of the kind of 'independent phonological rules' that characterized CGP and those of a theoretical alternative based on what he called 'analogical rules', but which we shall simply characterize as the 'analogical approach'.¹ With his permission, we summarize a few of these below, with some re-organization and other minor modifications imposed:

Independent-Rules Approach

1. Requires fewer items in basic lexical store, e.g., abstract underlying forms for individual morphemes.
2. Less need for rapid search of lexicon.
3. Requires considerable long-term storage of rules.
4. Computation of derived forms is rather complex, depending on particular derivation.
5. Inductive learning of such rules is extremely difficult, especially if highly abstract underlying forms are necessary.
6. Requires keeping all the lexical and phonological machinery carefully hidden from inspection by speaker's conscious mind.³

Analogical Approach

- 1a. Requires much greater number of items to be stored in lexicon, e.g., words.
- 2a. More need for rapid search of lexicon.
- 3a. No storage of rules. New 'rules' can be created on spur of the moment by reference to existing words, then forgotten.
- 4a. Computation is relatively simple and roughly equal in complexity for all derivations.²
- 5a. No rules to acquire *per se*, but rather building up a network of lexical connections.
- 6a. No such secrecy required; phonological contents of lexicon subject to introspection.

One thing that is readily apparent from the list of characteristics summarized here is that some rather fundamental trade-offs are involved. In just those areas (items 1 and 2 above) where the analogical approach is seemingly cumbersome and complex (a very large lexicon and a consequent need for a very rapid lexical search mechanism), the rule-based approach is relatively 'simple' by comparison (a much smaller lexicon to be stored and searched through); in other areas (items 3 and 4), however, it is the rule-based approach which is encumbered with the excess machinery (rules to store and complex derivations to run through before words become available for use) in comparison with the analogical approach (no rules *per se* to worry about, with direct access to words possible in retrieval). Clearly, both classes of theories are burdened with formidable learning problems (item 5): a large set of intricately inter-related rules and (at least in CGP) an abstract, bare-bones lexicon in one case vs. an immense lexicon of systematically interconnected

whole words in the other), i.e., neither side takes language acquisition to be a piece of cake. Finally (in 6), though the independent-rules approach seems to be the evident loser, we dare not make too much of the contrast at this point, knowing as little as we do about the mechanisms or limits of introspection in general. (Nonetheless, we are faced with at least a minor intellectual puzzle of sorts: if the trappings of the grammar are indeed as varied and complex as contemporary theories suggest, why is it that no one but a few professional linguists seems to have even the slightest inkling of any of it?)

On balance, though, based, at least, on the present discussion, we can find no compelling reason for choosing between these two fundamentally different alternative approaches on *a priori* grounds. Both have their advantages and both have their disadvantages. For lack of attention in recent decades, of course, the analogical approach is at a very large disadvantage from the standpoint of detailed theoretical development (a shortcoming that all of the major figures involved would, no doubt, readily admit). But no such short-term deficit is any clear indicator of long-term benefits or survivability. In any event, as in all areas of serious scientific inquiry, theoretical choices must always be made in the light of available empirical evidence, and in this connection we can report on a fairly considerable body of psycholinguistic data that seems to bear on the main issue at hand.

3. Some Psycholinguistic Indicators

Through a series of ingenious experiments performed about a decade ago, Robert Stanners and his collaborators at Oklahoma State University made extensive headway in clarifying some key questions concerning the nature of the lexicon and the place of morphology in it. These studies all exploited the phenomenon of repetition or identity priming, an effect noted some years earlier in connection with some independently motivated studies involving a yes-no lexical decision task (Forback, Stanners & Hochhaus 1974). In the lexical decision task itself, subjects had merely to decide as quickly as possible whether a CRT-presented letter string was or was not a real word, and the priming effect might be informally described as a kind of sled-greasing phenomenon: if the same word was presented twice on the same series of trials, decision times were substantially reduced on the second presentation, even if the two presentations were separated by as long as 10 minutes or by as many as 36 intervening items. In the later work of Stanners *et al.* (1979b), this effect was adapted to the investigation of whether or not morphologically complex words (such as *discomfort* or *unaware*) were represented in the mental lexicon as unitary wholes, or whether their morphological constituents were represented separately and the full

words synthesized by rule, as needed. The authors reasoned that if the latter were the case for the word *discomfort*, for example, the prior presentation of other words containing its presumed parts (i.e., the base word *comfort* and some other word containing the prefix *dis-*, such as *disarm* or *disfavor*) ought to function just as effectively as a prime as the prior presentation of the whole word *discomfort* itself. They found, however, that this was not the case: though the word 'fragments' yielded a significant priming effect in comparison with the unprimed response, the effect was also significantly weaker than when the whole word prime was used. (Moreover, something the authors do not specifically note, the response patterns for clear-cut 'free root' cases, such as the two already illustrated, were very much the same as for the more problematic 'bound root' cases that they also investigated, as illustrated by such words as *retrieve* and *progress*.) Such evidence supports what Butterworth (1983) has called the 'Full Listing Hypothesis' (FLH), that is, while not all word-forms necessarily appear in the mental lexicons of speakers (see Stemberger & MacWhinney 1988 for some evidence that bears on this point), the forms that do appear there are represented as whole words, not as disembodied parts.

By much the same token, in other studies (Stanners *et al.* 1979a, Kempley & Morton 1982; but cf. Fowler, Napps & Feldman 1985), some indications were found of significant differences in the strength of these secondary priming effects, depending on the type of morphological relationship involved: best for inflectional variants (as when priming the base word *sing* with *sings* or *singing*), intermediate for derivatives (as when priming with *singer*), and weakest for any irregular variants that the base word might have (as when priming with *sung*). Therefore, as Cutler sums up in her own survey of this and other evidence (1983:58), a picture of the mental lexicon has emerged in which, at least for English,⁴ (a) words are represented in their full, 'undecomposed' forms and (b) the representations for morphologically related words are 'connected in some way'. Clearly, all of this is highly compatible with a general 'analogical network' type of framework, particularly one where morphological variants are connected, with varying degrees of strength, with a central basic or 'root' word.

It must now be pointed out that this quite considerable evidence in favor of a massive word-store network contrasts sharply with the total absence of evidence for anything like the generative notion of the morpheme-invariant underlying form (see Linell 1979 for an independent critique). It thus flies directly in the face of one of the fundamental assumptions of much of modern phonological theory (and certainly CGP), viz., that the chief function of rules is to simplify the lexicon. (As Chomsky & Halle put it, 'the lexicon specifies only

idiosyncratic features of lexical entries, omitting all those that can be determined by general rule' [1968:166]). Ironically, though this practice became so widespread as to constitute virtually the conventional wisdom in the field for two decades or more, no good argument, to our knowledge, has ever been given for adopting it in the first place. This is surprising, first of all, because it has long been recognized that the economies so achieved in the phonological domain 'cannot be extended to the semantic system, since the meaning of derived words frequently cannot be recovered from the meaning of their constituent parts' (Henderson 1985:223). Moreover, in the context of the 'computation' issue raised in item 4, it is clear that to choose lexical simplification as the be-all and end-all of linguistic methodological practice is to put a quite arbitrary premium on storage at the expense of ease of retrieval, since the less is stored, the more reconstructive computation has to be done prior to retrieval (Derwing 1973:154, n. 2 and 1988); in fact, as Aitchison emphasizes in her excellent survey (1987:9ff), there are very good reasons for thinking that it is considerations of retrieval that ought to be given priority concern, in view of the extremely rapid rates at which the processes of speech production and (especially) comprehension are normally carried out. (And, indeed, the general psycholinguistic finding is, consistent with all that has been said above, that 'morphologically complex words are ... no more difficult to access from the lexicon than morphologically simple words' [Cutler 1983:73].) All these things considered, therefore, the notion of 'rule' under discussion here seems to be scarcely tenable.

We cannot dismiss the entire rule-based approach in quite so quick and off-hand a manner, however, as the ill-begotten lexical simplification function is certainly not the only one that can be (or has been) conceived for rules. One somewhat more promising alternative was proposed, for example, by Vennemann (1974), who suggested that rules be viewed as learned generalizations about the lexicon and thus might serve not to simplify the lexical word-store, but rather help to organize it or give it structure — which is obviously something that is going to have to be done in one way or another, in any event, if efficient retrieval is ever to be achieved. Under this conception, the notion of rule is perfectly compatible, in principle, with the FLH and with all the other findings about the mental lexicon so far discussed (though no mechanism is as yet provided within this framework for the kind of 'network of morphological connections' that the data suggest is also required). The learning problem (item 5 above) would also appear to be considerably ameliorated under a conception of this sort, which lends itself quite naturally to what has come to be known as the 'true generalization condition' on the learnability of rules (Vennemann 1974; Hooper 1976). For contrary to many assertions (e.g., Anderson 1987:342), such a constraint is not

arbitrary but is instead consistent with the kind of general capacities that human beings are already known to possess, notably, the ability 'to extract regularity from the environment' (see Derwing 1973 for an extended argument, especially pp. 66, 200-201, 310). What is not so consistent — and which is why there is a 'serious learning problem' associated with the more abstract conception of rule — is the conception of language it entails that must presume an immense (but otherwise unmotivated) innate schematism simply to 'make possible' its acquisition by the child (Chomsky 1969:67).⁵

There are, however, other potentially serious difficulties associated with the notion of rule, even under the kind of radical reconception as the one just outlined. One of these is the following ontological problem: what kind of reality can be ascribed to a notion of rule whose mental existence is not open to introspection (item 6 above) and whose operations are ordered in non-real time (cf. Cook 1974). Linguistic models, we will recall, are not conceived as models of what speakers and hearers actually do (so-called 'performance models', often pejoratively described), but rather as models of what they (in some obscure 'implicit' sense) are presumed to 'know' (so-called 'competence models', which are characterized as somehow 'neutral' with respect to the processes of speech production or comprehension [Chomsky 1965 and elsewhere]).

And there is more. For in addition to the contrasts (independently) formulated by Ohala (1972), as already noted, Skousen (*Analogical modeling of language* [AML], in press) lists some others of even more potentially serious import:

Independent-Rules Approach

7. Contextual space is partitioned into well-defined rule contexts.
8. Transitions in behavior are sharp and precise.
9. Usage: find the correct rule that applies to the given context.
10. Usage is a function of the description.

Analogical Approach

- 7a. Contextual space remains atomistic.
- 8a. Transitions in behavior are gradual and fuzzy.
- 9a. Usage: find an appropriate example to model behavior after.
- 10a. Usage is the description.

As noted in 7 and 8 above, the kind of rules that appear in formal grammars explicitly and sharply demarcate the conceptual space. Though some attempts have been made to temper this rather harsh property (as through the *ad hoc* device of the so-called 'variable rule' [Labov 1970; Cedergren & Sankoff 1974]), in its classic form a rule either applies to a representation or it does not; a particular

morphological construction is either regular or irregular; a sentence is either grammatical or ungrammatical; etc. As Hockett (1970), in particular, has emphasized, this has led to a conception of the grammar of a language (and hence of the language that such a grammar generates) as a 'well-defined system', i.e., one that can be 'completely and exactly characterized by deterministic functions' (p. 45). Hockett then proceeds to spend most of the rest of his book arguing, on the basis of a host of examples, that natural (i.e., human) language is just not like that, but is rather a much more flexible, open and ill-defined thing, with analogy, once again, seen as the primary creative mechanism.⁶ By much the same token, Bolinger, in a particularly delightful as well as compelling article (1974), argues not only that the edifice of language 'has more patching and gluing about it than it has architectonics' (p. 1), but also (as an implicit commentary on what we have already said about the nature of the mental lexicon) that 'the human mind is [perhaps] less remarkable for its creativity than for the fact that it remembers everything' (p. 2) — and that, even in syntax, 'idiomaticity is a vastly more pervasive phenomenon than we ever imagined' (p. 3).

4. On Formalizing the Notion of Analogy

We could cite all of the examples provided in these and numerous other sources, however, and still fail utterly to convince — the main reason, of course, being that, until quite recently, at least, the principle of analogy suffered from a single, but ultimately fatal, fault of its own: it was too flexible, too open-ended and too ill-defined to serve as a suitable explanatory vehicle for what was genuinely productive in language, as it failed to exclude endless other creative productions that occurred only very rarely, if at all, as Kiparsky (1975:188) has properly emphasized.

The main problem with the traditional notion of analogy, in other words, was that there was no limit to its use: almost any form could be used to explain the behavior of another form, provided there was some similarity, however meager, between the two forms. But the problem is not 'inherent' in the notion in principle, as Kiparsky thought (*loc. cit.*), but is rather a consequence of the informality with which the notion has tended in the past to be characterized. By contrast, Skousen (AML) has recently presented a detailed and explicit definition of analogy which seeks to overcome this problem in a principled and well-motivated way; specifically, the range of search is sharply delimited through explicit characterization of a notion of *analogical set* for a given context. Though technical details are too complex to be treated in a satisfactory way here, the basic principles involved are those of *supracontextual homogeneity* and *random selection*, meaning that, if the given context does not lead to single, definitive solution in the lexicon, a range of surrounding

supracontexts is explored until a point of supracontextual *heterogeneity*, explicitly defined, is reached; a random choice is then made from among the set of possible analogical examples made available by the search.

To illustrate these principles with concrete examples, Skousen presents a number of detailed cases, including (1) leakage in the direction from *an* to *a* in children's use of the English indefinite article, (2) the spelling of /h/-initial words by English-speaking adults, (3) VOT crossover data for the English bilabial stop phonemes /p/ and /b/, (4) terms of address in colloquial Egyptian Arabic, and (5), the most extensive example, dialectal variation (and historical changes) involving the Finnish past tense forms. In all these examples, speaker variability is the rule rather than the exception, and the model in each case makes a set of explicit quantitative predictions about expected outcomes. To take just one specific illustration here, his model predicts three possible outcomes for the past tense forms of the three Finnish verbs shown in Table 1, viz., either to replace the stem-final vowel by /-i/ (=V-i in the table), or by /-oi/ (=a-oi), or else to replace the stem-final dental stop+vowel sequence by the suffix /-si/ (=tV-si). For speakers who have not fixed a past tense for such low frequency verbs (e.g., children), or who may have forgotten them (cf. the English *succumb* example used at the start of this paper), the predicted relative probabilities of the expected outcomes are also shown (as percentages).

Table 1. Outcomes for Three Infrequent Finnish Verbs

1. Verbs in -'aV[+son]ta		<u>Pr(V-i)</u>	<u>Pr(a-oi)</u>	<u>Pr(tV-si)</u>
kaarta-	'swerve'	0	48.6	51.4
saarta-	'surround'	0.1	41.9	57.9
	Average	0.1	45.3	54.7
2. Verb in -'aVta		<u>Pr(V-i)</u>	<u>Pr(a-oi)</u>	<u>Pr(tV-si)</u>
raata-	'toil'	0	99.6	0.4

Note especially that even though all these verbs can, in theory, take all three outcomes, Skousen's model predicts a clear difference in behavior between those verbs that have a sonorant immediately preceding the /t/ and those that don't.⁷ Quantitative predictions of this kind have the great advantage, of course, that they can, in principle, be tested against the behavior of real speakers and learners of the language, so we need not wait forever to see what, if anything, this particular model has going for it.

One brief comparison might usefully also be made at this point between Skousen's model and the competing 'connectionist' or

'interactive activation model' of the PDP group, which can also be characterized as a variant of the general analogical approach, in a broad sense (e.g., both share the key property of dispensing with independent rules in favor of some notion of a network of connections among forms). An important difference between the two sub-approaches, however, is that a connectionist model does not make available an alternative set of outcomes to choose from, but predicts behavior by having the various possibilities compete with one another until stability is reached and a single, preferred outcome emerges. One empirical difficulty with this design feature (see Skousen's AML for others) is that it cannot readily mirror the ability that speakers have to choose an alternative outcome when additional input indicates that the original choice of outcome is wrong. Thus, for instance, when confronted with the nonce spelling YEAD, speakers typically suggest a pronunciation (usually /yid/) with no difficulty. If told that their first pronunciation is incorrect, these speakers also have no difficulty in producing an alternative (such as /yed/). There is also evidence that speakers can quickly alternate from one outcome to another, especially when one or more of the resulting choices is considered strange by the speaker. (Skousen gives an example of a child, 5 years and 10 months of age, looking at a picture of the Grand Canyon and making a rapid-fire series of attempts to pluralize the word *cliff*: /klɪftɪz/, /klɪfs/, /klɪvz/, /klɪfs/....'). In Skousen's approach the rules of usage can be readily extended to find alternative outcomes when the first outcome chosen is rejected for some reason, as all possible outcomes are readily available for inspection in the analogical set defined for the context in question. In order to model this kind of ability using a connectionist approach, however, the connections pointing to the first outcome chosen would presumably have to be deactivated or momentarily disconnected and the entire system allowed to re-establish stability on an entirely new basis. This seems both cumbersome and implausible as a practical procedure.

But to return to our main theme, we can press on to the usage issue (items 9-10 above), where it becomes immediately clear that the analogy model-builders are all involved in the construction of models of real-time mental activities, i.e., performance models of real language users. This has two immediate and important advantages. For one, an explanation of the mystery of the 'missing intuitions' is readily available, as nothing more than a specific example of the general, classical distinction between procedural knowledge ('knowledge how') and declarative knowledge ('knowledge that'). Rumelhart has put it this way:

The knowledge that we have about language seems to be largely embedded in the procedures involved in the production and comprehension of linguistic utterances.

This is evidenced by the relative ease with which we perform these tasks when compared with our ability to explicate the knowledge involved in them (1979:2; see also Derwing 1973:251-258).

The second (and by far most important) advantage of modeling usage instead of merely describing forms, as we have already seen, is that the kind of quantitative claims that usage models make about linguistic behavior are straightforward and can be empirically tested. As has been widely recognized, this is not yet so for rule-based systems, which still largely lack a critical 'heuristic' component which might convert them into testable real-time models of linguistic performance (see Derwing 1973:259-296 for an extended critique). Since rule-based systems have been traditionally conceived as descriptions of forms, not of activities, they are not readily interpreted as real-time models of performance, and are interpreted only with great difficulty and uncertainty in any other psychologically relevant sense, as well (see Skousen 1979 and Derwing 1980). Until the requisite supplemental machinery is all in place, therefore, the place of so-called 'competence models' in general cognitive theory will remain very uncertain, at best, and little in the way of serious quantitative evaluation is likely to ensue. We thus expect that theoretical development of analogical models, now at last seriously underway, will be rapid, substantial and largely forward-moving, while progress with rule-based systems continues to advance mostly laterally, in response to what Ohala has aptly described as 'a kind of Brownian motion through the possible theoretical space' (1988:2).

5. Conclusions

To sum up: we have seen at least ten important empirical and conceptual differences between the rule-based and analogical approaches; these give the lie to the gratuitous suggestion by Pinker & Prince that the analogical approach — or at least the particular R&M version thereof — may, in the end, turn out to be 'nothing more than an implementation of a symbolic rule-based account' (1988:182). The differences between the two approaches are both substantial and fundamental; they also, incidentally, provide a potentially vast empirical ground on which the relative merits of the two approaches may, over time, be carefully and systematically weighed. While the evidence is not yet all in, by any means, we should not be blind to the fact that what weight of evidence we do have supports, quite overwhelmingly, the analogical approach, confirming Antilla's speculation that 'Memory or brain storage is on a much more extravagant scale than we would like to think; even the most "obvious" cases can be stored separately' (1972:349, cited in Bolinger 1974:2).⁸

To be sure, given the current 'mental set' of our discipline, news of

this sort is not likely to bring much joy to the hearts of a great many linguists. Even so staunch a 'live and let live' type as Fred Householder once wrote, in fact, that 'A linguist who could not devise a better grammar than is present in any speaker's brain ought to try another trade' (1966:100). But why? Whose grammars are learned or acquired by speakers, after all — linguists' grammars, or the grammars (if we may call them that) that are actually present in individual brains? And whose grammars, after all, actually play a role in the very real processes of language production and comprehension that real speakers and hearers actually engage in? And whose grammars go wrong in any of the various aphasic disorders? Surely, if linguists are content to write arbitrary grammars, based on arbitrary theories and judged by arbitrary decision criteria, they remove themselves by default from those very areas of explanation that most of them, we gather, have hoped might lift their field out of the backwater of its taxonomic past.

There is one final irony in all this that is perhaps also worth mentioning. Specifically, though the focus of this paper has been on the great chasm of contrast that separates rule-based theories from analogical ones, it seems that this very notion of a formal (generative) rule was itself based on the formulation of an analogy, namely, the analogy between the notion of a formal language (as known within automata theory in mathematics) and a so-called 'natural' language (as learned and manipulated by real language users; see Derwing 1973:284ff. for discussion). In other words, the rejection of the principle of analogy in general by nearly an entire generation of linguists has been based on the acceptance of one very specific analogy — and a false one, at that, if the evidence outlined above is anywhere near the mark. Once we have managed to get all of our analogies (as well as our priorities) straight, what we suspect is that some version of the analogical approach is likely to turn out to be the real answer to most of our problems, after all.

Notes

¹ Skousen (in press) uses the terms 'structural' vs. 'analogical' to distinguish these two fundamentally different approaches to language description.

² But see below for the problem of limiting the range of the search.

³ It is for this reason that R&M refer to the rule-based approach as 'the explicit inaccessible rule view' (1986:217).

⁴ This qualification is necessary and potentially important, as the vast bulk of research on which the FLH is based has been research on English, or at least on a small set of languages typologically very close to English; clearly, the situation is a deplorable one and needs to be corrected without delay (see Derwing 1988 for further discussion).

⁵ This situation is a major topic of concern in Derwing (1973), where it is discussed at length.

⁶ Ironically, one of the chief criticisms that Pinker & Prince (1988) raise against R&M's approach is that it fails to distinguish sharply between regular and irregular cases of the English past tense (p. 137), whereas the weight of evidence, of course, is that no such sharp boundary exists for actual learners or even adult speakers (see Derwing 1988).

⁷ Note also that the *Nykysuomen sanakirja* (Sadeniemi 1973) list both *a-oi* and *tV-si* as possible variants for the first two verbs, but only *a-oi* for the third, *raata*-.

⁸ Cf. also Hunt (1982), who sees analogy as the fundamental cognitive strategy.

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ES and "Missing" Subjects in German

Hana Filip
University of California at Berkeley

1. DISTRIBUTION OF 'ES' IN GERMAN CLAUSES. The subject in German can be roughly characterized as the noun phrase in the nominative case which determines agreement (cf. Reis 1980:20ff.). As a general rule, the subject must be overtly expressed in tensed clauses. However, in certain so-called impersonal passives there is no overt subject:

- | | |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| <p>(1-a) <i>Gestern wurde (*es) getanzt.</i>
yesterday was-AUX danced-PAS
'There was dancing yesterday.'</p> | <p>(1-b) <i>Wurde (*es) getanzt?</i>
was-AUX danced-PAS
'Was there dancing?'</p> |
| <p>(1-c) <i>Er sagt, dass (*es) getanzt wurde.</i>
he says that danced-PAS was-AUX
'He says that there was dancing.'</p> | |

The impossibility of inserting the element *es* 'it', third person singular pronoun, in (1a) - (1c) proves that these constructions do not allow either a subject or an expletive element in the positions that are typically subject positions in German.

Another type of a 'subjectless' construction in German is realized with verbs of physical perception, such as *frieren* 'to freeze', 'to be cold', and also with verbs of cognition, such as *grauen* 'to dread', 'to be afraid of something'. Here *es* can be omitted if it occurs after a finite verb, or if it occurs in a subordinate clause:

- | | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <p>(2-a) <i>Mich friert (es).</i>
me-ACC freezes (it)
'I freeze.'</p> | <p>(3-a) <i>Ihm graute (es) vor der Prüfung.</i>
him-DAT dreaded (it) because-of the-DAT exam
'He dreaded the exam.'</p> |
| <p>(2-b) <i>Friert (es) Dich?</i>
freezes (it) you
'Are you cold?'</p> | <p>(3-b) <i>Graute (es) ihm vor der Prüfung?</i>
dreaded (it) him-DAT because-of the exam
'Did he dread the exam?'</p> |
| <p>(2-c) <i>..., dass (es) mich frierte.</i>
... that (it) me-ACC froze
'... that I was cold.'</p> | <p>(3-c) <i>..., dass (es) ihm graute.</i>
... that (it) him-DAT dreaded
'... that he dreaded the exam.'</p> |

In main declarative clauses, and just in case no other constituent occurs in the clausal onset position, the element *es* is **obligatory** (indicated by "*(es)") in the corresponding main declarative clauses, as (4), (5) and (6) show:

- | | | |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <p>(4) <i>*(Es) wurde getanzt.</i>
it was-AUX danced-PAS
'There was dancing.'</p> | <p>(5) <i>*(Es) friert mich.</i>
it freezes me
'I freeze.'</p> | <p>(6) <i>*(Es) graut ihm.</i>
it dreads him-DAT
'He is afraid (of something).'</p> |
|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|

Apart from occurring in constructions with "impersonal" passive predicates (1), with verbs of physical perception (2) and verbs of cognition (3), the constituent *es* can also appear as a full pronominal argument (7), with weather verbs (8), in sentences with an inverted subject-NP (9) and with extraposed sentential subjects (10):

- | | |
|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(7) <i>*(Es) klopft.</i>
it knocks
'Somebody is knocking at the door.'</p> | <p>(9) <i>*(Es) liegt ein Brief auf dem Tisch.</i>
it lies a letter on the table
'There is a letter lying on the table.'</p> |
| <p>(8) <i>*(Es) regnet.</i>
'It rains.'</p> | <p>(10) <i>*(Es) wundert mich, dass du gekommen bist.</i>
it wonders me-ACC that you come-PAS are-AUX
'I am surprised that you have come.'</p> |

At first sight the distribution of the constituent *es* in German appears to be puzzling: the problem is to account for those cases in which *es* must appear, as in (4) - (10), for those cases in which it need not appear, as in (2) and (3), and most importantly, for those cases in which it must not appear, as in (1). The above examples show that German differs from English, for example, where missing subjects are not permitted, and also from "pro-drop" languages, like Romance languages, for instance, where subjects need not be overtly expressed in such clauses as (7). In particular, the fact that there are tensed clauses in

German without any overt subject-NPs is of great interest and poses a number of problems to any current linguistic theory.

2. SOME RECENT PROPOSALS. According to Heidolph et al. (1981:325ff.), there are three kinds of semantically empty, or expletive, *es* in the examples (4) - (10): the place-holder *es* in (10), the "theme"-*es* in (4) and (9), and finally, *es* in (5) - (7) does not function either as a place-holder or a "theme". Haiman (1974) distinguishes between supposedly 'subjectless' constructions such as (4), (6), and (8) from such constructions in which the subject is present, such as (9) and (10). According to Seeffranz-Montag (1983:13, 40), in such sentences as (4), (6) and (8), *es* is a lexically empty subject, whereas such sentences as (9) and (10) contain an *es*-subject in the function of a correlate to the extraposed subject-NP and sentential subject, respectively. Lenerz (1985:103, 129) proposes yet another distinction. According to him, cases such as (6), (8) and (10) have a syntactic *es*-subject. This syntactic subject is, according to him, obligatory with semantically null-place predicates, as in (2), and with verbs of cognition and physical perception, such as (5) and (6). In (4) there is no subject argument, in (9) there is both a formal *es*-subject in the clausal onset position and a notional subject argument in the postverbal position.

The differences between the above proposals illustrate the difficulties in describing the properties of the element *es* in German. Even though they all provide valuable insights both into the diachronic and synchronic facts, they all fail to describe the distribution of *es* and the existence of subjectless finite clauses in German in a systematic way.

First, I will argue that not all *es* constituents in the above examples are empty expletive, or "dummy", constituents, and that not all of them are subjects. I will propose that we must distinguish between those cases in which *es* satisfies a valency requirement of a main lexical predicator in a sentence (*lexically determined es*) and those cases in which *es* merely fills the first syntactic position in main declarative clauses (*clausal onset es*). The *clausal onset es*, as in (4) and (9), is semantically empty and does not instantiate any valency requirement. As far as the *lexically determined es* is concerned, we must distinguish between those cases in which *es* is a referential, subcategorized subject-argument, as in (7) and (8); those cases in which *es* is a non-referential, subcategorized subject-argument, as in (5) and (6); and finally, those cases in which *es* co-instantiates a subcategorized subject argument of a main lexical predicator, as in the sentential subject extraposition (10). In all the above examples *es* obligatorily appears in the clausal onset position of main declarative clauses, just in case the clausal onset position is not taken by some other constituent. In short, except for the clausal onset in main declarative clauses, *es* may or may not appear depending mainly on its status with respect to subcategorization, its semantic properties and pragmatic function in the whole construction.

Second, I would like to show that it is not necessary to postulate an empty structural subject position in the syntactic structure of the German tensed clauses which do not contain any overtly expressed subject or dummy NP. So (1c), for example, can be represented as

(11) ..., dass [[getanzt wurde]_{VP}]_S

and not as

(12) ..., dass [[e]_{NP} [getanzt wurde]_{VP}]_S

as it is assumed, for instance, by Safir (1984) within the Government-Binding Theory.

3. GERMAN CLAUSE STRUCTURE AND GRAMMATICAL CONSTRUCTION. In this section I would like to present in a theory-neutral way some basic facts relevant for the fragment of German which is analyzed in this paper. Special attention is paid to facts about word order. The order of NP constituents is to a considerable extent free in German, whereas both finite and nonfinite verbs have fixed positions determined by the clause type (main or subordinate). Thus, the following three basic construction types are traditionally distinguished in German depending on the position of the finite verb:

(13)

I. Verb-second order:

[clausal onset] - [finite Verb] - [max +]* - [non-finite verb]*.

II. Verb-initial order:

[finite verb] - [max +]* - [non-finite verb]*.

III. Verb-final order:

[max +]* - [non-finite verb]* - [finite verb].

According to most accounts of German the crucial property of the main declarative clause which sets it apart from the other two construction types is the **verb-second constraint**: The finite verb must occur in the second position in the clause.¹ This constraint implies that one maximal constituent fills the *clausal onset position*, that is, the first position in the clause.² Only the clausal onset and the finite verb positions are obligatorily filled by lexical material. The finite verb can be a main lexical verb, a modal, or an auxiliary verb. The feature specification "[max +]*" in (13.I.) indicates that the finite verb can be followed by none, one or more maximal subcategorized argument(s) of the main lexical verb and/or optional adjunct(s). The last position, "[non-finite verb]*", is either left "empty" or it may be filled by one or more nonfinite verb forms. The verb-second order is mainly realized in declarative main clauses, as in (7), and in main clauses in which a constituent is questioned.

The verb-initial order is found in yes-no questions, as in (1b), as well as in imperatives, exclamations, and in unintroduced conditional and concessive clauses.

And finally, the verb-final order is characteristic of subordinate clauses.

My account of the syntactic, semantic and pragmatic constraints which determine the distribution of *es* in German tensed clauses is based on the assumptions of the Construction Grammar framework as it is being developed in Berkeley (cf. Fillmore 1986a, Fillmore 1986b, Fillmore 1988, Fillmore, Kay, and O'Connor 1988, Kay 1988, Lakoff 1986, Lambrecht 1986). Construction Grammar can be roughly characterized as a monostratal, non-transformational, and unification-based framework (cf. Fillmore 1988, Fillmore and Kay 1987). One of the central notions of Construction Grammar which plays an important role in this paper is the notion of *grammatical construction*: "By **grammatical construction** we mean any syntactic pattern which is assigned one or more conventional functions in a language, together with whatever is linguistically conventionalized about its contribution to the meaning or the use of structures containing it" (Fillmore 1988:36).

The following sections will discuss in detail different types of constructions in which *es* occurs. It will be shown that the proposed distinctions can be justified by the different distributional properties of the constituent *es* in non-initial syntactic positions in main declarative clauses as well as in those clause types which do not have any clausal onset position, i.e. in verb-initial and verb-final clauses. I will start with the most straightforward cases of lexically determined *es*, which are exemplified by (7) and (8). Then I will describe the cases in which *es* is a syntactico-pragmatic property of main declarative clauses, as in (4) and (9). And finally, the occurrence of *es* with verbs of cognition (6) and physical perception (5) will be discussed.

4. LEXICALLY DETERMINED 'ES'-SUBJECT. One-place predicators such as KLOPFT in (7) require one obligatory argument which is realized in the nominative case, functions as the subject and is linked to the semantic role Agent (or possibly Force). The valency description for the verb form KLOPFT can be represented as a list consisting of a phonological form and a list of subentries: (KLOPFT ((GR Subj) (SR Agent) (MS N/Nom))), whereby "GF" stands for a grammatical function, "SR" for a semantic role and "MS" for a morpho-syntactic realization. Since the constituent *es* in (7) fulfills the subject requirement of the main lexical predicator, it is a lexically determined subject. Therefore, it must always occur in all three construction types, regardless of its position in the sentence,

as is shown by (14a-c):

- (14-a) Jetzt klopft **(es)* an meiner Tür.
now it knocks at my door
'Now somebody is knocking at my door.'
- (14-b) Klopft **(es)* an Deiner Tür?
knocks it at your-DAT door
'Is somebody knocking at your door?'
- (14-c) Ich glaube, dass **(es)* an meiner Tür klopft.
I think that it at my-DAT door knocks
'I think that somebody is knocking at my door.'

This behavior mainly follows from the fact that the *es*-subject in (14a-c) has semantic content and bears a semantic role to the predicator. The obligatory occurrence of *es*-subject in such examples as (14a-c) can be explained by an independently motivated constraint of German grammar:

- (15) In finite clauses, the subject-NP which constitutes both a syntactic and semantic valency requirement of the main lexical predicator must be overtly expressed in the surface structure.

The syntactic structure of (7) can be represented as in Figure 1:

Figure 1: Declarative Matrix Clause with Subject in the Clausal Onset

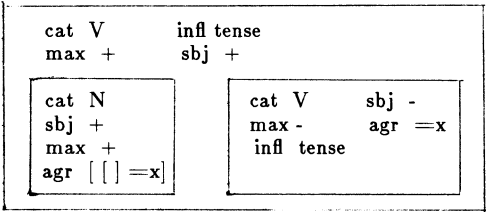


Figure 1 represents an instantiation of the schematic grammatical construction for main declarative clauses given in (13.1). In Construction Grammar, grammatical constructions are often represented as box diagrams in which the combinatorial properties of the constituents are encoded as matrices of feature specifications. Each feature specification is a two-item list of the form: [attribute - value]. In Figure 1, the feature specification matrix "((cat V) (max +) (infl tense) (sbj +))" represents the external syntax of the largest box. The representation of levels of headed constructions is accounted for by the attributes "max(imal)" and "min(imal)". Maximal categories fill major structural positions in constructions, and minimal categories are the lexical items which are listed in the lexicon. Any expression of the category "((cat V) (max +))" is a maximal projection of a head verb, and it is an expression which can function as a sentence. In Figure 1, the verbal constituent which follows the clausal onset position is a non-maximal lexical predicator ("[max -]") which lacks its subject requirement ("[sbj -]"). The subject argument in the left-hand side box is unified with this non-maximal verb-headed phrase under the condition that it is finite ("[infl tense]") and that their agreement features match. The result of this unification is a maximal verb-headed phrase which can function as a main declarative clause.

As far as weather verbs are concerned, there is no general agreement with respect to the two following questions: (i) should weather verbs be treated as null-place or one-place predicators? (ii) does the constituent which occurs as the subject of weather verbs (and which corresponds, for example, to the German *es* or English *it*) have a referential content?

It has been proposed that weather verbs have no valency requirements, and therefore the 'weather'-*es* is not a subcategorized subject argument, but rather only a formal subject. In addition, it has also been claimed that it has no referential content (cf. Seefranz-Montag

1983:40; Lenerz 1985). According to this position the 'weather'-*es* is similar to the *clausal onset es* in impersonal passive (4) and inverted-subject (9) constructions. However, the 'weather'-*es* cannot be treated in the same way as the clausal onset *es* because, unlike the clausal onset *es*, it must occur in postverbal positions and in subordinate clauses:

- (16-a) *Jetzt regnet *(es).* (16-b) *Regnet *(es)?* (16-c) *Ich glaube, dass *(es) regnet.*
 now rains *(it) rains it I think that it rains
 'It is raining now.' 'Is it raining?' 'I think that it is raining.'

Notice that this is also true for predicatively used adjectives in weather clauses: *Ist *(es) hier zu warm?* 'Is it too warm here?'

It has also been suggested that 'weather'-*es* is a subcategorized subject argument and has no referential content. On this assumption, it might be difficult to distinguish it from the element *es* which occurs with certain verbs of cognition and physical perception and to explain why 'weather'-*es* can never be omitted, regardless of its position in the sentence, whereas with verbs of cognition and physical perception, *es* can be omitted in postverbal positions and in subordinate clauses (cf. examples (2) and (3)), precisely in those cases in which it does not have any referential content (cf. section 6).

Both the proposals seem to lead to unnecessary complications in the grammar. Under the assumption that 'weather'-*es* is a subcategorized subject argument that has no referential content, it must be postulated, in addition to (15), that an active finite clause must contain at least one subcategorized argument, regardless of whether the argument has a semantic content. Furthermore, under the assumption that 'weather'-*es* is not a subcategorized subject argument and has no referential content, it must be postulated, in addition to (15), that null-predicators must always be realized with the default expletive *es*-subject in active finite clauses. Consequently, we would have to distinguish two kinds of subjects: those that are syncategorematically introduced into the surface syntactic structure, and those that have their origin as subcategorized elements in valency descriptions in the lexicon. However, a syncategematic introduction of expletive subjects (which do not co-instantiate a subject argument of the main predicator) into the surface syntactic structure runs counter the desideratum to motivate syntax as much as possible in terms of semantic relations holding between constituents of the clause. Furthermore, instead of distinguishing two kinds of subjects, it seems to be preferable to have a uniform notion of "subject", namely the nominative noun phrase which determines agreement and which satisfies an argument requirement of the main lexical predicator in the clause.

I would like to propose that weather verbs are subcategorized for one obligatory subject argument, which (in their literal sense), is always *es*. It has a vague referential content that could be described as an atmospheric situation in the relevant domain of discourse. Bolinger (1973) coined the term *ambient it* for the English equivalent. This assumption has the advantage that the distributional properties of the 'weather'-*es* can be described in the same way as those of other referential subcategorized subjects in German; that is, it is not necessary, in addition to (15), to invoke special well-formedness constraints for active finite clauses in German.⁴ This solution seems to be confirmed by the fact that the 'weather'-*es* has the same distributional properties as the subcategorized referential subjects of other one-place predicators, such as *klopfen* 'to knock' (cf. (7) and (8), (14) and (16)).

5. CLAUSAL ONSET 'ES'. The clausal onset *es* occurs in impersonal passives (4) and in sentences with an inverted subject (9). It differs from the examples described in section 4 in that it is not a subject. The reasons are simple and straightforward: (i) in the case of impersonal passives (cf. section 5.1.) there is no syntactic subject requirement assigned to the verb which is the lexical head of the clause; (ii) in the case of sentences with an inverted subject, the subject argument is satisfied by a maximal noun phrase in the postverbal position (cf. section 5.2.).

Arguments in support of the claim that the clausal onset *es* does not function as a subject in these two types of constructions can be provided by agreement and maximality facts. First, the clausal onset *es* does not trigger agreement. In the inverted subject

construction, the finite verb always agrees in number and person with the inverted subject, as example (17) shows:

(17) *Es näherte/ näherten sich zwei Autos.*

it 3rd-pers-SG approached-SG / approached-PL self two cars-PL

'Two cars were coming closer.'

Since only subjects determine agreement in German, it is obvious that the plural noun phrase in the nominative case which occurs after the finite verb is the subject and not the expletive *es* in the clausal onset position. In section 5.1. it will be shown that in so-called impersonal passive constructions the finite verb occurs in a default third person singular form, and since there is no expressed subject in the nominative case, the element *es* is used as an empty place-holder.

Second, the clausal onset *es* is not a subject, because it is followed by a maximal verb-headed phrase of the category "((cat V) (max +))", that is, a sentential expression. And moreover, this sentential expression has a verb-initial order, and it can, on its own, function as a yes/no-question:

(18-a) *Es wurde getanzt.*
it was-AUX danced-PAP
'There was dancing.'

(18-b) *Wurde getanzt?*
was-AUX danced-PAP
'Was there dancing?'

(19-a) *Es liegt ein Brief auf dem Tisch.*
it lies a letter on the table
'A letter is lying on the table.'

(19-b) *Liegt ein Brief auf dem Tisch?*
lies a letter on the table
'Is there a letter lying on the table?'

In general, all the sentences are maximal verb-headed expressions. However, the reverse, of course, does not hold: not all maximal verb-headed expressions can function as sentences.

Another property which distinguishes the clausal onset *es* from the lexically determined subcategorized subjects is the fact that it can only occur in the first position of main declarative clauses. And it must occur here if no other element appears in front of the finite verb. Whereas in **(Es) lebte ein König in Frankreich* 'There lived a king in France', *es* is obligatory, in *In Frankreich lebte (*es) ein König*, *es* cannot appear. In short, the clausal onset *es* is not an argument of the verb, because it would be the only argument which is restricted to the clausal onset of main declarative clauses.

The claim that the clausal onset *es* is a semantically empty syntactic filler can also be supported by the fact that both the constructions with the clausal onset *es* and the corresponding constructions without it express the same propositional content (compare, for example, (18a) and (18b), (19a) and (19b)). However, each construction type is associated with a different illocutionary act and a different type of discourse context. Furthermore, the clausal onset *es* did not historically develop from the anaphoric pronoun *ez* ('it' NOM/ACC, Middle High German) or *es* ('it' GEN, Middle High German), but was introduced as an analogy to other constructions with the clause-initial *es* (cf. Behagel 1928:450, vol. III).

It has already been observed that an important characteristic of main declarative clauses in German, as well as in other Germanic languages (with the exception of English), is the verb second order: the clausal onset position must be filled by at least one lexical item. This element can be a subject-NP in the nominative case, as in (7). However, non-subject arguments ((2a), (3a)), adjuncts (1a) and/or non-finite verbs may also occur in the clausal onset; in such cases the subject-finite verb inversion is obligatory, and the subject then usually occurs in the position immediately following the finite verb. Notice that English differs from other Germanic languages in the status of the first major constituent in the constituent structure of main declarative clauses: in English it is typically the subject position (cf. also Haider 1984:75 and Platzack 1983). In German *finite active* clauses must consist of a finite verb in the second position and at least one argument which must fill the clausal onset position if no other element does. *Passive finite* clauses may consist of "bare" passive predicates, that is, of predicates that have no expressed arguments or adjuncts, provided that the verb-second constraint is satisfied. In such a case, a passive

participle, for example, may be fronted for contrastive purposes: *GETANZT wurde* (lit.: danced-PAS was-AUX) 'People DANCED'.

The clausal onset position is usually reserved for the expression of the topic. Often it is the subject that functions as the topic. Since the clausal onset *es* is semantically empty, it cannot be a topic. Its function in the clausal onset is to guarantee the verb-second order, and at the same time, to indicate that the constructions, in which it occurs, are to be understood as *main declarative* utterances. From this it follows that the clausal onset *es* is a syntactic and pragmatic property of a particular grammatical construction type: a main declarative clause without a topic (cf. section 5.1. and 5.2.).

The distinction between the clausal onset and the rest of the main declarative clause seems to be virtually indispensable for the description of the intricate interaction of syntactic, semantic and pragmatic factors that determine the form and meaning of German main clauses. In particular, this distinction allows one capture in a simple way the maximality, agreement and other facts that define the clausal onset *es*-construction (cf. section 5.1. and 5.2.).

Even though I propose that there is a special construction type with the clause-initial *es* for sentences without topic, i.e. impersonal passive sentences and sentences with an inverted-subject, this proposal does not lead to undue complications in the grammar. Both the construction types are different instantiations of the same general verb-second construction (13.I). What must be explicitly specified in each case are only the idiosyncratic syntactic, semantic and pragmatic properties of each instantiation type. I will turn to these properties in the next two sections.

5.1. IMPERSONAL PASSIVE CONSTRUCTION. What matters most in this context is the fact that *bare* passive predictors, and subjectless passive predictors, in general, involve 'demotion' of a subject without a corresponding 'advancement' of another nominal to subject. This is due to the fact that such impersonal passive predictors are derived from active predictors which are not subcategorized for an accusative object argument. They can be derived either from one-place predictors, such as *tanzen* 'to dance', for example, or from two-place predictors with a dative argument, such as *jemandem helfen* 'to help somebody', or with an oblique argument, such as *über etwas sprechen* 'to speak about something'. In German only noun phrases which occur in the accusative case in active sentences can function as nominative subject-NPs in the corresponding passive sentences.

Within the Government-Binding Theory it is assumed that an empty subject position that has no theta-role assigned to it is present in the syntactic structure of (1) - (3). This assumption is not only intuitively dubious but it also poses a number of serious problems for the Government-Binding Theory (for details see, for example, Haider 1984 and Safir 1984). Within the limits of this paper, it is not possible to discuss the merits and deficiencies of the Government-Binding approach to this particular problem. Instead I would like to sketch how the "subjectless" passive sentences in German can be described within my approach.

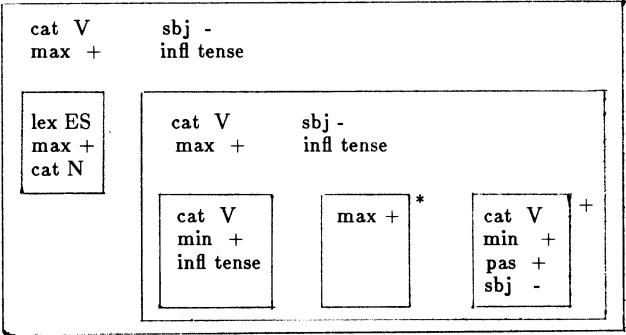
The valency descriptions for the active predictor *tanzen* 'to dance' (TANZEN ((GR Subj) (SR Agent) (MS N/Nom))) and for the passive participial predictor *getanzt* 'danced' (GETANZT ((GR nil) (SR Agent) (MS nil))) contain one argument, Agent, in their semantic lists. However, they differ in that this argument does not constitute a syntactic subject requirement of the passive participle. This is indicated by the attribute "nil" in the grammatical relation list of its valency description. Consequently, it is not phonetically realized in the surface syntactic structure, as is predicted by (15). So even though the Agent argument of the passive participle is suppressed in the surface syntactic structure, it is present in the semantic description. In an active sentence such as *Wir tanzten* 'We danced', the speaker is asserting something about the participants expressed as the subject *wir* 'we' in the topic position. Sentences with bare passive predictors, on the other hand, have an "event-reporting" function: Since the Agent is suppressed, and only the action or event is overtly expressed, the speaker can emphasize that a certain kind of an action or

event takes place and abstract away from its participants. Such a sentence as (4) can occur, for example, in the following context: *Wir hatten gestern unser Jubiläum. Es wurde getanzt* 'We had yesterday our anniversary. It was danced.' The second sentence (4) in this sequence can be paraphrased with *Tanzen fand statt* (lit.: dancing took place). Such bare passive constructions differ from the prototypical passive constructions with an expressed Patient argument (in the nominative or oblique (21) case) in that Agent *cannot* be expressed at all in the optional agentive prepositional phrase, as the following examples show:

- (20) *Es wurde* (*durch uns)/(*von uns) *getanzt.* (21) *Ihm wurde* (von uns) *geholfen.*
 it was-AUX (*through us)/(*by us) danced-PAS him-DAT was-AUX (by us) helped
 'There was dancing./ People danced.' 'He was helped.'

Since there is no syntactic subject requirement, the passive predicate does not "unify" with a subject argument in the syntactic structure of an instantiated passive construction. In Figure (2), the feature specification "(sbj -)" in the external syntax of the construction indicates that the whole construction is a complete sentential expression which does not contain any syntactic subject constituent. There is no need to postulate an empty structural subject in the syntactic structure of such 'subjectless' finite passive clauses. The surface syntactic structure of impersonal passive clauses, such as (4), can be schematically represented as in Figure 2:

Figure 2: Declarative Matrix Clause with the Clausal Onset *Es* and Passive Predicate



The partial information structure in Figure (2) represents an instantiation of the general grammatical construction for main declarative clauses with verb-second order (13.I.). The clausal onset, filled by the expletive *es*, is followed by a maximal verb-headed phrase which exhibits a verb-initial sentence pattern. Furthermore, it requires at least one non-finite verb, namely the passive participle. This is indicated by the feature specification matrix "((cat V) (min +) (pas +) (sbj -))⁺" in the box diagram. The matrix "((cat V) (min +) (infl tense))" stands in this case for the finite passive auxiliary *werden* 'to become', 'to be'. And "(max +) *" indicates that zero or more non-subject arguments or adjuncts can occur in this position, as in, for example, **(Es) wurde bis zum Morgen getanzt.* (lit.: it was-AUX till to-the morning danced-PAS) 'There was dancing until morning.'

Passive sentences such as *Es wurde gelesen* (lit.: it was read) are ambiguous between (a) the reading in which *es* is a referential subject pronoun, which may refer, for example, to *das Buch* 'the book', and (b) the reading in which *es* is a non-referential clausal onset *es*. In the latter case, the sentence *Es wurde gelesen* can be translated as 'We/People read (something)'. In the first case, the passive participle is derived from a two-place predicator

with lexically realized Agent and Patient relations, whereas in the second case it is derived from a predicator with a pragmatically controlled null object complement (Fillmore 1986b). In my approach this ambiguity, which stems from the different properties of a main lexical predicator in the corresponding active sentence, is also directly reflected in the syntactic structure. The sentence with the non-referential *es* has the syntactic structure given in Figure (2). The sentence with the referential *es*-subject, on the other hand, has the syntactic structure exemplified in Figure (1).

It is also important to notice that the impersonal passive construction imposes strong semantic constraints on the kind of permissible passive predicators.⁹ Impersonal passive can be derived from active predicators which are subcategorized for a subject argument referring to a human, or any animate, being (cf. Heidolph et al. 1981:551), which has, or can be thought of as having, control over the action or event in which it takes part. So we find bare passive predicators in such expressions as *Es wurde gestritten* (lit.: it was-AUX argued) 'There was fighting', *Es wurde gelacht* (lit.: it was-AUX laughed-PAS) 'We/People laughed', *Es wurde gearbeitet* (lit.: it was-AUX worked-PAS) 'We/People worked', *Es wurde geschlafen* (lit.: it was-AUX slept-PAS) 'We/People slept'. However, the following passive sentences are not well-formed: **Es wird geblüht* (lit.: it is-AUX blossomed-PAS), **Es wird (von dem Jungen) schnell gewachsen* (lit.: it is-AUX by the-DAT boy quickly grown-PAS).

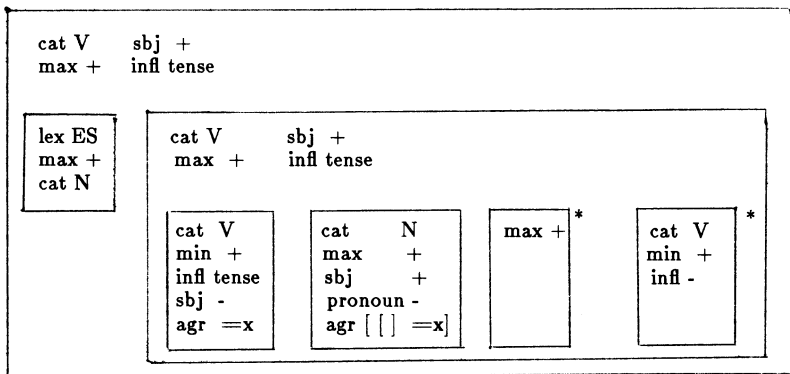
Both the features of the impersonal passive construction -- the participant's control over the action or event, as well as the foregrounding of the state of affairs and backgrounding or suppressing of its participants -- can be exploited by using the impersonal passive *es*-construction as an indirect imperative to express an energetic command:

(22) *Es wird hier geblieben!*
it is-AUX here stayed-PAS
'Now (you'll) stay here!'

(23) *Jetzt wird aber geschlafen!*
now is-AUX but slept-PAS
'Now you really must sleep!'

5.2. INVERTED SUBJECT CONSTRUCTION. The inverted subject construction contains an expletive *es* in the clausal onset position and an inverted subject-NP in the postverbal position.

Figure 3: Inverted Subject Construction



Active sentences with inverted subjects contain at least one finite verb and zero or more non-finite verbs; passive sentences with inverted subjects, on the other hand, must have at least one non-finite passive participial verb form. This is indicated by the feature matrix

"((cat V) (min +) (infl -))*" in Figure 3. Notice also that in this account, the German predication structure is "flat" in the sense that the finite head verb, nonfinite verb(s) and subcategorized arguments are sibling constituents.⁶

The construction with an inverted subject imposes constraints on the semantic and syntactic properties of the main lexical predicator, the definiteness of the inverted subject, and on its compatibility with discourse factors. These constraints seem to be motivated primarily by the "presentational" discourse function of this construction type.

The restrictions on the definiteness of the inverted subject in German are complicated and have eluded a satisfactory description so far. In what follows I will attempt to sketch briefly at least some of these tendencies. The inverted subject construction is exemplified by (24b) and (25b):

(24-a) *Ein Hund bellt.*
a-NOM dog barks
'A dog barks.'

(25-a) *Der Hund bellt.*
the-NOM dog barks
'The dog barks.'

(24-b) *Es bellt ein Hund.*
it barks a-NOM dog
'A dog barks.'

(25-b) **Es bellt der Hund.*
it barks the-NOM dog

If the subject-NP refers to a single individual which is either new in the domain of discourse (24a) or is already known to the speaker (25a), then the whole sentence has a single event reading. The main intonational stress is on *Hund* 'dog', about which the property that it barks or that it is barking is predicated. If, on the other hand, the main intonational stress is on *bellt* 'barks', then the sentence is acceptable only under the generic interpretation, that is, if by uttering (24a) and (25a) the speaker asserts something about all the dogs in general. Whereas (24a) and (25a) are ambiguous between the individual (specific or non-specific) and generic interpretation, the corresponding inverted subject construction only allows for the individual reading, and the subject-NP tends to be indefinite (compare 24b and 25b).

The use of the indefinite article with an inverted-subject can be motivated by the conditions of use associated with the whole construction. In the inverted subject construction the postverbal position is a focus position (however, not the narrow contrastive focus). It is mostly reserved for the linguistic expression which is at the center of the speaker's communicative intention, because it conveys new information: it introduces a new participant into the domain of discourse. Moreover, by occurring in the postverbal position the subject is also marked as non-topic. Notice that the subject that functions as the topic of the sentence usually occurs in the clausal onset position and tends to refer to some specific participant.

The *es*-construction with an inverted-subject excludes pronominal noun phrases, both anaphoric referential (26) and expletive non-referential (27), as its inverted-subject:

(26) **Es springt es auf den Baum.*
it jumps it-NOM onto the tree

(27) **Es friert es mich.*
it freezes it-NOM me-ACC

The unacceptability of (26) can be explained on pragmatic grounds: pronouns usually refer to already introduced and specific participants in the discourse domain, and they typically function as topics. Therefore, they cannot occur as inverted subjects in this construction type. In order to exclude such sentences as (26) and (27), and to encode the fact that this construction requires a full lexical subject-NP, I use the feature specification "[pronoun -]" in the feature matrix of a subject-NP which fills the postverbal position in Figure 3. However, notice that if both the pre- and postverbal *es* is anaphoric, that is, if the postverbal *es* is a direct object, then the whole sentence is grammatical, as it is illustrated by (28b):

(28-a) *Hat das Kind, das Spiel, begriffen?*
has the-NOM child the-ACC game understood
'Has the child understood the game?'

(28-b) *Ja, es, hat es, begriffen.*
yes it-NOM has it-ACC understood
'Yes, it has understood it.'⁸

The use of the feature "pronoun" is motivated not only by the facts relevant to the *es*-construction of this type, but it is independently motivated by other German data, for example, by the fact that it influences the order among noun phrases that do not differ with respect to focus, definiteness or specificity (for example, pronouns tend to precede full noun phrases). Since the communicative purpose of the inverted-subject construction is often to introduce a new participant into the domain of discourse, it is often headed by one-place predicators denoting existence or coming into existence of some participant, or indicating its new appearance or disappearance in the domain of discourse. So the *es*-construction is often used to indicate a new start in the discourse: *Es zogen drei Burschen wohl über den Rhein* 'Three lads crossed/were crossing Rhine'; *Es kam ein Prinz über die Hügel geritten* 'A prince came riding on horseback'.

However, the pragmatic function of this construction type is not restricted only to the "presentational", or participant-introducing, function described above. Sometimes a referent which is already known to the speaker and hearer, and which is not new in the current discourse, can be expressed as the definite inverted-subject:

(29) *Es spielten die zwei Kinder im Sandkasten.*

it played the-NOM two children in-the-DAT sand-box
'The two children played in the sand-box.'

The inverted subject can also be definite if it is modified by a relative clause (30), a possessive pronoun (31), or a possessive genitive (32):

(30) *Es kommen nur die Leute, die ich eingeladen habe.*

it come-PL only the people whom I invited-PAS have-AUX
'Only those people whom I have invited will come.'

(31) *Es wuchsen seine Kraft und Ausdauer.*

it grew-PL his power and tenacity
'His power and tenacity were growing.'

(32) *Es wurde Wagners Musik bevorzugt.*

it was-AUX Wagners music preferred-PAS
'Wagner's music was preferred.'

In (30) - (32) the reasons why the subject-NP occurs in the postverbal position may not have to do so much with the givenness of the participant referred to by the subject-NP, but rather with the "heaviness" of the subject-NP compared to the other constituents in the sentence. In (30), instead of tearing the subject-NP *die Leute* 'the people' and the predicate *kommen* '(they) come' apart, as in *Nur die Leute, die ich eingeladen habe, kommen* (lit.: only the people that I invited have come), or placing the predicate *kommen* in between the head noun and the relative clause which modifies it, as in *Nur die Leute kommen, die ich eingeladen habe* (lit.: only the people come that I invited have), we can use the inverted-subject construction, which provides the means of avoiding both of these somewhat clumsy constructions.

It has also been observed that in English the use of a universal quantifier with an inverted-subject gives rise to ungrammatical sentences (cf. Belletti 1988). However, in German universal quantifiers can be used with inverted-subjects in well-formed sentences (33):

(33) *Es kommt die ganze Sippe.*

it comes-sg the-NOM whole clan
'The whole clan will come.'

(34) ? *Es gab Maria dem kleinen Jungen das Buch.*

it gave Mary the-DAT little boy the-ACC book
'Mary gave the little boy the book.'

And it may even be possible to use proper names as inverted-subjects (34).

The indefiniteness constraint on inverted subjects certainly needs a more detailed formulation than can be given within the limits of this paper. The constraint is clearly weaker in German than it is, for example, in English. It would be an oversimplification to claim that the inverted subject-NP in German must be always indefinite.

In contrast to the syntactically similar inverted-subject constructions in English (*there*-construction), French (*il*-construction), and Italian, for example, it seems that not only one-place predicators but also two- and three-place predicators can be used in the corresponding German constructions with an inverted subject.⁹ In the following examples, the b. sentences illustrate the inverted subject construction with two-place (35b) and

three-place (36b) predicates:

- (35-a) *Ein Mann sprach mit Hans.* (35-b) *Es sprach ein Mann mit Hans.*
a man spoke with John it spoke a man with John
'A man spoke to John.' 'A man spoke to John.'
- (36-a) *Ein Mann hat dem Peter den Lottoschein gegeben.*
a man has-AUX the-DAT Peter the-ACC lottery ticket given-PAS
'A man gave Peter the lottery ticket.'
- (36-b) *Es hat ein Mann dem Peter den Lottoschein gegeben.*
it has-AUX a man the-DAT Peter the-ACC lottery ticket given-PAS
'A man gave Peter the lottery ticket.'

The main point of the two previous sections was to show that German distinguishes among the different types of verb-second constructions a construction type with the clausal onset *es*. The *es*-construction is characterized by being topic-less, by constraints on the predicate and definiteness of the subject-NP (that is, if the subject is present) as well as by the constraints on the pragmatic function of the whole construction. It is obvious that an adequate linguistic representation of this construction type must be based not only on its syntactic and semantic properties, but it must also be motivated by such pragmatic properties as "focus" and "specificity" of the participants.

6. ES WITH VERBS OF COGNITION AND PHYSICAL PERCEPTION. All the verbs of cognition and physical perception have in common that the *es*-subject must occur in the clausal onset position if no other element precedes the finite verb. However, there seems to be a tendency to use the referential Experiencer argument rather than *es* in the clausal onset position and to attach *es* in its contracted form 's to the finite verb, as in *Mich friert's* 'I am freezing'. This is motivated by the fact that it is preferably topics that are expressed in the clause onset position in German. Experiencer arguments that are definite and have a specific reference are much better topic candidates than *es* that, with verbs of cognition and physical perception, is either semantically empty or has a vague referential content. In short, expressions of the type *Mich friert es*, *Mich friert's*, or *Mich friert* (cf. (2)) are preferred to expressions with the clausal initial *es*, such as (5) *Es friert mich*. Furthermore, the constructions of the type *Mich friert es*, *Mich friert's* are preferred to the type *Mich friert*.

I would like to propose that *es* with verbs of cognition and physical perception has a status of a lexically-determined subject, because it determines agreement and occurs in subordinate clauses as well as after the finite verb in questions and in main declarative clauses. The fact that *es*-subject with certain verbs of cognition and perception can be omitted in postverbal positions and in subordinate clauses can be explained by its referential properties. A number of verbs of cognition and physical perception have, apart from the Experiencer argument, an obligatory referential subject argument linked to the Stimulus role: *sich freuen* 'to rejoice'; *scheinen* 'to seem', 'to appear'; *gefallen* 'to please'; *gelingen* 'to succeed'; *sich wundern* 'to wonder'; *verdriessen* 'to annoy'. With such verbs the *es*-subject cannot be omitted as, for example, (37) shows:

- (37) *Wundert Dich*/('s)?*
wonders you-ACC it
'Does it surprise you?'

The lexical entry for the lexical item *WUNDERT* can be represented in the following way:

- (38) (WUNDERT (V ((GF Subj) (SR Stim) (MS NP/Nom/ES))
((GF Obj) (SR Exp) (MS NP/ACC))))

However, with a restricted group of verbs of cognition and physical perception, such as *Mich friert* (lit.: me-ACC freezes) 'I freeze/I am freezing', *Mir graut* (lit.: me-DAT dreads) 'I am afraid (of something)', *Mir/Mich ekelt davor* (lit.: me-DAT/me-ACC disgusts because-of-that) 'It disgusts me', (?)*Mir/Mich schaudert* (lit.: me-DAT/me-ACC shivers) 'I shudder', *Mir/Mich schwindelt* (lit.: me-DAT/me-ACC is-giddy) 'I am feeling/I feel

giddy/dizzy', the *es*-subject is non-referential (neither anaphoric/cataphoric nor exophoric), and it does not bear a semantic role to the predicator. Since the *es*-subject cannot be interpreted as referring to some stimulus or circumstance, which causes the referent of the Experiencer-NP to have certain physical perceptions or mental states, it cannot be replaced by a full lexical noun phrase: **Die kalte Luft friert mich* (lit.: the cold air freezes me-ACC). So the lexical entry for the lexical item *FRIERT*, for example, can be represented in the following way:

- (39) (FRIERT (V ((GF Subj) (SR nil) (MS NP/Nom/ES))
((GF Obj) (SR Exp) (MS NP/ACC))))

With this restricted group of verbs the semantically empty *es*-subject is used in the clausal onset position in order to satisfy the verb-second constraint. If the verb-second constraint is fulfilled by some other lexical item(s) in the clausal onset position, or if the clause does not comply with the verb-second constraint (i.e. if it instantiates a verb-initial or verb-final construction type), the *es*-subject may be omitted, as it is predicted by (15), without changing either the propositional content of the clause or breaching the structural and pragmatic constraints imposed on main declarative clauses in German (cf. (2) and (3)).

The preference for using the *es*-subject even with those verbs which may omit it in non-initial positions seems to follow from the general tendency to "provide" each active verb form in modern German with a nominative subject argument (cf. Seefranz-Montag 1983:178; Lenerz 1985:129). In colloquial German, this preference is clearly shown by the fact that postverbal *es* almost always occurs in the form of a contracted pronoun 's:

- (40) *Graut's dir? / Graut dir's?*
dreads-it you-DAT/ dreads you-DAT-it
'Are you afraid of something?'

The subjectless constructions in which *es* is not used are gradually becoming obsolete (cf. Seefranz-Montag 1983:163 and 188, Haiman 1974:106, Admoni 1976:223, Lenerz 1985:104). They are restricted to a high register written language, reflect older stages of the German language, and are characteristic of a small class of verbal predicators cited above. The use of the *es*-subject with verbs of cognition and physical perception must also be seen in connection with the complicated interaction between morphological and syntactic factors which are partially determined by what is characterized as a change from the TVX (i.e. topic - verb) to the SVX (i.e. subject - verb) order which modern German is currently undergoing.¹⁰ The tendency to provide every active verb form with a nominative subject-NP and to use a referential argument as topic in the clausal onset position makes itself noticeable also in the fact that the constructions of the type *Mich friert (es)* (lit.: me-ACC freezes (it-NOM)) are gradually being replaced by the corresponding constructions of the type *Ich friere* (lit.: I-NOM freeze) 'I freeze/I am freezing'. In other words, the constructions with topicalized non-nominative Experiencer arguments are gradually replaced by the constructions with nominative Experiencer subjects (cf. Seefranz-Montag 1983:158ff., 163, 184). This transition is facilitated by the fact that oblique Experiencer arguments already manifest some of the properties which are typical for subjects in German: not only do they often occur in the clausal onset position as topics, but also they may even control reflexivization, as in *Faust. graute vor sich*, (lit.: Faust-DAT dreaded because-of himself-DAT) 'Faust abhorred himself'. A valency description for a one-place predicator such as *frieren* 'to freeze' in *Ich friere* 'I freeze'/'I am freezing' can be represented in the following way:

- (41) (FRIER- (V ((GF Subj) (SR Exp) (MS NP/Nom))))

In contrast to English and French, for example, the expressions with the Experiencer in the nominative case are still less widespread.

To summarize, verbs of cognition and physical perception have an obligatory argument which is linked to the Experiencer semantic role and which can be realized either in the nominative case or in the oblique case (accusative, as in (2), and dative, as in (3)). Those predicators which link the Experiencer argument to the oblique case may also

require *es* as their obligatory subcategorized subject argument. The lexicon contains lexical entries for both two-place predicates, such as (39), and one-place predicates, such as (41), which are related by a lexical redundancy rule. Since not all of these verbs can occur with a nominative Experiencer subject argument, the lexical entries for two-place predicates, that is for those predicates that take the *es*-subject and the Experiencer argument in the oblique case, are taken as basic and those for one-place predicates, that is those that take an Experiencer argument in the nominative case, are derived. This description allows one to make a distinction between the verbs that are subcategorized for a subject argument that is always realized in the surface syntactic structure and those that can occur without a subject. Since this is a lexical property of each verb, the best place to encode this information is in the lexicon, rather than to treat it as a property of special construction types.

For the purposes of this paper, I left aside *es*-constructions with predicatively used adjectives and nouns. In general, predicatively used nouns allow more readily the omission of the *es*-subject in positions which are not clausal onset positions than predicatively used adjectives do; and predicatively used adjectives allow this more often than verbs. I assume that such *es*-constructions can also be described along the same lines as it has been suggested for the *es*-constructions in this paper.

To conclude, only if it is assumed that the realizations of *es*, in the types of sentences given above, have different status, both with respect to their semantic properties and with respect to their syntactic and pragmatic function, can it also be explained why they differ with respect to their distribution in tensed clauses.

Notes

1. Apart from German, the verb-second constraint also holds in other Germanic languages such as, for example, Icelandic, Dutch and Norwegian.
2. There are topicalization constructions which involve fronting of what is not usually considered to be a single maximal constituent. Consider, for example, the following sentence in which indirect and direct objects are fronted together with the nonfinite verb: *Dem Jungen das Buch schenken wollte Maria* (lit.: the-DAT boy the-ACC book give wanted Mary) 'Mary wanted to give the book to the boy.' For the purposes of this paper I will assume that the verb-second constraint holds and the first position in the main declarative clause is filled by a single maximal constituent, or, at least, that whatever occurs in front of the finite verb can be considered as a single maximal constituent. For a detailed discussion of such complex fronting cases in German see Nerbonne (1982) and Uszkoreit (1984).
3. This notation is inspired by the unification-based approaches to natural language description. Cf., for example, Shieber (1986), and a similar approach is adopted in Pollard and Sag (1987). For a more detailed description of the Construction Grammar formalism, see for example, Fillmore (1988).
4. For more details on arguments *pro* and *contra* the referential content of weather *it* in English and other languages see Darden (1973), Bolinger (1973), Ruwet (1986).
5. For more details on the constraints on passivizability of one-place predicates in German, and other languages, see, for example, Comrie (1977), Kirsner (1975), Perlmutter and Postal (1984a), Perlmutter and Postal (1984b), Rice (1987), Shannon (1987).
6. For arguments in support of this proposal see Uszkoreit (1984) and (1987).
7. However, a pronominal inverted subject may be acceptable if it is contrastively stressed: *??Es habe ich die Ansprache gehalten*. (lit.: it have I the address delivered) 'It was I who delivered a speech.' Such sentences differ from the *es*-construction with a presentational function in that they have a narrow contrastive focus on the inverted subject-NP.
8. Examples are taken from Lenerz (1985:122).
9. The corresponding inverted-subject construction in English (*there*-construction) and in French (*il*-construction), for example, require unaccusative verbs and an indefinite inverted subject-NP. For the more recent studies on this topic see, for instance, Safr (1987) and Belletti (1988).

10. According to Vennemann (1973), (1974), (1975) and Seefranz-Montag (1983:189), the "TVX" (i.e. topic in the clausal onset) serialization is still the dominating pattern in modern German. Cf. also Heidolph et al. (1981) and Uszkoreit (1984).

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A Unified Account of the Semantics of the English Ditransitive¹

Adele E. Goldberg
University of California, Berkeley

Ditransitives, or expressions of the form Subj Verb Object Object, have been traditionally classified into three distinct groups: those paraphrasable using *to*, those paraphrasable using *for*, and a third group which has no such paraphrases. This carving up of ditransitives has its roots in the transformational tradition. Ditransitives were thought to be derived from their paraphrases with *to* or *for*. Those ditransitives without such paraphrases were thought to be idiosyncratic and were largely ignored. Recent trends toward mono-stratal theories of syntax, however, encourage the search for generalities in the "surface" structure of expressions.

I would like to demonstrate that the English ditransitive can be described as a construction in the Construction Grammar sense of the word, that is, a pairing of both form and meaning. That is, I will argue that the skeletal syntax, Subj Verb Obj Obj, is paired with an identifiable semantics. The semantics involved can best be represented as a category of related meanings. In this sense the ditransitive can be viewed as a case of *constructional polysemy*: the same form is paired with different but related senses.

The semantics of the ditransitive will be shown to interact with several conventional systematic metaphors. The understanding of these metaphors turns out to be crucial to a unified account of the ditransitive's semantics.

The present work is in part a direct outgrowth of Green's (1974) work on ditransitives. In addition to providing a large database, she notices many of the generalizations I restate here. Added to her analysis are further generalizations and refinements. These additions are in part based on subsequent developments in linguistics, such as the recognition of the persuasiveness of metaphors in our everyday language, a recognition due in large part to Lakoff and Johnson (1980), as well as systematic analyses of lexical and constructional category structure as provided by Brugman (1988), Lakoff (1987), Lindner (1981), Nikiforidou (ms), Michaelis (ms) and others.

This paper proposes a necessary condition for licensing of the ditransitive construction, and that is that the semantics of the expression must conform to the network of semantics outlined below. What I am proposing, then, can be interpreted as a well-formedness constraint or a constraint on the interpretation of ditransitives. This work does not address the question of sufficient conditions for licensing the ditransitive construction, and does not rule out the possibility that the final licensing of the ditransitive is to some extent lexically idiosyncratic.

At the same time, an account which simply says that the ditransitive syntax is purely lexically idiosyncratic is rejected because the pattern is somewhat productive. For example, the new lexical item *fax* is used ditransitively as in:

1. He faxed his boss the report.

Also, hypothetical lexical items are readily adapted to the ditransitive syntax. An example comes from Marantz(1984): if we define a new verb *shin* to mean "to kick with the shin" and we use the new verb in sentences such as:

2a. Joe shinned the ball to his teammate during soccer practice.

it is quite natural for us to allow this new verb to be used ditransitively, as in:

2b. Joe shinned his teammate the ball.

Also, there are many attested examples in which people use the ditransitive syntax despite the fact that the predicate involved normally does not allow this syntax.

Finally, some predicates which do allow the ditransitive syntax, allow it only when a specific semantics is involved. For example, *owe* can be used ditransitively in:

3. He owed the bank a fortune.

However, this predicate cannot be used ditransitively when its meaning is slightly altered. For example, while we can say:

4a. He owed his present success to his upbringing.

We cannot say:

4b. *He owed his upbringing his present success.

These facts argue that there is an underlying semantic pattern that is recognized by speakers. What follows is a description of this pattern, a pattern that turns out to have prototype structure as represented below.

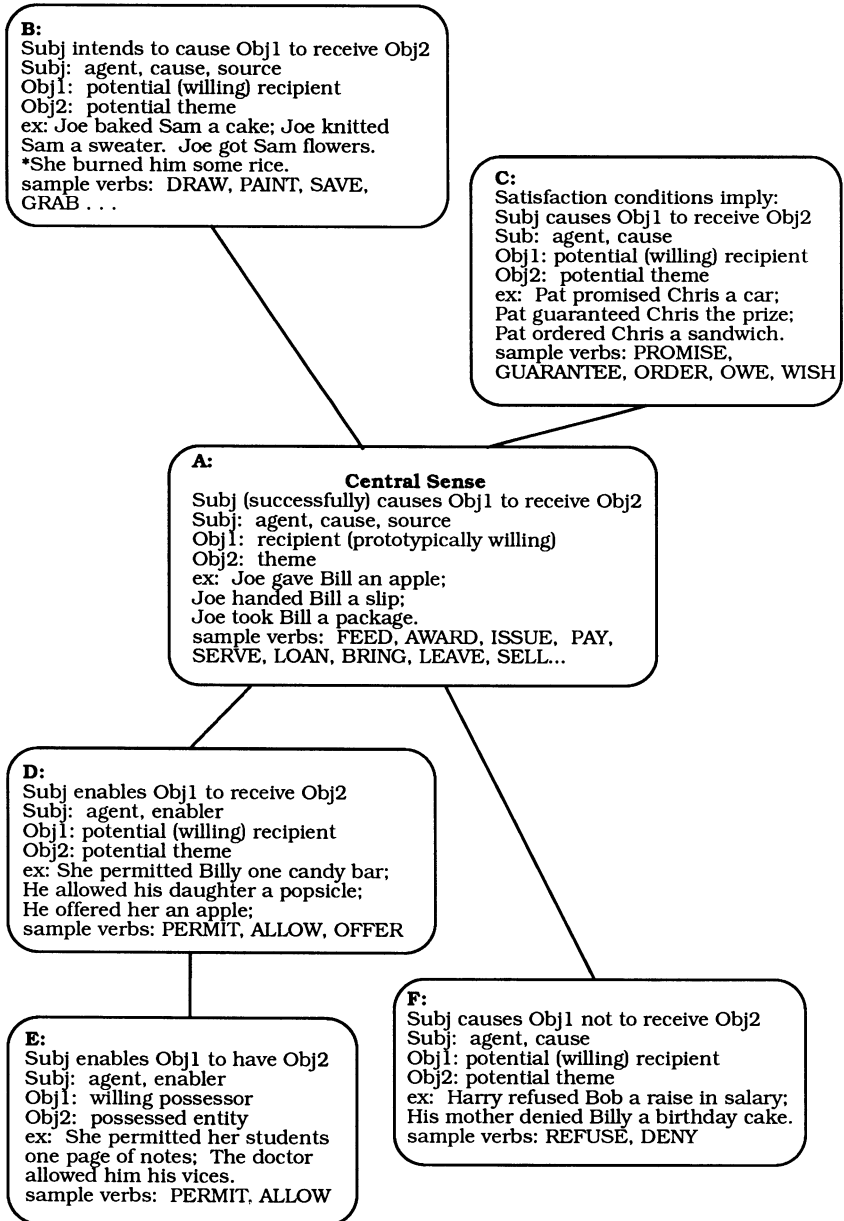


Figure 1

Central Sense

As represented in Box A of figure 1, the central sense of the ditransitive is that of transfer of a physical object to a recipient, i.e., the subject agentively causes the second object to be transferred to the first object. Examples of this sense include:

5. Jo gave Bill an apple.
6. Jo handed Bill a slip.
7. Jo took Bill a package.

and similar expressions involving the predicates *feed*, *award*, *issue*, *pay*, *serve*, *slip*, *loan*, *bring*, *leave*, *sell*, etc.

There are several reasons to postulate this class as the central sense. It involves concrete, as opposed to metaphorical or abstract (here, potential) transfer, and concrete meanings have been shown to be more basic diachronically (Traugott 1988, Sweetser to appear) and synchronically (Lakoff&Johnson 1980). Further, this is the class most metaphorical extensions are based on. Finally, this class is argued to be central because the other classes can be represented most economically as extensions from this sense.

There are five major classes of extensions. Each of these is based on slight permutations of the transfer schema. It is possible to show that each extension is natural by showing that the link between the central sense and the extension appears elsewhere in the grammar; and in fact, I have found such links. But for the most part the permutations on the basic transfer schema are so slight that I will not explicitly discuss these parallel links here.

An Extension based on the Relationship between Actual and Intended Transfer

The first extension is based on the relationship between actual and intended transfer. This is represented in Box B of figure 1.

This extension from the basic sense involves predicates which are not themselves transfer predicates, for example, *bake*, *find*, and *get*. Ditransitive expressions involving these predicates acquire a transfer interpretation from the semantics of the construction.

In the following examples, successful transfer is not strictly implied, as it is in the central sense, but is a *ceteris paribus* implication.

Examples include:

8. Joe baked Sam a cake.
9. Joe found Sam a sweater.
10. Joe got Sam flowers.

and similar expressions involving the predicates *draw*, *knit*, *paint*, *save*, *grab*, etc.

The majority of the expressions in this class is often said to be associated with paraphrases using *for* by derivation or lexical rule. For example, *Bill made Sam a hat* would be said to be associated with *Bill made a hat for Sam*. However, the latter sentence, *Bill made a hat for Sam*, has

many interpretations: Bill may have made a hat that Sam was otherwise obliged to make; Bill may have made the hat as a demonstration of hat making; Bill may have made the hat for himself because Sam wanted him to wear one; or lastly, Bill may have made the hat with the intention of giving the hat to Sam. It is only the last interpretation, in which intended transfer of the hat to Sam is involved, that is acceptable as a paraphrase of the ditransitive. An explanation in terms of constructional polysemy accounts for this fact.

Most theories postulate a beneficiary role for the first object position of these expressions because they are paraphrasable with a benefactive *for* phrase. This role assignment is supported by the fact that the example:

11. *She burned him some rice.

is unacceptable *except* in the context that he is thought to like burnt rice, in which case the sentence is fine.

I would like to suggest that the role assigned should actually be a conflation or conjunction of potential recipient and beneficiary since both of these semantic aspects are involved. We might describe the role assignment as that of a potential willing recipient.

The additional stipulation of willingness on the part of the first object in extension B cannot be used to distinguish this class from the other senses, because the recipient-beneficiary role is not just a property of this class, but of each of the extensions of the central sense as well. (This role assignment will hopefully be self evident in the extensions to follow.) The only case in which willingness or beneficiary status is not required of the first object is in the central sense, involving actual transfer. However, in the prototypical case of transfer, the recipient of the transfer is a willing recipient.² Therefore, it appears that a fact about the prototypical scenario involving the central sense becomes obligatory in the extensions from the central sense.

An Extension based on Satisfaction Conditions

Extension C of figure 1 is based on "satisfaction conditions" as defined by Searle (1969). Ditransitive expressions involving the predicates *promise*, *guarantee*, *order* (as in *Joe ordered himself a sandwich.*) and *owe* do not necessarily involve transfer directly; e.g., *Sue promised Frankenstein a kiss* does not imply that Sue gives Frankenstein a kiss. However, transfer is implied by the "satisfaction conditions" associated with each predicate. A *satisfied* promise for example does imply that the promisee receives whatever is promised.

A further difference separating this class (as well as the rest of the extensions) from the central sense is that in these examples it is not necessary for the second object to move from the subject; that is, the subject is still understood to be the cause of the transfer, but is not necessarily understood to be the source of the transfer.

An interesting case of an extension based on satisfaction conditions involves the predicate *wish* as in:

12. I wish you all the best.

Here the subject is not actually causal. However, due to a kind of superstition, this is exactly what this expression is meant to convey. To ask someone to wish you good luck is to ask for the person's help in attaining for yourself good luck. Thus one can say, after some mishap,

13. I wish someone had wished me good luck.

Extensions Based on Enablement

A third class of Extensions is based on enablement; this is represented by Box D of figure 1. Expressions in this class involve predicates which select for a subject which is not causative but rather *enables* reception to occur. Examples of such predicates are *offer*, *allow*, and *permit* as used in expressions such as:

14. She permitted Billy one candy bar.

15. He allowed his daughter a popsicle.

16. He offered her an apple.

This class is actually further extended when the subject allows the first object to keep the second object. Box E of figure 1 represents this class. In these examples, possession and not reception is involved. Examples of this class include:

17. She permitted her students one page of notes.

18. The doctor allowed him his vices.

A final literal Extension based on Negation

Some ditransitive expressions express the negation of transfer, for example:

19. Harry refused Bob a raise in salary.

20. His mother denied Billy a birthday cake.

Here, transfer is relevant in that the possibility for successful transfer has arisen, but by virtue of the specific semantics of the predicates involved, the subject refuses to act as the cause of the reception. Box F of figure 1 represents this class.

Metaphorical Transfer

Orthogonal to all of these extensions are extensions based on conventional systematic metaphors. The source domains of the metaphors involved are the central sense.

A major source of ditransitives is a metaphor involving effects, construed as objects, *traveling across* from their cause to the affected party, the "recipient." Evidence for the existence of this metaphor, independent of the ditransitive construction, includes expressions of the following kind:

This is the *source/origin* of the effect., meaning "This is the cause of the effect."

The effect was *blocked*.

They *held off the negative effects* for as long as possible.

The effect *came from* the cause.

This metaphor licenses examples:

21. The rain brought the farmers relief.
22. She gave him a pain in the neck. (The pain is also metaphorical, but that is not relevant here).
23. The paint job gave the car a higher sale price.
24. The tabasco sauce gave the chili some flavor.

This class can be represented as follows:

Metaphor: Causes are Sources of Their Effects

Source Domain: A

Target Domain:

Subject is the cause of Obj1 being affected by Obj2
 Subj: cause
 Obj1: affected party
 Obj2: effect
 ex: The rain brought the farmers relief.
 She gave him a pain in the neck.
 The paint job gave the car a higher sale price.

The claim that this particular metaphor motivates the syntax of the above examples is supported by the polysemy of each of the predicates involved. The predicates *give* and *bring* are used in the above examples to imply causation, but both of their central senses involve *transfer*. The link between these two senses is accounted for by appeal to the metaphor. *Give* and *bring* here involve the "transfer" of effect.

This metaphor has an important implication for the understanding of the construction as a whole. First notice that most ditransitives require a volitional subject. The intention must extend so that not only is the action of the verb performed agentively, but it is also performed with the intention of causing the first object to receive the second object. For example,

25. Joe painted Sally a picture.

implies that Joe intended the picture to be for Sally. It cannot be the case that Joe painted a picture (intentionally), and that Sally happened to receive the picture. Similarly,

26. Bob told Joe a story

is only acceptable in the context that Bob intends to tell Joe a story. It cannot be the case that Bob tells the story to someone else and Joe just happens to overhear. Notice further that each of the verbs mentioned so far selects for an agentive subject. These facts might tempt us to conclude that the subject of the ditransitive must be agentive. But we have just seen examples where this requirement is not met. Consider again examples 21-24, or the following examples:

27. The medicine brought him relief.
28. His wide grin told his buddy the whole story.

It turns out that the subject is not necessarily volitional in just those cases where the transfer is understood metaphorically by the Causation metaphor. Therefore, recognition of the metaphor allows us to state the generalization of volitionality and still account for the cases where the volitionality requirement is not met.

Another metaphor, the Conduit Metaphor, described and named by Michael Reddy (1979) involves communication *traveling across* from the stimulus to the listener. The listener understands the communication upon "reception." Evidence for the metaphor includes:

He *got the ideas across* to Jo.

His thoughts *came across* from his speech.

Jo *received* the information from Sam.

Jo *got the information* from Bill.

This metaphor licenses the following examples:

29. She told Jo a fairy tale.

30. She wired Joe a message.

31. She quoted Jo a passage.

32. She gave Joe her thoughts on the subject.

This class can be represented thus:

Metaphor: Conduit

Source Domain: A

Target Domain:

Subj communicates Obj2 to Obj1

Subj: speaker

Obj1: listener

Obj2: information

ex: She told him a story.

She wired Joe a message.

She gave Joe her thoughts on the subject.

The final metaphor I will discuss, but by no means the last metaphor involved in the ditransitive, is a metaphor involving understanding forces as being propelled entities. The endpoint of the force is understood as the recipient of the entity. Evidence for the metaphor includes:

He *blocked* the kick.

He *caught the full force* of the blow.

A blow *struck* him in the head.

The punch was thrown.

Punches were flying.

Bob *received* a punch/kick/slap/tug from Jo.

This metaphor licenses the following expressions:

33. Jo gave Bob a punch.

34. Jo gave Bob a kick.
 35. The men gave the grand piano a push.

This class can be represented as follows:

Metaphor: Forces are Propelled Entities

Source Domain: A

Target Domain:

Subj initiates a force (Obj2) that affects Obj1
 Subj: initiator of force
 Obj1: affected party
 Obj2: force
 ex: Joe gave Bob a punch. Bob gave Joe a kick.
 The men gave the grand piano a push.

There are several other metaphors involved in the construction, which unfortunately I do not have space to discuss here. Hopefully the metaphors just described will give an idea of how the analysis would work.

On the Notion "Recipient"

Noticing that a recipient is involved in ditransitive expressions may be a first step toward motivating the double object syntax of the construction. Those interested in the semantics of the direct object since Jakobson have noted that *recipients* of force and effect make for good direct objects (Jakobson 1938, Langacker 1987, Rice 1987). (Of course this is not to say that all direct objects are recipients; clearly the objects of cognition verbs such as *believe*, *see*, and *know* would present difficulties for such a claim.)

Apparent Exceptions

Finally we come to cases that appear exceptional.

Cost does not fit the pattern outlined above for two reasons. First it does not require a volitional subject. Secondly, the first object does not receive the second object, but rather potentially loses the second object. However, *cost* also differs from the other predicates discussed in that it is not passivizable:

*I was cost ten dollars by this sweater.

This fact may indicate that the first object complement of *cost* should not be considered an object, and that therefore *cost* should not be included in the class of ditransitive predicates.

Ask is exceptional in expressions such as:

37. She asked Sam his name.
 38. She asked Sam a favor.

These clearly do not imply that Sam potentially "receives" his name or a favor. It is possible, however, that the second objects in examples 37 and 38 should be analyzed as metonymic for the clausal *what her name was* and the phrasal *for a favor* respectively. If analyzed this way, they would fall outside the domain of ditransitives. Another possible explanation for example 38 is that the expression is simply idiosyncratic. Notice the

pattern is not productive:

- 39. *He asked her some help.
- 40. *He asked her five dollars.

Forgive and especially *envy* as used in:

- 41. He forgave her her sins.
- 42. He envied the prince his fortune.

are also exceptional. The subjects in these cases are not causal and no reception is involved. However, these predicates have illuminating semantic histories. *Forgive* and *envy* historically had senses that were closely related to *give*. *Forgive* used to mean "to give or grant" (OED:452). *Envy* used to mean "to give grudgingly" or "to refuse to give a thing to" (OED:232). This of course is not evidence that *forgive* or *envy* are part of the synchronic semantic pattern outlined above. But the historical facts do suggest that these predicates were at least at one time associated with this sort of pattern. These facts also of course suggest that the construction can occasionally be frozen without continuing reference to the original semantics.

However, it seems reasonable that syntactic change should tend toward patterns that are more transparent to the speaker. If the construction with the semantics I have outlined is psychologically real, then it would be natural for odd cases of ditransitives involving *forgive* and *envy* to drop out of use. And in fact I myself find archaic sounding sentences involving *forgive* and *envy* much more acceptable than modern-sounding sentences. For example:

- 43a. She forgave him his sins.
- 43b. ?*She forgave him his goof.
- 44a. She envied him his vast fortune.
- 44b. ?*She envied him his extensive stock portfolio.

Conclusion

This work attempts to add an additional example to the growing body of evidence that suggests that constructions involving pairings of syntax and semantics provide rich areas of generalizations. Generalizations based on radial categories and not necessarily classical categories of necessary and sufficient conditions are accepted as legitimate based on recent empirical research into the nature of human categories (for references and discussion see Lakoff 1987). This type of generalization allows us to view the ditransitive as a case of constructional polysemy. Specifically, the semantics of the ditransitive construction has been shown to be based on transfer and capable of interacting with the semantics of individual predicates, yielding a family of different but related semantic conditions. So, while *give* lexically codes transfer, expressions involving other predicates, for example *draw*, take on a transfer interpretation by virtue of appearing in the ditransitive construction.

Further work is necessary to investigate sufficient conditions for licensing the ditransitive. I hope to have demonstrated the validity of further research into ditransitives as a unified construction with

identifiable polysemic semantics.

Endnotes

1. Extremely helpful criticisms and suggestions were made by Claudia Brugman, Jane Espenson, Charles Fillmore, Don Forman, Jean-Pierre Koenig, Laura Michaelis, Eve Sweetser, and especially George Lakoff. All the usual disclaimers apply.
2. In support of this claim, notice that expressions whose predicate codes a malafactive argument are never paraphrasable as ditransitives. For example, in the expressions,
 1. She forced more work on him.
 2. She dumped her beer on him.

transfer is implied; i.e., the other conditions on the central sense are met; and yet these expressions are completely unacceptable as ditransitives:

- 1'. *She forced him more work.
- 2'. *She dumped him her beer.

(Remember that once the assumption that ditransitives are derived from paraphrases with *to* or *for* is relinquished, these examples fall into the domain of potentially ditransitive expressions.)

Further notice that entities which are incapable of being willing recipients are odd as first objects in ditransitive expressions:

3. ?The bereaved widow gave the corpse a kiss.

3. See for example Fillmore, Kay, O'Connor(1988), Lakoff(1987).

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Proto-linguistic variation: a link between
historical linguistics and sociolinguistics.

Joseph H. Greenberg
Stanford University

This study resumes and expands some of the topics discussed in Greenberg (1978) on the stages of the definite article and Greenberg (1981) which is devoted to two additional examples of Stage III articles, Nilo-Saharan k- and Penutian -s. In the present context, I will be especially concerned with an aspect of the Stage III article which only received incidental treatment in the earlier studies, namely, the fact that the distribution of the forms with and without the article shows a certain kind of randomness in relation to the languages and dialects of the linguistic stock in which it is found. I will also seek to show that this particular kind of randomness of distribution, to be defined and illustrated later, also exists in regard to other grammaticized elements than definite articles in their later stages of development, and indeed is not confined to grammaticized markers, but also extends to variants of morphophonemic origin and perhaps even to those arising from purely phonetic changes. Finally I will suggest that the sociolinguistic and linguistic situations which give rise to such variation are distinct from both the areal and the genetic types to which we are accustomed and thus constitute a third type of phenomenon with both historical and sociolinguistic implications.

In illustrating what is meant here by random variation, I will take as an example the Nilo-Saharan prefix k- which in my first study of languages in that family was called moveable k- (Greenberg 1966). The reasons for considering this the continuation of a Stage I article similar to the English definite article followed by a Stage II article (roughly speaking combining the characteristics of a definite and indefinite article) are set forth in Greenberg (1978, 1981) and are not repeated here. From the point of view of distribution over languages in a particular linguistic stock, what is here called random variation has some, or usually all, of the following four characteristics as illustrated by Nilo-Saharan k-:

1. Random distribution of forms with and without k- over separate branches of Nilo-Saharan, e.g. Maba eri, Songhai kuri, Daza gere 'blood'. Here the languages cited belong to separate branches of Nilo-

Saharan at the deepest level of subclassification. Likewise within the same branch of Nilo-Saharan similar phenomena are found. In Table 1 below some etymologies are to be found which are represented both in Nile Nubian and Bari which belong to separate subgroups of the Eastern Sudanic branch of Nilo-Saharan.

Nile Nubian		Bari	
guar	'ant'	ki-gwur-te	'ant'
ur	'head'	ur-et	'crown'
aru	'rain'	k-are	'river'
gu-mur	'neck'	mur-ut	'neck'

Table 1.

It will be noted that all four possibilities are represented, both languages with reflexes of *k-, 'ant', neither language, 'head/crown', presence in either one without the other, e.g. 'rain/river' with k- in Bari but not in Nubian and 'neck' with k- in Nubian but not in Bari. This represents the usual situation and numerous additional examples could have been given.

2. Such random variation can also be found even among dialects of the same language. In Table 2 examples are adduced from Moru, a language of the Moru-Madi subbranch of the Central Saharan branch of Nilo-Saharan. Regarding the three dialects cited, Tucker (1940:3) states "The three dialects Miza, Kediri and Moroꞑndri are so similar as to be almost identical." Yet even at this low genetic level similar variations occur.

Miza	Kediri	Moroꞑndri	
k-umu	k-umu	umu	'fly'
k-ini	ini	ini	'skin'
k-ari	k-ari	k-ari	'leprosy'

Table 2.

3. There are even instances of free variation within the same dialect. For instance in the Keliko dialect of Moru kari and ari are given as variants of the same word for 'blood'. Of course, as with numerous statements regarding free variation, one does not know in the absence of sociolinguistic studies the nature of this variation, whether between individuals, social strata, kingroups or geographically determined entities. Nor does one know

whether the variants are differently distributed in accordance with such criteria in lexically distinct items.

4. Finally it should be noted that, usually at a very low genetic level, particular dialects or languages show a distinct or even exclusive preference for one variant over another. Thus in Table 2, Miza has k- forms in all three instances. An examination of the relatively brief comparative vocabulary in Tucker (1940) shows only rare instances in which Miza shows forms without k-.

Although the instances just cited show a kind of functionless choice of variants among related languages and dialects, this need not always be so. Four types of acquisition of new functions can be distinguished, once more illustrated from Nilo-Saharan k-. One of these, however, the second one listed, could not be found in this instance but will be illustrated later.

1. There are sporadic cases in which what would otherwise be homonymous forms are differentiated by the choice of one of the variants as against the other.

An example from dialects of Moru, the Central Sudanic language which is the source of the examples in the foregoing table, will illustrate this possibility. In both Miza and Kadiru, the root ari without k- means 'bird', while k-ari, otherwise identical means 'blood'. It is interesting that in the third dialect of Table 2, Moroñdri, the two are differentiated in a quite different fashion. In this dialect ari is the word for 'blood' while ari-va means 'bird'. The suffix -va in this latter form is a diminutive.

2. Sometimes both forms are retained but undergo a secondary semantic differentiation. As noted earlier, I have been unable to find an example of this involving Nilo-Saharan k-. An example in a quite different context is English 'shade' and 'shadow', the first deriving from the nominative singular scadu and the latter from the oblique stem scadw- after the dissolution of the Old English case system.

3. There may be sporadic new grammatical functions. Thus in Kanuri, a language of the Central Saharan branch of Nilo-Saharan, in just one root, the form with k- prefix, k-am is used as a singulative 'person', while the form without k-, am is a collective meaning people. The most closely related language to Kanuri, Daza, uses am as the general root for 'person' and has no form with k-. In Karimojong, a

language of the Eastern Nilotic subbranch of Eastern Sudanic, examples of this kind are more numerous but the formation is still not productive, e.g. (e)-ki-twani 'a single scorpion'; (ni)-twani 'scorpions'. In these forms, the prefixes (e)- 'singular' and (ni)- 'plural' are new second stage articles.

4. However, productive new grammatical functions are sometimes found. Since the k- prefix as a former article deriving from a demonstrative occurs only on nouns, it is reinterpreted as simply a mark of nominality and as such becomes a productive derivational element forming verbal nouns. An instance is Sara, a language of the Central Sudanic branch of Nilo-Saharan. As an example we may cite the verb root usa 'to eat' from which a verbal noun k-usa 'act of eating' is formed.

We see from the above example of reinterpretation, that one possibility is that the formative spreads and acquires new functions. Another possibility is the opposite, which we may call contractive. In such instances the element does not spread and acquire new functions (expansion with resemantization) but survives in just a few examples in which it has been lexicalized, in the sense, that, from the synchronic point of view, it has been incorporated as an indistinguishable part of a lexeme.

However even in a purely synchronic description, it may be noted that there is, statistically, more than a chance correlation between certain grammatical or semantic classes, and certain sequences of phonemes which thus form a submorphemic entity.

These possibilities, namely of expansive resemantization and contractive desemantization can be illustrated from the Chibchan - Paezan suffix -kwa. The original meaning seems to have been 'egg, nut or other similar round object'. It survives in a few instances as a lexical item with this meaning e.g. Terraba (Costa Rica) gwa 'egg', and Cuna (Panama) kwa-(kwa) 'nut'. In this latter case we find -kwa also as a suffix on round objects but also extended to a considerable part of the nominal vocabulary so that it is difficult to assign it a single, definite meaning synchronically.

As an example of expansion with resemantization we may cite the instance of Millcayac, a Chibchan language of Argentina in which -gue is a productive derivational suffix forming verbal nouns, e.g. cheri 'to give'; cheri-gue 'gift'. Thus it has ended in this case with a derivational function quite comparable to that of Nilo-Saharan k- in spite of its very different

origin.

The second type of development that -kwa undergoes in some Chibchan languages is incorporation into a system of numeral classifiers and indicating small round objects. As noted in Greenberg (1972), the most common source of a general classifier is that for round objects. In some cases, after acquiring this function, the very fact that it can appear with all nouns, even if only in quantifying phrases, makes it once more a possible general marker for nouns. However, given the syntactically limited use of numeral classifiers, it is the development which is less likely to occur, particularly if the original order is numeral-numeral classifier. Under these circumstances it may survive in isolated cases as a mark on a few numerals and can be considered from the synchronic point of view simply as part of the numeral. Still its presence in several numerals, and even more powerfully, the comparative evidence, will lead to the correct historical interpretation.

In the case of Chibchan -kwa, this occurs in some languages. For example in Kagaba, a Chibchan language of Colombia, it is found in just four numerals, mai-gua 'three'; ku-gua 'seven'; abi-gua 'eight'; aita-gwa 'nine'. With these we may compare Margua, another Chibchan language of Colombia, which has mai 'three' and avi 'eight'.

In both cases discussed above, Nilo-Saharan k- and Chibchan -kwa, we are dealing with grammaticalized elements in which the variation is between presence or absence of the item in question. It could have been further illustrated from instances like petrified honorifics or diminutives.

However, the variational phenomena earlier enumerated are not confined to grammaticalized morphemes which alternate between presence and absence. Similar distributional properties across language and dialects, and in some instances, similar examples of semanticization are to be found in the case of morphophonemic alternants. Since in such cases, the item in question did not previously have a meaning, we may talk about semanticization rather than resemanticization. Moreover, the variants, typically two in number, both have overt phonological expression in contrast to the examples treated above.

An important source of such variation is the breakdown of vowel harmony systems. There are two main types of development. One is through merger of pairs of alternants resulting typically in so-called neutral vowels as in the instance of Mongolian i which

functions both as back and front vowel. The usual assumption is that this is the result of a change by which its former back partner y becomes i, thus eliminating the alternation. It is easy to see how further mergers may finally destroy a vowel harmony system completely and this has indeed happened in Kerek and Aliutor, both dialects or perhaps separate languages closely related to Koryak, a Chukotian language. In Koryak itself as well as in Chukchee and the more distantly related Kamchadal, a system of high-low harmony still functions. Another course of events, however, gives rise to the kind of variability that we have already seen in the case of grammaticalized elements. An example is that of the East Mongolian languages, all of which are spoken in China. It is clear that Proto-Mongol in regard to vowel harmony was essentially like Classical Mongolian and the present day Western Mongolian languages such as Khalka, Buriat and Kalmuck. The back-front harmony of these languages is stem-driven in that the vowel of the stem remains constant, and the derivational and inflectional affixes, which all follow the stem, vary in regard to backness or frontness depending on the stem.

In the Eastern Mongolian languages, the stem vowels remain basically in their inherited form, but the vowels of affixes tend to have a single variant, each one being an independent case. Thus in a particular language, the front variant can be found in one affix, but the back in another, or they may be in free variation, a variation which thus has nothing to do with the vowel of the stem. The breakdown of harmony may here be attributed to contact with Chinese. In Table 3, a number of inflectional morphemes which originally had the vowel a with stems in back vowels and e in stems with front vowels is shown for the four Eastern Mongolian languages Baoan, Dagur, Dunsian and Monguor.

	Baoan	Dagur	Dunsian	Monguor
Plural	le	--	la	--
Ablative	se	se	se	dza
Locative	re	aare	--	--
Instrumental	gale	gala	--	--
Comitative	--	--	le	la
Causative	ge	gaa, gee	ga	ga, ge
Past Participle	sang	sen	sen	dzan

Table 3.

As can be seen we have a kind of cross-linguistic and internal language variability in principle basically similar to that which was encountered in regard to Nilo-Saharan k- and Chibchan -kwa even though the variants are of phonological rather than morphological origin.

A very similar situation obtains in regard to the so-called Iranicized Uzbek dialects in which, presumably under Iranian influence, the Turkic vowel harmony system, which except for the existence of distinct high back and front vowels has essentially the same structure as Mongolian, has broken down in affixes with results that are basically similar to those found in Eastern Mongolian languages. In neither of these instances is there any semanticization of variant forms. That morphophonemic variants can be utilized to express grammatical distinctions is, of course, well known from the example of German umlaut in which noun pluralization, the expression of the subjunctive in verbs and that of the comparative and superlative of adjectives are expressed by umlauted vowels although generally as a subsidiary mark along with affixes of the usual kind.

An interesting example of the breakdown of a vowel harmony system based on height, in a system which still functions in a few limited aspects of the grammar, e.g. the numeral classifier system, and the third person singular prefixed pronominal object of the verb, occurs in Gilyak.

The Gilyak system of vowel harmony is shown in Table 4.

High	i	y	u
Low	e	a	o

Table 4.

If we compare the two main dialect areas, that of the Amur basin in Siberia, and that of Northern Sakhalin, we see along with numerous instances in which both dialects have generalized the low variant, or both have retained the high variant, a considerable number of cases such as those in Table 5 in which one dialect has chosen the low and the other the high variant.

Amur	Northern Sakhalin	
yl	al	'mouth'
park	pyrk	'only'
mut	mot	'pillow'
nik	nek	'recently'

Table 5.

In general the Amur dialect prefers the high variant and Northern Sakhalin the low variant but there are a fair number of exceptions. In addition there are instances in which both variants are found in both dialects but have differentiated their meanings, e.g. vi-, 'go, walk'; ve- 'run (of animals)'; lax 'cloud', lyx 'rain'. In one instance we even have an incipient grammaticalization, nog 'to be fragrant' (intr.) and nugnug 'to smell' (tr.). In all the forms just cited the two dialect areas agree.

In addition to morphological elements and morphophonemic alternants, it seems likely that variants developing out of word sandhi can give rise to a similar pattern of cross-linguistic and intralinguistic variation. A well-known instance is the so-called s-moveable of Indo-European which appears preceding roots in unvoiced stops, r, l, m and n. An example is Latin tegere 'to cover' as against Greek stégos 'roof' which also has a variant tégos in the same language.

Can a similar pattern of distribution result from variants produced by sound change? The usual pattern is either clearly genetic or areal. Thus the Indo-Aryan change of *e > a, merging with original *a which is found only in this branch of Indo-European is clearly genetic. A classic instance of an early areal feature is found in the case of "incomplete satemization."

The fronting of front velars to sibilants found in the satem branches of Indo-European, namely Indo-Aryan, Balto-Slavic and Albanian is only complete in Indo-Aryan and probably Armenian. In Balto-Slavic there are instances of velar reflexes in particular forms, in regard to which the languages differ from each other and even show variation within the same language. Thus corresponding to Sanskrit sru- 'to hear' we find Old Church Slavic slu-ti as expected but in Baltic Lithuanian klausy-ti, Lettish klausi-t and Albanian guhëm 'I hear'.

Corresponding to Sanskrit ásman 'stone' we find forms with velars in both Baltic and Slavic: Old Church Slavic kamy, Lithuanian akmuo and Latvian akmens. However, in Lithuanian there is the doublet asmuo with the differentiated meaning 'edge, blade'. In the word for 'dog', Sanskrit śvan corresponds to Lithuanian szuo as expected but within Latvian we find the surprising variation suns 'dog' but kuna 'bitch'. Sanskrit śmasru 'beard' is connected etymologically to Lithuanian smakra, Latvian smakrs 'chin' and Albanian mjakrë 'beard'.

These and other examples show some degree of randomness in the distribution of the palatal and sibilant but on the whole exhibit an areal pattern which, as noted above, suggests an eastern origin for the sound change with imperfect propagation westward among the Indo-European dialects.

An instance which does seem to show the type of distribution seen above for morphological and morphophonemic variants are the reflexes of the reconstructed syllabic r of Proto-Indo-European, in Greek ra or ar and Germanic ru or ur. Brugmann in the second edition of his comparative grammar (1897:4) notes that there is no satisfactory solution to this alternation. In his later summary grammar (1902:131) he says "Probably a PIE difference in pronunciation is the reason." This variation in regard to Greek is illustrated here by a few examples. Athenian kardíā 'heart' corresponds to Ionian and Homeric kradíā. Within the Athenian dialect itself we find kárta 'very' but kratús 'strong' and the variant past passive participles dartós, dratós 'flayed'. In Pindar who wrote in the Theban Aeolic dialect we even find thrasus kardíā 'bold heart' in which the reflexes ra and ar are found in the same phrase. The choice was probably because of the meter but that both variants were available to him is significant.

An interesting case of secondary semantic differentiation is the existence of the two forms thrásos and thársos for 'courage' in Athenian and the Standard Koine. Aristotle (Eudemian Ethics 1234b.12), after his discussion of the golden mean as lying between a particular vice and its corresponding virtue, distinguishes another case, namely that the excess of a good quality is likewise condemned and is to be contrasted with its possession to a moderate and fitting degree. His example is thársos 'courage' vs. thrásos 'foolhardiness'. In a similar vein Ammonianus, a lexicographer of the second century A.D., says that thársos is said of human beings, that is 'reasonable courage', as against thrásos, the unreasoning courage of animals.

I believe that we are to envisage the third alternative as distinct from the genetic and the areal but describable from the sociolinguistic point of view as follows. The protolinguistic community showed variations reflecting changes which were just in progress as it began to break up. They were distributed idiosyncratically across small groups and even individuals. Within each group that later became a separate language there was a specific

distribution of subject, of course, to later analogic changes and often with an inherited preference for one variant or the other. We may compare these to the 'founder' groups of population geneticists. No particular subgroup represents a perfect sample of the original population in language just as in regard to gene frequencies.

The ensuing results take the form of a random distribution, continuing often for a surprising length of time, that we have found in the examples illustrated in this study. Such ongoing changes in the proto-language only affect a small part of the total linguistic structures involved but it may be present in any aspect of the language.

Examples such as those discussed are then not amenable to either genetic or areal explanation. They present a problem to the comparatist seeking to reconstruct a total and uniform ancestral linguistic system. If, however, we take seriously the facts about linguistic variation observed and studied by sociolinguists, we will not find such phenomena surprising. It is the thesis of this paper that the kind of random distribution of competing forms discussed here and which could be illustrated by many more examples, is reasonably accounted for by the sociolinguistic factors just mentioned.

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NON-LOGOGRAPHIC CHINESE AND THE NON-ALPHABETIC ALPHABET

Mark Hansell
University of California, Berkeley
(1)

0. INTRODUCTION

The classification of writing systems in general, and of the Chinese writing system in particular, has been the cause of much controversy. This paper will examine some of the classificatory difficulties involving the writing systems of Chinese and English. The development of Mandarin loanwords from English, in which Chinese characters can be used phonographically and Roman letters non-alphabetically, suggests that writers/readers have a variety of strategies available to them (including the logographic and phonographic principles). These strategies are options that can be chosen to fit the situation or even used simultaneously, in order to preserve what Wang (1981) calls "optimality" in the writing system, the prototypical relationship between the structure of written and spoken language. The paper will be organized as follows:

1. Classification of writing systems
2. Types of lexical borrowing
3. Chinese borrowing from English
4. Discussion
5. Conclusion

1. CLASSIFICATION OF WRITING SYSTEMS

1.1. Traditional "idealized" view

In most studies of writing, scripts are assumed by definition to be graphic means of rendering spoken language. Scripts are classified according to the level of linguistic structure that corresponds to the smallest independent graphic unit. If a grapheme corresponds to a segment, the script is alphabetic; if it corresponds to a syllable, it is syllabic; if it corresponds to a word, it is logographic. Chinese is considered the logographic script par excellence, and English is considered to be an example (though perhaps not the best) of a language using an alphabetic system. (See Gelb 1963, Pulgram 1976 for detailed discussions of such classifications.)

An idealized logographic script consists of

graphemes that are associated directly to lexical items of the language, with no phonological elements. Phonological and morphological information are supplied by the lexicon of the spoken language as part of the writer/reader's linguistic competence. Since it has no direct connection to pronunciation, an ideal logogram can represent the same word despite varying pronunciations, even across different languages, as long as the identity of the lexical item is preserved. In the traditional view of Chinese as an ideal logographic script, each character represents a single monosyllabic word. These words are cognate across all Chinese dialects, meaning that mutually unintelligible dialects of Chinese are united by a common writing system.

In an ideal alphabetic system, graphemes are directly associated to segments in the phonology of the spoken language. Strings of letters are arranged in a linear order that corresponds to the temporal order of segments in a spoken word, and from the phonological information given by the writing, morphological and lexical information is supplied by the linguistic knowledge of the reader, in the same way that sequences of segments in speech are interpreted. The essential differences between these two types of writing can be summarized as follows: 1) Level of structure linked to graph: lexical item in one case, phoneme in the other. 2) Direct connection to meaningful unit: present in logographic, absent in alphabetic. 3) Direct connection to phonological representation: present in alphabetic, absent in logographic.

1.2. Complications

Applying these ideal categories to actual writing systems leads to many complications. One is that even cursory examination shows that no form of Modern Chinese has monosyllabic words, especially not Mandarin, the form with which we will concern ourselves. The elements linked to graphemes in Chinese are morphemes, which are generally (with interesting exceptions (2)) monosyllabic. Some scholars have suggested that the Chinese writing system should more properly be categorized as morphographic or morphosyllabic. I wholeheartedly agree with this suggestion, and from here on will use the term morphographic to refer to the reality of Chinese writing, reserving logographic to refer to the idealized notion introduced above. This deviation from the logographic ideal changes the level of structure from word to morpheme, however it has no bearing on the other essential differences between logographic and alphabetic writing: a character still represents a meaningful unit, without reference to sound.

A much more fundamental complication lies in the

structure of Chinese characters themselves: by one count 97% of them contain a phonetic element that gives useful hints as to the character's pronunciation (DeFrancis 1984). Though these phonetic elements may be explained away as relics of the historical character-formation process, evidence suggests that they play an important role in reading and writing.

The behavior of readers and writers of English does more to complicate the situation. A glance at the English orthography is enough to destroy any notion that letters are related to phonemes in any regular way (in fact, they are related in many irregular ways). All the evidence indicates that readers and writers make use of spelling irregularities to differentiate words by graphic shape (that is, logographically) in pairs like Sue and Sioux, bee and be (Bolinger 1946) (3). Though these spelling irregularities, like the phonetic elements in the Chinese characters, may be attributed to historical accident in the course of lexical accretion, the fact that they disrupt the purity of the classification does nothing to dissuade native readers and writers from using them. Users of the written language use any available strategy to make their task easier, including a "phonographic" strategy in Chinese and a logographic strategy in English. (4)

In light of the above complications, the differences between the English and Chinese writing systems in terms of the three criteria above become less clear. The level of structure linked to a graph is still different-- a syllable-morpheme for Chinese, and a phone for English-- but connection of written form to meaningful unit is no longer exclusively the province of Chinese (cf. Sue and Sioux), and representation of phonological information in the script is not restricted to languages like English (cf. the phonetic element 皇 in the characters 惶 huang2 "afraid", 蝗 huang2 "brilliant", 蝗 huang2 "locust", 鯨 huang2 "sturgeon" etc. (DeFrancis 1984:103)). The distinction comes closest to collapsing in the area of Chinese transliteration of loanwords. French (1976:109) states that "...in one field, namely its representation of loanwords, the Chinese writing system may justly be called phonographic." If this is the case, as many scholars agree, then the obvious question is why would a writing system completely change its character simply because the word it is transcribing is of foreign origin? Is the functioning of a writing system determined by the type of script, by the language it is applied to, or by the relation between the two?

In what follows I will examine the way lexical borrowing from English interacts with writing in the Chinese of contemporary Taiwan. In addition to

"phonographic" uses of Chinese characters, I will also examine the non-alphabetic use of the Roman alphabet, which is a recent and rapidly expanding phenomenon in Taiwan. Before introducing the data, a brief introduction of a theory of lexical borrowing is necessary.

2. LEXICAL BORROWING

I have elsewhere paraphrased Haugen (1950:212) and defined lexical borrowing as "the attempted reproduction in one language of signs previously found in another" (Hansell 1986:10). The sign in question is a Saussurean sign consisting of the linkage of a signified and a signifier (deSaussure 1915). Borrowing, as opposed to code-switching, requires that the signifier be reproduced out of "native" linguistic material, that is, using elements already extant in the L2 system. This is done through a two-step process described by Weinreich (1954): identification and substitution. Identification is the selection of the elements in the L2 system that are most similar to elements of the same level in the L1 system. Since linguistic units like phonemes, morphemes, words etc. are abstract entities that become meaningless outside of the system they belong to, similarity across languages must be measured in terms of qualities that exist outside the system of a particular language: phonetic similarity (in terms of acoustic shape) and similarity in meaning (in terms of similarity of scope of real-world referents). Substitution then substitutes the identified L2 elements for the L1 elements to create the new L2 signifier. For example, on the basis of phonetic similarity, English [t^h] is identified with Japanese [t]; [ow] with [o]; [f] with [f]; and [u] with [u] respectively. Given the Japanese signifier tofu [to^hfu], the identified English elements are substituted to form [t^howfu].

When identification is by phonetic similarity as above, substitution of L2 phones results in a phonetic loan. Identification is also possible in terms of meaning, with substitution at the morphemic or lexical level. The result is a loan-translation, or calque. For example, English hot dog is the model for Mandarin 热狗 re4 gou3 'hot'+ 'dog'. The morphemes hot and re4 are identified through similarity of reference to the quality "hot", and dog and gou3 on the basis of reference to the same animal "dog". It is the combination of these morphemes that is novel in Mandarin, and therein lies the reproduction of the signifier.

One other type of loan is the graphic loan, where a written signifier is vacuously "reproduced". This happens between two languages that use the same script, when the written form of a word is simply copied into L2

and pronounced according to L2 reading rules. For example, we have borrowed the written form of Paris from the French, but have supplied our own pronunciation [p^hʔi s]. If we had substituted English phones and spelled it accordingly, we should have something like [p^hʔi j] spelled Parree. Graphic loans are very common between Chinese and Japanese, and between Chinese dialects, for instance Chinese 科学 ke1 xue2 "science" from Japanese 科学 kagaku. (5)

3. MANDARIN WRITTEN FORMS OF BORROWINGS FROM ENGLISH

The data that follow were collected in Taiwan in 1987. Some of the items were borrowed prior to 1949 and are therefore similar to forms used in Mainland China, others are more recent innovations.

3.1. Transliteration of phonetic loans

In the transliteration of phonetic loans, Chinese characters may be used strictly for their pronunciation value, without their meaning being taken into account at all. For instance:

English	Mandarin form	Literal gloss
#1) MICROPHONE	麥克風 mai4 ke4 feng1	'wheat'+ 'conquer'+ 'wind'
#2) DACRON	達克龍 da2 ke4 long2	'attain'+ 'conquer'+ 'dragon'
#3) PUDDING	布丁 bu4 ding1	'cloth'+ 'population'
#4) BASS (GUITAR)	貝斯 bei4 si1	'cowrie'+ 'this'

The meanings normally associated with the characters in #1-#4 are totally unrelated to their use in these transliterations. The characters here were chosen strictly because their normal reading pronunciations in Mandarin approximate the strings of phones substituted for the English phones.

Although there is a set of characters that appears often in transliterations (克 ke4 in #1 and #2 is one, so is 斯 si1 in #4), their preponderance is only a statistical tendency, transliteration characters are by no means restricted to a finite set. There is no syllabary from which all transliteration characters are chosen (6). Conversely, writers are not wholly free to substitute homophonous characters in transliterations: for instance, 布丁 bu4 ding1 "pudding" could not be written 步丁 or 都丁, even though the pronunciation of all three sequences is identical. Though there is

always variation in new borrowings, a standard is quickly established for any given loanword.

Of course the meaning of a character is not ignored if it is possible to somehow connect it to the meaning of the English model word. In some cases, skillful choice of transliteration characters can suggest something about the meaning of the borrowed term, optionally introducing a degree of semanticity (without changing its status as a phonetic loan). For example:

- #5) JELLY BEAN 結粒(糖) 'coagulate'+ 'pellet'
jie2 li4 (tang2) + ('candy')
- #6) The BEATLES 披頭四 'disheveled-hair'+
pi1 - tou2 si4 'four'
- #7) LASER 雷射 'thunder'+ 'shoot'
lei2 she4
- #8) SONAR 聲納 'sound'+ 'receive'
sheng1 na4
- #9) VITAMIN 維他命 'support'+ '3rd pers'+
wei2 tai ming4 'life'

All of the folk-etymologized loanwords in #5-#9 show a fairly good phonetic similarity to the English model, and all are at least suggestive of the meaning. Only #5 "jelly bean" is the most phonetically accurate transliteration that Mandarin can provide, in #6-#9 there are sacrifices of phonetic similarity made in order to provide the semantic link. In terms of semantics and morphological structure, #5 and #6 are both accurate descriptions of the referent and well-formed Mandarin compounds, while #7 and #8 suffer semantically (what a laser shoots is not "thunder", and sonar does not merely "receive" sound), and the VO structure of #9 is anomalous.

In between the transliteration of loans by seemingly arbitrary characters in #1-#4 and the successful marriage of semantic and phonetic replication in #5-#9 are transliterations using characters that only hint at the meaning, or that mix arbitrary and meaningful characters:

- #10) SHOCK 休克 'rest'+ 'conquer'
xiu1 ke4
- #11) DIOXIN 戴奧辛 'wear'+ 'mysterious'+
dai4 ao4 xin1 'caustic'

- #12) SUNKIST 香 吉 士 'fragrant'+ 'lucky'+
xiang1 ji2 shi4 'scholar'
- #13) FORD 福 特 'lucky'+ 'special'
fu2 te4

In #10 'rest' bears some relation to what your body does when you're in shock, and in #11 'caustic' contributes the idea of a toxic chemical, neither of these is even close to sufficient as a description of the referent, and the additional syllables serve only to replicate the sound of the English signifier. #12 and #13 are examples of a different type of phonetic loan, the transliteration of commercial brand names. These most commonly use characters that have slight connection to the product ('fragrant' in #12 is the only semantically related one), but have positive or auspicious connotations (characters meaning 'lucky', 'special', 'scholar' etc.) (7). One of the most important jobs that a Taiwan advertising company can do for a foreign client is to choose the proper transliteration characters, ones that link the product to notions of good fortune, beauty and happiness.

3.2. Alphabetic loans

Nearly universal English language training in public schools in Taiwan has not produced a generation of fluent English speakers, but it has produced widespread knowledge of the English version of the Roman alphabet among literate people. This allows increasing borrowing from English by means of graphic loans. Such borrowing creates special problems of adaptation: unlike graphic borrowing between alphabetically written languages, where L2 reading rules can be applied to the graphic form borrowed from L1, Chinese has no reading rules that can be applied to alphabetic script. The creation of reading rules would be not much simpler than teaching everyone English, and would negate any advantage that can be gained from the simplicity of graphic borrowing. Instead, the folk in their wisdom have spontaneously solved the problem through the creation of what I call the Sino-alphabet. (8)

The Sino-alphabet is simply the letters of the Roman alphabet, as used in English, paired with their spoken names, as used in English ([ej], [bi], [si] etc.). The exact pronunciation of a given letter depends on the speaker's level of English ability, for instance a speaker with good command of English might pronounce C, H and N as [si], [ejtʃ] and [ɛn], while most people who speak little or no English will pronounce them [ɕi], [eitɕi], and [ɛn]. The primary feature that distinguishes the Sino-alphabet from its English model

is that it functions non-alphabetically. Letters do not represent phones that are then combined into syllables, they represent invariant units of a syllable or more in length. For instance:

- | | | |
|------|---------------------------|--------------------------------------------|
| #14) | AIDS | "AIDS" |
| #15) | BIC | "BIC" (pens) |
| #16) | MTV | "rock video" |
| #17) | PVC | "polyvinyl chloride" |
| #18) | X- 光
guang1 | "X-ray" (X + 'light') |
| #19) | B 型 肝 炎
xing2 gan1yan2 | "hepatitis B" (B +
'type'+ 'hepatitis') |
| #20) | M 十 六
shi2 liu4 | "M-16" (rifle) |

The non-alphabetic, non-combinatory nature of the Sino-alphabet favors borrowing of acronyms like #16-#17 and blends with single-letter tags #18-#20. Forms like #14 and #15 are reanalyzed non-alphabetically, facilitating Sino-alphabetic adaptation, producing the pronunciations [ej aʃ ti Es] and [pi ai ʃil]. Borrowings like #14-#20 are increasingly common, and often are the only written form that a lexical item has, not merely stylistic variants or instances of code switching.

4. DISCUSSION

The transliteration characters do not behave like syllabaries in a phonographic writing system. First of all, there is no finite number of them (although some of them are quite common, like 克 ke4 in #1-#2). Second, choice of a transliteration character can be based on semantic principles even when the word is not a full-blown folk etymology, as #10 and #11 show. That is, there is a continuum between fully semanticized transliterations and fully phonetic ones, creating a gray world of fuzzily semanticized loanwords that makes the drawing of a boundary between phonographic and morphographic uses an arbitrary exercise in futility. Third, even when a transliteration character has no semantic relation to the foreign word it transcribes, it cannot be arbitrarily replaced by homophonous characters.

If they follow the vast majority of their fellow characters and represent morphemes, then how can these morphemes have semantic and syntactic properties

entirely different from those morphemes usually represented by these characters? In some cases there is no discrepancy, as in #5. In others, like #7-#11 varying degrees of syntactic and semantic deviation in the use of these morphemes create what Haas (1983) calls "idiomatic" usages, exocentric compounds that are semantically translucent. Yet the total opacity of the loanwords in #1-#4, is due to a complete lack of connection between their meaning and internal structure on the one hand, and the meaning and syntactic functions of their constituent morphemes on the other hand. While the transliteration morphemes in #7-#11 are more or less polysemous with the native morphemes whose graphic form they share, those in #1-#4 are only homophonous, and correspondingly more idiomatic.

The entities represented by transliteration characters are best understood as empty morphemes. These empty morphemes are created by the imposition of prototypical Chinese morphological structure (monosyllabic morphemes, combining to form multisyllabic compound lexical items) on borrowed multisyllabic monomorphemic (or morphologically unanalyzed) signifiers. If a morpheme is a unit that combines three kinds of information-- a phonological value, a semantic value, and syntactic privileges and obligations-- then these morphemes are empty of the latter two, possessing only phonological value.

Being empty is not a permanent state, these morphemes can be and often are "filled". In a phonetic loan, replication of the signifier is accomplished through identification and substitution of phones, with no reference to morphemic identity. In a language like Mandarin with its rampant homophony at the syllabic level, a given syllable can be equally well related to any of a number of native morphemes, and a new criterion comes into play: semantic relatedness to the signified. This represents the filling of the empty morph with a native morph. For example, in #5 JELLY BEAN, the two syllables used to replicate *jelly* were filled with native morphemes in a combination that is semantically closely related to the signified. In #10 SHOCK, only the first syllable could be filled, (with a more tenuous semantic relationship), the second syllable remains empty. In #1-#4, all remain empty.

It is precisely the previous existence of empty morphemes that has made the formation of the Sino-alphabet possible. The 26 graphs with their 26 different phonological values, empty of any inherent meaning or syntactic restrictions, structurally parallel the empty morphemes used in transliteration. The only difference is that they have no graphic form in common with native, meaningful morphemes, leaving no

possibility for them to be "filled".

5. CONCLUSION

Y-R Chao referred to "...the genius of the Chinese language to read meaning into every syllable" (1968:167). This overwhelming propensity of the language, combined with a writing system that represents morphemes syllable by syllable, creates a prototype of writing as a one-to-one relationship of graph to morpheme to syllable (9). In multisyllabic loanwords, this prototypical relationship cannot exist, yet it is too strong to be ignored. The meaningless syllables of loanwords are treated as empty morphemes, to be filled with whatever morphological or semantic content will bring it closer to the prototype. The empty morpheme strategy is clearly illustrated in the development of the Sino-alphabet, with easy and extensive borrowing of non-alphabetic uses of Roman letters, while borrowing of alphabetic uses is incompatible with the Chinese writing system.

In the classification of writing systems, it is clearly impossible to classify a script as inherently logographic, morphographic, syllabic, or alphabetic. The Sino-alphabet is an example of the Roman alphabet used as morphographic writing. Chinese characters, which function morpho-syllabically in Chinese, can also be fully morphographic (Japanese kanji) or completely syllabic (Japanese man'yōgana, the ancestor of kana (Sampson 1985), or Sino-Mongolian (Halliday 1959)). It is a great improvement to say that classification should only apply to the relationship of a given writing system to a given language, as is the case of calling Chinese characters "morphosyllabic" when applied to Mandarin, taking into account the ways that the structure of the language interacts with that of the script. Yet even then discrepancies emerge when phenomena like loanwords are considered. Only when writer/readers are given full credit for understanding and using all the connections between the various elements of their language, both written and spoken, at all levels of structure, can we see principles of writing like the logographic and the alphabetic for what they are-- strategies for relating written to spoken language that are available to any literate person in any written language.

NOTES

(1) The fieldwork portion of the research for this paper was supported by the U.S. Department of Education Fulbright-Hays Research Abroad Program, Grant #022AH60004.

(2) In Mandarin, one glaring exception is the suffix -er, a distinct element graphically and

morphologically, which is incorporated into the preceding syllable. Another class of exceptions is disyllabic monomorphemes, both old loanwords (e.g. 葡萄 pu2 tao2 "grape", 琵琶 pi2 pa2 "balloon lute") and many names for insects and vermin: 蚂蚁 ma3 yi3 "ant", 蝴蝶 hu2 die2 "butterfly", 蜈蚣 wu2 gong1 "centipede", 蚂蟥 ma3 huang2 "leech" etc. This plethora of disyllabic bug names presents a fascinating puzzle, but its very concentration in one corner of the lexicon weakens its status as a counterexample to the one morpheme = one syllable generalization.

(3) Fromkin (1987) presents evidence that readers and writers of English not only use both kinds of information (phonographic and logographic), but that they are stored differently in the brain.

(4) Cheng (1978) explicitly examines different encoding strategies used by Taiwanese speakers when writing morphemes that have no standard written form.

(5) Gao and Liu (1957) give a detailed discussion of Chinese graphic borrowing from Japanese, and its relation to both Western languages and Classical Chinese.

(6) Godwin (1979) finds that in transliteration of foreign names in Hong Kong, there is no specific set of characters that is used, but that a certain structural type of character is favored.

(7) Godwin (ibid.) describes an even more subtle device for introducing connotations into transliterations. In Cantonese transliterations of Western celebrities' names, the radicals 王 "jade", 艹 "grass", and 女 "woman" are frequently used in women's names, but not in men's.

(8) Bauer (1982) and Chan and Kwok (1982, 1986) describe alphabetic forms used in the Cantonese of Hong Kong, without commenting on the theoretical implications for the writing system.

(9) Wang (1981) calls it the "happy fit" between Chinese morphological structure and Chinese characters.

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Mary Hare, David Corina, and Garrison Cottrell
University of California, San Diego

One area of interest in current phonological research is the representation and analysis of prosodic structure in language. This research is concerned not with the minimal contrastive units, or phonemes, in isolation, but with higher levels of organization which govern these units in context. Such research relies on representations such as the mora, syllable, or foot, and attempts to characterize well-formedness conditions on these representations. These constraints are often expressed as rules which maintain well-formed structures.

Accounts relying on prosodic structure in language are firmly entrenched in current linguistic theory and account for a wide variety of facts (McCarthy and Prince 1986, Clements and Keyser 1983, Hayes 1989). The current paper will begin by considering one such analysis, the syllable-based account of Vowel Epenthesis in Turkish, as discussed in Kornfilt (1986). This example demonstrates a standard linguistic treatment of prosodic phenomena in which segmental content is pressured to conform to well-formedness conditions imposed by higher-order prosodic units, in this case the syllable. We will then reconsider these data from the perspective of Parallel Distributed Processing models, with the goal of investigating the development of these higher-order constraints. In the Kornfilt account, the existence of the syllabic template is presupposed. Our question is whether such an assumption is necessary, or if the functional equivalent of well-formedness conditions may be abstracted from samples of positive data. In this paper we develop two implementations of a particular learning algorithm and demonstrate that functional constraints on well-formed outputs may indeed be induced from a limited number of correct examples.

I. Vowel Epenthesis

A formal treatment of Turkish vowel epenthesis is described below (Kornfilt 1986, Clements and Sezer 1982). This approach involves associating a word of Turkish with a template corresponding to the well-formed syllables of that language. If an abstract underlying form of the word does not correspond to the structure demanded by the template, it is not allowed to surface. Instead, some process (here, vowel epenthesis) occurs to "save" the otherwise illicit form.

The example we are concerned with here involves data shown in (1). Although here we give only a subset of the relevant data, there is reason to assume that the epenthesis account is to be preferred to an account involving deletion.

Notice that in (1), the high vowel in the second syllable of

the nominative form is absent in the accusative. Further, while the nominative is unaffixed, the accusative is formed by the addition of a high vowel.

(1)	nom	acc	
	fi.kir	fik.ri	'idea'
	a.kil	ak.li	'intelligence'

This account relies on the certain well-formedness constraints on syllable structure in Turkish. In this language, only three types of syllable-final consonant clusters are allowed:

- a. sonorant + obstruent (*türk*, 'Turk')
- b. voiceless fricative + oral stop (*çift*, 'double')
- c. k + s (*raks*, 'dance')

In the examples below, (2) shows the accusative form of the word, and the syllabification of the CV template with which it is associated. Notice that since the accusative form is V-final, this form divides correctly into two acceptable syllables, and no change is required. (3) and (4) show the derivation of the nominative or unaffixed form of the same root. In (3) the first three segments of the word comprise a licit syllable, but the final *r* cannot combine with the *k* in the coda since a CS cluster is not allowed in coda position. The *r* is left unattached. This is not a well-formed representation, and is unacceptable. The representation in (4), on the other hand, is well-formed. Here a second vowel has been epenthesized before the *r*, creating an acceptable syllable. The form in (3) is assumed to be the underlying representation associated with this word, and serves as input to the vowel epenthesis rule which results in the form shown in (4).

(2)	\$	\$	(3)	\$	(4)	\$	\$
	/ \	/		/ \		/ \	/ \
	C V C	C V		* C V C C		C V	C V C
	f i k	r i		f i k r		f i	k i r

The causal process in the examples above is a rule which is sensitive to syllabic representations and acts to preserve or create well-formed structures.

The remainder of this paper will take a different approach to these data. In the simulations described below, prosodic structure does not have the status of presupposed representations related by rules. Instead, generalizations describing correct output are developed in the course of producing legal samples of a given language. The implicit structure derived from this process then serves to constrain subsequent language production. The paper describes two Parallel Distributed Processing (PDP) networks

developed to model this view of prosodic structure as a dynamic process. Before turning to the models, we will provide a brief overview of Parallel Distributed Processing.

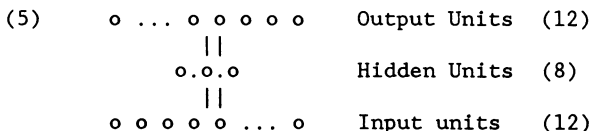
II. Parallel Distributed Processing

Parallel Distributed Processing (Rumelhart and McClelland 1986a, McClelland and Rumelhart 1986) is a computational theory of cognitive modeling inspired by neural information processing rather than by the traditional von Neumann computer metaphor. In these models, knowledge is represented in weighted connections that spread patterns of activation over large numbers of interconnected processing units. Networks of this type have been shown to be successful in a variety of constraint satisfaction tasks.

Although PDP networks may take a wide variety of forms, the two described in this paper consist of three levels of processing units: input units, which respond directly to stimuli from outside the system; output units, whose activation patterns represent the system's response to that input; and one or more levels of "hidden" or intermediate units. Further details concerning these models will be given during the description of the simulations.

III. Simulation I

The first model uses the architecture diagramed in the figure below.



This type of network is known as an auto-associator, or identity map. In an auto-associator, the input and output patterns are always the same. That is, given a certain input pattern, the task of the model is to reproduce that pattern as output. In order to understand why performance on such a simple task might lead to interesting consequences, it is necessary to understand certain principles about this type of architecture.

In models of this type an activation pattern is presented on a bank of input units. Activation is then sent from this input layer to a second layer of internal units, where the input pattern must be re-represented. This internal pattern is then mapped to the output units. In our model, as shown in figure (5), the input and output layers each consist of 12 processing units, while the internal layer has only 8. More patterns may be encoded on a 12-bit bank than on an 8-bit bank, yet in order to reach the output, the model must go through the step of re-encoding the input patterns on this smaller internal layer. Clearly, the inputs cannot be literally copied on the internal layer. The only way the model

can successfully complete the identity task is to discover what the most useful generalizations about the input patterns are, and use the internal layer to form an efficient representation of these generalizations or constituent subpatterns. In other words, the use of an auto-associator with a compressed internal layer is a way of forcing a network to abstract generalizations out of the input patterns. As a consequence of this architecture, a pattern may only be reproduced if the network is able to view it as some lawful combination of the constituent sub-patterns.

In the simulation to be described, we are interested in discovering whether a network, when exposed to examples of acceptable strings, can extract the prototypes corresponding to licit syllable templates. One way of knowing whether a network has accomplished this task is to present it with an ill-formed string, and see if it changes this string in ways which are consonant with well-formed templates. In the simulation described below we will use this task as a measure of the success of the induction process.

Our assumption has been that if a model is given the task of producing well-formed words, the sub-patterns taken as significant would be those which correspond to canonical syllable patterns, and the model will then be pressured into producing outputs which conform to those patterns. In testing this assumption we used data such as that shown in figure (6). Input was designed to represent well-formed Turkish words, or rather to correspond to a CV skeleton for those words, with no segmental content. For example, the Turkish words in (a) were represented in the model as the strings in (b).

(6)	(a) dik	(b) CVC
	sirk	CVSC
	boksit	CVCCVC

(were C = consonant, S = sonorant, V = vowel)

Each slot in the skeleton was represented by two processing units. One unit encoded information about segment type (C, V, or S) while the other gave information about position in the syllable. The coding scheme is given below.

(7) syllable position	segment type
1 = peak	1 = vowel
0 = onset	0 = consonant
.5 = coda	.75 = sonorant
or second half	
of long vowel	
.25 = sonorant in 2nd	
position in onset	

Thus the Turkish word *brut* received the following input

representation:

(8)	b	0	0
	r	.25	.75
	u	1	1
	t	.5	0

The input *brut* occupies eight of the twelve input units. The input was 12 units to allow for strings of up to six segments. When the string was shorter, as in this example, the remainder of the input space was padded with random entries.

There were 34 input patterns in all. The model was trained to reproduce the input on the output layer. This training is accomplished through a learning algorithm called back-propagation of error (Rumelhart, Hinton, and Williams 1986). Back propagation works in the following way: When an input is presented to the network, activation is propagated forward through the system, leading to some pattern of activation on the output layer. The first time an input is presented, output is essentially random. This actual output is compared to the target and the discrepancy between the two is computed. This discrepancy between the actual and the desired output is the error produced by the network on that pattern. The weights on the connections between the input, internal, and output units are then modified slightly in order to minimize this error. At this point the input pattern is presented again, and the process is repeated until the error meets some criterion of acceptability. This network was trained for 1000 epochs, where an epoch equals one presentation of each pattern in the training set. At this point the model responded perfectly to the training patterns.

The interesting question is not whether the model learned to produce the output correctly, but what generalizations about the data it had formed in the course of the learning. To determine this, we tested the network on 22 novel strings. Recall that the response of the model to novel data is conditioned by the generalizations that have been abstracted from the training set. If the model has extracted prototypes corresponding to licit syllable types, this will be clear in its response to new inputs. It will be able to reproduce inputs which can be viewed as lawful combinations of the correct subpatterns (i.e. prototypically good strings). However, when faced with input that deviates from these canonical patterns, the network will be unable to reproduce it. Instead, the network will force the output to conform as much as possible to a canonically good string.

The results of the test show this to be the case. The generalization test set was divided into three main classes. Ten items corresponded to prototypically acceptable strings in Turkish. A small number of test items, for example the string CCCV, were wildly unacceptable as examples of good syllable structure. The last three items were of intermediate acceptability, or have been posited to exist as underlying forms in the language.

In the first class, the model correctly reproduced 8 of the ten forms. The model responded in an interesting way to the other two items in this set. Both these items were patterns with complex onsets, as for example V.CSVC, where the second syllable begins with a consonant-sonorant cluster. The model made no clear decision on where to attach the first C, outputting a response ambiguous between V.CSVC and VC.SVC. This is striking in that although the model saw no examples of the second type, this in fact is also an acceptable syllabification. This sort of graded categorization judgement might be akin to what is referred to in the literature as ambisyllabicity, where a single segment serves both as the coda of one syllable and onset to the next (Kahn 1976).

As for the strongly ungrammatical examples, the model was unable to reproduce the input on the output layer. Instead, it produced near random output, which results in a high error rate. If error is taken as a measure of grammaticality, the response of the model is reasonable. One can contrast this with the cases described above, where prototypical items were reproduced with little error.

Perhaps the most illuminating was the response of the model to the third class of test items. In all three of these cases, the network edited the illicit forms and produced acceptable syllable structures. Given the input *VCCS, the model added a V to the end, and resyllabified to give the good form VC.CSV. In the second case, the input string ?CV:C was modified to CV:CV. This is interesting because long vowels in closed syllables appear to be only marginally acceptable at normal rates of speech in Turkish (Sezer 1986). This, then, is a reasonable response to this input string. The final form was the most interesting for us, since it corresponded to an illegal surface form which is assumed to be an existing underlying form in Turkish. This was the input string *CVCS. The model responded with the output CV.CVS. Note that the vowel here was not simply added to the end of the string, but inserted between the second C and the S. This is noteworthy because this is precisely the environment in which Turkish epenthesizes vowels. (See example (1).)

We find these results interesting for a number of reasons. In the first place, the model was able to reproduce well-formed strings correctly, and unable to reproduce those that were ill-formed. The model's response to the generalization test demonstrated that it had not only induced generalizations about canonical syllable structure, but that these generalizations had processing consequences, and were used to constrain novel outputs. Finally, these constraints were induced through exposure to only positive data.

The results given above are encouraging. However, the auto-associator is an example of a very basic type of network, and as such displays certain limitations. For example, the encoding of inputs and outputs as static, fixed-length patterns is an unrealistic representation of language. Language is clearly a

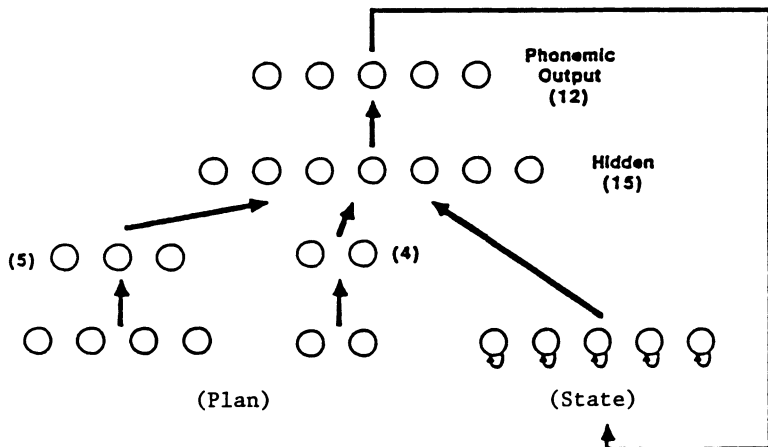
sequential phenomenon, and ideally this should play a role in the representations in language models. Furthermore, the representations used in this model presuppose certain theoretical constructs. The input to the model overtly classifies consonants as onsets and codas, while the form of the test set explicitly assumes the reality of underlying representations. The objection might be raised that the success of this simulation depends on such questionable features of the model.

For this reason we ran a second simulation, using a more sophisticated architecture which avoids many of the limitations of the first model.

IV. Simulation II

The architecture used in this simulation is based on work by Michael Jordan (1986b). In this model the output data represents words, rather than simply CV skeletons. However, these words are produced over time instead of as static output patterns. In the model, output at any given time represents only one phoneme; a word is represented as a string of phonemes on successive output cycles. The model used the architecture diagramed below.

(9)



(Jordan 1986)

Input to the model is divided in two parts. The first input bank, referred to as the "plan", contains no phonological information. Instead, this plan is an arbitrary vector that can be taken to represent the concept which a given phonological string expresses. The mapping between the input and output patterns is the mapping from this abstract "concept" to a phonological output. A concrete example will help clarify the input-output relationship. Suppose that the desired output is the phonological string

cat. The input (the "plan") is only an arbitrary vector of numbers, for example [11011]. This plan is presented and held constant as the network produces, in sequence, the three outputs corresponding to /c/, /a/, and /t/. Although there is no phonological information present in the plan, the network is trained to respond to the cue [11011] by producing the output sequence c-a-t. This training is effected in the same way as in the earlier model.

However, there is a difference between this model and the one described earlier. Notice in the diagram that the input consists not only of the "plan", but also of a bank of units referred to as the "state". As the network produces a response at time t1, that response is fed back onto the "state" units, and forms a part of the input at time t2. This means that as the network learns, it is given two pieces of information: (i) a plan, which triggers the production of a particular sequence, and (ii) the current state, which serves as a context, telling the network what part of that sequence was produced last. These two inputs in combination aid the network in learning what step of the sequence is the next to be produced.

The intent of this second simulation was to examine whether the positive results of the first model could be reproduced given the constraints imposed by a sequential network. This is a desirable outcome, since this architecture has certain advantages over the auto-associator used in Simulation I. It avoids the difficulty of a fixed-length representation of variable-length patterns, since the length of the output pattern is no longer frozen into the architecture. In addition, the model is able to examine data involving phonological alternations without having to take a stand on the psychological reality of underlying representations. A form which never appears on the surface need not be represented as input.

In this simulation, the training set consisted of fourteen roots and two morphological variants of each, for a total of 28 possible forms.

The input was given as described above, and the output was processed dynamically. That is, the phonemes of each word were represented sequentially, one per cycle, over the eleven bits of the output layer. These eleven bits encoded syllable location (onset, peak, and coda) and a ten-bit modified distinctive feature matrix, shown below.

- (10)
1. syllable placement
 2. vocalic
 3. consonantal
 4. front/back
 5. voiced
 6. nasal
 7. high
 8. low
 9. stop
 10. strident

11. round

The network was trained on a subset of 24 of the 28 possible forms. These involved the 14 different lexical items, with one or both morphological variants of each.

V. Results

As stated above, the task of the current model was to take in an arbitrary code for a word and produce the correct surface form. The simulation ran for 10000 epochs, with training as described in Section III. The network was then tested on a set of four novel patterns. Testing involved giving an input pattern corresponding to a stem plan which the network had seen, combined with a novel morpheme plan. For example, if the training set had included a given word only in the nominative, the test set asked for the accusative form. If the network had seen only the accusative form of the word during training, it was tested on the nominative.

The task facing the network was to produce the phonological form of a word, given an arbitrary plan corresponding to that word. However, the hypotheses being tested were the same as in the original simulation. The model develops a set of connection weights in the process of learning to produce the correct output patterns. These weights permit the network to output correctly the forms it has learned, and the generalizations encoded in these weights are the equivalent of "well-formedness conditions" which impose themselves on the outputs. As the network develops a set of weights which allow it to produce the correct phonological forms, those weights act as constraints on future outputs. The prediction here, as in the first simulation, is that those constraints will result in phonological alternations that correspond to real processes occurring in the language. The results of the test were very encouraging in that they confirmed this prediction.

The test set consisted of the plans corresponding to the four following output forms:

- | | | |
|------|--------|-----------------|
| (11) | bakir | 'copper' (nom) |
| | Çiiri | 'era' (acc) |
| | garipi | 'strange' (acc) |
| | fikir | 'idea' (nom) |

The first, *bakir*, was reproduced perfectly. This was the nominative, or unaffixed, form. The next two entries in the test set were in the accusative case, and these were output as vowel-final, as required. In one case (*Çiiri*) this additional vowel harmonized with those of the stem. Vowel harmony is a phonological process evident in Turkish. Once again the model extracted this generalization even though this was not an original intent of the simulation. The third entry, *garipi*, was produced with the final high vowel which marks the accusative case. However, in this case the

vowel did not harmonize with the stem vowel, so that the actual output was closer to an /u/ than to an /i/.

Fikir, the last entry in the test set, is the most interesting. The network was trained on the accusative form of this word, which is *fikri*. Notice that if the network creates a nominative form simply by eliminating the accusative affix, the expected output is **fikir*. As was shown in Section II, *fikir* is not an acceptable phonological form in Turkish. Although this model was given no information on syllable-structure constraints, it correctly "epenthesized" a high vowel between the stop and the sonorant.

In summary, the results of both simulations strongly suggest that syllable well-formedness information can be induced from examples of positive data, and this information is then used by the network, pressuring outputs to conform to canonical patterns. These results have certain implications. First, constraints on syllabic well-formedness need not be taken as given, but can be learned (See McCarthy and Prince 1986 for a similar point). In addition, the constraints which are learned are not discrete statements that function independently of the data. Instead, these are soft constraints, intimately connected with the data and subject to continual modification. While some have argued that this context-dependency is an inherent problem in connectionist language models, we suggest that this is in fact a desirable outcome. It is the fact that these constraints are not independent which allows them to account for data that might not fall neatly into discrete classes.

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A CONNECTIONIST APPROACH TO THE STORY OF OVER

Catherine L. Harris

University of California, San Diego

Introduction

Linguists working in the framework of cognitive linguistics have recently suggested that connectionist networks may provide a computational formalism well suited for the implementation of their theories (Langacker 1987; Lakoff 1987). The appeal of these networks includes the ability to extract the family resemblance structure inhering in a set of input patterns, to represent both rules and exceptions, and to integrate multiple sources of information in a graded fashion. The current paper explores the matches between cognitive linguistics and connectionism by implementing some aspects of Brugman and Lakoff's analysis of the diverse meanings of the preposition *over* (Brugman 1988; Brugman and Lakoff 1988).

I will briefly describe some of the matches between the cognitive linguistics approach and connectionist capabilities, sketch part of the Brugman and Lakoff work, and then present the connectionist model.

Cognitive Linguistics and Connectionism

Two of the attractions of connectionism for cognitive scientists are its use of spreading activation for satisfying multiple, simultaneous constraints (McClelland and Rumelhart 1981; Hinton 1984; Smolensky 1988), and learning algorithms which can discover the statistical regularities existing in a large corpus of patterns (Rumelhart and McClelland 1986; Elman 1988; St. John and McClelland 1988). To explain these properties and how they arise out of connectionist networks, I will focus on models in which a gradient descent learning procedure (such as the back propagation algorithm of Rumelhart, Hinton & Williams 1986) is used to train a network to associate a set of input patterns with a set of output patterns. The patterns are binary strings which are assigned linguistic values by the implementor. For example, in Rumelhart and McClelland's (1986) model of the acquisition of the past tense of English verbs the input patterns represented phonological strings for the present tense of various English verbs, and the output represented phonological strings corresponding to the past-tense form of these verbs.

A network is an arrangements of units, where units are entities which have an activation value and are capable of sending activation to other units through weighted connections. Typically, a network has an input and an output layer of units, and possibly some intermediate or "hidden" layers. A pattern is presented to a network by giving the units of the input layer activation values corresponding to the patterns to be represented. The activation of each unit of the input layer is propagated forward to activate the units on the next layer. The pattern of activation appearing on the units of the output layer constitutes the output pattern.

During training, a teaching pattern is presented for each input. Learning algorithms such as backpropagation provide a method for modifying the weighted connections between units so that each time a given pattern appears on the input layer,

the desired pattern will appear on the output layer. The computational task of the network can thus be seen as finding a configuration of weights which will allow storage of some (possibly very large or, under some circumstances, infinite) number of input-output pairs.

This type of storage has been called "superpositional" or "distributed" to emphasize the contrast with traditional views of how data can be stored by mechanical devices. In the traditional view, distinct items are stored in distinct memory locations, while in distributed systems items are stored on top of one another, or "superimposed" (Rumelhart and Norman 1986). Two things of particular interest to cognitive linguists are that the superpositioning of multiple patterns can allow the invariances among the patterns to emerge (as in the extraction of a prototype from multiple exemplars) and that the detection of invariances by the network can yield a structure which allows novel patterns to be treated on analogy to previously stored patterns.

The Story of Over

The preposition *over*, like other highly frequent English words, can evoke a range of meanings. Brugman (1988) and Brugman and Lakoff (1988) (hereafter B&L) identified three main ways that *over* can indicate a spatial relationship between a trajector (TR) and a landmark (LM). (In their analysis, non-spatial usages are variations on these three schemas. The connectionist model will be restricted to spatial usages.)

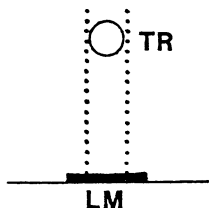
- I. The **above** schema: The TR is vertically above, but not touching, the LM, as in example (1) below.
- II. The **above-across** schema: The TR is an object moving on a path above, and extending beyond, the boundaries of the LM, as in example (2). Alternately, the TR could be a stationary, 1-dimensional object, as in (3). Example (4) shows that this schema allows contact between the TR and the LM.
- III. The **cover** schema: The TR is an object whose 2-dimensional extent covers the LM (extends to the edges of or beyond the LM). In most cases, the TR is construed as being vertically above, and in contact with, the LM (5). The TR does not have to be vertically above the LM, as illustrated by (6).

The three schemas are diagrammed in Figure 1. Two variations on the **above-across** schema are shown.

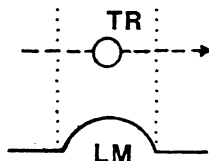
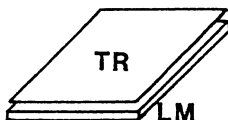
- (1) The helicopter hovers over the city.
- (2) The plane flies over the bridge.
- (3) The line stretches over the wall.
- (4) The plane rolls over the bridge.
- (5) The cloth is over the table.
- (6) The carpet stretches over the wall.

One way the uses of *over* are related is through shared components. For example, the sentences in (7)-(10) share an *above* component. (Some hypothesized features of the expressions in these sentences are listed in *italics*.)

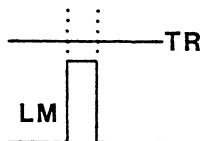
The helicopter hovers over the city.



The cloth is over the table.



The plane flies over the bridge.



The line stretches over the wall.

Figure 1. Image schema diagrams for 4 uses of *over*.

- (7) The bee is over the table. *above*
- (8) The bird flew over the hill. *above across up*
- (9) The person walks over the hill. *above across up contact*
- (10) The person lives over the hill. *above across up contact end-point*

The component **up** in (8) signals that the trajectory of the bird's flight has an upward component, while the component **contact** in (9) refers to the presence of TR-LM contact. B&L view (10) to be a further variation on (9), in that it shares components with (9) but differs in having a focus on the end-point of the trajectory. (That is, the location of the person's house is specified to be at the end of the path which extends over the hill.)

The traditional approach to representing the different meanings of polysemous words has been to identify word meaning with "core meaning", where "core" is something common to all of a word's multiple uses (Jackendoff 1983). Where core meanings cannot be found, theorists have proposed that polysemes be treated like homonyms: the different meanings must simply be listed separately in the lexical entry of each word. B&L present arguments for why an abstract notion of aboveness could not be the candidate for a core meaning for *over*. They describe how the polysemes of *over* are interrelated and point out that the separate listings approach fails to acknowledge these relationships. In addition, their analysis sheds new light on the problem of how one meaning is selected and integrated with the meanings of other words in the utterance: the meaning evoked by an utterance is the result of constraint satisfaction. An utterance is most felicitous when its component words contribute to a single coherent schema. Successive words in an utterance narrow down or constrain the

number of possible meanings.

Implementation

Connectionist models are good at integrating simultaneous constraints, at extracting prototypes from examples, at representing both rules and exceptions, and at generalizing to new forms on analogy to stored patterns. B&L describe how polysemous words are prototype categories and that the meanings they evoke are the result of constraint satisfaction. Although the mapping from expressions to their meanings cannot be described by a single rule, this mapping does contain a number of regularities. As Rumelhart and McClelland (1986) have shown, connectionist networks are good at representing rules, sub-regularities, and rule-exceptions. For these reasons, the different meanings of *over* appear to be a good domain for exploring the problems and rewards of implementing a cognitive linguistics analysis in a connectionist network.

There are many different ways a model could incorporate the matches between cognitive linguistics and connectionism, and many different methods of implementing aspects of B&L's analysis of *over*. The B&L analysis is rich and complex, and the current model is necessarily a subset. It includes only spatial, non-metaphorical uses of *over*, and only those spatial senses which could be captured with a limited vocabulary and sentence length. Although the model contains many aspects of their analysis, it does not incorporate every distinction made by B&L, and some of their details appear here in slightly altered form. Furthermore, in no way is the model intended to be a "test" of B&L's account of polysemy. Instead, it demonstrates that mechanisms exist which will produce the constructs they hypothesize.

It is difficult to adequately describe the details of the implementation in this brief report. A full account is contained in Harris (1989).

Architecture

The network was given the task of mapping input patterns of the form "trajector verb (over) landmark" to either the **above** schema, the **above-across** schema, or the **cover** schema. Figure 2 shows the number of layers, connections between layers, and the contents of the input and output layers.

The output layer. The output layer consisted of 6 units, one for each of the three schemas, and three to indicate whether the landmark and trajector make contact, whether the trajectory has an upward component, and whether the path has an end-point focus (as is the case with expressions such as *The man lives/is over the hill*). A number of other features could have been included. For example, B&L describe variations on the **above across** schema in which the LM has or doesn't have significant horizontal extent, or in which the TR is 1-dimensional or a multiplex of entities. Although the pattern set (described below) contains TR's and LM's with these properties, such properties were not explicitly represented in the output schema. It was desired that the output schema include only features that emerged when one looked at the level of the schema, not features that would always occur whenever a particular item (e.g. *mountain*) was present in the input sentence.

The input layer. Sentences were limited to four words: "trajector verb (over) landmark." (Because all sentences involved the preposition *over*, no actual unit for *over* was needed.) A vocabulary of trajectors, verbs, and landmarks out of which to construct the sentences was then selected. An attempt to maximize diversity in properties such as dimensionality, size, animacy, and motion was the main criterion for selecting the specific words used in the model.

What method can be used to represent the meanings of these words? B&L found that properties such as the dimensionality of the trajector, vertical height of the landmark, and whether a verb specified TR-LM contact were important in determining which schema an utterance would evoke. One goal of the current model was to see if the network could, like B&L, discover these properties.

Lexical items were represented in a localist fashion: a unique unit of the input layer was used to designate each word. This means that the network received no semantic information about the input words. For example, to present the pattern "man live (over) hill" to the network, the input unit for *man*, *live*, and *hill* were turned on in the input vector.

In order to use the same set of weighted connections to map a large number of input patterns to their target outputs, I hypothesized (following Hinton 1986) that the network would have to learn, from the distributional regularities in the mapping between TR-verb-LM combinations and their output features, that some input items are similar to others in some context but not in other contexts. For example, some hidden units might learn to respond similarly to *car* and *plane* but differently to *car* and *person*. If the inputs had been given a semantic representation (e.g. *mountain* coded as +tall, +wide) the network would still have to learn what combinations of coded input features could be mapped to which six-feature output vectors. In the current case, however, the analytic task of the network is harder, since all it has is the distribution of mappings from TR-verb-LM triples to the six-feature output vectors.

The architecture of the network is shown in Figure 2.

The Pattern Set

For each trajector, three to nine verbs agreeing with the selectional restrictions of English were selected. The goal was to obtain combinations representative of English sentences, not to list all such patterns exhaustively. These TR-verb combinations plus the plural/singular marker were combined with all possible landmarks to generate 2700 patterns. Not all landmarks made sense with each combination of "trajector plural/singular verb." While balls can rolls over floors and tables, they don't typically roll over oceans. Deleting the most obviously anomalous patterns yielded a final set of 1600 patterns.

Network training

The number of hidden units which appear in Figure 2 was obtained by training the network with increasingly fewer hidden units. The 22 units shown in Figure 2 were the minimum required for the network to learn correctly all 1600 patterns.

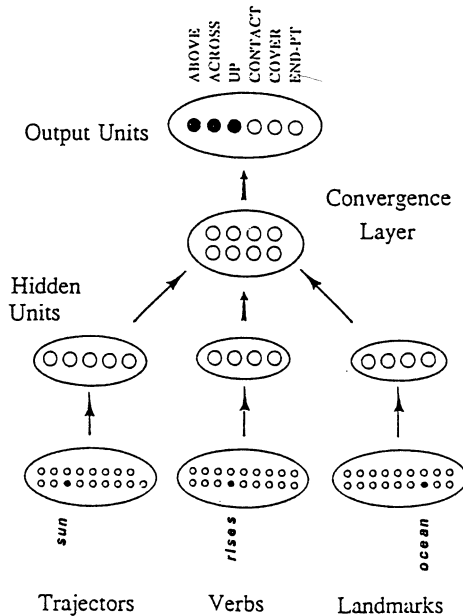


Figure 2. Network architecture.

Weights were modified after every presentation of an input-output pair. Training was considered complete when the network had either achieved correct performance on all patterns, or when the number of correct patterns no longer increased with continued training. The activation of each output unit had to be within 10% of the target unit for a pattern to be considered correct.

The model was run on McClelland and Rumelhart's (1988) BP, a program which implements backward error propagation.

Self-organization of the Hidden Units

Two questions about network behavior are typically asked: (a) how well can the network generalize to patterns on which it has not been trained, and (b) what internal representations has the network constructed in order to learn the input-output mapping. In the current paper, I will focus on the self-organization of the hidden units. Understanding how the hidden units have recoded the input items into abstract categories is a prerequisite for understanding how the network could generalize to novel patterns at all. A complete report of network performance is contained in Harris (1989).

Of the two hidden layers in Figure 2, we are now concerned with only the first layer: the banks of units receiving connections from the input layer. To explore how these units have self-organized during learning, the activation of each hidden unit in response to each of its inputs was recorded. Each hidden unit is separately graphed in Figures 3, 4, and 5 (corresponding to trajector hidden units, verb hidden units, and landmark hidden units).

Visual inspection of the graphs suggests that the hidden units are selectively responding to inputs of a certain type. The inputs which cause the hidden unit to have a high activation value could be called the "receptive field" of the unit. The graphs have been annotated with suggestions about what properties these inputs may have in common. It should be kept in mind that these labels are only hypotheses about the types of recoding the network finds useful in solving the input-output mapping.

Trajectors

Hidden units 1 and 4 appear to be sensitive to the dimensionalities of the trajectors. The two units, however, make different categorizations of the inputs. HU 4 distinguishes between one-dimensional trajectors and all of the other trajectors. The differentiation between these two groups is abrupt compared to the more graded range of values of HU 1. HU 1 roughly divides the trajectors into zero-dimensional, and all non-zero-dimensional. Note that the input unit for "Number" is included in the non-zero group. This is most likely due to the status of the plural marker as a component of a mass entity.

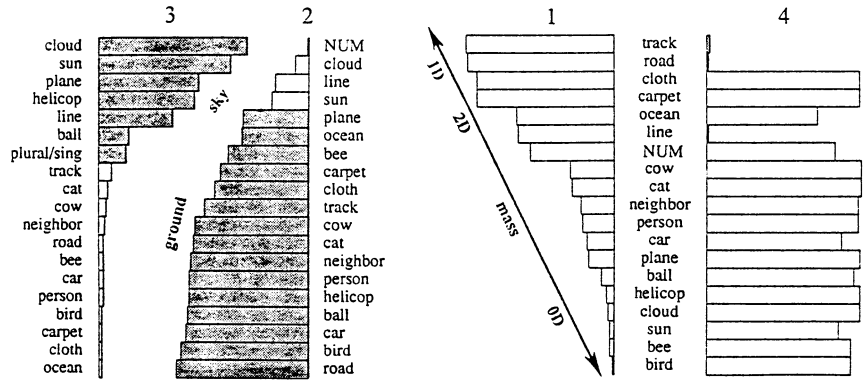


Figure 3: Trajector hidden units.

HU's 2 and 3 grouped their inputs according to whether a trajector was typically a "sky" object (not normally in contact with a surface) or a "ground" object. In HU 3, *plane* and *helicopter* are considered "sky" objects while in HU 2 they are not. This might be because the training set included patterns in which plane and helicopter were in contact with the ground (e.g. when the verb was *roll*).

HU 5 (not depicted) appears to function as a "cloth-carpet" detector. Activations for *cloth* and *carpet* were 1.0, and activations for all other trajectors were under 0.25. These two trajectors participated in **cover** schemas 100% of the time. Because *cloth* and *carpet* were such valid cues to the correct output schema, it was cost-effective for the network to dedicate a hidden unit for detecting their presence in the input.

Verbs

Verb hidden units 2 and 3 distinguished between path verbs and non-path verbs, although they made different divisions. The verbs that allow the **end-point focus** schema (*live, belong, is*) are path verbs in that their schema is **above across up contact endpoint**. Hidden unit 3 groups these with all the other path verbs (*walk, run, fly, lie, rise, roll*). Hidden unit 2, on the other hand, categorizes the **end-point** verbs in the non-path group.

One way to interpret the groupings in hidden units 4 and 1 is as affording information about whether the schema specified by hidden units 2 and 3 should be augmented by the **contact** or **up** features. Hidden unit 4 appears to represent the probability of TR-LM contact, while 1 signals that the verb typically maps to a schema with an **up** feature.

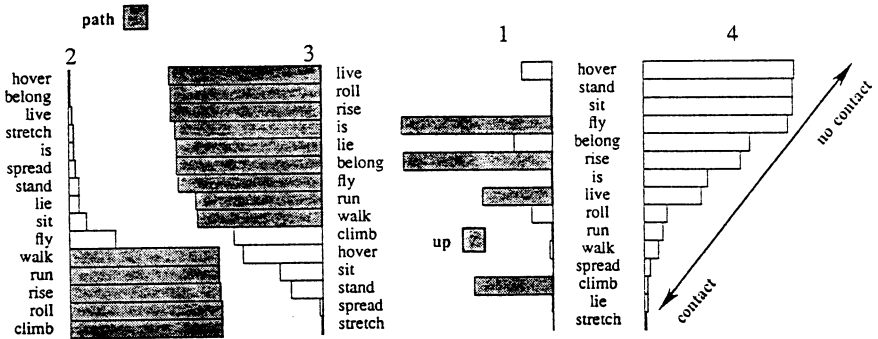


Figure 4: Verb hidden units.

Landmarks

Landmark hidden units 1 and 4 both scale inputs for degree of verticality, but the scales are slightly different. In HU 4, *mountain, hill, and bridge* are placed in one group, and *wall, building, and house* are in the next-tallest group. In HU 1, however, *bridge* is classified as similar to *wall, building and house*. Because both hidden units do turn on in response to the tallest landmarks, we can guess that the network has chosen to encode tall landmarks as the default case.

HU 2 appears to encode the distinction between surfaces and non-surfaces, an important one for predicting whether a path over which mass entities (cats, cows) can spread or lie. The specialization of HU 3 is less clear.

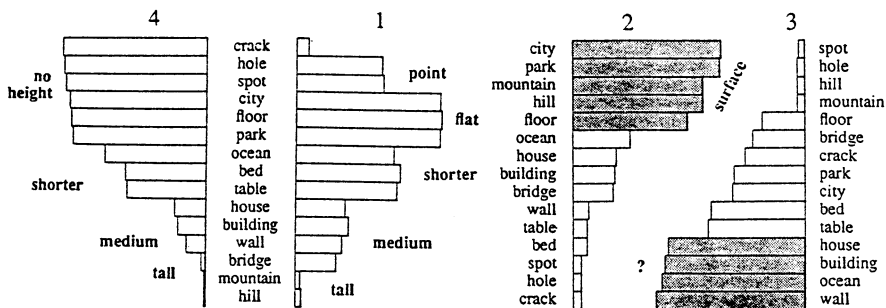


Figure 5. Landmark hidden units.

Extracting Rules from Statistical Regularities

The limited number of hidden units in the current model created an information bottleneck. This bottleneck forced the network to recode the inputs in a highly abstract manner: specific information about the identity of a particular input was mapped into information about salient properties of the input.

These abstract properties could be viewed as the conditional components of rules used by the network to activate the output pattern. For example, the network has extracted two features to characterize the input *person*. From Figure 4 these are "ground TR" and "not-1D TR." (Trajector hidden unit 1 has only a low activation, unit 2 signals "not-1D TR," unit 3 also has only a low activation, unit 4 signals "ground TR," and unit 5 has a low activation). The input pattern "person walk (over) hill" could be understood to activate the following rule:

IF ground TR, AND (not 1D TR), AND path type1, AND path type2,
AND surface LM, THEN **above across up contact.**

The hidden unit activations of eight input patterns have been reproduced in Figure 6. I have labeled each of the role-specific hidden units according to what information it appears to be passing on to the next layer (as indicated by the charts in Figures 3 - 5). The activations of the convergence layer have also been included.

If the properties of the role-specific hidden layer are viewed as the abstract components of rules, then the network could, in theory, represent 1600 rules (where a rule is understood to be an action that applies when some preconditions are met). This would be the case if even very related patterns resulted in subtly different hidden unit activations. In the current network, a number of the inputs function as synonyms (compare the activation values for the pairs *cat* and *cow*, *person* and *neighbor*, *run* and *walk*, *hill* and *mountain*, *hole* and *spot* in Figures 3-5). This means that there will be less than 1600 different patterns of activation across the role-specific hidden units. However, it is clear that in theory the number of "rules" could approach the number of patterns seen by the network. This is a desirable feature when the regularities to be

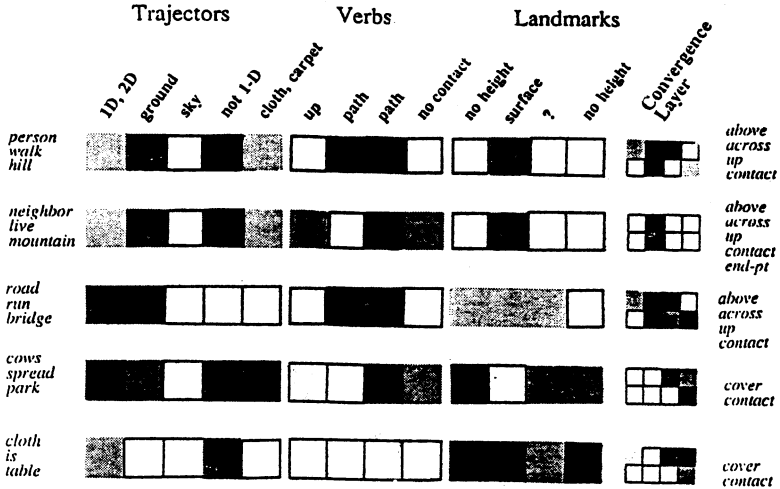


Figure 6. Hidden unit activations for five input-output pairs.

extracted contain complex sub-patterns and are dependent on contextual variation, or when a system must be continually accommodating old forms to the new forms of a changing environment.

Analogy

A system can be understood to represent an analogy between two different patterns if it has a means of recoding them into patterns which are identical or (by some criterion) sufficiently similar.

Figures 3-6 show that the network did develop such a system: the hidden layer functions to map specific inputs such as *car run hill* into abstract properties like "0D trajector" and "tall LM." These abstract properties could then be used to interpret novel patterns. For example, although the network had never been given a *car fly* pattern, it has learned that cars are similar to planes and helicopters (see trajector hidden unit 1, 4, and 2, Figure 4). Given this similarity, it is not surprising that the network responded to the novel pattern, "car fly (over) LM" on analogy to the learned pattern "plane/helicopter fly (over) LM."

More difficult for the network was the novel pattern "carpet fly (over) LM". This pattern was difficult because it contains a conflict of schemas. All examples involving *carpet* that the network was given had **cover** schemas as their target output. In contrast, the verb *fly* always activated the **above-across** schema. Because the network was never given any examples in which it had to resolve the conflict, it didn't know whether the rule for *fly* outweighed the rule for *carpet*, and so activated both schemas simultaneously.

Discussion

The connectionist research program outlined by McClelland and Rumelhart (1986) and Smolensky (1988) looks for correspondences between the representational and processing capacities of connectionist systems and general cognitive phenomena. The correspondences between cognitive linguistics and connectionism are intriguing. B&L's account of polysemy points to the need for a mechanism that can induce categories from a set of examples, learn to extract rules from rule-governed data, and resolve conflicts in rules by constraint satisfaction. The model described here contributes to past work (e.g., Anderson 1983; Elman 1988; Rumelhart & McClelland 1986; Hinton 1986) in showing how networks provide such a mechanism.

Although the model fares well in illustrating how connectionist networks extract the statistical regularities of input data and construct internal representations which support analogy, its limitations as a model of the polysemies of *over* are sobering. Few of the senses of *over* are captured, only a single lexical item is represented, and the schema transformations posited by B&L are not included.

The method used for representing combinations of words (the input units) and the meanings of expressions (the output units) is an awkward one. The network was given no information about what individual lexical items mean. Instead, it received information about the meaning of whole expressions. This strategy was adopted to ensure that the problem of mapping sentences to their meanings was not made too trivial. For current purposes, this was a wise choice, since one of the successes of the model was that, under pressure to solve the mapping task, it constructed a sophisticated system for recoding the inputs into their abstract properties. Nevertheless, the model would be more intuitively pleasing if lexical items were given some of the semantic richness which characterizes our conceptualization of words like *road*, *plane*, *fly*, etc.

The meaning of *over* was defined to be various combinations of the elements in the set **above across up cover contact end-point**. These elements were supposed to be a short hand for the image schemas evoked upon encountering an *over* expression. Ideally, however, the schema would not be something given or taught to the network, but something the network constructs in the effort to make sense of the mapping from linguistic units to some very rich internal conceptualization.

At present, connectionist networks provide metaphors for understanding how categories might be induced from examples and how rules, regularities and exceptions could be learned and processed by a single mechanism. Whether these networks can be useful computational tools for linguists will depend on whether small successes like the current work can be repeated on a larger, more complicated scale.

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Questioning vs. Identifying: A Functionalist Analysis of the [A candidate that which professor recommended was hired?] Construction in Japanese

Yoko Hasegawa
University of California, Berkeley

1. Introduction

Japanese has an interrogative construction containing a relative clause in which a WH-expression (WHE) appears (hereinafter, *interrogative relative construction*, IRC). For example:

(1)a [NP [Rel Clause ... **WHE** ...] Head N] [Predicate ...]?

b [[**dono kyoozyu-ga** suisen-sita] hito]-ga
which prof.(Nom) recommended person(Nom)
saiyoo-saremasita ka.
was hired Q

Lit. A person that which professor recommended was hired?

I will discuss the IRC from a functionalist perspective for two reasons. The first reason is its peculiarity. The meaning of IRC questions is not immediately transparent to the analyst. Do they ask for the entity corresponding to the head N or for the entity corresponding to the WHE alone? I will demonstrate that the IRC provides the possibility of separating what is to be questioned and what is to be identified. This phenomenon is schematically represented in (2).

(2) **narrow-reading** Identify the referent

[NP [Rel C ...

WHE Questioned

 ...] Head N] [Pred ...]?]

broad-reading

↑
Identify the referent

As the ungrammaticality of the translation of (1b) shows, English does not permit one to separate these two concepts; i.e., what is questioned is what is to be identified in English.

The second reason for investigating the IRC is the descriptive inadequacy of recent proposals. This construction has been analyzed by several researchers in the framework of Government and Binding Theory. Their motivation is as follows: because it is possible for the WHE

to move to an operator position at LF even though there is no movement at S-structure in Japanese, the IRC may reveal whether or not Move α has the same properties at these two levels of representation (Huang 1982; Nishigauchi 1984, 1986; Pesetsky 1987). I will argue that LF, which is supposed to represent the properties of syntactic form relevant to semantic interpretation (May 1985), cannot provide descriptively adequate accounts for this construction.

2. Broad-reading: what is questioned is NOT what is to be identified.

Let us first consider the broad-reading in (2). In this reading, the questioner wants to identify the referent of the head N, but s/he nevertheless questions an entity in the relative clause. A typical context is illustrated in the following scenario. Suppose that both A and B attend a piano competition, but A has to leave before the winner is announced. The following day, A asks (3).

(3) A: Who/Which person won the competition?

(4) Ba: It was Alice Clemens.

Bb: It was the one Professor Huxley recommended.

Bc: It was the one who played Chopin's Polonaise.

Bd: It was the one who played second from the last.

Be: It was the one wearing the blue outfit.

If in fact the winner was Alice Clemens, who was recommended by Professor Huxley, and who played Chopin's Polonaise second from the last in the performance, and who was wearing a blue outfit, any answer in (4) could serve to identify the winner of the competition. However, the utility of each answer depends on the background knowledge of the questioner. For example, (4Ba) is useful only if A knows the competitors by name, (4Bb) only if A knows the recommenders, (4Bc) only if A remembers the titles of pieces played by the competitors, and so forth. B may have a presumably infinite number of denotationally equivalent responses.

Asking a question is a speech act of eliciting information (Searle 1969). Merely true answers often do not help accomplish this goal. Because the respondent may not know which descriptions can communicate the intended denotation to the questioner, unsatisfactory answers such as in (5) may result.

(5) A: Who won the competition?

B: Alice Clemens.

A: Who is she?

B: She is the one who played Chopin's Polonaise.

A: I don't remember which competitor that was.

B: She was the one wearing a blue outfit.

A: Oh, I understand.

The IRC in Japanese serves to specify a useful description. To illustrate, the IRC in (6) enables A to request in a single question not only the identification of the winner, but also how the winner should be identified. The IRC contains "built-in" instructions on how the question should be answered.

- (6) b dono kyoozyu-ga suisen-sita hito-ga
which professor(Nom) recommended person(Nom)
yuusyoo-simasita ka.
won Q

Lit. A person whom which professor recommended won?

- c dare-no kyoku-o hiita hito-ga yuusyoo-simasita ka.
whose music(Acc) played

Lit. A person who played whose piece of music won?

- d nanban-me-ni hiita hito-ga yuusyoo-simasita ka.
what number played

Lit. A person who played in what position (in the sequence of the performances) won?

- e naniiro-no huku-o kiteita hito-ga yuusyoo-
what color(Gen) cloth(Acc) was wearing
simasita ka.

Lit. A person who was wearing what color clothing won?

The sentences in (4) are appropriate answers to the corresponding questions in (6) in a bilingual conversation.

The logic behind the use of the IRC in the broad-reading is that, given the value of the WHE, the questioner can identify the referent of the head N. For example, there is a one-to-one correspondence in the questioner's mind between the clothing colors and the competitors themselves.

(7)	Color of Clothing	Competitor
	green	a
	purple	b
	blue	c
	etc.	etc.

In English, the IRC can occur only in echo questions; i.e., when the construction is already provided by the previous utterance, and the questioner recapitulates it, clarifying some part(s).¹ The IRC in Japanese is used in the opposite way: the questioner anticipates the form of the answer.

3. Narrow-reading: when what is questioned is what is to be identified.

In order to describe the narrow-reading, in which what is questioned is the same as what is to be identified, it is instructive to mention Nishigauchi's (1984) analysis of the IRC.

3.1. The pied-piping account of the IRC

Following Kuno (1978), Nishigauchi assumes that in elliptical answers everything but the focused element must be omitted.

- (8) Q: suzuki-san-wa sattoo-san-ni nan-zi-ni aimasita ka.
 Mr. Suzuki(Top) Mr. Sato(Dat) at what time met Q
 At what time did Mr. Suzuki meet Mr. Sato?
- Aa: ku-zi-ni desu.
 at 9 o'clock
 Lit. (It) is at 9 o'clock.
- Ab: #**sattoo-san-ni** ku-zi-ni desu.

According to Nishigauchi, the LF of (8Q) is:

- (9) [**nan-zi**]_i [suzuki-san wa sattoo-san ni *t_i* aimasita ka]

He claims that an elliptical answer with the copula *da* (*desu*) 'is/are' to a WH-question must supply only the value of the operator expression of the question, i.e. the preposed WHE. (8Ab) is inappropriate because *sattoo-san ni* 'Mr. Sato(Dat)', which is not a value of the operator expression in the question, is left undeleted. He then examines IRCs and their possible answers.

(10) Q: dono kyoozyu-ga suisen-siteiru hito-ga
 which prof.(Nom) is recommending person(Nom)
 saiyou-sare soo desu ka.
 be employed Evid(inferential) Cop
 Lit. A person that which professor is recommending is likely
 to be employed?

Aa: suzuki kyoozyu-ga suisen-siteiru hito desu.
 (It) is the person that Prof. Suzuki is recommending.

Ab: # suzuki kyoozyu desu.
 (It) is Prof. Suzuki.

Since (10Ab) is not a possible answer, Nishigauchi posits (11a) below, not (11b), as the LF representation of the IRC.

(11) a $[_{NP} \text{ WHE}_i [_{Rel\ C} \dots t_i \dots] \text{ Head}]_j [_S [_S \dots t_j \dots] Q]$
 b $*[_{WHE_i}] [_S [_S [_{NP} [_{Rel\ C} \dots t_i \dots] \text{ Head}] \dots] Q]$

The appropriateness of (10Aa) shows that the entire NP that contains a WHE is moved into the operator position in addition to the movement of the WHE within the relative clause. He considers this as a kind of pied-piping effect. The inappropriateness of (10Ab), on the other hand, shows that the WHE alone cannot move to the operator position—which is, according to Nishigauchi, due to the Subjacency constraint. He claims that although Subjacency is not applicable at S-structure in Japanese, it is applicable at LF. In (11b) Subjacency is violated; hence the inappropriateness of (10Ab).

There are, however, some IRC questions for which supplying only the value of the WHE is acceptable.

(12) Q: nani-too-o sizi-siteiru hito-ga itiban
 which political party(Acc) are supporting people(Nom) most
 ooi desu ka.
 many
 Lit. People who support which political party are most
 numerous?

Aa: zimin-too-o sizi-siteiru hito desu.
 Liberal-Democratic Party(Acc)
 (It) is the people who support the Liberal-Democratic Party.

Ab: zimin-too desu.
(It) is the Liberal-Democratic Party.

Nishigauchi does not count (12Ab) as evidence for the violation of Subjacency, but rather he considers it as a truncated form of (12Aa). He writes,

Various factors, more or less pragmatic in nature, must be involved here ... it appears to be easier to recover the identity of a certain description from a truncated answer when the sets denoted by the entire description and by the value of the operator inside that description are disjoint in reference ... In the case of [12], the description in question involves the set of people and the operator inside that description ranges over a set of political parties, and those two relevant sets are sufficiently disjoint ... in [10], the entire description refers to a set of candidates for a certain position and the WH expression contained within it ranges over a set of professors: these two sets are close to each other in reference, if not intersecting. (1984:13)

The statement is inaccurate, however. Consider the following:

(13) Q: dono koohosya-o sizi-suru gakusee-ga ooi desu ka.
which candidate(Acc) support student(Nom)
Lit. Students who support which candidate are numerous?

Aa: zyehu tyan-o sizi-suru gakusee desu.
(It) is the students who support Jeff Chang.

Ab: zyehu tyan desu.
(It) is Jeff Chang.

According to Nishigauchi's account, (13Ab) must be factored out, or at best marginally accepted, because the set of students and the set of candidates are close to each other in reference. In fact, Jeff Chang is the current president of the student body, and he is a student at UC Berkeley. And yet (13Ab) is an appropriate answer. Moreover, most native speakers consider (13Ab) as more appropriate than (13Aa). They say that what is actually asked regards the candidate who is popular among students, not the students themselves. Therefore, (13Aa) sounds like a textbook response; viz., it too strictly follows the structure of the question.

Although Nishigauchi's methodology of using elliptical answers as evidence to derive LF representations of corresponding questions is

problematic, the effect he points out does exist.² Many, if not most, native speakers feel the b-answer is inappropriate in (10) but is perfectly appropriate in (12). This fact calls for explanation.

What Nishigauchi considers exceptions to his analysis are those for which the narrow-reading is possible or preferred. In the case of (10Q), the broad-reading is strongly preferred for reasons which will be discussed later, whereas in (12Q), the narrow-reading is mandatory. The crucial information to determine the reading in the latter case comes from the adjective *ooi* 'many/numerous'. This quantificational adjective makes the broad-reading (i.e., the questioner's intention is to identify the referent corresponding to the head N) impossible. "Individual" cannot be numerous. Therefore, the respondent takes the narrow-reading and may supply an elliptical answer with the value of the WHE alone. (12Q) can be phrased as "Which political party is supported by many people?"

3.2. D-linked WHEs

Another formalist analysis I would like to discuss is that of Pesetsky (1987). He asserts that there are two types of WHEs, *discourse-linked* (D-linked) and *non-discourse-linked* (non-D-linked). Which-phrases are D-linked in the sense that they require that both the questioner and respondent have in mind a set of entities from which a felicitous answer will be drawn. The WHEs like *who*, *what*, or *how many books* impose no such requirement, and are thus non-D-linked. Non-D-linked WHEs adjoin to S' at LF as proposed in Chomsky (1976), whereas D-linked WHEs remain in situ at LF. Pesetsky claims that the moved WHE shows a diagnostics for movement, e.g. Subjacency, but the unmoved WHE fails to show such effects. The following sentences of Pesetsky illustrate the difference between non-D-linked and D-linked WHEs.

(14) a *Mary asked *what_i* **who** read *e_j*. (Non-D-linked)

b Mary asked *which book_i* **which man** read *e_j*. (D-linked)

In (14a), when *who* moves to Comp at LF, it violates the Nested Dependency Condition; hence ungrammaticality results.³ According to Pesetsky, (14b) is grammatical because *which man* (D-linked) remains in situ at LF.

Since phrases like *what the hell* are used to express surprise, the appropriate values corresponding to them are presumed not to figure in previous discourse. Therefore, those phrases are good examples of "aggressively" non-D-linked WHEs, which must move at LF. He considers that the Japanese equivalent of *the hell* is *ittai*. Comparing the following pair of sentences, he concludes that a Subjacency effect does

show up when the WHE is "aggressively" non-D-linked.

- (15) a *marii-wa zyon-ni nani-o ageta hito-ni atta no?*
 Mary(Top) John(Dat) what(Acc) gave person(Dat) met Nlz
 Lit. What did Mary meet the man who gave to John?
- b **marii-wa zyon-ni ittai nani-o ageta hito-ni atta no?*

In my analysis, (15b) does not permit the broad-reading because (in order to use the IRC to identify the referent of the head N) not only does the questioner know the possible values of the WHE, but s/he must also have in mind a one-to-one correspondence between the values of the WHE and the possible referents of the head N (cf. (7)). Therefore, as Pesetsky correctly claims, *ittai* is incompatible in (15b).⁴ As far as structure is concerned, however, (15b) could tolerate the narrow-reading.

- (16) Q: *marii-wa ittai dare-o korosita hito-o keesatu-ni*
 Mary(Top) who(Acc) killed person(Acc) police(Dat)
tuuhoo-sita no?
 reported Nlz
 Lit. Who did Mary report to the police the person who killed?
- Aa: *suzuki kyoozyu-o korosita hito desu.*
 (It) is the person who killed Prof. Suzuki.
- Ab: *suzuki kyoozyu desu.*
 (It) is Prof. Suzuki.

The appropriateness of (16b) shows that the narrow-reading is possible. Thus, Pesetsky's claim that the IRC with a non-D-linked NP is ungrammatical because of a Subjacency violation at LF does not hold.

4. Selection of the interpretation of the IRC

I have so far demonstrated that the IRC allows both broad- and narrow-readings, and that the choice between the two readings is determined by context. Let us now consider what particular elements in context are relevant to the selection. There are two crucial notions: (i) the referability of the head N, and (ii) the inherent topic-worthiness.⁵

4.1. Referability of the head noun

Recall that in case of (10Q), the head N is very likely to be interpreted as referential, whereas in (12Q), the head N must be interpreted as non-referential. When the head N is understood as referential, the broad-reading is favored. In real discourse, there are usually some clues as to

whether or not the head N is intended to be referential. In (12Q), the clue is the use of *ooi* 'many/numerous'. The following pair of sentences illustrates another such clue.

- (17) Q: dono kyoozyu-ga **suisen-suru** gakusee-ga kigyoo-ni
which prof.(Nom) **recommends** student(Nom) industry(Dat)
ninki-ga arimasu ka.
popularity(Nom) there is
Lit. Students that which professor **recommends** are popular
in the industry?
Free. Who recommends the students who are in demand?

Ab: suzuki kyoozyu desu.
(It) is Prof. Suzuki.

- (18) Q: dono kyoozyu-ga **suisen-siteiru** gakusee-ga kigyoo-ni
is recommending
ninki-ga arimasu ka.
Lit. A student that which professor **is recommending** is
popular in the industry?
Free. Whose student is in demand?

Ab: #suzuki kyoozyu desu.
(It) is Prof. Suzuki.

In (17), the b-answer is possible, but not likely to be chosen in (18). Notice that the verb form in the IRC in (17Q) is simple present, whereas that in (18Q) is present progressive. In general, simple present does not describe a particular event in time but rather a type of event. Therefore, the complex subject NP is naturally interpreted as non-referential in (17). Although very different in connotation, it can be paraphrased as: "Which professor's recommendation gets students the best jobs?" Uttering (17Q) can be a circumlocutory way of eliciting information about professors' influence in the industry. In (18Q), on the other hand, the questioner is referring only to the current event, and thus the head N is likely to be interpreted as referential. Therefore, without strong evidence which suggests otherwise in discourse, the respondent chooses the broad-reading, i.e. to identify the referent of the head N.⁶

4.2. Inherent topic-worthiness

In some cases, the IRC question may be neutral with respect to these two readings.⁷

- (19) Q: dono tyookyooosi-ga kunren-sita inu-ga yuusyoo-simasita ka.
 which trainer(Nom) trained dog(Nom) won
 Lit. A dog that which trainer trained won?

Ab: suzuki tyookyooosi desu.
 (It) is Trainer Suzuki.

Since (19Q) is asking about a particular past event, we expect the head N to be referential, and therefore the b-answer is inappropriate. Some native speakers found (19Ab) a strange answer, and others did not. This split is due to the equal probabilities of the two readings without further context. If (19Q) is a conversation-initiating question, I favor the broad-reading, identifying the dog, but the narrow-reading is not as unnatural as was seen in (10). I attribute this effect to *inherent topic-worthiness*.⁸ Certain entities (e.g. humans) have inherently higher probability to be selected as a topic than others (e.g. animals) when contextual support is minimal. When the value of WHE is high in topic-worthiness, and the sentence can be interpreted as expressing its property, a narrow-reading is possible even when the head N is referential. Therefore, if the WHE in (19Q) is *dare* 'who', which is more general than *dono tyookyooosi* 'which trainer', the b-response is less acceptable for some speakers.⁹ This is because producing prize-winning champions is an important property of trainers but not of "ordinary" people.

5. Conclusion

I have argued in this paper that there are two possible interpretations of the IRC in Japanese: asking for the value of the WHE alone (narrow-reading) and for the value of the entire complex NP (broad-reading). The construction itself is neutral with respect to these two readings. The appropriate application is selected on the basis of intra- and inter-sentential context(s). If the respondent considers that the questioner is asking for the identity of the referent corresponding to the complex NP, s/he may provide an elliptical answer with the value of the entire NP, whereas if the respondent considers that the identity of the entire NP is not in question, s/he may respond to it, supplying only the value of the WHE.

The formalist analyses concerning the IRC have ignored this fundamental fact. In so-doing they assume that only one reading (the broad-reading) is assigned to this form—which is observationally inadequate. Analyzing the IRC, moving constituents around at LF does not make the sentences more transparent to semantic interpretation.

Notes

The comments of the following individuals on earlier versions shaped this paper: Charles Fillmore, Paul Kay, Hideo Komatsu, George Lakoff, Toshio Ohori, Peter Sells, Stanley Starosta, Robert Van Valin, and Helen Wheeler.

1 Following the presentation of this paper, Arnold Zwicky pointed out that in examination questions, the IRC may occur even in English. I have never heard any yet, however.

2 Kuno and Masunaga (1986) caution that it is risky to attempt to determine the syntax of questions solely on the basis of the syntax of answers to them because many pragmatic factors interact with the answering patterns. They argue against the pied-piping account, using answers to questions with *koto*-clauses, coordinate structures, and temporal clauses.

3 Nested Dependency Condition: If two *wh*-trace dependencies overlap, one must contain the other (Pesetsky 1987).

4 The anomaly of (15b) is also due to the use of *ager-* 'give', which implies that the questioner takes the view point of the unknown giver over the more discourse-salient participants, Mary and John.

5 This term was suggested by Robert Van Valin.

6 For significance of referability of the complex NP in determining possible elliptical answers to IRC questions, see Kuno and Masunaga (1986) and Hasegawa (1987, 1988).

7 Example (19) has been provided by Charles Fillmore.

8 This may be related to the Silverstein Hierarchy (Silverstein 1976) and the *Topichood Condition for Extraction* (Kuno 1987).

9 This effect was called to my attention by Toshio Ohori.

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CREATIVE IDIOMATICITY

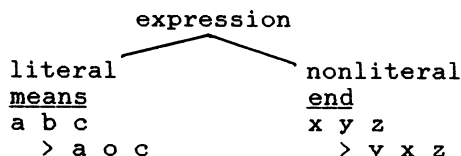
Zili He

University of Kansas

For the purpose of my discussion, the terms "idiomatic" and "creative" are restrictively applied as follows. An idiomatic expression is a conventionally fixed multiword form, which is actually used for its noncompositional meaning to express a significant cultural concept. Creativeness means rule-governed innovativeness and originality in language use.

Creative idiomaticity refers to the ingenious manipulation of idiomatic expressions normally taken as fixed, which requires cultural or literary awareness (Cowie 1983), and which effects all sorts of subtle variations and surprises (Nattinger 1980). It is the use of idiomatic expressions not in the normal way, as part of the ordinary use of language, but in the creative way, as part of the imaginative use of language, conceding that a clear-cut distinction between "ordinary" and "imaginative" language is highly problematic (see, e.g. Fish 1973 and Friedrich 1979).

Idiomatic expressions can be creatively manipulated in various ways on all levels of the language. What intrigues me the most is the semantic, conceptual, and cultural aspects of creative idiomaticity. In particular, I am interested in the following phenomenon:



An idiomatic expression has a literal (i.e. compositional) meaning--a b c, and a nonliteral (i.e. noncompositional) meaning--x y z. Through deliberate substitution of component(s) in the literal means (e.g. a b c > a o c), an intended change of interpretation at the nonliteral end (e.g. x y z > v x z) can be achieved.

This phenomenon of creative idiomaticity raises different questions from some previous concerns about (a) whether people ordinarily process the literal meaning in the conventional nonliteral use of an idiomatic expression, and (b) whether people directly process the literal meaning in the exceptional literal

use of an idiomatic expression (see, e.g. Gibbs 1986). In other words, in (a) and (b), the idiomatic expression is intended to be processed either purely nonliterally or purely literally, respectively. What I have in mind, by contrast, is that the creatively manipulated idiomatic expression is intended to be processed literally, but as a means, to achieve the end of a special nonliteral interpretation.

Let us look at some examples from Chinese (the morpheme-for-morpheme translation appears in parentheses, and the nonliteral meaning, between quotation marks):

- (1) zǒu hòu mén 走后门 (enter-by back door)
'use one's influential connections to gain an objective'
- (1a) kāi hòu mén 开后门 (open back door) 'use one's influence to let someone gain his objective'
- (1b) dǔ hòu mén 堵后门 (block back door)
'impede the channel whereby people gain their objectives through influential connections'
- (1c) kāi qián mén 开前门 (open front door)
'open up the channel through which people can gain their objectives properly and fairly'
- (2) jiè dōng fēng 借东风 (borrow east wind)
'take advantage of a favorable situation'
- (2a) sòng dōng fēng 送东风 (present east wind)
'promote the unhealthy trend'
- (2b) shā dōng fēng 杀东风 (stop east wind)
'check the unhealthy trend'
- (3) wáng yáng bǔ láo 亡羊补牢 (lose sheep mend sheepfold) 'immediately take measures against future problems after something has gone wrong'
- (3a) guān yáng bǔ láo 关羊补牢 (shut-in sheep mend sheepfold) 'always take proper care to do things right as well as taking precautions against potential problems'
- (4) zǒu mǎ kàn huā 走马看花 (pass on-horseback view flower) 'take a cursory glance at things'
- (4a) xià mǎ kàn huā 下马看花 (get-off horse view flower) 'go deep into the realities and make thorough investigations'
- (5) shā jī gěi hóu kàn 杀鸡给猴看 (kill chicken for monkey see) 'punish one as a warning to others'

- (5a) shā hóu gěi jī kàn 杀猴给鸡看 (kill monkey for chicken see) 'punish an official in front of the people'
 (5b) shā hóu gěi hóu kàn 杀猴给猴看 (kill monkey for monkey see) 'punish an official as a warning to all other officials'

(1), (2), (3), (4) and (5) are the original idiomatic expressions; (1a-c), (2a-b), (3a), (4a) and (5a-b) are their creative usages. In these examples we can see that the nonliteral meanings are altered through deliberate, overt alterations in the literal meanings (with substitutes underlined).

My discussion of such phenomenon of creative idiomaticity in imaginative language use consists of three parts: (i) theoretical assumptions, (ii) prerequisite cultural knowledge, and (iii) the cognitive basis for creative idiomaticity.

Theoretical assumptions. I have adopted Grace's (1981) view of TWO MODES OF KNOWING a language. Accordingly, an idiomatic expression may be known both holistically, as a ready-made complex unit with a noncompositional interpretation, and analytically, concerning its constituency and structure. It is familiar to the language users-in-the-culture as a conventional expression for an established cultural concept, with its lexical and grammatical properties brought to consciousness in creative usage.

I have also adopted the view of a CREATIVE-MEMORIZED SPEECH CONTINUUM (see, e.g. Nattinger 1980, Pawley & Syder 1983). Simply put, "creative speech" and "memorized speech" are two extremes of the continuum, between which there could be numerous delicate gradations, depending on how much creation and how much memorization are involved, and in what ways the two factors interplay. In a sense, we can think of the creative use of idiomatic expressions under consideration as a mental process of creation which is modeled on specific memorized expressions.

As to the relationship between the nonliteral meaning and the literal meaning of an idiomatic expression, my position is that there are various types ranging from deadly opaque to vividly transparent. Idiomatic expressions with a more transparent nonliteral-literal relationship are more likely to become candidates for creative usage.

Prerequisite cultural knowledge. I have in mind the notion of cultural knowledge with the following understanding: (a) there is no sharp distinction between linguistic and cultural knowledge, for, as it

has been argued, semantic knowledge in principle presupposes basic cultural knowledge about "the world" (see Searle 1978, Keesing 1979, and Haiman 1980); (b) for the purpose of discussion, linguistic knowledge can be abstracted and reduced to what constitutes the mere computationality of language (Chomsky 1986), against which cultural knowledge can be defined as what else one should know in order to use the language effectively in real-life communication in a given language-culture community. The basic question is what else, beyond purely linguistic, computational knowledge, ought to be known about an idiomatic expression to the members of a language-culture community in order that the creative manipulation under discussion could be performed with the intended effect. I would suggest three aspects of cultural knowledge.

The first aspect of cultural knowledge concerns knowing the idiomatic expression as what it is, i.e., knowing that the expression is, by convention, not to be interpreted literally, and that its well established nonliteral meaning expresses a culturally significant concept. Consider the example, (3) *wáng yáng bǔ láo* 亡羊补牢. Members of the Chinese language-culture community know for sure that this is not a literal description about some accidental happening of losing sheep and mending the sheepfold, but a familiar idiomatic expression embodying a piece of institutionalized cultural wisdom, 'immediately taking measures against future problems after something has gone wrong', with the moral "it is never too late to mend". I would argue that even when the language users-in-the-culture are conscious about the literal interpretation of this expression, it will indeed serve to VITALIZE the nonliteral, idiomatic meaning, instead of causing any ambiguity. This leads us to the next consideration.

The second aspect of cultural knowledge concerns knowing how the nonliteral and literal meanings of the idiomatic expression are associated. Very often, for the sake of simplicity and convenience, the linguistic analyst is tempted to assert that the relationship between the nonliteral and the literal meanings of an idiomatic expression is by definition arbitrary, and that an idiomatic expression is necessarily ambiguous between its nonliteral and literal meanings (Weinreich 1969). This is related to a commonly held basic assumption that no part of an idiomatic expression contributes to the interpretation of the whole (Fraser 1970). Such a view about idiomaticity is, in my

opinion, too restricted by a purely linguistic consideration, namely, the part-whole relation is semantically noncompositional. For, beyond mere part-whole compositionality, if one looks at how the literal meaning, as a whole, is associated with the nonliteral meaning, certain nonarbitrariness of idiomaticity may be seen. That is, the language user-in-the-culture may know how the nonliteral-literal association of an idiomatic expression is culturally motivated. Then, the expression will not be impartially ambiguous between its literal and nonliteral meanings pending some decisive clues provided by specific linguistic and/or situational contexts. Instead, the knowledge and consciousness of the literal meaning and the cultural nonliteral-literal association serve to vitalize the nonliteral, idiomatic interpretation. Such cultural knowledge may reflect the genuine, original nonliteral-literal association, or may be the product of folk reconstruction of the association. Also, the association is diversely based, e.g. on conceptual metaphors, historical stories, customary practices, traditional beliefs, etc., and vary in degree of transparency (see He 1988). Idiosyncratic and irrelevant though it may appear to the linguistic analyst, the cultural knowledge about the nonliteral-literal association of an idiomatic expression is, for the language user-in-the-culture, definitely a prerequisite for the creative manipulation of its literal means to serve its nonliteral end.

Let us examine (2) *jiè dōng fēng* 借东风 (borrow east wind) 'take advantage of a favorable situation'. From the viewpoint of the pure linguistic analyst, (2) is strictly noncompositional: the actual meaning of the whole expression is by no means the composition of the meanings of the parts. However, the failure of part-whole composition does not entail that the meanings of the parts should be totally opaque or irrelevant, or that the literal and nonliteral relation should be wholly arbitrary. As a matter of fact, the nonliteral-literal association in (2) is based on a well known historical story: Zhuge Liang, a strategist during the "Three Kingdoms" period (168-265 A.D.), assumes the garb of a Taoist priest to summon the southeastern wind in a winter, which blows against the enemy's fleet of chained ships and so assists his fire attack to a complete success. The story gave rise to the expression, which evolved into an idiomatic expression with a generalized and abstract nonliteral meaning. It is precisely the cultural knowledge of the nonliteral-literal

association that vitalizes the idiomaticity of the expression. In other words, we can say that to the language user-in-the-culture, it is such cultural knowledge that renders the expression idiomatic, and it is such cultural knowledge that underlies his creative manipulation of the idiomatic expression.

The third aspect of cultural knowledge concerns knowing the contexts in which the idiomatic expression is understood and used. Context is central to language use. Three types of contexts can be roughly distinguished: the discourse context, the concrete situation, and the context of pertinent background experience and knowledge.

Let us first consider the discourse context. It is typically the case that the creative manipulation of an idiomatic expression takes place within a specific discourse context, the knowledge of which is indispensable for it to make sense. As an example, in an article (People's Daily, August 3, 1988) criticizing the malpractices of the government officials, the author introduces, at the very beginning, the idiomatic expression: (2) *jiè dōng fēng* 借东风 (borrow east wind) 'take advantage of a favorable situation'. However, he immediately specifies that it is to be taken in this particular case with a drastically modified nonliteral interpretation: 'take advantage of the official corrupt practices to make huge profits in business'. Then, with this special nonliteral meaning, (2) is creatively manipulated throughout the entire discourse, giving rise to expressions such as: (2a) *sòng dōng fēng* 送东风 (present east wind) 'promote the unhealthy trend', and (2b) *shā dōng fēng* 杀东风 (stop east wind) 'check the unhealthy trend'.

Situational context generally involves such concrete factors as time, place, participants, relevant activities and happenings. Its effect on the creative usage of idiomatic expressions is a fascinating question, which I will set aside for a more detailed investigation.

Let us look at the third type of context, namely, background experience and knowledge. In the most general sense, meaning presupposes fundamental cultural background knowledge about "the world" (see Searle 1978); in a more specific sense, we can conceive of the context of concrete cultural experiences within which an expression is understood and used (see Fillmore 1976). Although the nonliteral meaning of an idiomatic expression could be known in generalized terms, true understanding of its actual usage requires knowing the specific experiential context of its

application. For instance, the Chinese idiomatic expression (1) zǒu hòu mén 走后门 (enter-by back door) 'use one's influential connections to gain an objective' and its English counterpart "to pull strings" may be regarded as more or less equivalent. The experiential base of the understanding and use of each is, nevertheless, culturally different. We can further imagine that if one came from another society where such practices and the like had never been experienced, then it might be rather difficult for him actually to comprehend the message at all. It is also important to see that the creative manipulations of an idiomatic expression, as shown in (1a-c), are crucially based on the understanding of relevant real-life experiences.

Cognitive basis. My contention is that the phenomenon of creative idiomaticity in question is linguistically feasible because the creative power resides in the underlying cultural conceptual system, which is based on the physical and intellectual experiences (cumulative historicity) of the community, and which is given instrumental shape by the linguistic system. I would therefore briefly explore the cognitive basis for creative idiomaticity.

Take the idiomatic expression (5) shā jī gěi hóu kàn 杀鸡给猴看 (kill chicken for monkey see) 'punish one as a warning to others'. The relationship between its literal and nonliteral meanings is grammatically unpredictable. Therefore, to change the nonliteral meaning through altering the literal meaning by componential substitution is inexplicable, from a purely linguistic point of view.

Conceptually, evoked by the expression with its nonliteral meaning is an abstract concept of a social practice of punishing with the real intent to signal a warning to others. The expression with its literal meaning, on the other hand, conjures in the mind an image of slaughtering a chicken before the eyes of some monkey(s). Given as a prerequisite for creative usage, the cultural nonliteral-literal association is assumed to be known and to be brought to consciousness, which, in this case, is based on the following bits of cultural knowledge. Monkeys by nature dread the sight of blood; to train them, a chicken is slain right before their eyes, which will scare them into obedience and docility. Humans, like animals, need to be frightened sometimes. When a human wrongdoer is punished in public, all the others will learn a lesson. With such cultural knowledge, a conceptual association is established between the two concepts

(corresponding to the nonliteral and literal meanings of the idiomatic expression) in the cultural conceptual system (cf. White 1987). This conceptual association is indeed conventionalized by the very existence, in the culturally inherited terminological resources of the language-culture community, of the ready-made idiomatic expression, which embodies a bit of traditional cultural knowledge or wisdom of interpreting one type of experience in terms of another type, and which is commonly used to express one culturally significant notion in terms of another. It is precisely such established cultural conceptual association that allows: (a) the more abstract, propositional concept (that which is usually linked with the nonliteral meaning) to be reconceptualized in terms of, or grasped by means of, the more concrete, imagerial one (that which is usually linked with the literal meaning); and (b) the more abstract, propositional concept, to be elaborated or modified, when called for by the need of a real-life experience, through elaborating or modifying the more concrete, imagerial concept with details of knowledge drawn from the source of some more clearly delineated experience (see Quinn & Holland 1987, Lakoff & Kovecses 1987, and Lakoff & Johnson 1980). On the basis of such underlying conceptual association and as a result of an art of conceptual creativity, the literal composition can be deliberately manipulated linguistically as a means to achieve a special end of nonliteral interpretation.

In an article (People's Daily, December 19, 1988) directed at the political and economic crises in current Chinese society, the author creatively manipulates the idiomatic expression, (5) *shā jī gěi hóu kàn* 杀鸡给猴看 (kill chicken for monkey see) 'punish one as a warning to others', to elaborate on the theme "who should be punished to warn whom". In his opinion, the basic nonliteral meaning of (5), when applied to the real-life experiences, ought to be qualified, in order to accentuate the supremacy of punishing the corrupt and law-breaking officials as a warning to all other officials. To achieve the ends, in the nonliteral interpretation, of discriminating between the officials and the common people and of identifying the due target of punishment--the officials (rather than the masses) who have much more power and cause much greater destruction engaging in wrongdoings--the following folk beliefs are called upon to support the manipulation of the literal means of the expression. Monkeys are rare creatures of remarkable ability and character and chickens are mere

common animals of much less value. Thus the difference in value between monkeys and chickens can be used to stand for the contrast in social status between the officials and the people. Sacrificing the life of a chicken to discipline the monkeys is really unjust to the innocent chicken. To be fair, if the problem is the monkeys', a monkey ought to be punished instead of a chicken. Then a suggested modification of (5) is examined, which is in the form of (5a) shā hóu géi jǐ kàn 杀猴给鸡看 (kill monkey for chicken see) 'punish an official in front of the people', with hóu 猴 (monkey) now symbolizing the superior and the ruling, and jǐ 鸡 (chicken) the subordinate, and with the monkey being the executed and the chickens the witnesses. While the proper target of punishing is singled out, namely, the officials, no matter how high their authority and how great their power, the author still considers (5a) inadequate in respect to understanding the problems in the actual experiential context and specifying the due maneuver and purpose of the punishment. The punishment of an official, he argues, should not be done just as a show in front of the common people. It should be unequivocally aimed at all other officials, so that it will have substantial effects. Motivated by such consideration of what should be seen, said and done about reality, the author again explores the imagerial concept and its underlying folk experiences and ideas. If the monkey is killed only in front of the chickens, then the other monkeys will not be scared at all since they are not seeing the blood with their own eyes. If the purpose is truly to frighten the monkeys, let them be present and witness the execution of one of their peers. Hence the author strongly suggests a change of (5a) into (5b): shā hóu géi hóu kàn 杀猴给猴看 (kill monkey for monkey see) 'punish an official as a warning to all other officials'.

This paper has explored a unique phenomenon in imaginative idiomatic usage: the deliberate substitution of component(s) in the literal means of an idiomatic expression to achieve the end of a special nonliteral interpretation. The phenomenon, which I call creative idiomaticity, cannot be satisfactorily accounted for in terms of purely computational creativity or strictly noncompositional idiomaticity. Three aspects of cultural knowledge are prerequisite to such creative idiomatic usage, in particular, the knowledge of the nonliteral-literal association, and the knowledge of the experiential context in which the idiomatic expression is understood and used. I sug-

gest that, with the culturally inherited, ready-made idiomatic expression, the conceptual association is conventionally established between the more abstract, propositional concept and the more concrete, imagerial one (corresponding to the nonliteral and the literal meanings of the expression). This association in the cultural conceptual system allows the former to be reconceptualized in terms of the latter; it also allows the former to be elaborated or modified through elaborating or modifying the latter. The phenomenon of creative idiomaticity under discussion is linguistically feasible because the creative power resides in the underlying cultural conceptual system. It is deep-rooted in substantive cultural experience, originates through profound understanding and creative thinking, and is expressed with innovative talent.

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*Consciousness Condition on the Korean Reflexive Caki**

Ki-Sun Hong
Stanford University

1 Problems

Much discussion on Korean syntax has been centered on a reflexive *caki*, since it evades generalizations of most syntactic binding theories. Its characteristics have been generally assumed as in (1) (Lee 1973).

- (1) a. the domain of binding: *caki* may be bound either within the governing category or outside it.
- b. the nature of antecedents: *caki*, which refers to the third person only, is mostly bound by a grammatical subject, a topic, or the head of the relative clause.

However, recent studies (S.Cho 1985, Y.Cho 1985, Chang 1986, O'Grady 1987, among others) observe that (1b) is not the correct generalization as to the nature of antecedents. (2) through (5) demonstrate some crucial cases.

(2) violation of the subject condition

- a. John_i-i Mary_j-lul Chris_k-eykey caki-ui pang-eyse
 NOM ACC to ~~GEN~~ GEN room-in
 sokayha-yess-ta.
 introduce-past-VE
 'John_i introduced Mary_j to Chris_k in his_i/her_j room.'
- b. Na-nun John_i-ey uihay caki_i-ui hyung-eykey
 I-TP by GEN brother-to
 sokaytoi-ess-ta.
 be introduced-past-VE
 'I was introduced to his_i brother by John_i.'
- c. [caki_i-ka iki-n] kes-i John_i-ul kippukey
 NOM win-adjectival fact-NOM ACC please
 ha-yess-ta.
 make-past-VE
 'That he_i won pleased John_i.'

(3) violation of the c-command condition

- a. John_i-ui chayk-i caki_i-ui pang-ey iss-ta.
 GEN book-NOM GEN room-in be-VE
 'John's book is in his_i room.'
- b. [John_i-i iki-n] kes-i caki_i-ui umma-lul
 NOM win-adjectival fact-NOM GEN mother-ACC
 kippu-key ha-yess-ta.
 please-past-VE
 'That John_i won pleased his_i mother.'
- c. [John_i-i sa-n] chayk-un caki_i-ui tongsayng-ul
 NOM buy-adjectival book-TP GEN brother-for
 wuihan senmwul-i-ta.
 present-be-VE
 'The book that John_i bought is a present for his_i brother.'

(4) violation of the third person reference condition

- Ne_i-nun caki_i-ui il-ina hay.
 you-TP GEN business do
 'Mind your own business.'

(5) binding in a discourse situation

- a. John: Chris-ka [ney-ka ku party-ey ka-ass-ta]-tela.
 NOM you-NOM the party-to go-past-VE-said
 'Chris_i said that you went to the party.'
 Mary: anya, caki_i-ka ka-ass-e.
 no NOM go-past-VE
 'No, HE_i went.'
- b. (John_i is looking for a pen.)
 Mary (to herself): caki_i-ui ap-ey issnuntey.
 GEN in front of be
 '(The pen) is in front of him.'

(2) shows that non-subject arguments can bind *caki*, although subjects are most preferred. In (2a), any arguments within the governing category, i.e., *John*, *Mary*, *Chris*, bind *caki*. (2b) shows that the passive agent, *John*, can be the antecedent. In (2c), non-subject arguments outside the governing category can also be the antecedent. (3) demonstrates that the antecedent does not have to c-command *caki*. The possessor NP in (3a), an NP embedded in a nominal clause in (3b), and an NP in a relative clause in (3c) can freely antecede *caki*. (4) shows that the first or the second person also binds *caki* in some limited situations. (5a) shows that *caki* can find its antecedent in a previous discourse. Furthermore, the antecedent does not have to be expressed linguistically as (5b) demonstrates. *Caki* can refer to somebody in the actual situation. In sum, the set of potential binders of *caki* is not limited to a grammatical subject or a topic that c-commands it.

However, it is not the case that *caki* does not impose any condition on its antecedent, contrary to Manzini and Wexler (1987:422-23). There are cases where *caki* may not be bound. Furthermore, the set of its potential binders is affected

by preferential hierarchies. This paper attempts to show that the set of its binders is constrained primarily by the concept of *consciousness*.¹ Precisely speaking, *caki* is a referring term exclusively adopted when the speaker considers a person as a conscious entity. Once we show that *caki* is semantically/pragmatically constrained, it will naturally follow why syntactic approaches solely in terms of configurational generalizations fail to explain *caki* binding.

2 *Consciousness condition*

Let us consider subtle differences in grammaticality judgement in (6).

- (6) a. ??na-nun John_i-eykeyse [caki_i-ka cohun salam-i-lila]-nun
 I-TP from NOM good person-be-VE-COMP
 insang-ul pat-ass-ta.
 impression-ACC receive-past-VE
 'I received from John_i an impression that he_i might
 be a good person.'
- b. na-nun John_i-eykeyse [caki_i-ka Korea-eyse sa o-n]
 I-TP from NOM from buy come-adjetival
 senmwul-ul pat-ass-ta.
 present-ACC receive-past-VE
 'I received from John_i a present that he_i brought from Korea.'
- c. na-nun John_i-eykeyse [caki_i-ka iki-ess-ta]-nun mal-ul
 I-TP from NOM win-past-VE-COMP saying-ACC
 tul-ess-ta.
 hear-past-VE
 'I heard from John_i that he_i won.'

In (6), all the occurrences of *John* take the oblique function and bear a source thematic role. It is difficult, however, to bind *caki* in (6a) compared to (6b) and (6c). The subtle difference lies in whether *John* is conscious of the situation expressed in the reported speech. In (6b) and (6c), *John* assumes a high degree of agenthood and should be conscious of the situation. That is why we cannot say *I received from John a present that he brought from Korea*, but he did not know that he brought it from Korea or *I heard from John that he won*, but he did not know that he won. In contrast, in (6a), *John* does not play any agentive role to give the speaker a certain impression: the impression is based on the speaker's observation of *John*'s behavior. Hence, *John* cannot be said to be conscious of the situation. We can explain (7) in the same way.

- (7) a. ??Mary-ka John_i-eykey [caki_i-ka ci-ess-ta]-ko
 NOM to NOM lose-past-VE-COMP
 malha-yess-ta.
 say-past-VE
 'Mary told John_i that she/he_i lost.'

- b. Mary-ka John₂-eykey [caki₂-ka ci-ess-nun]-ci
 NOM to NOM lose-past-whether
 mwule po-ass-ta.
 ask try-past-VE
 'Mary asked John₂ whether she/he₂ lost.'
- c. Mary-ka John₂-eykey [caki₂-ka ci-ess-um]-ul
 NOM to NOM lose-past-nominal-ACC
 insiksiki-ess-ta.
 make realize-past-VE
 'Mary made John₂ realize that she/he₂ lost.'

In each example in (7), *John* is the indirect object and bears the goal role. It is difficult, however, to bind *caki* in (7a), compared to (7b) and (7c). In (7a), *John* is interpreted as a goal toward which a speech is addressed. Whether he actually understands the content of the reported speech or not does not matter. Accordingly, we may say *Mary told John that he lost, but he did not listen*. In contrast, the verb *ask* presupposes that *John* is in control of the information in (7b). In (7c), the main verb requires that *Mary's* reporting event should be followed by *John's* understanding of the reported speech. In other words, he should come to be in a condition of being in control of information. That is why we cannot say *Mary made John realize that he lost, but he did not listen*. This account in terms of consciousness applies to simple sentences as well.

- (8) a. ??Mary-ka John-ul caki₂-ui chayk-eyse chingchanha-yess-ta.
 NOM ACC GEN book-in praise-past-VE
 'Mary praised John₂ in her/his₂ book.'
- b. Mary-ka John-ul caki₂-ui pang-eyse manna-ass-ta.
 NOM ACC GEN room-in meet-past-VE
 'Mary met John₂ in her/his₂ room.'
- c. Mary-ka John-ul caki₂-ui pang-ulo tolie ponay-ass-ta.
 NOM ACC GEN room-to send back-past-VE
 'Mary sent John₂ to her/his₂ room (caused John to go).'

Although all the occurrences of *John* bear the same grammatical function and the same thematic role, there is a difference, depending on how much the speaker considers *John's* consciousness of the situation. In (8a), *John* is a patient which is simply affected by *Mary's* action. However, when the verb designates a reciprocal action in which both parties' consciousness or volition is equally considered or a causative action as in (8b) and (8c), the object is interpreted as playing a more agentive role. As we predict, *caki* binding is preferred in these cases.

We can find several pairs that exhibit the same effect in this respect. In (9), all the second cases share the characteristics that *John* may be conscious of the specific situation depicted in the sentence. In these cases, *caki* binding is preferred.

- (9) a. John-ey kwanhay malhacamyen : John-ui kwancemeyse pomyen
 about speaking GEN point of view seeing

- 'talking about John' : 'from John's point of view'
- b. John-eykey malhata : John-eykey malhay cwuta
 to say for say give the favor of
 'to tell John' : 'to give John the favor of telling'
- c. John-eykey malhata : John-eykey allita / kaluchita /
 to say to inform / teach /
 sangkisikita
 remind
 'to tell John' : 'to inform / teach / remind John'
- d. John-ey kwanhay uinonhata : John-kwa hamkkey uinonhata
 about discuss with discuss
 'to discuss about John' : 'to discuss with John'

So far, we have considered when *caki* binding is preferred, that is, the cases where the referent is considered to be conscious of the situation depicted in the reported speech. (10), however, shows that this generalization is too restricted.

- (10) a. na-nun John-eykey [caki-ka ci-n] kes-ul
 I-TP to NOM lose-adjectival fact-ACC
 sumki-ess-ta.
 conceal-past-VE
 'I concealed from John_i the fact that he_i lost.'
- b. John-ul wuihay caki-ui chinkwutul-i surprise party-lul
 for GEN friends-NOM ACC
 koyhoyk-cwung-i-ta.
 plan-in the middle-be-VE
 'For John_i, his_i friends are planning for a surprise party.'

In both situations given in (10), *John* does not actually know the specific situation expressed in the sentence, but antecedes *caki*. What matters here is not that the referent is actually conscious of the situation, but that the speaker perceives him as being potentially conscious. Whether or not to view a person as a potentially conscious entity depends on the speaker's discretion.

Then how can we formulate the precise condition for *caki* binding? I contend that *caki* is basically bound by an NP whose referent is considered as a conscious entity by the speaker. How to view a person in these terms varies greatly, depending on speakers and discourse contexts.² The referent does not have to be conscious of the specific situation depicted in the reported speech. However, if the lexical semantics of the predicates clearly requires that the referent should be conscious of that situation, it would explicitly indicate that he is a conscious being. Accordingly, *caki* binding is preferred in these cases as we have observed in (6) through (8).

This account in terms of *consciousness* provides us with correct generalizations about the antecedents of *caki*.³ First, *caki* is preferably bound by an NP taking an experiencer thematic role, since one cannot think or feel if he is not conscious. Secondly, among the NPs taking a goal or a patient role, the object of the lexical causatives is most salient. In such predicates as *feed*, *kill*, *send*, the object plays

In contrast, my account seeks to find semantic characteristics shared by all the binding cases of *caki*.

Let us then consider Kuno's account in terms of empathy. Kuno (1987:206) defines the term *empathy* as *the speaker's identification, which may vary in degree, with a person/thing that participates in the event or state that he describes in a sentence*. For example, consider the Japanese sentences in (12).

- (12) a. Taroo₂-wa zibun₂-ni ai-ni kita hito niwa, dare-demo
 TP self-to to see came people to whoever
 syokuzi-o dasu.
 meal ACC offer
 'Taroo₂ offers a meal to anybody who has come to see him.'
 b. *Taroo₂-wa zibun₂-ni ai-ni itta hito niwa, dare-demo
 went
 syokuzi-o dasu.
 'Taroo₂ offers a meal to anybody who has gone to see him.'

In (12), the person with whom the speaker empathizes becomes the deictic center. Others should come toward the deictic center, but cannot go there. The Japanese reflexive can be used with the verb *come* only, which clearly shows that its referent is the deictic center and is, furthermore, the person with whom the speaker empathizes. This analysis differs from my account in two respects. First, while my account simply says that the referent should be considered as conscious, the empathy account requires that the speaker should take the referent's point of view when describing a situation. However, we do not necessarily take one's point of view in order to consider him as conscious. We can retain our own point of view but still consider others as conscious. In other words, a simple sentence can have only one point of view, while many persons can be considered as conscious. Accordingly, when *caki* is used in the corresponding Korean sentences of (12), it can be used with both verbs, *come* and *go*. Secondly, while *consciousness* is basically a condition on the lexical semantics of the reflexive itself, the latter concerns the sentential level, that is, the relationship between the speaker and the reported situation.

4 Conclusion

In this paper, I have attempted to show that the notion of *consciousness* can account for *caki* binding. This analysis suggests that syntactic constraints do not play a significant role in *caki* binding. A broader principle stated in terms of *consciousness* predicts not only the configurational generalizations but also the exceptions to them.

5 Notes

* I am grateful to Joan Bresnan, Yo Matsumoto, K.P. Mohanan, and Peter Sells for their valuable comments and suggestions.

1. Im (1987) and Lee (1988) independently arrive at a similar conclusion. Im's analysis differs from mine in that it takes an interpretive approach: *caki* always requires its antecedent to be interpreted as being conscious of the situation. Peter Sells suggested to pursue the interpretive approach, which I could not incorporate in this paper. Differently from Im (1987) or my present argument, Lee considers only *actual* consciousness cases as acceptable. He does not accept *potential* consciousness cases, which I deal with in Section 2. Accordingly, Lee (1988:4-5) observes the following contrast:

- (1) a. ?nay-ka John-ul caki-cip kunche-eyse po-ass-ta.
 I-NOM ACC house near see-past-VE
 'I saw John near his house.'
 b. ?*nay-ka namwu twi-ey swumese John-ul caki-cip
 I-NOM tree behind hiding ACC house
 kunche-eyse po-ass-ta.
 near see-past-VE
 'Hiding behind a tree, I saw John near his house.'

2. This is the reason for wide idiolectal variations in the grammaticality judgments of native speakers on the use of *caki*.

3. In this paper, I have considered only the cases where non-subject arguments bind *caki*. It is still disputable whether the same account can apply to all the subject binding cases. I think two arguments support that the *subject* condition may be replaced by the *consciousness* condition. First, Keenan (1976:310) observes a difference in meaning between the active and passive of sentences containing some adverbs in English, which is equally applicable to Korean.

- (2) a. The police arrested John willingly.
 b. John was arrested by the police willingly.

In (2a), the police is the only willing participant in the given situation. But (2b) is ambiguous as to whether *John* or the police acted willingly. Such adverbs as *intentionally*, *volitionally*, *consciously* show the same subject orientation. This seems to show that the subject position always requires its referent be conscious/volitional to a certain degree. Secondly, the grammatical subjecthood is semantically constrained in Korean: the subject should be a controller of the sententially denoted action (Klaiman 1984).

- (3) a. na-nun sikan-ey ccoch-ki-ko iss-ta.
 I-TP time-by chase-passive be-VE
 'I am being chased by time'
 b. *sikan-i na-lul ccoch-ko iss-ta.
 time-NOM I-ACC chase be-VE
 'Time is chasing me.'

A controller of the sententially denoted action should be conscious of it. Accordingly, the subject should always be a conscious being in Korean. These two arguments suggest that the subject condition may be replaced by the *consciousness* condition.

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Displacement Features in Phonology

Grover Hudson
Michigan State University

Twenty years after The Sound Pattern of English (SPE) numerous unresolved controversies persist about the set of phonological features. Keating (1988: 7) in a recent survey says "the whole area of back consonant distinctions seems unclear". A number of revisions have been recently proposed, in work on autosegmental phonology and, particularly influentially, by Ladefoged and Halle (1988). The general result of these seems to be an introduction of new features with little emphasis on their replacement of other features. The present paper shows how a thorough revision of the feature-set follows from the extension of [coronal] to characterize front vowels. This suggests revisions of the role of [back] in sorting vowels and consonants. A general feature of backness expressing retraction of any of the three articulators fulfills much of the role of [tense], [ATR], [strident], and [distributed]. A new feature, [fronted], is justified as a result of these revisions, and this feature can fulfill the rest of the role of [strident] and [distributed], and [low] as well. The revised feature-set suggests a somewhat new understanding of phonological structure.

1. Revision of [coronal]

Consider [coronal], a feature said in SPE (304) to characterize only retroflex vowels, even though the articulator involved in it, "the blade of the tongue", can certainly be considered as important in shaping vowels as consonants. In fact, it has been previously proposed to characterize front vowels as [+coronal]. Wood (1982; discussed by Fischer-Jørgensen 1985) groups the front vowels less [æ] as "palatal" on acoustic evidence. Clements (1976), on the evidence of palatalizations, which often involve the coronalization of velars conditioned by front vowels, and, rarely, the similar coronalization of labials, proposed to extend [+coronal] to characterize the non-low front vowels and glides.

Problematic for this argument for a class of front vowels and glides and coronal consonants is that the most common such shift of place of articulation is the raising of already-coronal dentals or alveolars to alveopalatal. Clements notes that this change, when conditioned by only [i], as in Japanese, is to be seen as assimilation of [high]. It appears, indeed, from

the numerous palatalizations surveyed by Bhat (1978), that palatalization of velars by mid-front [e] is quite common but palatalization of dentals and alveolars is typically by [i].

Revised as suggested, [coronal] almost expresses the class of tongue-blade consonants and front vowels which was expressed through the Jakobsonian feature [+grave], neglected by SPE and for which considerable post-SPE evidence exists (Keating 1988: 4, and references there). A difference between [grave] and [coronal] as revised is that the latter excludes the low front vowel [æ]. As Clements (1976: 97) notes, the SPE (304) definition of [+coronal] as "with the blade of the tongue raised from the neutral position" is suitable for all the front vowels except [æ]. [-Grave] phones were said to employ "a smaller and more divided cavity" (Jakobson, Fant and Halle 1952: 30), which seems valid for coronal versus labial and velar consonants, but valid only for non-low front vowels. The evidence from palatalizations for a class of front vowels rarely involves low front [æ] (Bhat 1978).

As a characteristic of all front vowels, [+coronal] would fully duplicate the sorting of vowel-classes of [-back]. Excluding [æ], its comparison with [-back] will be different. As our initial hypothesis, then, let [+coronal] be defined as articulated with simply the front of the tongue in such a way that the feature will be relevant for vowels and will characterize the non-low front vowels as well as the dental, alveolar, and alveo-palatal consonants. See (1), which compares the basic five-vowel set as characterized with [coronal] so employed, versus with [back] as in SPE.

(1) 5-vowel set characterized by [coronal] and [back]

	i	e	a	o	u		i	e	a	o	u
coronal	+	+	-	-	-	back	-	-	+	+	+
high	+	-	-	-	+	high	+	-	-	-	+
round	-	-	-	+	+	round	-	-	-	+	+

Note the symmetry of this prevalent vowel-set as characterized with [coronal], that the pairs of mid, high, front and back vowels are parallel, and that [a] rather than [e] is unmarked in the sense, which could certainly not be insisted on, of lacking plus-values. We will see below that the correlation of markedness in phones with the number of their plus-values for distinctive features is characteristic of the revised feature-set proposed here.

Revising [coronal] for use with vowels leaves [anterior] as the major place-feature only for conso-

nants, and it may be an argument for this revision that it further promotes the replacement of that problematic feature by [labial]. The revised [coronal] provides the ready expression of a class of dental-alveolar consonants and non-low front vowels, for which, frankly, the evidence has never been overwhelming. Also, we have lost the SPE characterization of retroflex vowels, which must be regained below. As revised, [+coronal] characterizes a set of vowels already characterized as [-back, -low]. Perhaps, therefore, the main contribution of the hypothesis of coronal vowels is to raise questions about the role of these features, particularly [back].

2. Reconsideration of [back]

An oddity of the SPE [+back] vowels is the inclusion in this class of the central as well as traditionally recognized "back" vowels. Indeed, the body of the tongue in [ɨ], [ʉ] and [a] only came to be considered retracted in 1968. Extending [+coronal] for use with non-low front vowels makes [back] redundant in characterizing most vowel systems, in which the [+back, -low] vowels are distinct by being [+round]. Stevens (1983: 258) says that, acoustically, roundness rather than backness is what distinguishes the English high vowels [i] and [u]. With [coronal] used as suggested, as well as with SPE's [back], the vowels of the most common three, four and six-vowel sets, as well as of the five-vowel set of (1) above (120 of 173 languages in the corpus of Crothers (1978: 105)), are fully distinct with also [high] and [round]. See (2).

(2)	i	a	u		i	ɛ	a	u		i	e	ɨ	a	o	u
coronal	+	-	-		+	+	-	-		+	+	-	-	-	-
high	+	-	+		+	-	-	+		+	-	+	-	-	+
round										-	-	-	-	+	+

The ready expression of the common contrast of low vowels, [æ] versus [a] (though not in these common sets), is lost without [back], and must be regained below. However, the basic replaceability of [back] by [coronal] in vowels suggests that we rethink the role of [back] in characterizing consonants also.

In fact, [back] is as unnecessary in the most frequent consonant sets as it is, with [coronal] employed as suggested, in the most frequent vowel sets. Five consonant places of articulation are sorted by [anterior] and [coronal] plus either [high] or [back]. If [labial] is used instead of [anterior], [coronal] and

[back] are inadequate to distinguish [t] and [č], but [coronal] and [high] suffice. [High] is apparently needed in sorting vowels, and, given [high], [back] is redundant in sorting these five places of articulation. See (3).

(3)	p	t	č	k	?		p	t	č	k	?
anterior	+	+	-	-	-	anterior	+	+	-	-	-
coronal	-	+	+	-	-	coronal	-	+	+	-	-
back	-	-	-	+	-	high	-	-	+	+	-
	p	t	č	k	?		p	t	č	k	?
labial	+	-	-	-	-	labial	+	-	-	-	-
coronal	-	+	+	-	-	coronal	-	+	+	-	-
back	-	-	-	+	-	high	-	-	+	+	-

There is further evidence that [back] has been misconstrued in phonological-feature theory. Recall the definition of [back] as given in SPE (305): "Back sounds are produced by retracting the body of the tongue from the neutral position". In SPE, velars are [+back], but the briefest consideration of the actual position of the tongue in the articulation of velars raises doubt. If introspection about this isn't enough, see the tongue-position diagrams presented by Ladefoged 1975 (50, 138), who says (208) of velarization that this "involves raising the back of the tongue," but not that it involves retraction. Ohala (1983: 199) mentions research by Houde (1968) that velar stops in English actually "...have a forward-moving component to them". Retraction of the tongue-body certainly occurs in uvulars and pharyngeals, but not in velars.

As reasonable as the [-back] value of velars is the [+high] value of uvulars, also contrary to the sorting of back consonants by SPE features (p. 305), shown in (4):

(4)	velars	uvulars	pharyngeals	laryngeals
high	+	-	-	-
back	+	+	+	-
low	-	-	+	-

Ladefoged (1975: 305) says that "uvular sounds are made by raising the back of the tongue toward the uvula". Keating (1988: 8) says that "phonetically, it would seem that velars and uvulars are really on a diagonal, not a vertical line, with uvulars being both lower and

backer than velars". She mentions Kirghiz, in which "uvulars are said to alternate with velars as a function of vowel backness, not vowel height". If uvulars are, indeed, both [+back] and [+high], the four "back" places of articulation can be fully sorted by using just [high] and the revised [back], without need for [low], as in (5).

(5)	velar	uvular	pharyngeal	laryngeal
high	+	+	-	-
"back"	-	+	+	-

A problem with (5) is that the [+high, -back] characterization of velars makes them identical to palatals, and this contrast will have to be regained below. An argument for the identical backness of velars and uvulars, the claimed neutralization of vowel-height in favor of [-high] before putative [-high] uvulars in Eskimo (Kenstowicz and Kisseberth 1979: 250) could be seen as [-high] before [+back], which is not unreasonable.

3. Further revision of [back]

Two other features characterizing tongue displacements are [+tense], which in vowels has been employed to characterize the relatively fronted members of the pairs [i/I], [e/ɛ], [o/ɔ] and [u/U], and [+ATR], which characterizes similar pairs. With [coronal] employed in characterizing vowels as suggested, a revised "[back]" can reasonably and usefully be employed to characterize such pairs as in (6). The specific phon-

(6)	i	I	e	ɛ	a	ɔ	o	U	u
coronal	+	+	+	+	-	-	-	-	-
high	+	+	-	-	-	-	-	+	+
round	-	-	-	-	-	+	+	+	+
"back"	-	+	-	+	-	+	-	+	-

etic nature of these vowels certainly varies from language to language, but it is uncontroversial that relative tongue-body retraction is partly involved. Lindau (1978: 558) has argued that the [+tense] vowels of English and German are "peripheral" rather than "advanced", and if this is so, backness would correlate with laxness in the front vowels but with tenseness in the round back vowels, as in (7), below.

Now if retraction of the back of the tongue plays any such role in speech, it would be odd if similar re-

(7)	i	I	e	ɛ	a	ɔ	o	U	u
"back"	-	+	-	+	-	-	+	-	+

traction played no role in connection with the other two articulators, the lips and front of the tongue. [Anterior], besides creating a controversial class of labials and dental-alveolars, has played such a role in relation to the tongue blade, but relatively redundantly, since [-anterior] coronals differ from [+anterior] coronals by [+high] also. [Distributed] also distinguishes coronal consonants with different degrees of retraction. Furthermore, [strident] and/or [distributed] have played such a role in relation to the lower lip which, retracted, creates a [+strident] and [-distributed] phone. Since these retractions of the tongue body, tongue blade, and lower lip appear to be mutually exclusive, it is reasonable to let the retraction feature characterize all three articulators, as [strident] and [distributed] characterize articulatory differences in all three.

In labials, retraction describes the labio-dentals, which involve backing of the lower lip. In coronals, retraction describes the retroflexed phones, which Ladefoged (1975: 139) says "are made by curling the tip of the tongue up and back". Retroflexion of [+coronal] consonants before retroflex vowels may be neatly seen as assimilation of [+back]. Further evidence for [back] in this role, when it has already been employed in the distinction of pairs such [i/I], [u/U], is the (apparent) absence of contrast of the latter sort between retroflex vowels. In American English, for example, the tense/lax distinction is merged before /r/. Some retroflex vowels are apparently not produced by retraction of the blade of the tongue; but these have tongue-root retraction (Lindau 1978: 55).

These distinctions of relative retraction in the lower lip and tongue blade are collected in (8), but in order to avoid confusion with the traditional use of [back], which was for retraction of just the tongue root, the revised, extended, retraction feature will be termed "[backed]".

(8)	m	ɱ	n	ɳ		ə	ɤ
coronal	-	-	+	+		-	-
backed	-	+	-	+		-	+

[Backed] also seems appropriate for capturing the distinction between the four high vowels of Swedish and

Norwegian. Swedish [ɤ] is described as "inrounded" by Lass (1984: 88), and by Lindau (1978: 548) as lacking the lip protrusion which characterizes [u]. Norwegian according to Lindau (1978: 547) "differs from Swedish ...in that the vowels /y ɤ u/ have the same lip position, as well as the same value of the feature High"; see (9). Language specific phonetic interpretation would have to relate [backed] in Norwegian [u] to the tongue-body (9a) and in Swedish [ɤ] (9b) to the lips.

(9)	a.	i	y	ɤ	u	b.	i	y	ɤ	u
	coronal	+	+	-	-		+	+	+	-
	high	+	+	+	+		+	+	+	+
	backed	-	-	-	+		-	-	+	-
	round	-	+	+	+		-	+	+	+

[Backed] also appropriately distinguishes the retroflex from the other [+coronal] liquid, the lateral, (whose velar(ized) allophone like the other velars, would not be [-backed]). Thus it is unnecessary to employ [lateral] to distinguish the two liquids, nor is [continuant] needed to make the distinction, defining [-continuant] as having "blockage of air flow *past the primary stricture*", as suggested in SPE (318). In fact, given the potential for syllabicity of the liquids, it seems reasonable that both [r] and [l] be considered to share continuantness with the glides. With [backed], the liquids and glides can be fully sorted by place of articulation as in (10).

(10)		l	r	y	w
	coronal	+	+	+	-
	high	-	-	+	+
	backed	-	+	-	-

4. Proposal of [fronted]

Our initial hypothesis to extend the use of [coronal] led to a revision of [back], and this feature, as revised, replaced some of the roles of [tense], [ATR], [strident] and/or [distributed], with no necessity for additional features, and with coverage of some previously problematic contrasts. In fact, it would be odd, given the flexibility of the articulators, if corresponding to [+backed] there was no [+fronted], a feature defined as expressing the relative fronting of any of the three articulators; cf. [+ATR], with fronted tongue root. The cost of adding this new feature will be more than offset by its fulfilment of the rest of the role

of [strident] in distinguishing such fricative pairs as [θ/s] (in which the former has relative fronting of the blade of the tongue), in distinguishing palatals and velars (in which the former has relative fronting of the body of the tongue, and whose SPE sorting is prevented if velars are [-backed], as was suggested above), and in distinguishing [æ] from central [a] (in which also the former has relative fronting of the body of the tongue). These distinctions are shown in (11).

(11)		θ	s		c	k		æ	a
	fronted	+	-		+	-		+	-

Here the palatals are seen as non-coronal, fronted velars, consistent with the SPE analysis, and inconsistent with their grouping with coronals, as by Jakobsonian [grave]. In the distinction of [æ] vs. [a] (the latter a back rather than central vowel), [+backed] may distinctively characterize the latter, rather than [+fronted] the former.

Palatalization of velars by front vowels, as in Turkish, is in SPE features assimilation of [-back]. This characterization is lost in the present proposal, in which instead this would be assimilation of [+fronted], redundant with [+coronal] in the front vowels. Palatalization of velars by [æ] would also be characterizable as assimilation of [+fronted].

With [fronted], English epenthesis with the sibilant suffixes (in *kisses*, *catches* etc.) is in the environment (12)a rather than (12)b. Four features have to

(12) a.	[-sonorant +continuant +coronal -fronted]	___	[-sonorant +continuant +coronal -fronted]
---------	----------------------------------------------------	-----	----------------------------------------------------

b. [+strident] ___ [+strident]

be mentioned rather than one, but the efficiency of a feature like [strident] in such a rule is entirely owed to its lack of generality, and is offset by its relative uselessness elsewhere in the grammar of English and in other languages. Though it is of questionable significance, notice that since the English coronal stops are redundantly [-fronted], rule (12)a unlike (12)b can be generalized to handle the epenthesis with the past tense suffix (in *waited*, *waded* etc.) just by changing the value of [continuant] to α. The hypothetical role of articulator backness in the phonology of such cases in no way denies acoustic stri-

dency a primary role in phonetic distinctness.

Since [strident] is only relevant for fricatives, the four-way contrast among coronal stops, nasals and laterals in Dravidian and some Australian languages (Keating 1988: 5) requires [distributed] in the SPE feature-set in addition to [strident]. These four stop contrasts are fully sorted as in (13) by the combination of [backed] and [fronted] with [high], which for parallelism with the other two displacement features I will term "[raised]". The characterizations of (13), however, unlike those with [distributed], provide no understanding of why, if Keating (1988: 5) is right, alveolars and retroflexes (apical, [+distributed]) and dentals and palatals (laminal, [-distributed]) should "often pattern together".

(13)		t̤	t	t̚	č
	coronal	+	+	+	+
	raised	-	-	-	+
	backed	-	-	+	-
	fronted	+	-	-	-

The feature [low] turns out to be largely unnecessary in the resulting system. In sorting basic consonant places, [low] is redundant with backness playing the role we saw in (5). In vowels, [low] has always been redundant in sets with only [a] of the low vowels where the other "back" or [-coronal] vowels are [+round]. When two low vowels must be distinguished, either [fronted] or [backed] will suffice, depending on which is the more restricted. In languages where these two must be distinguished from non-low [ə], both [fronted] and [backed] will be needed but will suffice. These possibilities are shown in (14).

(14)		e	æ	a	o		e	æ	a	o		æ	ə	a
	coronal	+	-	-	-		+	-	-	-		-	-	-
	backed	-	-	-	-		-	-	+	-		-	-	+
	fronted	-	+	-	-		-	-	-	-		+	-	-
	round	-	-	-	+		-	-	-	+				

5. The resulting system

The resulting system of two articulator features and three displacement features is considerably more efficient than the SPE features, as seen in the matrix (15) of eleven places of articulation of consonants and the eleven vowels of English. Seven or eight SPE features would be needed to express the same contrasts.

(15) Eleven consonant places and eleven vowels sorted by two articulator & three displacement features

	p	f	θ	t	t̚	č	c	k	q	ħ	ʔ		i	I	e	ɛ	æ	ə	a	ɔ	o	U	u
labial	+	+	-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	+	+	+	+
coronal	-	-	+	+	+	+	-	-	-	-	-		+	+	+	+	-	-	-	-	-	-	-
raised	-	-	-	-	-	+	+	+	+	-	-		+	+	-	-	-	-	-	-	-	+	+
backed	-	+	-	-	+	-	-	-	+	+	-		-	+	-	+	-	-	+	+	-	+	-
fronted	-	-	+	-	-	-	+	-	-	-	-		-	-	-	-	+	-	-	-	-	-	-

Place of articulation is unexpressed directly. The five features express the employment of three articulators ([+labial], [+coronal], and [-labial, -coronal]) and their possible displacements ([raised], [backed], and [fronted]). [Backed] and [fronted] are mutually exclusive. [Raised] is irrelevant for labials. One of the three displacements is required in conjunction with the tongue-body articulator; [+raised, -backed] (velar) would be unmarked. Negative values for [labial], [coronal], and for the three displacement features defines laryngeal articulation.

In addition to these and the major-class features, other features will certainly be required for some languages (tenseness, laryngeal features, etc.). But these five features express a natural logic of articulation: languages *do* employ three articulators, plus in their absence laryngeal articulation, and these *do* have the three possibilities of displacement described. It seems reasonable and, I hope to have shown, useful for the feature system to express these.

Though they appear to reduce the number of features, the displacement features nevertheless allow many possibilities of analysis. It was mentioned that [+backed] [u] might be interpreted as having backed lips in Swedish but a backed tongue-body in Norwegian. It was suggested that of /æ/ and /a/ the former might be considered [+fronted] in some languages, but the latter [+backed] in others. Retraction in retroflexes may be of the blade or back of the tongue. Vowel pairs like [i]/[I] could reflect either backing or fronting, depending on markedness.

The three displacement features have characteristics of the neglected Jakobsonian features [flat] and [sharp], which, as described by Ohala (1985: 224), each have "discontinuous articulatory correlates", and generally are not used distinctively until near-maximal use is made of the primary features. As seen in (15), phones assumed to be more marked generally have more plus-values --those of the three displacement features.

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Contextual Operators: *respective*, *respectively*, and *vice versa*

Paul Kay
University of California at Berkeley

0. Introduction: contextual operators

The special kinds of meaning properties that sentences acquire in scalar contexts have been extensively studied by Horn, Ducrot, Anscombe, Fauconnier and more recently by Fillmore, Kay and O'Connor (1988) with respect to sentences containing the expression *let alone* and by Kay (1988) with respect to sentences containing the word *even*. The papers just cited argue that certain linguistic items, in particular *let alone* and *even*, contain as part of their semantic content instructions to the addressee to construct the interpretation of any utterance that contains them in conformity with stipulated contextual parameters. More specifically, *let alone* and *even* require the interpreter to construe the context as scalar and provide the interpreter with a concrete plan for integrating the semantic information presented in the sentence with the scalar information presupposed to obtain in the context. Scalar operators in effect say to the addressee: 'Construe the context of interpretation for the present utterance as containing a set of interrelated propositions conforming to a scalar model (elsewhere defined) and assign to the proposition(s) asserted or presupposed by the present utterance the following position(s) ... in that structure' (where what fills the ... will depend on the particular scalar operator in question).

The scalar operators discussed in the papers referred to above form a subclass of what we may call **contextual operators**. These are lexical items or grammatical constructions whose semantic value consists, at least in part, of instructions to find in, or impute to, the context a certain kind of information structure and to locate the information presented by the sentence within that information structure in a specified way.¹ The present paper deals with another group of contextual operators, which are, for the most part, not scalar, namely: *respective*, *respectively* and *vice versa*. While it is possible to argue that such scalar operators as *let alone* and *even* fail to affect truth conditions while nonetheless affecting so-called conventional implicature aspects of initial interpretation -- though this point depends on the evaluation of some subtle examples -- the contextual operators we are concerned with here unquestionably affect truth conditions, however this notion may be construed.

1. *Respective* versus *respectively*

It is generally known that *respective* and *respectively* share a common semantic property, roughly that of providing or evoking a mapping between the members of two sets (McCawley 1976). In the paradigmatic examples, a predicate is distributed over the pairings of the mapping attributable to *respective* or *respectively*. Thus the (b) versions of (1) and (2) provide glosses of the (a) versions.

- (1-a) Mr. Smith and Mr. Jones love Mrs. Jones and Mrs. Smith, respectively.
- (1-b) Mr. Smith loves Mrs. Jones and Mr. Jones loves Mrs. Smith.
- (2-a) Mr. Smith and Mr. Jones love their respective wives.
- (2-b) Mr. Smith loves Mrs. Smith and Mr. Jones loves Mrs. Jones.

The distributed predicate is in each case LOVE. I believe it is obvious that *respective* and *respectively* affect the conditions under which these sentences will be judged true.

There is, however, a semantic difference between *respective* and *respectively* which to my knowledge has not been previously noted and whose consideration will lead us to conclude that these are indeed contextual operators. Note as a preliminary that the expression 'the three respective highest scores' is not syntactically ill formed, as illustrated in

- (3) On the syntax, semantics and phonology exams, the three respective highest scores were received by transfer students.

We now need to explain the distributional contrasts highlighted by **bold-face** in the following three examples:

- (4-a) The three best students received the three highest scores, **respectively**.
- (4-b) *The three best students received the three **respective** highest scores.
- (5-a) John and Jack received the longest and the shortest comments from the teacher, **respectively**.
- (5-b) *John and Jack received the longest and the shortest **respective** comments from the teacher.
- (6-a) *The students were pleased by their scores, **respectively**.
- (6-b) The students were pleased by their **respective** scores.

Our problem is to discover the property shared by (4) and (5) and absent in (6) that permits *respectively* and prohibits *respective* in the former two cases (that is, (4) and (5)) while prohibiting *respectively* and permitting *respective* in the latter, (6). This property cannot reside simply in the presence or absence of conjoined NPs: neither (4) nor (6) contains a conjoined NP; the former accepts *respectively* and rejects *respective* while the

latter accepts *respective* and rejects *respectively*.

I propose that the controlling generalization is the following:

- (7) *Respectively* can denote or evoke a mapping between the denotata of two plural or conjoined constituents iff that mapping is achieved via independent linear rankings of the two constituents.

Respective can denote or evoke a mapping between the denotata of two plural or conjoined constituents iff that mapping is not achieved via independent linear rankings of the two constituents.²

In (4) each of the plural, superlative NPs, *the three best students* and *the three highest scores*, provides an independent linear ranking of its members. *Respectively* then maps the top student to the top score, the second best student to the second best score, and so on. In (6) neither of the NPs *the students* nor *their scores* provides on its own a ranking of its members. The mapping from students to scores is achieved, not by lining up the corresponding members of independently supplied rankings of students and scores, but by an entirely different process, one which depends crucially on our general knowledge that exam scores are given out one to a student.

Now, what about (5)? According to generalization (7), since (5) permits *respectively* and prohibits *respective* the two semantically plural NPs *John and Jack* and *the longest and the shortest comments* should both satisfy the independent linear ranking provision of (7). And so they do if we interpret the sequence of mention of the conjuncts in a conjoined constituent as one way of providing the linear ranking of a constituent called for in (7). The reference in (7) to the linear ranking of a constituent, rather than to the linear ranking of the denotata of a constituent, was intentional. With regard to selection of *respectively*, a constituent may be linearly ranked either by a notional ranking of its denotata or by the sequence of mention of its conjuncts. *Respectively* is thus appreciably less finicky than any self-respecting linguist would be, blissfully confounding under a single, abstract criterion of linear ranking a meaning relation over the content of a constituent and a metalinguistic relation over the form of a constituent.

2. Further predictions

A conjoined constituent is always susceptible of a linear ordering interpretation, since the order of mention of its conjuncts is always available for this interpretive purpose. Thus, when a conjoined NP co-occurs with a non-conjoined NP accorded an independent linear ordering

interpretation we should find *respectively*. This prediction is confirmed.

- (8) The two prettiest girls in the class dated the captain of the football team and the captain of the basketball team, *respectively*.
- (9) Mary and Sue dated the two biggest macho jerks in the class, *respectively*.

We see in (8) and (9) that in the case of *respectively* one ranking can come from order of mention and another from construal. Relative syntactic position does not matter: in (8) the conjoined NP is the object and in (9) the subject.

Another consequence of (7) is that conjoined NPs need not, although, of course, they often do, select *respectively* rather than *respective*. That is, conjoined NPs may be interpreted semantically simply as plurals, thus under contextually appropriate conditions triggering *respective* rather than *respectively*.

- (10-a) On the syntax, phonology and morphology exams, the three respective highest scores were received by students specializing in semantics.
- (10-b) *On the syntax, phonology and morphology exams, the three highest scores were received by students specializing in semantics, *respectively*.³

Note that *respective* in (10-a) maps exam subjects to highest scores. Neither of the NPs *the syntax, phonology and morphology exams* nor *the three highest scores* receives an **internal** ranking. Despite the fact that one of the NPs subject to the R-mapping is conjoined we find *respective* and not *respectively*. Example (10) may then be contrasted with (8) and (9), in which a single conjoined NP accompanies the choice of *respectively*. Now, comparing (5) with (11), we see that a sentence containing two conjoined NPs can likewise accept either *respective* or *respectively* depending on the construal process given in (7).

- (11-a) The husbands and lovers were writing letters to their respective wives and sweethearts.
- (11-b) Every officer and enlisted man wrote a letter to his respective wife or sweetheart.

Occurrence with NPs of *respective* versus *respectively* is not determined by presence or absence of conjunction; it is determined by the generalization about construal given in (7).

Limitations of time prohibit our considering examples in which *respectively* occurs with non-nominal conjoined constituents, other than to note their existence as in (12) through (15)⁴ and to mention that all of

them call on the order-of-mention interpretive strategy.

- (12) John and Mary sang and danced, respectively.
- (13) The three top prize winners sang, danced and played the kazoo, respectively.
- (14) John's and Mary's manuscripts were competent and brilliant, respectively.
- (15) John and Mary were furious, volubly and icily, respectively.

Respectively thus confounds constituents that can be considered ranked because of the interpretation of what they denote with constituents that can be considered ranked because of the order in which their conjuncts are uttered. A notion of context must not only be employed to explain the function of *respectively* but 'context' must here be construed broadly enough theoretically to comprehend both the interpretation of the content of a phrase and the order in which elements of its surface manifestation are uttered.

3. Independent evidence for the contextual character of the R-words

If we leave aside the order-of-mention basis of *respectively* and consider only those uses of *respectively* based on the *notional* ordering of a semantic plurality of elements, we can see that this also is context dependent. For example, in a horse race to 'finish in the money' means either to win the race and pay the most money, or to come in second and potentially pay a smaller amount of money or, lastly, to come in third and potentially pay a yet smaller amount of money. For those who know, or have just learned, these non-linguistic facts, example (16) is immediately acceptable; example (17) is not acceptable for anyone.

- (16) The horses finishing in the money were Shadrach, Meshach and Abed-nego, respectively.
- (17) *The horses finishing out of the money were Shadrach, Meshach and Abed-nego, respectively.

The acceptability difference between (16) and (17) arises from the fact that the background knowledge about what finishing in the money is permits, as specified in generalization (7), a notional ordering of the members of the subject NP in (16), but not in (17). This ordered set is then mapped by *respectively* to the denotata of the names of the three horses given in the nominal complement phrase, themselves ordered by the order-of-mention strategy.

4. *Respective*

Not much needs to be said to establish *respective* as a contextual operator. *Respective* very frequently, although not invariably, occurs in a NP whose determiner is possessive. I will take as established that the genitive construction (when the head noun is non-relational) itself has the contextual property (See Kay and Zimmer 1976). Thus while (18-a), with a relational head, appeals directly to the parental relation, (18-b), with a non-relational head, can evoke any of the relations indicated in (19) according as the context dictates.

(18-a) John's mother

(18-b) John's book

(19-a) John owns a book.

(19-b) John wrote a book.

(19-c) John illustrated a book.

(19-d) John intends one day to write/own/illustrate/... a book

(19-e) John has a book in his hand at the moment.

And so on.

Inserting *respective* in a possessively determined NP does nothing to reduce its contextuality. Thus the relation of John and Mary to the books mentioned in (20) has all the possibilities indicated in (19).

(20) John and Mary were worrying about their respective books.⁵

Similarly, in (21) the relation between each philatelist and his associated congressman will be different in the case in which the philatelists are congressional aides from the case in which they are ordinary citizens.

(21) The philatelists admired their respective congressmen.

Similar examples may be multiplied *ad libitum*.

Although not directly relevant to the issue of *respective* as a contextual operator, it should nonetheless be noted in passing that *respective* provides the principal source of examples in which the R-mapping is **not** employed in the service of distributing a predicate over the pairs of the mapping, as happens to be the case in all the examples we have considered so far and, to my knowledge, all of the examples that have been treated in the literature.

(22) Twelve generals and admirals from the United States, the Soviet Union and their respective allies ... met for two days of discussions.⁶

Note that no predicate is distributed over the mapping from the two countries to the sets of their respective allies. *Respective* is frequently

employed in this way, simply to indicate a plurality of objects which one can construct by increasing the size of a smaller set of objects through adding to it the image of each member under the R-mapping. Thus,

- (23) Two rock stars and their respective entourages can fill a small stadium.

5. *Vice versa*

There is a great deal to be said about *vice versa* and not enough time to say it in. But to make the main point of this paper with regard to *vice versa*, namely that this also is a contextual operator, two brief observations will suffice. The first is that *vice versa* can operate parasitically upon an R-mapping. Thus, if we add *vice versa* to the ambiguous *respective* sentence (21), the ambiguity is preserved.

- (24) The philatelists admired their respective congressmen, and vice versa.

That is, the congressmen who admire the philatelists will be either their elected representatives or their employers according as the context has already fixed the philatelists who admire certain congressmen to be the constituents or the employees of those congressmen. What gets 'interchanged' by *vice versa* is neither a pair of noun phrases (Fraser 1970) nor a pair of 'elements of [a] clause' (McCawley 1970), nor even the denotata of these. Rather, the items that *vice versa* interchanges are a pair of participants in the scene that is evoked by the interpretation of a sentence uttered in a particular context. The output of the contextually dependent construal process that yields an interpretation for (21) serves as input to the construal process that yields the interpretation of (24).

Since *vice versa* operates, not directly on the syntactic or semantic representation of sentential constituents, but rather on the participants in the contextually dependent interpretation of the utterance, ambiguities that are resolved only by extra-grammatical, context sensitive processes must be resolved before *vice versa* can apply. One such ambiguity is that between a bound variable reading of a pronoun and a simple anaphoric reading, as illustrated in the following.

- (25) Each of the men called his supervisor.

In an utterance of (25) only the context can decide whether the men are reported each to have called his own supervisor (bound variable reading) or, alternatively, each to have called the supervisor of some other man. call him Max, who has been previously mentioned in the discourse.

If we add *vice versa* to (25), as in (26-a), the interpreter must decide which reading to give to (25) before assigning to the interpretation of the semantic clause induced by *vice versa* either something glossable along the

lines of (26-b) or something glossable along the lines of (26-c).

(26-a) Each of the men called his supervisor and vice versa.

(26-b) And each man received a call from his own supervisor.

(26-c) And each man received a call from Max's supervisor.

Analogously, when *vice versa* is added to a sentence containing an ambiguity based on anaphora of sense versus anaphora of reference, that ambiguity must be resolved by the context of utterance in order for an interpretation to be given to *vice versa*.

(27) The Joneses don't like their next door neighbors but we do, and vice versa.

In (27), the proposition induced by *vice versa* will be understood as (28-a) rather than (28-b) just in case the zero anaphor in (27) is contextually resolved in favor of anaphora of sense rather than anaphora of reference.

(28-a) Our next door neighbors like us.

(28-b) The Jones's next door neighbors like us.

That is, whatever process(es) of pragmatic interpretation settle on the sloppy or standard identity interpretation of *we do* in a particular utterance of (27) will determine the participants understood to like us in the semantic clause induced by *vice versa*.

As we saw earlier with *respective* and *respectively*, *vice versa* is a contextual operator.

6. Conclusion

Neither *respective*, *respectively* nor *vice versa* is indexical. None of these expressions points to an aspect of, or a participant in, the speech situation in the way that constitutes the defining property of those expression types, such as personal pronouns or tenses, that are called 'indexicals.' The kind of extra-linguistic information to which contextual operators are sensitive is open-ended, unlike the reference of the closed-class indexicals. The latter locate an utterance in a fixed and bounded, if perhaps extensive, coordinate system, but contextual operators do not function within any pre-existing coordinate system: they can marshal the full productive capacity of language to specify that part of the context in which the addressee is to seek the information that they instruct him to incorporate into his interpretation of the utterance.

Nevertheless, the presence in a sentence S of a contextual operator such as *respective*, *respectively* or *vice versa* will affect the conditions under which we judge S true. The existence of such non-indexical, contextual operators establishes that truth judgments can depend on context in non-indexical ways. Thus, truth conditions are not properties of

sentences, even indexically fleshed out sentences, but of situated utterances. Consequently, truth conditions cannot be theoretically prior to sentential content but rather the other way round: if part of the literal content of a sentence *S* is a set of instructions that leads the interpreter of an utterance of *S* to interrogate the context to discover, amongst other things, what conditions will make that utterance of *S* true, then it must be the content of *S* that determines its truth conditions, not the truth conditions of *S* that determine its content.

Richard Montague's useful dictum notwithstanding, there does appear to be at least one significant theoretical difference between natural and formal languages.⁷ Natural languages have evolved within their contexts of use in such a way that their grammars have developed the capacity to provide, as part of the meaning of a sentence, a set of instructions for integrating contextual information into the interpretation of each utterance of that sentence. Formal languages, on the other hand, have evolved in an environment in which such a capability would have been a drawback. It is therefore not surprising that formal languages do not contain the contextual property of natural languages. Contextuality in natural languages is, as we have seen here, not restricted to a finite class of indexical expressions. A realistic theory of grammar and meaning for natural languages needs to be sensitive to this, and perhaps other, structural residues of their evolutionary history.

NOTES

1. Eve and Herbert Clark in their 1979 study of English denominal verbs introduced the term 'contextual expression.' Kay and Zimmer (1976), following the seminal work of Pamela Downing, later published as Downing (1977), argued that the English nominal compound and also certain genitive constructions have the contextual property. More recently, Herbert Clark (1983) has discussed many such contextual phenomena from a parsing perspective.

The general idea that, issues of indexicality aside, linguistic content significantly underdetermines first level, 'literal,' interpretation is not original here. Among those whose treatments of various aspects of this large problem have had a direct influence on the work presented here are Jean-Claude Anscombe, Eve Clark, Herbert Clark, Pamela Downing, Oswald Ducrot, Gilles Fauconnier, Charles Fillmore, George Lakoff, Ivan Sag, John Searle, Dan Sperber, François Recanati, Robert Wilensky, Deidre Wilson, and Karl Zimmer.

I would like also to acknowledge fruitful discussion with Claudia Brugman and Charles Fillmore regarding some of the specific issues of analysis reported here.

2. I am indebted to Claudia Brugman for discussion leading to the formulation in (7).

I assume here that in constructions where non-constituents are conjoined, as for example in right-node-raising cases, the result is nevertheless a constituent.

Each instance of *respective* or *respectively* betokens one case of the mapping referred to in (7), but there may, of course, be more than one such pairwise mapping to a clause.

- (i) Dawn and her roommate received first editions of the *I-Ching* and the *Book of the Hours*, respectively, from their respective admirers.

McCawley (1976) gives comparable examples.

A provision that the mapping provided by *respective* or *respectively* be one-one would be too strong, applying in most but not all cases. An attested counterexample to such a one-one provision is given in (iii), which comes from the New York Times, courtesy of Robert Amsler.

- (iii) The three women are, respectively, the mother and sisters of Randall Dale Adams, who has been ...

I am indebted to George Bergman for discussion of the last point.

3. Example (i), which violates (7) in the same way as (10-b) does, is felt by some to be less flagrantly unacceptable than the latter. Consider also example (ii), which if deemed acceptable will violate (7) in the direction opposite from that in which (i) will. [I am indebted to George Lakoff for offering (ii) as an acceptable sentence at the oral presentation of this paper.]

- (i) ?On the syntax, phonology and morphology exams, the three highest scores, respectively, were received by students specializing in semantics.
- (ii) ?Billy Martin and Tony La Russa are known for their respective volatility and calm.

An unsystematic survey shows considerable variation in judgment on both of these sentences. This variability may perhaps be explained as follows. Note that (i') is unproblematical. Example (ii') is equally unproblematical once one has the background knowledge that Martin and La Russa are baseball managers with reputations for excitability and calm, respectively.

- (i') On the syntax, phonology and morphology exams, the highest scores were received by students specializing in semantics.
- (ii') Billy Martin and Tony La Russa are known for their volativity and calm.

Note further that, although (i') and (ii') are not restricted by their grammar to the readings obviously intended for (i) and (ii), these are the most salient readings of (i') and (ii') given the available background information. In this respect, (i) and (ii) bear the same relation to (i') and (ii') as (iii) does to (iii').

- (iii) The men called their respective wives.
- (iii') The men called their wives.

That is, the use of the R-operator in the non-prime version is effectively otiose in that the mapping which the R-operator is employed to induce would probably be inferred by the interpreter even if the R-operator were not employed.

It seems to be under circumstances such as these -- in which use of any R-operator will be felt as pleonastic since the context is sufficient to lead the interpreter to the intended understanding without its use -- that judgments are fairly lenient if the wrong R-operator is used. This line of reasoning would predict that the judgments of unacceptability for (iv) should be about as much softened as those for (i) and (ii).

- (iv-a) ?The men called their wives, respectively.
- (iv-b) ?John, Jack and Harry, respectively, called their wives.

An empirical prediction of this line of explanation, which I have not had the opportunity to test, is that speakers should tend either to reject all the examples in this note marked with '?' or to accept them all.

4. McCawley (1976) makes this point as well.

5. Interestingly, it does not seem to be possible that a different relation is contextually established between John and the book associated with him from the one between Mary and the book associated with her. For example, sentence (20) can not be used to describe a situation in which John is obsessed with a novel he is reading while Mary is obsessed with one she is writing. It appears that an R-mapping must be imaginably coherent, intensionally tidy if you will, and not merely extensionally successful in context. In our hypothetical situation, if some speaker were actually to say (20), while we might not be able to escape realizing that reference was intended to the book being read by John and to the book being written by Mary, we would nonetheless be forced to conclude that this speaker had either failed to learn the conventional use of *respective* or else was engaging in an unfamiliar kind of word play. An R-mapping must cohere at the level

we once reluctantly acknowledged as notional and now proclaim as cognitive.

6. The example is from the New York Times, courtesy of Robert Amsler.

7. Of course, to say that natural languages and the languages of logic differ with regard to some properties, for example the contextual property, is not to say that natural languages are inherently unamenable to study by precise methods. To claim that linguistics is not a branch of logic is not to maintain that there is nothing in the subject of logic that linguists need to know. Indeed, when one considers the history of the subject of logic, it would be surprising if none of the concepts of modern logic were relevant to natural language.

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Discontinuous reduplication in vernacular Malay

Paul R. Kroeger
Stanford University / S.I.L.

Most current theories of partial reduplication depend on some model of templatic morphology. They treat partial reduplication as a process which associates segmental or "melodic" elements of the base form to positions in an autosegmental template or "skeleton" of the appropriate prosodic shape. This paper discusses a somewhat unusual pattern of partial reduplication reported in at least three distinct dialects of vernacular Malay.¹ This pattern poses two fundamental problems for the template-matching theory of reduplication. First, the process involves copying of discontinuous material, i.e. "melody skipping", of a type not previously discussed. Second, the shape of the reduplicative affix depends on the shape of the base in a way which seems to violate standard assumptions about the persistence of timing slots in templatic skeleta.

Templatic theories treat reduplication as a special type of affixation. Reduplicative affixes are special in that they lack segmental material -- they define only a prosodic structure. In the theory developed by McCarthy and Prince (1986), these bare affixes trigger a process which copies the melody of the base form, allowing the timing slots of the affix to associate with the copied melodic elements. This process of autosegmental association is assumed to proceed from Left-to-Right in prefixing reduplication, Right-to-Left in suffixing reduplication, until the template is full.

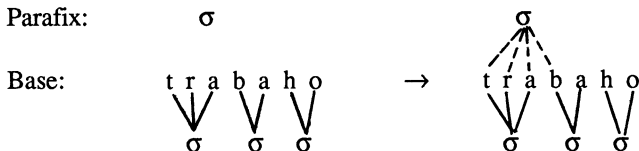
For example, to derive the well-known Ilokano forms shown in (1), a bare syllable template is prefixed to the base form. This triggers the copying of melodic material, which associates left-to-right to the slots in the template until a maximal syllable is defined. Unassociated melodic material is then deleted.

(1) Ilokano (data from McCarthy and Prince 1986:13)

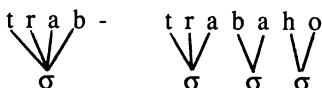
a. /basa/	ag-bas+basa	<i>be reading</i>
b. /dait/	ag-da+da.it	<i>be sewing</i>
c. /adal/	ag-ad+adal	<i>be studying</i>
d. /takder/	ag-tak+takder	<i>be standing</i>
e. /trabaho/	ag-trab+trabaho	<i>be working</i>

A variation of this model, developed by Mester (1986) and Uhrbach (1987) is illustrated in (2a). In this approach, the prosodic affix is attached as a "parafix", i.e. added in parallel to the base form. After association of melodic material to the base, the result is linearized by a process analogous to tier-conflation.

(2) a. Parafix:



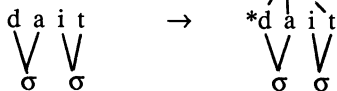
Linearization:



b. Parafix:

σ

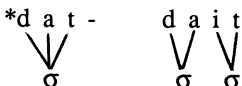
Base:



→



Linearization:



The association of melodic elements to positions in the templatic affix must be subject to a continuity condition, or "no-skipping" constraint, in order to derive the form da-da.it (shown in (1-b)) rather than the incorrect form *dat-da.it. The process which would lead to the incorrect form, and which the no-skipping constraint must block, is illustrated in (2b). After association of /d/ and /a/ to the onset and nucleus positions of the template respectively, the next segment in the melody is unable to associate because /i/ is not a possible coda in Ilokano. However, the following segment (proceeding left-to-right) is /t/, which is eligible to be a coda. The no-skipping constraint stipulates that if a melodic element (in this case /i/) fails to associate, then association stops.² This prevents /t/ from appearing as the coda of the reduplicated syllable, blocking the form *dat-da.it. While this pattern is impossible in Ilokano, something very similar is attested in vernacular Malay, indicating at the very least that the continuity condition must be modified.

A second assumption which is called into question by the Malay data involves the persistence of templatic slots. The standard assumption is that these must be filled if there are enough melodic units of the appropriate type to fill them, unless association to the appropriate melodic element is blocked by well-formedness constraints. McCarthy and Prince express this as the "Satisfaction Condition" (McCarthy and Prince 1986:6):

All elements in a template are obligatorily satisfied.

Violations of the continuity constraint can be handled in various ways, with varying degrees of success. But the violations of the Satisfaction Condition seem to suggest that the templatic approach is inadequate to account for the phenomenon under discussion. I will sketch out a non-templatic analysis based on a very old idea, recently revived by Steriade (1988), that partial reduplication can be derived from full reduplication.

1. The discontinuity problem

Let us first consider the following data from Johor Malay, as described by Farid Onn (1976):

(3) Johor Malay

(data from Onn 1976:104; allophonic processes (e.g. glide insertion, vowel lowering, final /k/ reduction, etc.) not indicated)

underlying intensification

timbus	tətimbus	<i>fill in (hole)</i>
jual	ʝəjual	<i>sell</i>
puas	pəpuas	<i>satisfy</i>
sapu	səsapu	<i>sweep</i>
malam	məmalam	<i>night</i>
sudah	səsudah	<i>complete, finish</i>
laju	ləlaju	<i>fast</i>
tiap	təʔtiap	<i>every</i>
buat	bəʔbuat	<i>to do, to make</i>
tembak	təʔtembak	<i>to shoot</i>
berkok	bəʔberkok	<i>bend</i>
tutup	təʔtutup	<i>close</i>

This is a case of prefixing syllable reduplication, with a prespecified ə in the prefixed syllable. The presence vs. absence of a glottal stop in the reduplicated prefix depends on the features of the stem-final consonant:

Just in case the original stem ends with a stop segment, then a glottal ʔ would also be added following the inserted ə. (Onn 1976:104)

An insertion rule of this type should, on theoretical grounds, be impossible, because it involves a drastic non-locality in the conditioning environment. I will suggest that the glottal stop is not simply inserted but rather represents a reduced copy of the stem-final stop. In other words, the process of reduplication must copy elements from both edges of the base form. Under this analysis, the apparent non-locality of the rule becomes instead a problem of "melody skipping", i.e. a violation of the continuity condition.

The proposed analysis is supported by parallel data from two other dialects. In Perak Malay, as described by Zaharani (1988), stem-final nasals as well as stops are copied (in reduced form) into the reduplicated syllable. By "reduced" here I mean that the copied nasal always assimilates to a following obstruent:

(4) Perak Malay (Data from Zaharani 1988:151-155):

	Stem		Reduplicated
(a)	čəʝite	<i>story</i>	čəčəʝite <i>all kinds of stories</i>
	kaji	<i>study</i>	kəkaji <i>to study repeatedly</i>
	kəʝe	<i>estimate</i>	kəkəʝe <i>by my estimate</i>
	dulu	<i>long ago</i>	dədulu <i>very long ago</i>
	məle	<i>begin</i>	məməle <i>at the very beginning</i>
	mude	<i>young</i>	məməde <i>very young</i>
	tue	<i>old</i>	tətue <i>very old</i>

(b)	baŋŋ? budŋ? kəʃe? siket gəlap	many child small alittle dark	bəʔbaŋŋ? bəʔbudŋ? kəʔkəʃe? səʔsiket gəʔgəlap	very much all kinds of kids very small very little very dark
(c)	baʀaŋ pətaŋ jaʀaŋ jaman kəʀen	thing evening seldom time dry	bəmbaʀaŋ pəmpətaŋ jənjaʀaŋ jənjaʀaman kəŋkəʀen	all kinds of things every evening very seldom for a long time very dry

Observationally, the reduplicative prefix has the shape $C_1\mathfrak{C}_F$, where C_1 is the initial consonant of the stem and C_F is defined as follows: [ʔ] if the stem-final consonant is a stop; a nasal unspecified for place of articulation if the stem-final consonant is a nasal; and Ø elsewhere.³ Brown (1956:86) also reports forms like those in (2a) and (2c) in Perak Malay, though he does not mention the pattern shown in (2b).

The pattern described by Hendon (1966) for the Ulu Muar dialect is quite similar to that observed in the Perak data, with two significant exceptions: (i) the reduplicated syllable contains a copy of the stem-initial vowel, rather than a default or prespecified [ə]; and (ii) stem-final /-h/ is copied as /-h/.⁴

- (5) Ulu Muar Malay (data from Hendon 1966:59)
(nasality, laxness etc. of vowels not shown)

sieʔ tariʔ budaʔ bueʔ (/buat/?) kueʔ (/kuat/?) laŋit sikit galap cakap	siʔ+sieʔ taʔ+tariʔ buʔ+budaʔ di-buʔ-bueʔ kuʔ-kueʔ laʔ+laŋit siʔ+sikit gaʔ+galap caʔ+cakap kaciʔ	<i>is torn repeatedly accordion children pretended vigorously, loudly, etc. palate various small quantities is repeatedly dark talks in a low tone</i>
kawan s-oran siaŋ dayaŋ diam tanam taraŋ	kaŋ+kawan/krj+kawan ⁵ soŋ+soraŋ siŋ+siaŋ dan+dayaŋ din+diam bo-tan+tanam tn+taraŋ lareh	<i>friend all alone during the daytime hand-maidens remains silent gardens regularly just light enough</i>
paraŋ jariŋ	pŋm+paraŋ jŋj+jariŋ	<i>to see vaguely sword-like decoration latticework</i>
pueh (/puas/?)	so-puh+pueh e	<i>to their complete satisfaction</i>

Hendon describes the process as follows:

Reduplication of this type is found only with stems (i) which end in a stop, /h/, or /l/, and begin with a consonant, or (ii) which end in a nasal and begin with a stop or /s/.⁶ The shape of the reduplication may be represented by this formula: C_1VC_2 . C_1 is the same phoneme as the initial consonant of the stem. [V is a copy of the initial stem vowel, which may be lax or lowered under certain conditions -- PRK] C_2 depends on the final consonant of the stem. If that is a stop or /l/, C_2 is /l/ ... If the stem ends in a nasal, C_2 is a nasal homorganic with the initial stop or /s/ of the stem ... If the stem-final consonant is /h/, C_2 is /h/ ...⁷
(Hendon 1966:59)

Several interesting questions arise concerning the melodic content and feature geometry of the copied stem-final consonant. It appears that either (a) no place of articulation features are copied for the final consonant, or (b) the place features are deleted in the copy. The loss of place features is seen most clearly in the assimilation of copied nasals to a following obstruent. Aside from the reduplicated forms shown here, nasal assimilation in Malay only applies to prefix nasals which are unspecified for place of articulation. Thus, the fact that nasal assimilation applies in the forms shown in (4) and (5) strongly suggests that the copied nasal is unspecified for place of articulation. Similarly the segments /l/ and /h/ can be assumed to have no place features.

It seems likely that these changes in melodic content are related to syllable structure requirements, since the preferred coda in all Malay dialects is a nasal homorganic to a following stop. It may well be that all syllable-final non-continuants lose their features for place of articulation through a rule of Coda Neutralization.

Apparent exceptions to this rule, i.e. consonantal codas fully specified for place of articulation, occur only at the end of a phonological word. Phonological word boundaries occur not only at the end of morphological words but also between halves of compound and fully reduplicated forms. Thus nasal assimilation never applies across compound boundaries, nor across root-reduplication or word-reduplication boundaries. In word- or root-reduplication, fully specified word-final nasals remain intact in the copy, i.e. retain their place features and thus do not assimilate:

(6) Perak Malay (Data from Zaharani 1988:150 ff.):

Stem	Reduplicated
tikam <i>stab</i>	tikam-tikam <i>stab repeatedly</i>
jaʁaŋ <i>seldom</i>	jaʁaŋ-jaʁaŋ <i>very seldom</i>
baŋonan <i>building</i>	baŋonan-baŋonan <i>various buildings</i>

Cross-linguistically it is very common to find segments or clusters occurring in word-final position which are otherwise impossible as codas of a syllable. This pattern is generally explained in terms of the possible extra-prosodicity of edge segments.⁸ In this case the claim would be that consonants in phonological word-final position are extra-prosodic, and thus invisible to the rule

which would otherwise delete the place features of non-continuants in coda position.

In the East Coast dialects of vernacular Malay, however, Coda Neutralization applies equally to word-final segments. Ismail Hussein (1973) reports that in the Kelantan and Trengganu dialects, all final stops reduce to [ʔ]. (In the West Coast dialects discussed in the present paper, as in Standard Malay, only final /k/ regularly undergoes this process.) Similarly, in the Kelantan and Trengganu dialects all final nasals reduce to [ŋ]. This difference between the two clusters of dialects can be expressed by assuming that the East Coast dialects do not allow final segments to be extra-prosodic, and thus Coda Neutralization applies equally to all coda positions.

2. Templatic solutions and the problem of non-persistence.

In the following discussion I will focus almost entirely on the Ulu Muar dialect; any analysis of the Ulu Muar data would account for the data from the other two dialects as well with minimal modifications.

In considering this data, the most glaring problem is the discontinuity of the copying. In one sense, this is the easiest problem to fix. After all, the continuity constraint is merely a stipulation anyway -- nothing in the templatic formalism makes melody skipping inherently impossible. As McCarthy and Prince (1986) state:

... The skipping phenomenon is limited to [core syllable, i.e. CV, reduplication], as in Sanskrit du-druv; we have no suggestion except to stipulate it. We take cold comfort in the fact that there is no known theory that does any better. (p. 94)

However, given the general goal of developing a constrained theory of reduplication, it would be a terrible setback if we had to abandon the continuity condition entirely, allowing reduplicative processes to skip over arbitrary amounts of material in the base when copying melodic features into the reduplicative affix.

Of course, the phenomenon described here clearly does not involve arbitrary gaps or leaps in the copying process. Copying in these examples is strikingly and crucially edge-governed. For example, in Perak Malay (example (4)), the reduplicated syllable contains the onset of the first syllable and the coda of the final syllable. What remains unattested, and is presumably impossible, is a rule which copies non-edge constituents, for example, the coda of the first syllable and the onset of the final syllable.

What we need is a way of relaxing the continuity constraint in just the right way. One possibility is to apply the rule of of Edge-In (E-I) association, as proposed by Yip (1987):

E-I association will associate the initial and final melodic elements with the initial and final free slots, anchoring the two ends. Remaining slots and melodic elements will then be associated in the same way, moving inwards, until all slots are associated. (p. 7)

Given such a principle, the derivation of the Ulu Muar forms would be as shown in (7). The initial and final consonants of the base would be linked to the onset and coda positions of the template respectively. The nucleus slot would be

Various other templatic solutions to the discontinuity problem can be suggested. However, all such solutions face the same problem: they predict incorrect results for vowel-final stems. For example, given the (Ulu Muar Malay) base form suko like , E-I association might produce either *so-suko or *suk-suko, depending on whether the association is assumed to be melody-driven or template driven; the actual form is su-suko.¹⁰

Similarly, under the second approach, the "coda-anchoring" rule would fail and the left-to-right convention would be expected to produce *suk-suko.¹¹ In order to make this analysis work, we would need to stipulate that the final C-slot of the template is deleted whenever it cannot be anchored to a stem-final consonant. But this violates a fundamental assumption of templatic morphology, i.e. the persistence of skeletal slots. These slots must always be filled if there is an eligible melodic element available. There is no general principle which would prevent forms like *suk-suko, given a CVC (i.e. maximal syllable) template.

The basic process at work in the Malay data presented above is easy to express in prose: copy the first CV- (or mora) of the stem, together with the stem-final consonant, if any. But the "if any" qualification is very difficult to formalize in terms of template matching because of the discontinuous nature of the association. The fundamental problem is that the reduplicative template must be CVC (or bi-moraic) with consonant-final stems and CV (or mono-moraic) with vowel-final stems.

This dilemma suggests that a template-and-association model of reduplication cannot provide an adequate analysis for these facts. We must look for a non-templatic solution.

3. A non-templatic analysis:

Partial reduplication as full reduplication

Steriade (1988) argues that all reduplication begins with full reduplication, and that partial reduplication is achieved by the deletion of unlicensed material from the copy. The shape of the output form is defined not in terms of templates but in terms of markedness parameters.

Under Steriade's approach, the prohibition against "skipping" melodic elements is not merely stipulated; it follows from the requirement that reduplicated syllables constitute a possible syllable of the base form. In the Ilokano example (1-b), the form *-dat+da.it would be blocked because no combination of resyllabification and matching operations can make /dat/ a syllable in the original stem, /da.it/.

While this approach yields the correct results for Ilokano, it is incapable of accounting for the data in (3)-(5). As noted above, what is impossible in Ilokano (and most other languages) is attested in vernacular Malay. However, while the details of Steriade's proposal are inconsistent with the data under discussion, I will adopt her basic strategy.

Basically, I will propose that the partial reduplication observed in these dialects results from full reduplication followed by a kind of truncation process applied to the copy. Truncation has frequently been proposed as a source of partial reduplicative patterns which appear to violate the universal conventions governing the direction of association, e.g. prefixing reduplication of the final syllable, which seems to imply right-to-left association. Some dialects of Malay have such a rule.¹²

Abdullah Hassan (1974) cites the following examples:

(8) Malay (data from Abdullah Hassan 1974:45)

budak	<i>child</i>	dak-budak	<i>children</i>
rumah	<i>house</i>	mah-rumah	<i>houses</i>
kata	<i>speak</i>	ta-kata	<i>speak repeatedly</i>
hitam	<i>black</i>	tam-hitam	<i>very black</i>

In order to formalize the rule of truncation needed to produce such forms, I will make use of concepts developed by McCarthy and Prince (to appear) in their work on Arabic broken plurals. While morphological constituents (e.g. stems, words, etc.) are the normal domains to which morphological processes apply, McCarthy and Prince point out that some morphological processes are instead defined over a prosodic domain. They cite numerous examples of morphological processes in various languages which apply to a prosodically defined subset of some morphological base.

Essentially, a parsing mechanism is assumed which constructs a prosodic constituent of the specified size, beginning at one edge of the base form. A particular rule may apply either to the specified constituent or to the rest of the word (the "residue"). Three parameters are identified which determine how such rules will apply: (i) the size of the prosodic unit to be constructed; (ii) which edge the parsing begins at; (iii) whether the process applies to the prosodic constituent itself or to the residue. In the latter case, the specified prosodic constituent appears to be "invisible" to that particular rule.

For example, infixation (e.g. Tagalog *-um-*) can be defined as a morphological operation (prefixation) applied to a prosodically-defined base. The size of the constituent to be parsed is a single consonant, parsing begins at the left edge of the stem, and prefixation applies to the residue:

(9) *-um-* + [b] ili → b-um-ili

The truncation rule which would need to apply after full reduplication to produce the forms in (8) could be formalized in these terms as follows: the morphological process in question is deletion. (i) Construct a (maximal) syllable, (ii) beginning at the right edge, and (iii) apply the operation to the residue. This rule would have the effect of deleting everything but a prosodically specified subset of the copy (the final syllable) or, equivalently, of licensing only the material inside that prosodic constituent. Notice that the identical rule would account for the Ilokano data in (1) merely by changing the specification of "right edge" to "left edge" in (ii).¹³

If partial reduplication can be viewed as truncated full reduplication in the way outlined here, we would have an explanation for the otherwise inexplicable parallelism between partial reduplication and extra-metricity (at least in the core cases of each phenomenon). First, extrametrical material must always constitute a single constituent, typically a single prosodic constituent. Second, that constituent must be peripheral in the relevant domain. Similarly, as McCarthy and Prince have argued, partial reduplication in general copies a single prosodic constituent which must be peripheral in the base. Under the view outlined above, both truncation and

extra-metricity are the result of applying an operation to the "residue"; that is why both phenomena seem to isolate a single, peripheral prosodic constituent.

Under this view of partial reduplication, the only unusual feature of the vernacular Malay pattern exemplified in (3) - (5) is that it requires simultaneous "licensing" of material on both edges: a single mora on the left edge and a single consonant on the right. This is analogous to allowing extra-metricity on both edges, as must be the case in forms that contain impossible tauto-syllabic consonant clusters in both word-initial and word-final positions. Since it is impossible to parse a discontinuous constituent, the rule must allow two separate parses to apply to the same base: (a) parse a light syllable (CV) on the left edge; and (b) parse a single consonant on the right edge. Then apply the deletion operation to the residue. In the case of a vowel-final stem, the second part of the parse would simply fail and nothing would be licensed on the right edge of the copy. The derivation of the Ulu Muar forms would be as follows:

(10)

a. galap	diam	pueh	suko
b. galap-galap	diam-diam	pueh-pueh	suko-suko
c. [ga]la[p]-galap	[di]a[m]-diam	[pu]e[h]-pueh	[su]ko[]-suko
d. [ga][p]-galap	[di][m]-diam	[pu][h]-pueh	[su]-suko
e. gaʔ-galap	din-diam	puh-pueh	su-suko

a. Base

b. Full reduplication

c. Parsing (left edge: one mora; right edge: one consonant)

d. Deletion of residue (i.e. unlicensed material) in copy

e. Syllabification, neutralization, assimilation

We have seen that the data in (3) - (5) pose two major problems for templatic theories of reduplication: (i) the discontinuity of the copied material, and (ii) the non-persistence of the coda slot. The non-templatic approach suggested here accounts for both of these facts in a straightforward way as resulting from full reduplication followed by truncation. The edge-boundedness of discontinuous constituents is a necessary consequence of the fact that parsing of prosodic constituents must begin from an edge.

Notes

¹In this paper, the term "vernacular Malay" refers to any dialect of Malay spoken primarily as a first language; this definition would exclude the standard languages, i.e. Bahasa Malaysia and Bahasa Indonesia, literary Malay, and the various forms of pidgin (Bazaar) Malay.

¹¹Viewing the initial anchoring as a constraint on possible associations rather than as an extrinsically ordered rule of association might save this line of analysis. The constraint would act as a filter, blocking any form in which the coda of the syllabic template was associated with a non-edge segment, or with a [+ cont] segment. The coda timing slot would be deleted by convention if it could not associate with a melody element. However, introducing filters or constraints of this type only adds to the complexity of an already complex and powerful formalism. Moreover, it appears that a disjunctive constraint would be needed in this case -- allow the final C slot to associate anywhere, then block forms in which it associated either to a vowel or to a non-final consonant.

¹²A similar pattern exists in Ulu Muar Malay, but is described by Hendon as being very rare.

¹³As this volume was going to press, a very interesting modification of this analysis was suggested to me by Sharon Inkelas: assume that full reduplication copies only the melodic material of the base. The specified parsing operations would then construct prosodic structure on a subset of this copied material: a syllable on the right edge in (8), a syllable on the left edge for the Ilokano forms in (1), and a single mora on each edge for (3) - (5). Melodic material without any prosodic structure would be deleted by the general rule of stray erasure, rather than by a stipulated morphological operation of deletion. This approach looks very promising, though the details have yet to be worked out.

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THE LINGUISTIC IMPLICATIONS OF EARLY AND SYSTEMATIC VARIATION IN CHILD LANGUAGE DEVELOPMENT

Elena V.M. Lieven

University of Manchester, England

Introduction

The fact that children learning language may seem to do it in different ways is no longer disputed. But there is still a great deal of argument about the significance of such differences. Inevitably, these arguments are polarised around the nativist-environmentalist debate. Thus nativists regard differences between children as uninteresting to a theory of language development. In their view, there is only one way to break into language and differences between children merely result from the fact that some are slower than others and are inclined to use non-linguistic strategies in verbal interaction until the correct linguistic knowledge develops. On this view there is a radical break between prelanguage and 'real language'. There are two assumptions here, both wrong.

The first is that the learning of language structure can be separated from all other aspects of language learning and the second that structure can only be learned in one way. These two assumptions derive from a view of biological innateness that insists on the invariable unfolding of a single blueprint. In fact there is nothing about a nativist account that makes differences impossible. Quite the reverse. A biologist would expect there to be differences which would allow the system to use environmental variation in a way that buffered against too much variation in outcome. So even in their own terms nativist theorists should be interested in systematic differences and in whether they show continuity through development.

The significance of early variation is that much stronger if it can be shown that these differences affect how the child moves into the next stage of language development. Thus if it can be demonstrated that progress depends on previous developments rather than arising *ab initio* as for instance Gleitman (1981) would argue that it does, this should be of central importance to any psychologically realistic theory of language development. By contrast, the failure to show any continuity from early differences might lead us to conclude that such variation is, indeed, a relatively transitory and uninteresting phenomenon.

As one would expect, environmentalist approaches tend to emphasise continuity between phases of development, most notably when they argue that communicative function underlies both the preverbal and the structural phases of development and that this in some sense explains the

development of structure. Because, in this approach, children are thought to have their communicative development shaped by the structures of interaction with which they engage, this ought to lead to the prediction that early variation is caused by differences in these structures of interaction. However, although differences are often noted in these accounts, only rarely is there any attempt to incorporate them into a theory of development (but see Nelson 1973, 1975, Lieven 1982, Peters 1983, Bates, Bretherton & Snyder 1988), or to relate them to what is known of children's development of language structure.

Thus, for different reasons, most present work on language development, whether underlyingly tending more to empiricist or nativist principles, tends not to incorporate the evidence for different strategies. In this paper, I suggest that a theoretically well-motivated approach to the nature of these strategies, can help us to identify the central, and to some extent, separate aspects of language that children have to master.

Prosody and lexicalisation

There seems to be evidence that children differ very early on in the extent to which they use either prosody or lexicalisation in their attempt to convey meaning (Dore 1974, Peters 1977). Some children appear to make a clear distinction between a babbling phase and the production of one word at a time to convey meaning. Others seem to have abstracted aspects of the sound pattern with which to convey systematic meaning. This has been found for Hungarian (MacWhinney 1985) as well as for English (Ramer 1976) and for second language learning (Wong Fillmore 1979).

At the very least this may signal the separation of these two most fundamental aspects of language: words on the one hand and prosody on the other. Children seem capable of focusing on one or the other in their first attempts to produce systematically meaningful utterances. There is some evidence that this distinction continues to operate at later stages of language development as some children identify slots in a prosodic pattern which they cannot as yet fill while others never appear to use fillers, schwas and reduplication to achieve a meaningful prosodic contour. The use of fillers and schwas by some children and not others has been reported for English (Bloom 1975, Ramer 1976), Turkish (Aksu-Koç & Slobin 1985) and Polish (Smoczyńska 1985). The Turkish example illustrates how this prosodic approach may provide a stepping stone to later development. Aksu-Koç & Slobin report that early on in development children sometimes attempt to retain the rhythmic picture of a complex verb by inserting morphemes which sound like passive or causative particles but are, in fact, meaningless. They point out that this "unmotivated analysis of words into combinable syllables (is) an obvious prerequisite to the discovery of principles of productive morphology" (p.848). The Polish example is very similar.

This Turkish example raises the interesting possibility that the prosodic approach may be of more use to children learning some types of languages than others. For instance a language with regular morphological patterning like Turkish may be much more accessible to such a strategy than would a language like Russian in which the morphology is irregular

and complex (Slobin 1981). However, if both approaches reflect basic processes in the language learning system, we might expect to find that, for each language being learned, at least some children adopting each approach though the relative proportions might vary as a function of the type of language. There is not much additional evidence on this proposal from other languages as yet though Leroy (1975) reports a difference between two children learning French, one of whom used variable word order with intonation apparently acting as a segmentation device, while the other child used much more fixed word order with shorter and phonologically clearer segments (see Clark 1985). Clearly there are some interesting avenues for crosslinguistic investigation here. It is also possible that this difference between prosodic and lexical approaches may be related to differences in the size of 'chunks' that children use as they start to structure their utterances (see below).

Inflections and word order

The two basic methods of expressing semantic relations in a sentence are the use of inflections and the use of word order. We know that, where there is unambiguous evidence in the input language, children can easily and rapidly learn either system, examples being the rapid acquisition of inflectional morphology in Turkish (Aksu-Koç & Slobin 1985) and of basic word ordering in English. We also know that where the input data are unclear or complex in terms of morphology, there is often a tendency to depend on word order until the inflectional morphology is well established. There are two situations in which we might expect to find individual differences in relation to these methods of expressing basic semantic relations. One is where children are exposed to a language in which both word order and inflectional morphology are non-transparent as to how to convey, for instance, basic agent-patient relations. In this situation do all children adopt the same strategy, i.e., does one method take precedence over the other or is there individual variation? The second situation might be where, although the language that the child has to learn is clear enough, s/he is exposed to a somewhat minimal version of it and is left very much to her/his own resources in the learning of the language. Is there any evidence in this situation that children sometimes adopt an inappropriate strategy for the language in question by contrast with children who are exposed to a 'rich' input? Since most of the children whose language development has been studied intensively come from environments which provide a great deal of interactive language, this is a difficult question to answer, but I have argued (Lieven 1984) that children learning to talk in relatively impoverished environments can use a variety of techniques to bootstrap themselves into language and that one should indeed find a wider range of variation in approaches to early language learning if one studies such children.

To go back to the question of whether a language in which both word order and inflectional morphology are relatively opaque will lead children to adopt both strategies, a suggestive but by no means conclusive example is provided by Argoff's (1976) Finnish data. Kai and Tuomas, the two children in this study, differed in the degree to which they used a fixed word order strategy and in their early control over inflectional morphology, particularly with regard to the objects of verbs. Finnish has a complex system

for marking the objects of transitive verbs and it also has a canonical SVO word order which can be varied for pragmatic focus. One child, Kai, used a relatively fixed word order which conformed to that of his input but took a considerable time to develop productive inflections for the object. Tuomas, on the other hand, did not follow the word order patterns of his input so closely but did indeed show earlier productive control of object marking. It is interesting to note that Tuomas did not use canonical word order until later - in other words his inflectional acquisition may have substituted for the use of word order - in this he is perhaps demonstrating an independence of input matching which accords well with Slobin's basic child grammar, although a more detailed study of his input would be necessary to decide this conclusively. If we can accept this example, we have here a demonstration that individual differences between children learning the same language may provide evidence as to the forms and relative strengths of different parts of the language making capacity.

However we do have to be rather cautious in interpreting these data. Firstly it is not clear that both children were hearing the same form of Finnish, since Argoff notes that the Finnish that Kai heard may have been contaminated by Swedish and therefore influenced in the direction of a more rigid word order. A second issue relates to the very small number of examples of each word order and inflection that Argoff managed to obtain. It is difficult, in the absence of data on productivity, to know whether these strategies on the children's part reflect the genuine expression of different approaches to the problem of marking meaning in utterances or whether they are nearer to rote-learned routines or patterns. The only way to answer this question would be a study of Finnish in which a larger number of children was involved and which involved larger samples of both adult input and of child output. The fact that Bowerman (1973) also found differences in the dependence on word order or inflections in the two Finnish children that she studied might encourage some Finnish scholar to follow up this suggestion.

There are no other clear reports of individual differences in word order versus inflectional strategies for production. It seems that, for the languages that have so far been studied, either the language is so clearly dependent on one or the other method (e.g. inflectional marking in Turkish) that there is little encouragement for the child to try an alternative strategy or that the data are so complex that they have so far defeated analysis. Thus Smoczyńska reports that the dependence of Polish children on rigid word order varied a great deal but could not be studied without a detailed study of the role of pragmatic word order in adult Polish and this has not, so far, been undertaken. The fact that children can pick up pragmatic word order from a very early point in their language development is well attested for both Japanese (Clancy 1985) and Turkish (Aksu-Koç & Slobin 1985) acquisition and this will obviously be a confounding factor in any language where word order variation is extensively used for pragmatic purposes.

Another source of data on inflectional versus word order strategies comes from experimental evidence on children's processing of active and passive sentences. Bridges (1979) makes some interesting suggestions about the way in which individual differences in processing strategies may account for some of the anomalies in the results on children's processing of

these sentences and there is a similar point made by Clancy (1985) in relation to studies by Hakuta (1982) and Sano (1977) in Japanese. Both the Japanese studies reported that children differed as to whether they were more dependent in their interpretations of the test sentences on local morphological markers or on word order. It would, of course, be fascinating to know whether such differences reflect acquisitional strategies which were present in the child's earlier development or whether they are specific to this task. If children's acquisitional strategies can be related to their later strategies for processing language, this has potentially far reaching implications for theories of adult language processing.

From the little evidence we have, then, it does appear that children may differ in whether they approach the task of systematically varying meaning by adopting either a word order or an inflectional strategy, provided that the language that they are learning does, in fact, use both methods. If this can be further substantiated, we have a demonstration of how the study of early differences between children can identify some of the separate processes which are involved in learning to talk.

Continuity from single words to structure

We now turn to the question of whether there is evidence that the ways in which children first start to use language conditions how they move into succeeding stages. In an earlier study, I showed that this was clearly the case for three children (Lieven 1980). The children differed radically in how they structured their multi-word utterances despite similar mean lengths of utterance. The major difference was the relative degree of dependence on formulae which were structured around a particular lexical item in a fixed frame (e.g. *more + X*, called a *pivotal formula*) or on formulae the structure of which depended on the use of underlying categories (e.g. *possessor + object possessed*, called a *categorical formula*) (see Table 1).

Table 1

Examples of multiword utterances: Possession

Beth	Jane	Kate
my Daddy	my babies	Lena's tapecorder
my car	my penny	not Kaykay's tapecorder
my shoe	my happy birthday	jam's knife
theres my daddy	there my baby	Gerald's turn
there, that my toy	there my big ones	that Kaykay's
there my two choo-cho	sat my broom car	like Zoe's
there my two more car	that my potty pot	frog's dinner
in there, my Daddy, Mum	theres my wiggly worm	frog's clock

One of the children, Kate, used almost no pivotal formulae and seemed, from the beginning of her production of multi-word utterances, to be structuring them using some kinds of underlying (probably semantic) categories. The other two children, Beth and Jane, relied very much more heavily on pivotal-type formulae, though within this they differed substantially. Jane's utterances covered both a wider and a more specific semantic range, with very few unanalysed phrases being used as part of the utterance. Beth's used a very small number of pivots but combined them with a large number of partially analysed chunks.

It is important to note that both Beth and Jane's utterances were productive in the sense that large numbers of utterances with the same pivot were produced and that many of them were unlikely to have been heard by the children. But the crucial point here is that how these children structured their multi-word utterances can be related to how they used words at an earlier stage.

Thus Kate's early talk about a wide range of objects may have led her into developing categories with which to talk about those objects (e.g. categories of possession, attribution). Beth's most frequently used single words formed the pivots for her multi-word utterances as, to a lesser extent, did Jane's. This seems to be evidence for continuity from the one-word stage into structure.

Starr (1975) also found that emphasis on nouns in the single word stage was associated with a more elaborate set of noun-noun non-pivotal type constructions in multiple word utterances, while her data suggest that the other group of children were more pivotal. And both Bloom, Lightbown and Hood (1975) and Nelson's (1973) findings in their longitudinal studies may be seen as suggesting the same phenomenon.

Both these latter studies suggest that one dimension on which the children's multi-word utterances differed was how dependent they were on pronouns. In the case of the Nelson study this was related to the classification of the children at an earlier stage as either 'referential' (object oriented) or 'social-expressive' (in Nelson's terms, interaction oriented). It seems quite probable that what is really being picked up is the tendency of the so-called 'pronominal' children to depend on pivots rather than the production of large numbers of noun-noun combinations. This would then be more evidence of continuity from a large proportion of nouns in the early single word vocabulary to categorically based multi-word utterances; and of continuity from a much lower dependence on nouns to a more pivotal strategy. Unfortunately none of these studies follows the children's stylistic differences any further and thus we cannot answer the critical question of whether these differences, which certainly suggest that children can move into the production of rule-governed utterances in rather different ways, then condition what they do next. For instance do pivotal children go on to work on the various parts of their pivotal utterances or do they, abandoning their pivots, start to produce multi-word utterances which are identical to those of categorical children. In other words are pivotal children up a blind alley or can they use their pivotal approach in building a more sophisticated grammar? Are they just doing what the categorical children are doing only slower or are they approaching the problem differently?

Two potentially conflicting answers are provided by a study by Bates, Bretherton and Snyder (1988) on the one hand and by the study I am conducting on the other (Lieven, Dresner Barnes & Pine, in preparation). The study by Bates et al. involved collecting data from 27 children on four occasions between 10 and 28 months. Early stylistic differences similar to the ones mentioned above (i.e. a tendency to use object names versus a tendency to use unanalysed units) were found at the earlier ages but in terms of measures of language advance as defined by Bates et al. the more phrasal style seems to predict children who are just slower overall. However, the study does not really address the issue of whether these children are not only slower but also building language itself on a different basis.

The study by Lieven et al., looks in much finer detail at the language of 12 children starting when they are 12 months old (and, ultimately following them to 36 months). The major difference to show up between these children was in the degree to which their very early vocabulary was based on object names as opposed to phrases (independent measures). There was a statistically significant continuity in the production of *either* object names *or* phrases in the acquisition of the earliest 50 and 100 utterances. In addition, there was also evidence of productivity with some of the phrasal children's patterns in the second 50 utterances. Peters (1983) has suggested that children may be able to segment their rote-learned phrases and produce structural patterns from them which show some form of productivity and our study provides preliminary evidence for this (see Table 2).

Table 2				
Examples of structural patterns with limited productivity, produced before the acquisition of a 100-utterance vocabulary				
Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5
(Subject 1)	(Subject 1)	(Subject 2)	(Subject 2)	(Subject 3)
want a yoghurt	I draw	see ball	my bum	itsa boat
want dinner	I got it	see baby	oh look my bike	itsa mouse
want that	I do it	see good girl	and my dummy	itsa miaox
want draw			oh my blanket	itsa nose
want bite				

Thus, there is no question of these children having to amass a large number of open class words before they start to produce multi-word utterances. In addition similar proportions of both the more object naming children and the more phrasal children showed a clear explosion of vocabulary during their early development. This is important because this

vocabulary explosion which is seen in many, but not all, children is usually regarded as evidence of a major breakthrough into language and there is an implicit assumption in the field that only 'referential' children will show it. And, finally, although the full data are not yet in, it seems that these phrasal children go on to generate multi-word utterances which are novel and have a pivot-like structure. I would like to argue that we have here preliminary evidence for a genuinely different, rather than simply slow, route into language.

Data reported by Clancy for Japanese is suggestive of the idea that similar kinds of differences in strategy between children can indeed, have consequences for other aspects of language development. Clancy reports a study by Okubo (1981a) in which two children differed in the single word utterance stage as to whether they were 'noun-dominant' or 'verb-dominant'. These differences had consequences for other acquisitions; thus the 'verb dominant' child acquired features associated with the verb, i.e. verbal inflections and sentence-final particles which typically follow the verb earlier than did the 'noun-dominant' child while he, in turn, though more limited in the predicate position, had more elaborated nominal arguments which included modifiers. Their multi-word utterances also differed in that, although both used pivots, the pivots were different as a function of the child's one word style. The verb-dominant child used her pivots with a large number of predicates and sentence-final particles, while the noun dominant child used his pivots in conjunction with a wide range of nouns. Here then we have a case in which, despite the fact that, at a later stage, these children will no doubt look identical in terms of their basic grammatical control over their language, there do seem to be different routes into at least a part of it. The fact that they end up with a similar grammar does not mean that the different ways by which they arrive at constructing it are uninformative to a theory of language development.

I suspect that differences between categorical and phrasal-pivotal strategies are related to the structural and distributional aspects of language (as argued by Maratsos & Chalkely 1980), in which case obviously both strategies lead on to further development. As I have argued above, children learning a language that uses both word order and inflections for marking basic case relations often start with one or the other. No one would suggest that in this case one strategy was useless or less advanced. The evidence is not yet in but my hunch is that eventually it will be found that the same is true for categorical and pivotal strategies, and that it may be that children can, initially, approach from one or the other direction. There is, of course, the further question of where they go from here, in other words how does the phrasal-pivotal approach develop? We hope that the fact that we are following these children until they are 36 months old will help illuminate this issue. The only evidence that we have in English that suggests a relatively long lasting effect on syntactic acquisition of some of these differences is a study by Horgan (1978, 1981), in which relative 'noun dominance' in the early stages of language development correlated with both speed and style of acquisition of passive constructions. Bates, Bretherton and Snyder (1988) argue that the evidence from their study suggests that there is not this kind of homotypic continuity (i.e. concentration on nouns through a number of stages of development) but that there is heterotypy in that the children with the

more analytic-categorical approach are ahead on measures of linguistic sophistication at all ages. (For a detailed appraisal of this book, see my forthcoming review in the *Journal of Child Language*).

What leads to different strategies?

Assuming that these strategies for the creative production of early multi-word utterances may be generated by the way in which the child uses words at an earlier stage, the question then becomes whether we can find any causes for early differences in vocabulary learning and use; particularly between those children who are clear object namers and those who are clearly phrasal. Part of Nelson's (1973) explanation was that the non object-naming children were more interested in social interaction than were the other group. But this can hardly be true as stated. In my earlier study (Lieven 1980), Kate was just as interested in social interaction as Beth: what differed was the form that the social interaction took.

While it obviously could be that cognitive, temperamental or affective factors 'in' the child account for different strategies, it is much more likely that the strategies result from the interaction between child and interlocutors, rather than the child being conceived of as some 'sealed off parcel'. There has been a considerable amount of work which suggests that object-naming children have mothers who use the child's language as a guide to topic continuity (i.e. provide a lot of expansions of what the child says) and who are object-oriented themselves while the mothers of the more phrasal children have been found to be more directive and less interested in talking about objects. (Cross 1978, Nelson 1973). Thus, Tomasello and Todd (1983) found that mothers who are directive in establishing joint attention tend to have non object-naming children while those who tend to pick up on the child's focus of attention are much more likely to have object-naming children. There has been a strong tendency in the literature to treat the phrasal approach and by association the directive maternal style as if both were a major impediment to language development. But it could be that directive and expanding styles tend to highlight different aspects of language for the child to pay attention to and that this accounts for the differences in vocabulary learning and use. In Barnes et al. (1983), while directives and expansions were negatively correlated, both were associated with linguistic advance. This fits well with the idea that we are not necessarily talking about better and worse ways to learn to talk but about different ways of doing it. We then need to pay close attention to the precise characteristics of the interaction between the child and her/his interlocutors in order to work out what guides to segmentation are being given. An example of this comes from a study by Goldfield (1985) in which the more directive mother also uses more social routines and games than does the other mother who is more likely to use objects as the focus of conversation. This may in turn also lead a child to use larger 'chunks' in learning to talk and to the use of a more phrasal-pivotal style. On the other hand, in the ongoing study mentioned above (and in a separate study by Pine, also in our Lab) it is our distinct impression that object-naming, rather than being the result of the application of an abstract analytic skill on the part of the child as has frequently been claimed, often derives directly or indirectly from the mother's desire to teach the child language - an easy way to do this is to teach the names of

things!

We need to know whether there is good statistical evidence for an association between so-called directive styles of babytalk and a stronger dependence on social routines and games by these caretakers. And in turn, are either of these factors associated with a phrasal-pivotal style in their children? In societies in which babytalk seems highly directive (e.g. Samoa: Ochs 1983, Kaluli: Schieffelin 1985) are children more likely to be non object-namers? (Pine's study is addressing these issues directly).

Summary and conclusions

In conclusion, the argument I am making is that the environment probably generates a particular kind of initial strategy, but what defines the characteristic features of these strategies is some of the most basic dimensions of all languages: word order and inflections; prosody and lexemes; syntagmatic and paradigmatic productivity. So, by looking in detail at systematic variation between children learning the same language, and also by looking at variations in language learning across languages, we may explicate what are the central and, to some extent, separate, aspects of language that children have to master.

It is vitally necessary to take the question of differences in strategies for language learning seriously if a psychologically realistic theory of language development is being aimed for. In identifying these strategies, we can see much more clearly where there is real continuity from previous development and where there may be discontinuity. Imposing a false unity on development either leads to a denial of any continuity (and a claim for simple nativism) or to the denial of any discontinuity (leaving nothing to explain!). In actually identifying development, albeit in more than one way, we allow ourselves to start asking sensible questions about the causes of that development, presumably both evolutionarily and interactionally determined.

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Metaphor and the Grammaticalization of Evidentials
Teenie Matlock
University of California, San Diego

1.0 Introduction

Evidentials, linguistic units comprising part of epistemic modality, code a speaker's source of information, and some degree of certainty about that information. Rarely marked as a separate grammatical category, evidentiality typically overlaps with the tense/modality system of a language. Research on evidentiality exists (primarily in Amerindian languages), but a clear understanding of it as a coherent linguistic category is yet to be realized.

This paper analyzes the role of metaphor in the grammaticalization of evidentials. First, I present some information about evidentials, including the distinction between *direct* versus *indirect* speaker experience in relation to various degrees of certainty. Then I discuss the evolution of verbs to evidentials. Next I analyze the KNOWING IS SEEING metaphor and its role in the grammaticalization of an evidential marker in Maricopa.

1.1 Direct versus Indirect Evidence

Evidentials express the speaker's attitude towards a situation, including some degree of certainty or uncertainty. How certain the speaker is about her assertion depends on how the information was obtained. (See Willett 1988.) When the speaker is certain about her information she uses an evidential that codes "strong" evidence, and when she is uncertain she uses an evidential that codes "weak" evidence.

Languages generally distinguish between *direct* versus *indirect* experience. Direct experience includes a speaker's direct visual, auditory, or other sensorial experience of a situation. Indirect experience includes *reported* information (typically hearsay), and *inferred* information (typically observation of end results). Crosslinguistically, there is a natural hierarchy of evidentials which correlates directness of experience to certainty of knowledge: direct experience corresponds to a high degree of certainty, indirect experience of the reported type corresponds to less certainty, and indirect experience of the inferred type corresponds to even less certainty. (See Willett 1988.)

The evidentials in (1)(a)-(e), from Tuyuca (Tuyucan), illustrate different degrees of certainty of speaker knowledge.

Tuyuca (from Barnes 1984)

(1)(a) direct visual perception:

diiga ape-wi
he played soccer (I saw him play.)

(b) direct auditory perception:

diiga ape-ti
he played soccer (I heard the game, but didn't see it.)

(c) indirect visual perception:

diiga ape-yi
he played soccer (I have seen evidence that he played: his shoe
 print on the field. But, I didn't see him play.)

(d) reported:

diiga ape-yigi
he played soccer (I obtained the information from someone else.)

(e) reasoning:

diiga ape-hiyi
he played soccer (It is reasonable to assume that he did.)

Not all languages have such an exhaustive inventory. Basque, for instance, has only one evidential, *omen*, which refers to various types of unspecified indirect evidence. In (2), this evidential implies hearsay.

Basque

- (2) jon-ek liburu bat irakurri omen du
 John-ERG book one=ABS read EV AUX=ERG-ABS
I hear that John read a book

2.0 The Evolution of Evidentials from Verbs

Languages mark evidentiality in different ways.¹ In some languages, evidentiality is marked *explicitly*, i.e., through discrete grammatical markers (typically verbal affixes). This is the case in Amerindian languages including Maricopa, Wintu, and Makah, as well as in Korean, Turkish, and Japanese. In other languages, evidentiality is realized *implicitly*, i.e., by particular combinations of lexical items. This is the case in English, Spanish, Swedish, Arabic, and Vietnamese. Some languages, e.g., German, combine both types of evidentiality.

Crosslinguistically, it is common for evidentials to evolve from verbs. This is the case for evidential markers, which mark evidentiality explicitly, and for verbs that are used (in evidential constructions) to mark evidentiality implicitly. In the diachronic development of evidential markers, the verb adopts a different grammatical function and gains an evidential meaning. (Examples are discussed later.) In the diachronic development of verbs that are used to imply evidentiality, the verb semantically extends, receiving an additional, evidential meaning. For instance, in English the verb *see*, which earlier referred only to visual perception, has adopted an evidential meaning. This is seen in expressions such as *I see that you ate all the Cheerios* (upon picking up an empty cereal box), and *I see that somebody spilled honey on the floor* (when my shoes are sticking to the tile). In these types of expressions, *see* refers to the speaker's deduction with respect to a past event, not to visual perception. Both types of diachronic developments involve similar semantic changes (even though one type involves adopting a new grammatical function via grammaticalization).

English and Spanish are languages that code evidentiality implicitly. One way that evidentiality is realized in these languages is through the use of a perceptual verb followed by a *that*-clause (e.g., *I see (that) [X]*). In such cases, the degree of directness of perception coded is consistently less than it is in prototypical uses of the same perceptual verbs. For example, in expressions such as *I saw you eating Cheerios*, the viewer directly perceives the event as it takes place. In contrast, evidential uses of perceptual verbs code the speaker's deduction based on the perception of the end results of an event. The English example in (3) and the Spanish example in (4) illustrate this.

- (3) I see that you were sick last night
 (4) veo que estuviste enfermo anoche

In (3) and (4), the speaker might see an aspirin bottle, or vomit, and deduce the person had been sick. Crosslinguistically, such evidence is considered to be somewhat "weak" in terms of how likely the assertion is to be true.

It is also common to code reported speech -- a type of indirect evidence -- by using verbs which canonically refer to audition. This is illustrated with English *hear* and Spanish *oír* in (5) and (6).

- (5) I heard that you did well
 (6) oír que te fue bien

The "hearing" cases in (5) and (6) are similar to the "seeing" cases in (3) and (4); in each the speaker indirectly experiences the event. However, (5) and (6) differ from (3) and (4)

because they code an intermediary. That is, (5) and (6) imply the speaker obtained the information about the event through a third party (e.g., a neighbor). Because (5) and (6) involve indirect transmission of information, there is greater "distance" between the speaker and the information being asserted than in (3) and (4). This increase in "distance" results in greater uncertainty on the part of the speaker. Such cases constitute "weaker" evidence than if the speaker were to witness the event firsthand.

Finally, it is common in languages such as Spanish and English to use verbs that refer to tacton to indicate intuition or premonition. In such cases, a verb that canonically refers to "feel" is semantically extended to indicate a subjective, uncertain sort of claim. Examples include (7) and (8).

- (7) I *feel* that I am going to do well
 (8) *siento* que me va a ir bien²

Such evidential uses express even less certainty on the part of the speaker than those referring to hearing and seeing. They also constitute the "weakest" forms of evidence. (See Willett 1988, Matlock and Sweetser 1989).

As was shown above with examples from English and in Spanish, a verb that originally referred solely to perception semantically extends, giving a new, indirect evidential meaning. This diachronic process occurs in many languages, typically such that the mode of perception coded by the verb in its original meaning correlates with the meaning of the new, evidential meaning of the verb at a later stage. Namely, verbs of vision are held to be "stronger", or more reliable forms of evidence than are those of audition or tacton. This correlation is not arbitrary; rather, it is systematic, natural, and motivated by the inherent nature of perception and the ways we think about perception. (See Matlock and Sweetser 1989.)

When verbs grammaticalize to evidential markers they undergo similar semantic changes to verbs which adopt an evidential meaning, but which do not take on a new grammatical function. I will now discuss some cases of grammaticalized evidentials.

In Newari (Tibeto-Burman), the direct experience evidential *tql* (shown in (9)) evolved from *tql*, a verb meaning 'keep, put'. In grammaticalizing to an evidential marker, it has adopted a new meaning; it now refers to the observation of the end results of something that occurred in the past. It has also taken on a new grammatical function. (This morpheme, in its non-evidential function, also serves as a benefactive marker and a perfective marker.) ('PD' = past disjunct.)

Newari (Genetti 1986)

- (9) *wq-q swama piy-a tol-q*
 he-ERG flower plant-PART EV-PD
he has planted the flowers (I see them blooming)

The evidential *tol* implies greater certainty of knowledge, or "stronger" evidence, than does *dhun(k-)*, another evidential in the language, shown in (10). The speaker uses this evidential marker to express unspecified inferred evidence. It evolved from the verb meaning 'finish'. (Genetti 1986)

Newari (Genetti 1986)

- (10) *wq-p swama pi-i dhun-k-qlq*
 he-ERG flower plant-PART EV-PD
he has planted the flowers (they're not up yet)

Maricopa (Yuman) has a complex system of evidentials.³ One evidential, *-yuu*, a verbal suffix, refers to direct visual experience. This is illustrated in (11). (*-k-* indicates 'neutral realis aspect'.) (See Gordon 1986b.)

Maricopa (Gordon 1986b)

(11) *iima-k'-yuu*

dance-ASP-EV

he danced (I know because I saw it)

This evidential evolved from *yuu*, a verb which still exists independently with the meaning 'see'. Like *-'a*, a verbal affix that means 'I heard it', and other evidentials in Maricopa, *-yuu* is in its early stages of grammaticalization (evidenced, for example, by the lack of phonological erosion). (See Gordon 1986a.)

Not all instances of *-yuu* indicate visual perception. Sometimes this evidential refers to situations that involve firsthand experience. This is shown in (12), in which *-yuu* occurs with the first person. Here, this evidential marker codes "strong" evidence even when it does not refer to visual perception.⁴

Maricopa (Gordon 1986b)

(12) *'-iima-k'-yuu*

1-dance-ASP-EV

I danced (for sure in the past)

Another example of an evidential that has evolved from a perceptual verb is found in Wintu (Wintun). In this language, the evidential *-nther*, evolved from a passive form of the verb *mut*, 'hear, feel, sense'. (See Schlichter 1986.) Shown in (13), this evidential marker indicates direct auditory perception. It also refers to other forms of non-visual perceptual experience, shown in (14). ('IM' indicates imperfective aspect.)

Wintu (Schlichter 1986)

(13) *heket wira waca:-bi-nthe:-m*

someone come cry IM-EV-DUB

someone is crying (I hear them)

(14) *pi k'ilepma: daqca-nthe:-m*

it awfully hot-EV-DUB

it's awfully hot (I feel the heat)

This evidential sometimes refers to speaker intuition, illustrated in (15).

Wintu (Schlichter 1986)

(15) *po:m yel-hurawi-nthe:-m*

earth destroy- SEQ-EV-DUB

the earth will be destroyed (I feel it intuitively)

In cases (9)-(15), a verb grammaticalized into an evidential marker, and in (3)-(8), a verb semantically extended to take on an evidential meaning. Both of these types of diachronic developments involved a verb gradually adopting a new, evidential function. I will now discuss some of the semantic changes that occur in the grammaticalized cases. In doing so, I will consider earlier observations about semantic change and how they relate to the grammaticalization of evidentials.

Each of the cases in (9)-(15) involved a verb grammaticalizing into an evidential. In each case, a shift from non-epistemic to epistemic has taken place. For instance, the Newari verb *tol* at Stage I simply indicated physical grasp. At Stage II, it functions as an evidential that codes attested knowledge of the speaker.

Also in (9)-(15) the meaning of the item undergoing grammaticalization becomes more abstract.⁵ For instance, in Wintu, the evidential *-nther* once (as a verb) referred to hearing and other forms of non-visual perception. It now, in some instances, refers to intuition, illustrated in (15). This meaning-shift is not surprising considering the nature

of perception and thought. Relatively speaking, hearing is more concrete than intuition. It is also more objective; we are exposed to the same sort of sounds, which we process accordingly. For instance, I can hear exactly what the person next to me is hearing, but I cannot think (under normal circumstances) exactly what the other person is thinking. Hearing is also less conscious and more passive than intuition. Sounds simply "enter" our auditory field and we process them. In contrast, intuition is generally more inaccessible and requires more conscious control. These kinds of differences motivate the shift from concrete to abstract.

At first glance, it might appear that there is semantic loss when a verb grammaticalizes to an evidential.⁶ For example, as shown in (12), in Maricopa, a verb meaning 'see' has grammaticalized to an evidential that in some instances does not refer to visual perception, but to "strong" evidence. This case initially seems to suggest that there is "loss" of the central part of the meaning of this item: visual perception. However, there are several reasons for ruling out the possibility of "loss" of meaning in the grammaticalization of verbs to evidentials. For one, it could be argued that there is actually an "increase" in meaning. For instance, with each of the above cases, the item undergoing grammaticalization increases its semantic scope. Specifically, in each case, the item at the beginning of the diachronic process had only verbal scope; at a later stage, it gained propositional scope.⁷ The Maricopa evidential *-yuu* illustrates this. At Stage I in its development, *yuu* expressed that a situation was visually perceived by some viewer. At Stage II, as shown in (11), it codes not only visual perception of some situation, but also the speaker's attitude about the situation.

With each of the above developments, there is also an increase in speaker *situatedness*. Each verb took on a greater degree of situatedness when it grammaticalized because the coding of the evidential directly involves the speaker's experience and knowledge of a situation. This can be seen in the Newari example in (9). As a verb, *tol* expressed physical grasp, and as an evidential, it refers to direct experience of the speaker (her attitude toward the situation).

These changes parallel the cases shown in (3)-(8) (which are essentially semi-grammaticalized cases). For instance, when used as an evidential, *see* becomes epistemic, increases in propositional scope, and reflects a greater degree of speaker situatedness. Hence, we see from several cases, "loss" of meaning does not occur because the argument could be made that there is increase in meaning. It is better to look at such cases as meaning-shifts.¹⁰

3.0 Metaphor as a Motivation in the Grammaticalization of Evidentials

Metaphor allows us to express abstract things in terms of concrete things. The basic structure of metaphor is as follows: a concrete domain, *source domain*, is mapped onto an abstract domain, *target domain*.¹¹ Examples of metaphors include LIFE IS A JOURNEY, TIME IS SPACE, MIND IS A CONTAINER, IDEAS ARE OBJECTS, and ANGER IS HEAT (Lakoff and Johnson 1980, Lakoff 1987). Some metaphors are more basic than others, reflecting deep cognitive entrenchment. Such metaphors are generally more conventionalized, and are more likely to occur crosslinguistically. As Lakoff (1987 and elsewhere) and many others have shown, metaphor is much more than simply a lexical phenomenon; it is a central part of everyday cognition.¹²

It is important to consider the role of metaphor in diachronic change because it reveals much about the conceptual nature of meaning-shifts that occur through various stages of development. (See Sweetser 1987a.) Research on how metaphor figures in grammaticalization has been done;¹³ however, its role in the diachronic development of evidentials has not yet been addressed. In attempting to better understand the role of metaphor in the diachronic shift of verbs to evidential markers, I will now discuss KNOWING IS SEEING, arguing that this metaphor is evoked synchronically with evidentials that refer to visual perception, and that it motivates the grammaticalization of evidentials from verbs of visual perception.

3.1 KNOWING IS SEEING

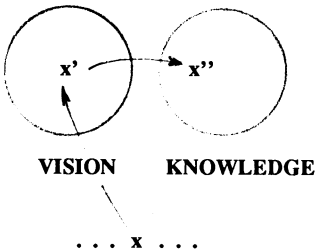
KNOWING IS SEEING is a pervasive and highly conventionalized metaphor.¹⁴ It occurs throughout Indo-European languages (see Sweetser 1984), and in many other types of languages. This metaphor underlies expressions such as *I see what you mean*, *her argument was clear*, and *in my view*... (See Lakoff and Johnson 1980 for other examples). In each of these, a word that pertains to vision is extended via this metaphor to indicate certain aspects of knowledge or thought. For instance, in *I see what you mean*, *see* does not refer to visual perception; rather, it refers to understanding.

In the KNOWING IS SEEING metaphor, VISION structures KNOWLEDGE.¹⁵ Each time this metaphor is evoked, elements of the source domain (VISION), map onto the target domain (KNOWLEDGE). "Elements" here refers to Lakoff's (1987) *basic image-schemata*,¹⁶ preconceptual, quasi-primitive elements that figure prominently in the mapping of KNOWING IS SEEING and other metaphors.

Existing at the preconceptual level, basic image-schemata are instantiated in the source domain (VISION), and where they then map onto the target domain (KNOWLEDGE). In this process, certain inferences arise, determined partially by the type of image-schemata evoked, and partially by the pre-existing structure of the source and target domains.

I will now discuss some of the details involved in the mapping of KNOWING IS SEEING. Figure I represents a partial mapping. It depicts the mapping of only one of the elements of this metaphor, the *link schema*. (See Lakoff 1987.) Simply stated, this element schematically relates any two entities. In Figure I, the link schema is represented by x. In the mapping of KNOWING IS SEEING, the link schema is generated preconceptually, i.e., selected from an array of basic image-schemata (represented by the dots). It "emerges", structures part of the source domain, and is invoked as x': *the viewer is linked to an entity via visual contact* (where *entity* refers to an object or process). The link schema is then mapped onto the target domain from the source domain via a *connector*, which is represented by the arrow. (See Fauconnier's 1985 *mental spaces*.) In the target domain this element is realized as x'': *the mental experiencer is linked to an entity via mental contact*.

Figure I



The *source-path-goal* schema (not shown) is another basic image-schema that structures KNOWING IS SEEING. It is instantiated in the source domain as the viewer's *line of sight*, is mapped onto the target domain, and realized as the mental experiencer's *focus of attention*. Evidence for the existence of this schema follows. When we look at something we direct our line of sight toward the entity, and when we think of something, e.g., idea, notion, we *direct* our focus of attention toward it. For example, the idea of direction of attention is invoked in "I see what you mean." This direction of attention constitutes a path at the preconceptual level. Certain inferences arise in this mapping. For example, the *viewer* becomes *mental experiencer* and *visual processing* becomes *mental processing*.

KNOWING IS SEEING occurs each time a speaker uses vision to refer to knowledge. This is the case with visual verbs such as *see* in expressions like *I see what you mean*. This is also the case with evidential markers that canonically refer to direct visual perception. For instance, the Maricopa direct visual evidential marker, *-yuu*, is used to indicate that the speaker has attested knowledge. (See (11) and (12).) Each time a speaker uses this evidential marker, she says 'I saw it firsthand', which indicates to the hearer that the evidence is "strong", i.e., **known** to be true.

KNOWING IS SEEING also motivates the grammaticalization of evidentials from verbs of visual perception, and motivates semantic extensions such as *see* referring to *know*, e.g., *I see what you mean*. This is partly because of the similarity between vision and cognition. For instance, one can pick out an object and focus on it visually, just as one can pick out an idea and focus on it mentally. Also, vision and knowledge are interconnected: knowledge often presupposes vision because vision is our primary source for obtaining information. Conversely, vision often presupposes knowledge; for instance, if I look at a picture of Richard Nixon, I recognize him because of my knowledge about his physical appearance. Finally, our construal of vision and our construal of knowledge are similar; for instance, I have objects in my visual field -- an abstract container (Lakoff and Johnson 1980) -- which I can visually access at will; similarly, I have mental objects, i.e., ideas, in my mind -- another abstract container -- which I can mentally access at will.

4.0 Perception and Knowledge

It was argued that the KNOWING IS SEEING metaphor is evoked synchronically with direct visual evidentials, and that it plays a role in the grammaticalization of evidentials from verbs of visual perception. Now the following question must be asked: Why is VISION used to structure KNOWLEDGE instead of AUDITION or other types of perception? For instance, in Maricopa, we saw that visual perception is used to indicate "strong" evidence, or attested knowledge, and not audition or other forms of perception. To answer this question, we must consider why VISION is associated with more certainty of knowledge than other forms of perception, and why AUDITION and other forms of non-visual perception are associated with inferred knowledge. Part of the answer relates to the nature of perception and our beliefs about it.

Our beliefs about visual perception can be explained by Lakoff's (1987) ICM OF SEEING. (ICM = "Idealized Cognitive Model".) A central component of this ICM is: *we believe what we see*. This is evidenced by the fact that vision is our primary way of gaining information about the real world; it affords us a means of accurately differentiating stimuli as to color, depth, space, size, distance, and a number of other properties. (See Rock 1976, Marr 1982, and Treisman 1986.) We do not have the ability to make such fine-tuned distinctions with audition or other types of perception. Additionally, vision is more active than audition; we can shut our eyes, but we cannot shut our ears (at least not to the same extent).

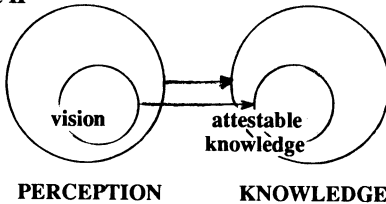
In summary, the way we conceive of perception determines the way we express it linguistically, and this conception motivates the evolution of evidentials from verbs of perception. This accounts for why visual perception has come to indicate "strong", certain evidence (attested knowledge) and why non-visual perception has come to refer to "weaker", less certain evidence (inferred knowledge). Because vision is inherently more accurate than other forms of perception, information obtained through this sensory modality is believed to be more certain or reliable than information gained through other modalities. (For discussion on linguistic coding of perception and knowledge, see Matlock and Sweetser 1989.)

4.1 Higher Level Mapping: PERCEPTION onto KNOWLEDGE

Mapping VISION onto KNOWLEDGE accounts for the cases of grammaticalization in which verbs that referred to vision evolved into evidentials that indicated attested knowledge. Now we need to consider what sort mapping occurs in the semantic change and grammaticalization of verbs of non-visual perception into evidentials.

As shown in the Wintu case in (14), an evidential that indicates inferred knowledge has evolved from a verb that indicated **non-visual** (ultimately auditory) perception. What type of metaphor motivates this type of semantic change, in which a verb of non-visual perception comes to indicate (a "weaker" type of) knowledge? It is possible to posit another metaphor, e.g., **HEARING IS KNOWING**, but because this mapping is not very productive it is more feasible to posit a more general, higher level metaphor along the lines of that shown in Figure II.

Figure II



In this mapping, **PERCEPTION** maps onto **KNOWLEDGE**. Subsumed under this mapping (at a lower level) are more specific metaphors relating to knowledge and perception. For instance, **KNOWING IS SEEING**, indicated here by the mapping of **VISION** onto (**ATTESTABLE**) **KNOWLEDGE**, is part of this mapping.

Although the details of this higher level mapping requires explication, it potentially accounts for the correlation between the different degrees of certainty of knowledge and the types of perception coded by evidentials.¹⁷ For instance, the correspondence between attestable knowledge and visual perception, as in Maricopa, is sanctioned, and so is the connection between intuition -- a type of unattested evidence -- and non-visual perception, as in Wintu. It also accounts for cases like the indirect visual evidential in English and in Spanish as shown in (3) and (4), in which vision is used to structure inferred knowledge. This is realized by the prominence of the *part-whole* schema because inference involves knowing part of something. Given this, the prominent portion of the target domain is **inferred knowledge** instead of **attested knowledge**, as would be the case with **KNOWING IS SEEING**.

5.0 Knowledge and Belief

We also need to consider the connection between knowledge and belief, because when the speaker uses an evidential, her intention is to inform the hearer of the certainty of her knowledge. To understand the relation between knowledge and belief fully, we must examine cultural models. According to Sweetser (1987b), our folk models of knowledge allow us to believe information unless otherwise indicated. Generally, it is only when information is contrary to what we would normally believe that we have to make explicit specification. This is evidenced by the fact that in many languages, the highest degree of certainty of evidence is zero-marked. For example, in Wintu, lack of an evidential implies direct visual experience. (See Schlichter 1986.) In such languages, the inferred types of evidence require overt specification. Furthermore, it is never the case that languages that mark direct evidence do not mark indirect evidence. (See Willett 1988.)

6.0 Conclusion

In this paper, I argued that metaphor plays an important role in the grammaticalization of evidentials. To demonstrate this, I analyzed the Maricopa visual evidential, *-yuu*, which refers to attested knowledge, and discussed its diachronic development from a visual verb. It was argued that the **KNOWING IS SEEING** metaphor was evoked synchronically each time a speaker uses this evidential, and that this metaphor figures in this

type of diachronic change. Also, a higher level metaphor that maps perception onto knowledge was proposed.

This research, in its initial stage, is part of a more global endeavor: to analyze how we conceptualize and structure meanings that relate to perception and other cognitive processes. Such research may lead ultimately to a clearer understanding of the relation between language and other cognitive processes such as vision. Exploring the conceptual structures underlying linguistic constructs is crucial to understanding their synchronic nature as well as their diachronic development.

Notes

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1. Although for *descriptive* purposes it is useful to differentiate the two ways in which evidentiality is coded, a clear-cut distinction cannot be made. A natural gradation exists between these two types of constructions. See Langacker (1987) and Talmy (1988), who argue that the difference between a morpheme and any larger linguistic category is gradational.

2. Some Spanish speakers prefer *presentir*.

3. See Gordon (1986a) and (1986b) for discussion of the development of *-yuu* and other evidentials in this language, and for arguments that these elements have gained grammatical status.

4. I am not saying that no sense of visual perception is coded in cases such as (12). I am saying that visual perception is backgrounded or at least not central to the meaning evoked. For instance, if I am dancing I might see my hands and legs moving, but I would not normally direct my line of sight towards my body. This viewing would be more subjective and less conscious.

5. Sweetser (1988), Traugott (1982), and others have discussed how the meaning of an item becomes more abstract in grammaticalization.

6. Semantic loss has been referred to by Heine and Reh (1984) as "desemanticization", and by Givon and others as "bleaching".

7. See Givon (1982) for discussion on the semantic scope of evidentials.

8. This development is similar to the evolution of modals in English, discussed by Bybee (1988).

9. Traugott (1988) argues that semantic changes, including those involved in grammaticalization, exhibit "greater situatedness of speaker": the meaning becomes more anchored in the context of the speech act, particularly the speaker's orientation to situation. See Traugott (1982:253).

10. Sweetser (1988), Traugott (1988 and elsewhere), and others have shown it is more appropriate to treat cases of grammaticalization as shifts in meaning, not loss of meaning.

11. Lakoff and Johnson (1980).

12. See Lakoff (1987), Turner (1987), Lakoff and Turner (1988), and Johnson (1987).

13. See Sweetser (1988), Claudi and Heine (1986), Bybee and Pagliuca (1985), Fleischman to appear, Traugott and König (1988), and Heine, Claudi, and Hünemeyer (1988).

14. This metaphor has been referred to (e.g., Lakoff and Johnson 1980, Turner 1987) as UNDERSTANDING IS SEEING. Because knowing typically presupposes understanding it is probably better to treat KNOWING as the target domain.

15. This is a natural mapping because vision is more basic than knowledge. (See Sweetser 1984.)

16. These elements are preconceptual elements that have their own internal logic and which shape

our experience. For instance, the *container* schema is comprised of the following properties: an interior, an exterior, and borders that divide the former from the latter. It is evoked linguistically with expressions that we use to refer to containment, for instance, *he's in the room*, *she's in my dreams*, and *the idea is in my head*. See Lakoff (1987) for in-depth discussion.

17. D'Andrade's (1987) *Folk Model of the Mind*, which claims that perception leads to knowledge, captures the essence of this higher level metaphor.

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Japanese-style Noun Modification ... in English*

Yoshiko Matsumoto
Ohio State University

In this paper I first describe adnominal clause constructions in Japanese, whose construal is strongly dependent on semantics and pragmatics. I will briefly outline a framework in which the construal can be analyzed, and will present examples that suggest that this framework is useful for corresponding constructions in Korean and Chinese. What is perhaps surprising is that certain constructions in English can also be analyzed within a similar framework.

1. NOUN-MODIFYING CONSTRUCTIONS IN JAPANESE

The constructions in Japanese that I wish to discuss are those of the form of a complex noun phrase formed by a noun or noun phrase preceded by a clause which semantically qualifies the head noun and whose predicate is in finite form. This includes the types that are usually called "relative clauses" and "noun complement constructions", illustrated by the examples (1) [watasi ga kinoo atta] hito 'the person (whom) I met yesterday', and (2) [[[tikyuu ga marui] zizitu]] 'the fact (that) the earth is round'. I refer to such constructions as adnominal clause or clausal noun-modifying constructions. The constructions in Japanese of the form just given can correspond to various forms in English; namely, modification by a finite, infinitival, or participial clause. Thus, the expressions the book which the student bought, things to do, and the result of skipping breakfast correspond in Japanese to this single form of construction; that is, to a head noun preceded by a clause in finite form.

As I argued elsewhere (Matsumoto 1988a,b), the construal and the generation of Japanese clausal noun-modifying constructions are controlled by a fundamentally different principle from that usually proposed for English and many other languages. The category "relative clause construction", for example, is in English a syntactically defined structure, characterized by the existence of a reference-binding relationship between the head noun and either a relative pronoun, or (in relative clauses without relative pronouns) a syntactic gap in the modifying clause. Within relative clauses introduced by relative pronouns (or relative-pronoun-phrases, such as with whose friends), the remnant of the clause following the relative expression can always be seen

as having an unfilled position which could be filled by a word or words denoting the category represented by the relative expression. Thus, for example, in the noun phrase the book the student bought, the semantic relationship of the head noun to the relative clause the student bought is strictly determined by the syntax of the relative clause.¹ The structure of relative clauses contrasts with that of noun complement clauses, which present no gap, as in the fact that the student bought the book.

In Japanese, however, there is no such syntactic dichotomy between relative and noun complement constructions. The first and most telling reason for this is that there is no rule in Japanese requiring all the arguments of a verbal to be present in a sentence; therefore, there may be missing arguments even in a regular non-relative sentence. For example, (3) katta '() bought ()' can be a grammatical sentence, even though no arguments are present, as long as the buyer and the goods are understood from the prior linguistic or extra-linguistic context. Hence, unlike in English, the apparent 'absence' of an 'expected' argument tells us nothing about whether the clause is a main clause, a relative clause or a noun complement clause. The second reason for the lack of any clear-cut syntactic dichotomy in Japanese between relative clauses and noun complements is the existence of constructions that do not correspond either to relative or to noun complement clauses in English. These two points together form the basis for the perspective in my analysis of Japanese noun-modifying constructions.

The concepts at the center of my analysis of noun-modifying constructions in Japanese (Matsumoto 1988b) are those of simple frame, host, and world view. A frame is a structure for expressing semantic relationships, and it has positions that can be indexed (or filled in) by certain words or expressions. By simple frame I mean the frame that is evoked by a word or an expression. For example, the verb katta 'bought' (kau 'buy') evokes a (simple) frame of "buying", or, more inclusively, a frame of a "commercial event". Such an evoked simple frame contains positions (or slots) for possible participants. In the "commercial event" frame, possible participants would include the "buyer", "goods", "seller", "money", and also the "purpose", "beneficiary", "byproducts". This concept of frame resembles Fillmore's case frames (Fillmore 1968), but with the modification (as in more recent studies using frame semantics) that the frame models a generalized scene,

rather than being strictly linguistic.

Construal of noun-modifying constructions in Japanese relies on a coherence between the two constituents - the adnominal clause and the head noun. This coherence can be expressed in terms of the concept of a host. Thus, when the frame evoked by one of the two constituents of the NMC is interpreted as integrating what is expressed by the other constituent, we say that the frame is host to the other constituent. Frames evoked by the main predicate of the modifying clause, and frames evoked by certain head nouns are the frames that most frequently function as hosts.

The third concept I mentioned - that of world view - refers to what R.N. Ross (1975) (quoted in Tannen 1979) has called a "structure of expectation", in other words, it is the culturally-based knowledge about the world that allows one "to predict interpretations and relationships regarding new information, events, and experiences". The necessity for consideration of the world-view is evidenced by the difficulty which Japanese speakers find in interpreting examples such as (4).

- 4) ?? [[Tookyoo o tabeta] tomato]
Tokyo ACC ate tomato
? 'the tomato (which) ate Tokyo'

As the English translation shows, the English counterpart of (4) has one indisputable reading which is imposed by the syntax: that in which the tomato is the agent and Tokyo the patient of the eating. In Japanese, however, the relationship between the two constituents is construable only if the hearers discard their ordinary or "default" world view and adopt one of fantasy. It should not be surprising, then, to find that many native speakers of Japanese should judge (4) to be unacceptable.

We can contrast (4) with example (5) which, in spite of the fact that the arguments of the verb in the modifying clause are not mentioned, and in spite of the fact that the head noun indexes an adjunct position, is perfectly comprehensible on account of the semantics of the head noun resutoran 'restaurant'.

- 5) [[Kinoo tabeta] resutoran] wa kondeita.
yesterday ate restaurant TOP was crowded
'The restaurant (at which) (I) ate yesterday was crowded.'

It should be emphasized that the degree of plausibil-

ity, relative to the construer's world-view, of the situation described or alluded to plays a non-negligible role in making acceptability judgments. In syntactic analyses, the extractability of a noun from a complex NP is employed to illustrate subject-non-subject asymmetry in that extraction out of an NP in subject position is allowed, while the extraction out of an NP in non-subject position is not (Hasegawa 1981, Saiki 1985). This contention, however, cannot be maintained. When the invoked situation is plausible, extraction from an indirect object position is also acceptable, as in (6a).

- 6a) [[[[watasi ga 0 0 okutta] o-tyuugen] ga
 I NOM sent HON.-summer-gift NOM
 kowareteita] tokuisaki] ga aru n desu ga...
 was broken client NOM exist NMLZR is but
 '(lit.) There is a client (to whom) the summer gift
 (which) (I) sent, was broken, but...'
 Cf.6b) Watashi ga (tokuisaki ni) (o-tyuugen o)
 I NOM client DAT HON.-summer-gift ACC
 okutta.
 sent
 'I sent the summer gift to a client.'

Japanese clausal noun-modifying constructions fall into three major types, according to which constituent plays the role of host in the construal of the construction. The three types are (i) constructions in which the modifying clause hosts the head noun (the Clause Host-, or CH-type), i.e., constructions in which the denotatum of the head noun participates in a frame evoked by the main predicate of the modifying clause, (ii) constructions in which the head noun hosts the modifying clause (the Noun Host-, or NH-type), i.e., constructions where what is described in the modifying clause is a complement of what is denoted by the head noun, and (iii) constructions in which both the modifying clause and the head noun host reciprocally (the Clause and Noun Host-, or CNH-type), i.e. in which the head noun can evoke a frame containing a slot for what is expressed in the modifying clause, while the frame evoked by the modifying clause in turn contains a possible participant role for the denotatum of the head noun.

The CH-type is illustrated by examples (7), (8) and (9).

- 7) [[hon o katta] gakusei] wa doko desu ka
 book ACC bought student TOP where is QP
 'Where is the student (who) bought the book?'

- 8) [[atama ga yokunaru] hon]
 head NOM gets better book
 'the book (by reading which) (one's) head gets better'
- 9) [[te o araw-anakutemo ii] oyatu] nai?
 hand ACC O.K. not to wash snack isn't there
 'Isn't there a snack (in order to eat which) (I) don't have to wash (my) hands?'

The head noun gakusei 'student' in (7) indexes the participant role "buyer" in the frame evoked by the verb katta 'bought' in the modifying clause. (8), in which the verb in the embedded clause is intransitive, is a more complicated example, but the same principle applies. The construal can be summarized by saying that the head noun hon 'book', in association with the action of reading, occupies the position of the "cause" in the frame evoked by yokunaru 'gets better'. Likewise in (9), the head noun oyatu 'snack', in association with the action of eating, occupies the position of the "purpose" in the frame evoked by the modifying clause. In these less straightforward constructions, the data I have collected suggest that the preferred relationships between the two constituents are condition and consequence (including a concessive relation), and purpose and requisite (Matsumoto 1988a,b).

Example (10) illustrates the NH-type.

- 10) [[kane o nusunda] zizitu] ga akirakaninatta
 money ACC stole fact NOM became clear
 'the fact that (he) stole the money became clear'

Because of its semantic content, zizitu 'fact' would not normally index a participant role (for instance that of the "thief") in the frame evoked by nusunda 'stole'. Instead, zizitu 'fact' is a "frame-evoking" noun; it evokes a (simple) frame in which it labels or encapsulates a proposition expressed in the adnominal clause. This characteristic of the head noun allows it to provide the host frame for the entire construction.

The complex NPs in (11) - (13) are also of NH-type.

- 11) [[kame ga taroo o tasuketa] hanasi] o
 turtle NOM Taro ACC rescued story ACC
 yonda.
 read
 '(I) read the story (that/in which) a turtle rescued Taro.'

- 12) [[siri-tai toiu] yoku] ga aru.
 want-to-know COMP desire NOM exist
 '(One) has the desire to know.'
- 13) kinoo tabesugita node [[kyoo nanimo
 yesterday overate because today anything
 taberarenai] kekka] ni natta.
 cannot eat result DAT became
 'Because (I) overate yesterday, it became the
 result that (I) cannot eat anything today.'

(12) includes a so-called complementizer toiu, literally meaning 'say that', which, I claim, functions to mark what is expressed in the complement clause as a quasi-quotation. In this sense, toiu is not exactly like the English complementizer that. I will mention more-or-less equivalent English constructions later on in this paper.

Finally, the CNH-type is illustrated by example (14).

- 14) [[kinoo tabesugita] kekka], kyoo nanimo
 yesterday overate result today anything
 taberarenai.
 cannot eat
 '(As) a result (of) having overeaten yesterday,
 (I) cannot eat anything today.'

The head noun kekka 'result' in (14) participates as the result of the action in the frame evoked by tabesugita 'overate'. On the other hand, kekka 'result' is what we may call a "relational noun": it evokes a frame which has a slot for a concept relational to it; here, the cause of the result. The modifying clause describes the cause. Thus the modifying clause and the head noun in (14) host reciprocally. Examples (15) to (17) are also illustrative of the CNH-type.

- 15) [[tabako o katta] oturi]
 cigarette ACC bought change(=balance of money)
 'the change (from) buying cigarettes'
- 16) [[katana de kitta] kizu]
 sword with cut wound/scar
 'the wound/scar (from being) cut with a sword'
- 17) [[sakana o yaku] nioi] ga suru.
 fish ACC grill smell NOM there is
 'there is a smell (of) grilling fish'

2. CORRESPONDING CONSTRUCTIONS IN KOREAN AND CHINESE

A preliminary survey suggests that the type of analysis that I have sketched above may be applicable

also to clausal noun-modifying constructions in Korean and in Chinese. Korean and Chinese, although differing from Japanese in that there is a morpheme marking embedded clauses, share the characteristic with Japanese that noun-modifying constructions lack overt indications of the semantic relationship between the two constituents. There are Korean and Chinese constructions falling into each of the three types that I discussed in connection with Japanese, although the appropriateness for Korean and Chinese of this tripartite classification needs to be examined more thoroughly. The following are Korean and Chinese constructions corresponding to the complex NPs of (9), (11) and (16) above.

- 9K) [[son ŭl anssissədodö -nŭn] gansig]
 hand ACC O.K. not to wash -NON PAST.Rel snack
- 9C) [[buyong xishou de] lingshi]
 need-not wash-hand NOM snack
 'a snack (in order to eat which) (I/you..) don't have to wash (my/your..) hands'
- 11K) [[gəbugi ga toki rŭl igyæssda nŭn] iyagi]
 turtle NOM hare ACC won COMP story
 'the story (that/in which) a turtle defeated a hare.'
- 11C) [[niulang zhinü qiyue giri xianghui
 herd-boy weaver-girl July 7th meet-together
 de] gushi]
 NOM story
 'the story (that/in which) the herd boy and the weaver girl meet on July 7th.'
- 16K) [[khal lo ccilu-n] sangchə]
 knife with stab-PAST.Rel scar
- 16C) [[dao ge de] shang/shangba]
 knife cut NOM wound/scar
 'the wound/scar (from being) cut with a knife'

Constructions such as (9) and (16), which are problematical to purely syntactic or structural analyses and which might have seemed to be peculiar to Japanese, are also possible in Chinese and Korean. There is, however, variation among these three languages in terms of what relations can be expressed by noun-modifying constructions in which there is no structural clue to the relation. For instance, the analogue in Korean of (8) is acceptable, while that in Chinese is not.

- 8K) [[məri ga johaji-nŭn] chaeg]
 head NOM gets better-NON PAST.Rel book
 'the book (by reading which) (one's) head gets

better'

8C)*[[tou bian congming de] shu]
 head become smart NOM book

3. JAPANESE-STYLE NOUN MODIFICATION IN ENGLISH

A reliance on semantics and pragmatics is not confined to "exotic" languages such as those I mentioned above. While English relative clauses are largely governed by syntax, and the category "relative clause" is structurally distinguishable from "noun complement clauses", there are some examples with varying degrees of acceptability that fall outside the standard analyses and that resemble the constructions I have been discussing from Japanese, Korean and Chinese. These examples are usually restricted to informal discourse, but are nonetheless acceptable to many speakers. Some examples that would, in the framework I outlined, be classed as Clause Host type, are the following. (23) and (24) are attested and (18) to (22) are elicited based on corresponding Japanese noun-modifying constructions.

- 18) This is the car where you feel energetic.
- 19) a TV program where you get depressed
- 20) Let me give you a tea where you get to sleep.
- 21) What was the homework where you couldn't come to the party?
- 22) I need a medicine that I can sleep.
- 23) Takes a while to get in the frame of mind that you have these things.
- 24) Here is a snack that/where you don't have to wash your hands.

Note that one of the examples, (23), is a variant of a 'regular' syntactically governed relative clause (i.e. ...frame of mind in which you have these things). In others, such as (24), where or that substitutes for a complex expression (i.e. a snack in order to eat which... or, as in (19), the TV program because of watching which ...).^{2,3} In terms of the Gricean principle (1975) of conversation, the Maxim of Quantity is violated in these examples, in that the structure does not determine the semantic relation between the two constituents, while the Maxim of Manner may be said to be followed, in that the construction is more succinct than a more explicit expression. It does not seem possible that the construal of such examples can be explained in purely syntactic/structural terms. Ideas such as frame and world-view seem to be required.

There are also constructions in English that are

analogues of certain NH-type constructions in Japanese. These are illustrated by attested examples (25)-(28).

- 25) ...one that terminates the interchange in a grumble, a meager excuse, a face saving I-can-take-a-joke laugh, or...
- 26) ...we meet two these-boots-mean-I'm-a-cowboy-type guys, who wink at us and ...
- 27) your sleepy just-out-of-bed voice is ...
- 28) ..., waiting for a call for the "Mary Beth-arrives-home-and-is-besieged-by-the-press" scene,...

A structural peculiarity of these English examples is immediately evident: the construction consists of a modifying clause preceding a noun. These are most comparable to Japanese constructions of NH-type with toiu, literally meaning 'say that', an example of which is given in (12). The modifying clause of both the English and the Japanese constructions of this type expresses the content or the manner of what is denoted by the head noun as if it were a quote. If, for example, (25) were to be paraphrased, it would be something of the sort; 'a laugh that can be described as indicating (or saying) that I can take a joke'. As with many of the Japanese examples we have considered, expressions of the sort (25) would be used when succinctness is valued more than maximum clarity. In Japanese, while the corresponding constructions are structurally regular for the NH-type, they are distinguished by the property that their head nouns are not content-taking nouns.

As we have just seen, certain clausal noun-modifying constructions in English show similarities to those found in Japanese. To that extent, the framework devised to analyze the Japanese constructions is of use also in discussing the English counterparts. Where this framework can find its greatest use, however, is in the analysis not of clausal modification but of Noun + Noun compounds in English. In fact, the variety of semantic relations that can hold between the two constituents of N+N compounds in English makes the Japanese noun-modifying construction seem tame by comparison, as witness compounds such as Bible Bed used as a title of a news story on Jessica Hahn, and Flea Products for products to prevent or to get rid of fleas.

N+N compounds have been discussed by, for example, Zimmer (1971), Downing (1977), Levi (1978) as well as by researchers in AI, such as Sowa (1987). Interest-

ingly enough, Sowa's analysis is in terms of types of frames, and he divides N+N compounds into four classes depending on the relationship between the meaning of the whole and the frames evoked by the two nouns.⁴

4. CONCLUSION

The examples discussed in this paper suggest that the semantic notion of frames and the pragmatic notion of world-view can form the basis of an analysis of a variety of constructions from diverse languages in situations in which the construal is not guided by the syntax but by the clues given by the individual lexical items and by the hearer's extra-linguistic knowledge. Moreover, they illustrate the importance of semantic/pragmatic considerations even in languages which are often thought to be controlled by syntax.

NOTES

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1. I owe this description of the English relative clause construction to Charles Fillmore.
2. There are also attested examples that indicate a violation of island constraints as in the following.
 - a) Then you look at what happens in languages that you know and languages that you have a friend who knows. (Cited by J. McCawley 1981)
 - b) He gave a talk which I should go home and study the hand out. (Observed by Knud Lambrecht)
 - c) All they have is a post office box which if you send mail to, it doesn't come back marked "undeliverable". (Observed by Pamela Downing)
3. Paul Kay pointed out that the expression such that in mathematical language is an equivalent of that, or where.
4. Sowa's classification and examples are as follows.
 - a) The head noun (supplies the frame):
philosophy teacher, jewelry thief, dog house
 - b) The modifying noun: mother hen, pet cat,
maintenance man, discussion topic
 - c) Both: employee compensation, bus ticket, discus-
sion leader
 - d) Neither: gold bar, cat people

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ANOTHER LOOK AT THE ROLE OF FEMALE SPEAKERS
IN SOUND CHANGE
BIRCH MOONWOMON
UNIVERSITY OF CALIFORNIA, BERKELEY

0. Introduction. I want to consider results from a sample of language change in progress studies from the last two and a half decades in addressing the question of the role of women in situations of phonological change. It is necessary to attend closely to the work of Labov, especially early work in which he and his colleagues laid the theoretical foundation for change in progress investigations. Within the early Labovian framework, certain generalizations were made about the role of women in sound change that are hard to clarify or challenge without reexamining a number of other early ideas and early data along with later material. There is a need to review and reevaluate certain sociolinguistic concepts: style shifting, hypercorrection, prestige, and others. Most of these concepts seem to fit well within a stratificational model, a sociological model that assumes the sharing of societal norms across classes. Some sociolinguists have suggested that a conflict model is a better one for describing and explaining variation (e.g. Rickford 1986). A conflict model assumes the inherence of class conflict and norm differences in societal structure. It seems to me that a conflict model is the better one for describing and explaining the different roles in sound change of different groups of female speakers in different situations.

1. Consideration of theoretical particulars. Since the beginning of modern sociolinguistic work two claims about the role of women in the process of sound change have been common. One is that women are more standard speakers than men, and therefore are found to correct more frequently and extremely toward the standard-prestige variant of a variable (Labov 1966a; Levine and Crockett 1967; Wolfram 1969; Shuy, Wolfram, and Riley 1967; Trudgill 1972). The other claim is that the women of a subgroup in a community are innovative in sound change (Labov 1966a, 1972; Labov, Yaeger, and Steiner 1972; Trudgill 1974).

On first consideration it seems that both claims can be true only if sound change begins in the highest ranking status group in a speech community since it is the speech of that group that defines the standard. On first consideration it seems that the two claims that women are more standard speakers than men and that women innovate or lead in sound change cannot both be true if a new form originates within any stratum except the highest. Nonconservative behavior would then be in violation of the standard norm. Nonstandard, vernacular speech, however, is just where linguistic innovation is often found (Eckert 1987; Labov, Yaeger, and Steiner 1972; Milroy and Milroy 1978). Because of style shifting, theoretically both claims could be true if a new form originates in or enters a speech community through a lower status group. It is possible for women to use innovative, nonstandard forms in one speech style, and conservative, standard forms in another. Some studies show this to be the case with regard to some variables—studies going back as far as Labov's (1972a) Lower East Side investigation of (eh) and (oh). (Also see Labov, Yaeger, and Steiner 1972; Milroy and Milroy 1978.)

Early modern work on sound change in progress, in which theory was developed concerning a mechanism of change relying on hypercorrection, overemphasizes the influence of either standard or conservative speech in the process. Of the 13 orderly stages in the process of sound change outlined by Labov (1965), the final five involve 'change from above', that is, socially

conscious correction of a stigmatized form, which makes for stylistic stratification. Speakers, and especially speakers of middle status groups, hypercorrect in careful speech (pp.524-525).

Pressures from below the level of social awareness operate on entire linguistic systems, Labov says, 'in response to social motivations which are relatively obscure and yet have the greatest significance for the general evolution of language'(1966b:123). Indeed, Labov's 'mechanism' model (1965:535) implies that the 'default' case of sound change is one in which change begins in a subgroup that is not the highest-ranking status group. Studies of the last two and a half decades confirm this. Yet, in early work Labov concerns himself primarily with social pressures from above, pressures motivating the overt process of social correction, perhaps because the social motivations involved in change from below are 'relatively obscure'.

Hypercorrection from above is graphic when a crossover pattern is observed. In the familiar sociolinguistics charts showing the distribution of values for a phonological variable across speech styles, one sees that the standard dialect variant is used more in formal speech by speakers in all classes—almost all of the time. Regularly, one line disturbs the pattern by crossing over another in formal style speech. The line which crosses over is the line representing, roughly, lower middle class (LMC) speech; the crossed line represents upper middle class (UMC) speech. LMC women show the most extreme values; female speech, in fact, largely accounts for the crossover. These same charts also usually show crossovers in casual speech. The same group of speakers corrects 'down' as well as 'up'. This is a phenomenon I will call 'the doublecross'. It has been observed for decades (e.g. Labov 1972a:301, in specific reference to women's speech behavior) but not named or attended to. In casual speech, means for the LMC are more extreme in the direction of nonstandard speech than is true for the working class (WC). Both the LMC and women can be observed correcting toward the standard variant, whether such behavior is conservative or innovative. The claim is that, across class, women behave like LMC speakers; or LMC speakers behave like women. Hypercorrection from above is strongest among LMC females (Labov 1970:69).

The motivation proposed—and the one widely accepted within sociolinguistics—for style shifting and hypercorrection from above is prestige (Joos 1952; Fischer 1958; Labov 1963, 1966a). This answer to 'Why copy standard speech?' seems to beg the question in so far as 'prestige' is used to mean prestige associated with the standard. Often that is what is meant. The word 'prestige' in this sense is sometimes, but not usually, qualified with the adjective 'overt', to distinguish it from a prestige not associated with the standard dialect, 'covert prestige' (e.g. Labov 1972a:66-67). In sociolinguistic literature an overt prestige and an overt norm have reference to the standard language controlled by the UMC. A covert prestige and a covert norm have reference to nonstandard language; they are evidenced by the regular selection of nonstandard forms for use. Why call one set overt and the other covert?

A stratification model seems to have been influential in Labovian theory. A stratification model assumes the desire for and expectation of upward mobility across, at least, the UMC and LMC. Especially within the last decade, investigators of sound change in progress have begun to point out that there are prestiges and norms at work that do not refer to the standard language; and it is part of the job to account for them. Labov admits that one 'can't avoid the implication that in New York City we must have an equal and opposing prestige for informal, working-

class speech—a covert prestige enforcing this speech pattern' (1972a:108). Commenting on the statement by Labov above in the course of interpreting his own findings in Norwich, Trudgill says, 'We suspect . . . that there are hidden values associated with non-standard speech, . . . but so far we have been unable to uncover them or prove that they exist' (1972:183). Groups that are not the highest status group behave as if they adhere to the standard language norm less than the highest status group—with the exception of the second ranking group, which hypercorrects. In casual speech especially, speakers of lower ranking groups use variants of variables that are different from the ones used by members of the highest ranking group. This suggests that the norm is not uniform for the speech community, even within speech styles. Milroy and Milroy claim that WC speakers in Belfast adhere to local, class-associated norms, and not to norms of middle class (MC) speech (1978:35-36).

Trudgill notes that WC speech (and other aspects of WC culture) appears to have connotations of masculinity, because it is associated with roughness and toughness. In contrast, femininity is associated with MC speech (1972:183). Trudgill is articulating a dichotomy that is probably a part of common cultural knowledge (whether true or not). The contrast makes a pair of symbols in the set of symbols that partly creates gender: boy and girl, toughness and delicacy, roughness and refinement, WC behavior and MC behavior, bad speech and good speech. And male speech is associated with urbanness as well as with the WC. Labov locates the cultural knowledge with subjective reaction tests: 'The sexes are opposed in their personal attitudes towards the speech of the city, with men favoring it slightly, and women heavily against' (1966a:495). This does not mean, of course, that members of one class can be counted on to do one thing, and members of another class to do another thing; or that men can be counted on to do one thing, and women another thing. Behavior may conform to class of gender norms or not. Norms, Labov points out, can be used 'to measure the degree of oscillation for individuals and class groups, measures which in turn can be correlated with social mobility and social insecurity' (1965:175).

The least formal level of speech, the one in which minimum attention is given to self audio-monitoring, is 'the vernacular'. This speech is 'more systematic speech' than other speech, Labov states (1966a:523). At this least formal level, linguistic relationships determining the course of language evolution can be seen most clearly. The spread of sound change is usually outward from urban areas and upward through the socioeconomic hierarchy (Chambers and Trudgill 1980; Eckert 1988), in spite of unusual cases such as the introduction of postvocalic *r* in New York City.

Peer groups in urban settings are the milieu of vernacular speech through which change spreads; these groups represent social networks. A number of sociolinguists have used sociology's social network theory to tackle the embedding problem in sound change (Labov 1972b; Milroy and Milroy 1978, 1985). Social network theory emphasizes that through social links an individual influences the behavior of others involved in a network and that the effects of these links also ramify through the society (Mitchell 1974:280). Multistranded relationships are more likely to be intense than singlestranded ones. If people are tied to one another by a variety of links they find it difficult to sever social relations and are therefore obliged to fulfil the expectations of those to whom they are linked (p.283).

The consideration of concepts and arguments I have just made in change in progress theory reveals certain problems, allows for certain expectations. The two claims about the role of women in the process of sound change—that women are

more standard speakers than men, and that women are innovative in sound change—can theoretically both be true if women style shift extremely; female speakers must hypercorrect both up, in formal speech, and down, in casual speech, making doublecross patterns. It is an empirical question whether women of different classes and in different ways of life do this. Early in modern sociolinguistic theory the role of LMC women was seen as key, because of hypercorrection from above. However, this view encourages a focus on correction toward the standard prestige forms, whether these are innovative or conservative speech. This is a problem because the vernacular is where structure and regularity are most to be found. It is in this speech, also, that change typically originates, among members of young peer groups, and, in urban societies, spreads out from city centers, from the speech of WC individuals. The vernacular is identified, in theory, with young, male speech. Early theory has also been faced, over the years, with more and more evidence for conflicting social prestiges and corresponding conflicting linguistic norms. The conflicts must involve women as well as men. A stratificational model cannot deal with this. A conflict model can. One can expect female speakers to behave differently depending on factors of class, economic mobility, social network membership, and so on.

2. Studies. I review now, very briefly, the findings of eight change in progress studies, relevant to the question of female speakers' role, from the last two and a half decades. I include studies of three communities where morphological change was investigated.

2.1. Labov (1972a). NYC. (r). Three prestiges are at work in the change involving (r) in NYC. Older UMC speakers conform to a conservative standard prestige norm. Younger UMC speakers and middle-aged LMC speakers are influenced by the new standard prestige norm of r-fulness. Young and old LMC speakers, and WC and LC speakers of all ages, are influenced by this norm very little or not at all (pp.58-60). Older WC speakers actually use more *r* than older UMC speakers in both casual and careful speech. In younger WC age groups, *r* is used less and less in casual speech (p.62). It is possible that the norm for WC speakers is simply different from the one for MC speakers. The variable (r), as well as (eh) and (oh), in NYC show doublecross patterns. LMC female speakers are largely responsible.

2.2. Levine and Crockett (1966). Piedmont NC. (r). Levine and Crockett's study reveals two norms for the variable, r-fulness and r-lessness, both of which associate strongly with the speech of high status individuals. However, the use of *r* is increasing among young people and speakers who are 'near but not quite at the top of the "white collar" class' (p.98). This group could be seen as an aspiring LMC or UWC. Levine and Crockett report that women across classes take the national r-ful norm as theirs (p.98). It should be noted that these investigators excluded unmarried women from their study and assigned married women the class of their husbands (p.89). Levine and Crockett's results resemble Labov's for (r) in New York City. The conflicting prestiges correspond to different linguistic norms.

2.3. King (1986). Port-au-Port, Newfoundland. (l). King finds that in this bilingual area of Newfoundland the prestige of the Montreal variety of French as a Canadian standard influences phonological and grammatical change (p.8). Speakers' sex is a significant factor for the deletion of *l*. The speech of young men is changing more quickly than women's in the direction of the standard Canadian French. Young males hypercorrect, refraining from deleting *l* even in environments where standard speakers delete (p.12).

2.4. Hartford (1976). Gary, IN. (r, ai). Hartford studies the speech of adolescent Chicanas and Chicanos in a community where the prestige variety of English is a middle class Black English (p.74). Girls more than boys use Black English variants rather than Spanish variants of most of the phonological variables considered: for instance, girls use flapped *r* rather than trilled *r* (p.74). High occupational aspiration corresponds with high scores for girls, but not for boys. Hartford claims that the Chicanas' peer groups, isolated both from school activities and most Latino community activities, encourage the use of the MC prestige forms (pp.77-79).

2.5. Cheshire (1982). Reading, Berkshire, England. *do, come*. Cheshire is able to identify core groups of individuals and to isolate the morphological features that best reflect adherence to the vernacular culture for boys frequenting adventure playgrounds (pp.153-154). She finds it was not possible to construct a vernacular culture index for the girls, who do not form structured peer groups the way the boys do (p.162). The core group boys use the nonstandard variables, except auxiliary *do*, more than any of the girls. *Do* is undergoing change away from an earlier dialect form toward the standard form *does*; the nonstandard variant is conservative. Past tense *come* marks vernacular loyalty for girls; the girls who are not 'good' girls use it. For boys it is simply an invariant feature; all the boys use it (pp.163-164).

2.6. Nichols (1983). Georgetown County, SC. *fu*, *at*, *ee*, *um*. Nichols investigates the speech of subpopulations of a Black speech community in rural South Carolina, including both educated and uneducated mainland groups and residents of an all Black river island. The language continuum encompasses Gullah, and varieties of English. Nichols examines variation in the use of the complementizer *fu*, the locative *at*, and the third person markers *ee* and *um*. River island women use standard forms much more frequently than poor mainland women or island men; and poor mainland women use standard forms less than poor mainland men (pp.60-61). Poor mainland women are mostly illiterate and are confined to their immediate communities. Nichols suggests that where educational and occupational opportunities are extremely limited, women will show more conservative linguistic behavior than men in their group. As economic opportunities begin to expand, they do so along sex-segregated lines, and female jobs require the use of English. The much higher paying men's jobs do not require control of English. The literate, more mobile river island women have an incentive to decreolize. For different reasons, neither the island men nor the poor mainland women have this incentive (pp.62-62).

2.7. Eckert (1987; 1988). Detroit, MI. (eh, e, uh). In her study of the speech of White adolescents in Livonia, a suburb of Detroit, Eckert finds that speech patterns conform most closely not to parents' class but to social category, Jock or Burnout (1988:5). The college-bound Jocks, isolated from the metropolitan area of Detroit, orient themselves to the high school. Burnouts actively extend their mobility and networks into suburbs closer to Detroit and into Detroit itself (1987:102-103). Relevant variables are (eh, e, uh). The backing and lowering of (e) and (uh), recent processes, are more advanced in the speech of Burnouts than of Jocks. An extremely raised variant of (eh), a variable that is no longer a strong urban marker, is used much more frequently by high school girls of all categories than boys (p.106). Gender expectations are more binding for Jock girls and Burnout boys than for Burnout girls and Jock boys. Most Burnout girls have higher scores than Burnout boys for the backing of (uh); females are leading in this vowel position change. The leaders are a group of Burned out Burnouts (p.108).

Eckert mentions that in many cities the older Northern Cities Chain Shift changes have been led by young, female speakers; she associates the Burnout girls' scores for the backing of (uh) with this larger pattern (1988:31).

2.8. Milroy and Milroy (1978; 1985). Belfast. (Λ , ai, a, ϵ). Milroy and Milroy investigate sound change in three Belfast neighborhoods, Clonard, Hammer, and Ballymacarrett. Only Ballymacarrett has an industry, the shipyards, which provides local employment for the males. A group of young women from Clonard also work in the same shop together. The variables (Λ , ai, a, ϵ), show grading by age, sex, and neighborhood (1978:29). In general, males score higher for the use of nonstandard variants than females. For instance, the centralization and lowering of [U] to [Λ] is a male marker. In Clonard, however, middle-aged women use the centralized variant almost as much as young men (pp.25-26). Young Hammer women raise and front (ai) in casual speech more than men or middle-aged women in their neighborhood. The young women raise and front least of all in word list speech (pp.33-34). Some important conflict of norms is involved. A raised variant of (ϵ) is associated with outer city speech. Younger female speakers are advancing the raising of the vowel most in Ballymacarrett. The raised variant is not, however, a network marker for any female group. Its use is associated with a certain male network, although the lowering of (ϵ) is characteristic of young, male speech in general (1985:361-362). The backing of (a), a marker of male speech, especially young male speech, is not a network marker for any male group. But the backing of (a) is associated with high network strength for women. The young Clonard women who have a strong network are the female speakers who back the vowel (p.362). In fact, an innovation originating with a highly ranked community within the WC of the city, the males of Ballymacarrett, is spreading to another area through the speech of these young women (1978:29). The juggle of (ϵ) and (a) allows each to be a gender marker for one sex and a network strength marker for the other.

3. Discussion. Comparison of the findings of the studies reviewed here shows that there are differences between changes which originate with or enter a community among higher socio-economic status speakers and changes which originate with or enter a community among lower status speakers. In the first case, the changes are often phonologically isolated. Significant social factors are class and gender—that is, identifications of global importance. In the second situation—changes originating among lower status speakers—changes involve whole phonological subsystems. The changes are typified by vowel chain shifts. This observation is in keeping with Labov's claim that casual speech reveals the phonemic level (1966a; 1972a). Significant social factors are social network and neighborhood—that is, identifications of local importance—, along with gender and class. There are few exceptions to the two generalizations that women lead in sound change and are more standard speakers than men if a change originates among or is associated with high status speakers. Sound change beginning among low status speakers involves variables the extreme variants of which are often associated with young, urban, working class male speech. Here, however, both young men and young women actually lead in sound change. This is so because different vowel variables, or even different directions of movement for the same variant of a variable, have different values for subgroups of males and females.

Changes associated with higher socio-economic status speakers are typified by the three different variables designated (r). Neither an / sound nor any other consonant displays variation along with (r) in New York City, Piedmont, or the

Latino community in Gary. Increases in the use of a standard variant of (ai) among Chicanas and of a standard French variant of (l) among males in Newfoundland are also structurally isolated changes in distribution. In some cases, a desire for upward mobility is clearly indicated: in the case of r-fulness among LMC women in New York City; in the case of flapped *r* and Spanish/standard English *ai* among Chicanas in Gary. Note that it is just in a situation where men, more than women, can realistically expect to benefit from conformity to the standard that males lead in change: the Newfoundland case. Similarly, the river island women in Nichols' study, who hope for better jobs, decreolize while the poor mainland women do not.

The majority of the changes studied by Eckert and the Milroys in Detroit and Belfast are associated with urban, WC speech. A raised (eh), however, a female marker, is no longer strongly associated with inner city speech. Eckert has suggested that this detachment from WC urbanness allows the raised variant to be a marker of female speech. The raised variants of both (ε) and (a) in Belfast changes are associated with nonlocal prestige. These variants are, of course, involved in the complex vowel variation of the inner city, but oppose the lowered variants that are *heard* as urban.

Further observation complicates the picture. In Detroit the girls who are leading in the backing of (uh), the Burned-out Burnouts, constitute a somewhat isolated network, oriented toward metropolitan Detroit as much as the tougher Burnout boys are. The group of young Clonard women in a close social network have adopted the backing of (a). Older Clonard women use a backed (Λ). Young women from Hammer show extreme raising with (ai). In all three cases the women are behaving differently from WC women in a nearby neighborhood or from WC women of another age or social group in their own neighborhood. In the cases of backing (a) and raising (ai) the young women whose behavior is innovative display marked style shifting. This suggests a conflict of norms for these women.

It is necessary to see women, including young women, as persons whose behavior is interpretable within the social and economic possibilities of their own communities. (See Nichols 1980, 1983, for discussion.) Sociolinguists seem at a loss to explain the observation that in casual style speech in some situations of sound change women, and in particular young LMC and WC women and girls, use innovative, nonstandard variants more frequently than men of their socioeconomic group in the same speech community; and that in addition, these female speakers style shift extremely.

It may be simply that the doublecross represents a double loyalty, a conflict of norms that corresponds to a conflict of demands for display: gender display, class loyalty display, peer group membership display. In general, women's urban social lives are unlike men's in many ways. Young women do not have the same street lives as young men. Milroy and Margrain (1980), Cheshire (1982), and Milroy and Milroy (1985) note that often WC women's social networks are not as dense as men's. When they are dense, however, they appear to function like male networks in the process of sound change.

A model that makes it difficult to consider conflicts of prestiges and norms and that assumes a cross-class desire for and expectation of upward mobility has difficulty with evidence that women of the same class group behave differently and that the same individual female speakers behave differently in the extreme in different speech situations. Labovian theory has had a conflict of 'defaults' since its development. On the one hand, the 'default case' of prestige is the 'overt' prestige attaching to the standard variety of the language; and prestige is the social motivation of sound change. On the other hand, early observation of change in

progress allowed the specification of sound change stages in which the default origin of a change is a social class somewhere below the highest status one. Choices that individual speakers make within the social contexts of their daily lives spread and accelerate sound change, which is most structural, it appears, when it originates in the speech of low status groups.

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Reduplication and Tone in Hausa Ideophones

Paul Newman
Indiana University

0. A number of interesting new studies have led to a reawakening of interest in reduplication. These studies have generally not, however, dealt with the question of tone. Hausa lends itself to such an analysis since it is a tonal language that is particularly rich in reduplicative morphology. This is especially true in the area of ideophones, where reduplication and tone interact in a close manner.

Before proceeding to the substance of the paper, we need to define the essential terms and symbols that will be used throughout. The term "base" refers to the morphological base on which reduplication takes place. This may be identical to the lexical stem but it need not be. In some cases the stem may be pruned before reduplication, for example by modifying vowel length or removing a frozen gender suffix, or it may be expanded in preparation for the reduplication by adding a morphological or phonological element. The "reduplicator" specifies what or how much is reduplicated, e.g. the numeral 2 by itself indicates complete reduplication, while 1σ and 2σ indicate reduplication of one syllable and two syllables respectively. The operation of reduplication is indicated by "x". (The symbol "+" is used for affixation.) The direction of reduplication is indicated by the position of the operator in relation to the base and the reduplicator; thus, Base x 2σ , for example, indicates reduplication of two syllables to the right, while 1σ x Base indicates single syllable reduplication to the left. The notation)^T associated with a suffix or a reduplicator, indicates a tone that applies to the resulting derived word, overriding in the process any lexical tone that falls within its domain.

1. In Hausa reduplication, tone is treated in two ways. In some cases, the reduplicator operates on the base *including* its tone. That is, the tone of the reduplicated product is simply a function of the tone of the non-reduplicated base, e.g.

- (1) wátàa-wátàa 'monthly' < wátàa 'month'; bìyáǎ-bìyáǎ 'five each' < bìyáǎ 'five'; lóokàcìl-lóokàcìl 'from time to time' < lóokàcìl 'time'; hòotâl-hòotâl 'hotels' < hòotâl 'hotel'; sálóo-sálóo 'different styles' < sálóo 'style'

This pattern of getting tone simply by a rule of Base x 2 also applies to modified bases, such as in the following examples where the stem

undergoes vowel shortening in preparation for the reduplication:

- (2) *rúwá-rúwá* 'watery' < *rúwáa* 'water'; *tòóká-tòóká* 'ashen, gray' < *tòókáa* 'ashes'; *kóórè-kóórè* 'greenish' < *kóórèe* 'green'

The other way in which tone is handled is by having the reduplicator completely specify the tone of the reduplicated product without necessarily any regard for the underlying tone of the base. This is the usual pattern with ideophones. It is clearly illustrated here by lexically reduplicated nouns formed by means of Base x 2)LLHL.

- (3) *bàabàbàabà* 'type of wild indigo' (cf. *báabáa* 'indigo'); *gòoràgòorà* 'type of grass' (cf. *góoràa* 'bamboo'); *ḡàatàḡàatà* 'a bitter grass' (cf. *ḡáacíí* 'bitterness', where /c/ = /t/ before a front vowel); *hàntàhàntà* 'talking through one's nose' (cf. *hàncíí* 'nose')

2. Hausa has a wealth of ideophones with varying phonological and syntactic characteristics. Many of these manifest reduplication of one type or another. Three main patterns are discussed here: partial reduplication, full reduplication, and "pseudo-reduplication".

3. Partial reduplication pattern: Base x 1σ)T

Partially reduplicated ideophones are formed by reduplicating the final syllable of the (usually disyllabic) base. The copied syllable may be light (CV) or heavy (CVV or CVC). Generally speaking all of the syllables in a word have the same weight and contain identical vowels, this being a fixed template. The reduplicator—in this case the reduplicated syllable—comes specified with a single tone, indicated)T, which spreads from right to left over the entire word. The result is that these forms are all monotonal as well as monovocalic. Since the tone of the pattern overrides whatever intrinsic tone the base might have had, it is usually impossible to tell what that underlying tone would have been or even whether the base was lexically specified for tone. Three partially reduplicated patterns are illustrated.

3.1. [x 1σ)L with long vowels]: These ideophones are characterized by identical long vowels and low tone, e.g.

- (4) *dòosdòosdò* 'ugly looking'; *bòosdòosdò* 'sitting indecently' (= *bàḡóo*); *gàajàajàa* 'filthy'; *càaḡàaḡàa* 'in profusion' (more often *cáḡáḡá*); *shèekèekèe* 'looking contemptuously'; *bùzùzùzù* 'very hairy' (= *búzúu-bùzúu*)

3.2. [x 1σ]^H with short vowels]: These ideophones are characterized by identical short vowels and high tone, e.g.

- (5) *dánáná* 'very oily' ; *málálá* 'covered with water' (cf. the verb *málàaláa* 'flow over') ; *sáǎǎǎ* 'stealthily' (cf. the verb *sáǎǎǎa* 'sneak') ; *fúrúú* 'white with dust' (= *fúrúu-fúrúu*) ; *túrúú* 'lots, esp. ants or people'

3.3. [x 1σ]^L with closed syllables]: Most of the words of this shape are "augmentative" ideophones, which correspond to augmentative/ ideophonic adjectives. They typically have three closed syllables with identical vowels and an all low tone pattern, e.g.

- (6) *bànkwàkwàl* 'huge (e.g. head)' ; *bùndùndùn* 'obese' ; *fàngwàlɣwàl* 'large & round (e.g. kola-nuts)' ; *fànkànkàn* 'broad, expansive (esp. water)' ; *gùndùndùn* 'long and thick' ; *řàmǎsǎs* 'heavy in body' ; *shàmǎřǎř* 'bosomy' ; *sùndùndùn* 'big and swollen' ; *wàngàgàn* 'wide open'

4. Full reduplication pattern: Base x 2)^T-T

Fully reduplicated ideophones reduplicate the entire base, which may or may not have undergone modification *before* the doubling (cf. (2) above). There is no requirement that the vowels or the syllable weight within a word be identical, although there are recurring rhythmic patterns. The reduplicator comes specified with a pair of single tones, noted)T-T. Each of the tones applies uniquely to one half of the reduplicated word, the hyphen between the parts being scrupulously respected. For example, *tsamoo* x 2)^{H-L} → *tsamoo*)^H-*tsamoo*)^L = /*tsámóo-tsámòò*/ 'dripping wet', and not **tsamootsamoo*)^{HL}, which, according to the normal rules of tone spreading in Hausa, would give */*tsámóotsámòò*/. One can contrast the behavior of tone in this fully reduplicated ideophone with the behavior of tone in a partially reduplicated noun plural formed with the high-low suffix -*unaa*)^{HL}, e.g. *maagun**unaa*)^{HL} = /*máagúngúnàa*/. Four patterns, reflecting the four possible tone combinations, can be illustrated.

4.1. [x 2)^{L-H}]: These ideophones, which primarily describe distinctive kinds of actions, have an overall low-high tone pattern and a light-heavy rhythmic pattern in each part. Many of these words have semantically equivalent derived nouns formed with a suffix -*niyaa*.

(7) bàgàa-bágéa = bàdàm-bádám 'floundering' (cf. the verb *bádándàmaa* 'flounder'); cākàa-cákáa 'chattering noisily' (= cākàaníyáa) ; dìřlì-dířlì 'dilly-dallying' ; mùtsùu-mùtsúu 'fidgeting' (= mùtsùumíyáa) ; màkòo-mákóo 'being stingy' (= màkòoníyáa) ; wàtsàl-wàtsál 'squirming' (= wàtsàlníyáa) ; kùmbiyàa-kùmbíyáa 'being evasive'

4.2.1. [x 2)^{H-L}]: Hausa has a large number of high-low ideophones with a light-heavy rhythmic pattern. These are primarily adjectival qualifiers, often with an implied plural meaning.

(8) kírìi-kìrìl 'brazenly, in broad daylight' ; tsámóo-tsàmò 'dripping wet' ; gázàř-gàzàř 'very bushy' ; cākŵàl-càkŵàl 'slushy' (cf. cākŵàlì 'slush') ; gájàa-gàjàa 'filthy' (= gàajàajàa) ; bùzùu-bùzùu 'very hairy' (= bùzùuzùu) ; řàfée-řàfée 'pendulous (breasts)' (cf. řàfèemíyáa 'dangling') ; jínàa-jìnàa 'bloody' (cf. jínì 'blood')

4.2.2. [x 2)^{H-L}]: Augmentative adjectives in Hausa, which are best translated in English by an adjective modified by an expressive adverb such as 'stupendously large' or 'smashingly beautiful', are derived by suffixation or pseudo-reduplication (see §5 below). The corresponding plurals are formed by full reduplication of the base—rather than of the singular forms themselves—with an associated high-low tone pattern. The plural augmentatives occur in two types, one formed by reduplicating the bare consonant-final base, the other by reduplicating a pre-prepared base containing final -aa. (See (6) for the glosses for the following examples.)

(9) bánkŵàl-bànkŵàl = bánkŵàl^{aa}-bànkŵàl^{aa} ; bündún-bündún (where final /n/ < /m/) = bündúm^{aa}-bündúm^{aa} ; fángŵàl-fàngŵàl = fángŵàl^{aa}-fàngŵàl^{aa} ; fánkàn-fànkàn = fánkám^{aa}-fànkám^{aa} ; gùndún-gùndún = gùndúm^{aa}-gùndúm^{aa} ; řám^{ba}s-řám^{ba}s = řám^{ba}s^{aa}-řám^{ba}s^{aa} ; shám^{ba}ř-shám^{ba}ř = shám^{ba}ř^{aa}-shám^{ba}ř^{aa} ; sùndún-sùndún = sùndúm^{aa}-sùndúm^{aa} ; wángàn-wàngàn = wángám^{aa}-wàngám^{aa}

4.3. [x 2)^{H-H}]: These adverbial ideophones have a light-light rhythmic pattern and high-high tone.

(10) bájá-bájá 'disorganized' ; dúkú-dúkú 'at earliest dawn' ; dúshí-dúshí 'nearly blind' (cf. dúshèe 'become dim') ; fátá-fátá 'helter-skelter' ; kácá-kácá 'in shambles' ; láfó-láfó 'tied insecurely'

4.4. [x 2)^{L-L}]: These adverbial ideophones, which seem to be more onomatopoeitic than most in Hausa, have a light-heavy rhythmic pattern and low-low tone.

- (11) *bùyàa-bùyàa* 'movement with a big gown' ; *hàyàa-hàyàa* 'bustling about' (= *hàyàaníyàa*) ; *kàyàa-kàyàa* 'noise of two objects rubbing together' ; *bàzàǎ-bàzàǎ* 'dressed in rags' (cf. *bàzáa* 'fringes') ; *fàcàl-fàcàl* 'playing in water' (= *fàcàlníyàa*) ; *gàtsàl-gàtsàl* 'eating in unmannerly way' ; *wàshàǎ-wàshàǎ* 'crumbling' ; *bùgùzùm-bùgùzùm* 'walking in ungainly manner'

With the H-H and L-L forms in 4.3 and 4.4, one could of course simply specify a single tone, i.e. $\times 2)^H$ and $\times 2)^L$. This, however, would miss the parallelism between these forms and the H-L and L-H ones and would require that one violate the integrity of the hyphen in Hausa as a barrier to tone spreading.

In all of the fully reduplicated words described above, there is only one tone specified for each half of the word. It should be pointed out that there are actually a few ideophones in which each half is not monotonal, e.g.

- (12) *tìnkís-tìnkís* 'hurrying along straight' ; *bùkúu-bùkúu* 'walking in a hunchbacked manner' (cf. *bùkúu* 'convexity') ; *dìdíím-dìdíím* 'sound of beating on calabashes' ; *dágwàm-dágwàm* 'incessantly' ; *fáfàs-fáfàs* 'immediately' ; *fátsàǎ-fátsàǎ* 'intense heat of sun'

The most likely explanation here is that these words are reduplicated along with their tone, like the examples in (1) and (2), rather than receiving their tone from a tone pattern belonging to the reduplicator. That is, an example such as *tìnkís-tìnkís* is assumed to be derived from *tìnkís* $\times 2$ rather than from *tìnkís* $\times 2)^{LH-LH}$.

5. Pseudo-reduplication pattern: Base + -vCv)T*

Derived words in Hausa formed by what I am calling "pseudo-reduplication" are those that on the surface manifest a copy of the stem-final consonant along with particular vowels that are fully specified. I call them "pseudo-reduplications" because the process involved is really suffixation even though the output looks like partial reduplication. The derivational ending comes with a set tone pattern, here indicated by $)T^*$, which consists of one or more tones. This can be contrasted with the partially reduplicated words discussed in §3 where the tone attached to the reduplicator is limited to a single tone. Pseudo-reduplication in Hausa ideophones is not common, it being limited to highly expressive, phonaesthetic adjectival forms that bridge the gap between ordinary common adjectives and full-fledged ideophones.

5.1. [+ -eeCee)^{HL}]: Singular augmentative adjectives are formed in two ways, apparently identical in meaning. One formation involves simple suffixation of -ii)^H to the lexical base, e.g. *súndúmí* 'big and swollen'. The other, the pseudo-reduplicative construction with which we are concerned, involves the suffixation of /ee/ plus a copy of the stem-final consonant plus /ee/, the entire output falling under the domain of the associated HL tone pattern, e.g. *súndúmeemèe*. This form can be further inflected for gender by adding the feminine suffix -ìyáa, e.g. *súndúmeemìyáa*. (In Hausa the replacement of the stem-final vowel by the initial vowel of a suffix is regular.) These ideophonic augmentative adjectives correspond to the ideophones in (6), where the glosses can be found.

- (13) *bánkwaléelèe* ; *búndúmeemèe* ; *ḡángwáléelèe* / *ḡángwáléelìyáa* (f.);
fánkáméemèe / *fánkáméemìyáa* (f.); *gúndúmeemèe* ; *ṙámḡáshéeshèe* ;
shámḡáṙéerìyáa (f.) ; *súndúmeemèe* ; *wángáméemèe*

Pseudo-reduplication in Hausa of the type illustrated above has always been described in terms of partial reduplication. I would contend, however, that the *process* involved is really suffixation, where the suffixal consonant just happens to be incompletely specified. The operation employed is thus "+", not "x", which characterizes true reduplication, whether full or partial. Note, for example, that the multi-tonal tone pattern found with the -eeCee)^{HL} ending is typical of what one finds with fully specified Hausa suffixes, but unlike what one normally finds in reduplicative constructions.

There are some clear advantages in Hausa in viewing what I have called pseudo-reduplication as straightforward suffixation. In the first place, it allows one to group together classes of morphological formations that otherwise would be described as manifesting different processes. For example, among the many ways of forming noun plurals in Hausa, there are three very common types that manifest the same high-low-high tone pattern. These are—and I am here using the traditional descriptive labels—partial reduplication, addition of the suffix -aayee, and infixation of -aa-. These plurals, however, are really phonologically conditioned allomorphs of a single morpheme which makes use of exactly the same suffix, namely -aaCee)^{HLH}, where C is either C (a copy of the last consonant of the base), /y/, or C₃ (the third consonant of the root itself), e.g.

- (14) [a] *dámóo* / *dámàamee* 'monitor / pl.'; *wúrí* / *wúràaree* 'place / pl.';
 (tonally irregular singular) *tàfáa* / *táfàafée* 'armlet / pl.'

[b] kíífí / kíífaáyée 'fish / pl.'; zóómó / zóomaáyée 'hare / pl.';
 (tonally irregular singular) gwání / gwanáyée 'expert / pl.'
 [c] gúlíbí / gúlàabée 'stream / pl.'; káskó / kásaakée 'wooden
 bowl / pl.'; bírní / bíràanée 'city / pl.'

Secondly, eliminating pseudo-reduplication from the inventory of reduplicative constructions allows one to draw a generalization about Hausa that otherwise could not be seen. This is the following: Hausa reduplication—and we are limiting ourselves to reduplication to the right—operates only on full bases or on full syllables, either one or two syllables, while Hausa suffixes are most commonly vowel initial, either -V (where the V is fully specified) or -VCV.

6. That ideophonic words should be formed by reduplication is so commonplace that it would hardly seem worth discussing. A careful look at Hausa ideophones shows, however, that the constructions generally lumped under the rubric "reduplication" actually represent a number of different processes that are not derivable from one another and that particularly need to be treated separately in terms of their tonal behavior. There are ideophones formed by partial, single syllable, reduplication, which are typically characterized by a single tone whose domain is the entire reduplicated product. There are ideophones formed by full reduplication, in which case tone is assigned on a different principle, namely the specification of a *pair* of single tones, the domain of each being one half of the reduplicated product. There are in addition a few fully reduplicated ideophones where the tone is not a property of the ideophonic reduplication as such, but rather comes from full reduplication of stems *including* their lexical tone. Finally, there are ideophonic words formed by pseudo-reduplication, which, it turns out, is not reduplication at all, but rather a subtype of simple suffixation.

Most studies of reduplication, especially recent attempts to find formal mechanisms for describing such constructions, assume that reduplication, wherever it occurs and in whatever form, is essentially a single phenomenon. This paper suggests that the phenomenon is far from unitary even in a single language, and thus it is even less likely to be so in the languages of the world.

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TOPIC CONTINUITY IN WRITTEN MANDARIN DISCOURSE
MING-MING PU
UNIVERSITY OF ALBERTA

1. INTRODUCTION

Givón in his article "Typology and Functional Domain" argues that: "functional domains in syntax are most commonly clines, upon which a number of more or less distinct points may be plotted along a functional continuum" (1981:164). One functional domain which fits this description is that topic continuity/discontinuity. Topic continuity/discontinuity concerns primarily how a speaker, in an on-going discourse, produces connected and coherent language which is relevant to the subject under concern, and what kinds of anaphoric construction the speaker uses in order to help his listener in identifying the topic/referent in the discourse.

The topic continuity model proposed by Givón (1981, 1983) considers primarily two factors: a) the grammatical devices of reference used by the speakers to code various topics in the discourse, and b) the exact position of those topics in the discourse, in terms of the amount of time elapsed between two successive mentions of the same topic/referent, and the potentiality of interference from other referents on the discourse immediately preceding the referent under consideration.

The fundamental assumption of this model is: the more continuous a topic is, the less coding material the hearer requires to identify the topic, and consequently the less elaboration the speaker needs to make. According to Givón, topic continuity in discourse can be measured by the following three parameters (Givón, 1983:13):

a. Referential Distance (RD): The distance between the present appearance of a referent and its last appearance in the preceding discourse -- marked by whatever grammatical means, including \emptyset anaphora. This measurement is expressed in terms of number of clauses.

b. Persistence (PS): This is a reflection of the topic's importance in the discourse and thus a measure of the speaker's topical intent. That is, more important discourse topics appear more frequently in the register. They have a higher probability of persisting longer in the register after a relevant measuring point. This measurement is also expressed in terms of number of clauses.

c. Potential Interference (PI): This is an ambiguity measure. The number of other referents in the directly preceding discourse environment -- most

commonly 3 clauses to the left -- that are semantically compatible with the predicate of the referent under consideration. This is expressed in terms of number of nominal referents found.

Many cross-linguistic, text-based quantified studies have demonstrated that various topic-marking grammatical devices are extremely sensitive to these three measures. They provide a hierarchy of grammatical devices along a scale of topic continuity that according to Givón, is highly replicable cross-linguistically. A typical ranking is (Givón, 1983:331):

↓ ↓ ↓ ↓ ↓	Most continuous/accessible (least surprising) zero anaphora unstressed/clitic pronouns stressed/independent pronouns unmodified definite NP's restrictively modified definite NP's referential indefinite NP's least continuous/accessible (most surprising)
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The iconicity interpretation underlying this scale is that more continuous, predictable, non-disruptive topics/referents will be marked by less marking material; while less continuous, unpredictable/surprising, or disruptive topics/referents will be marked by more marking material (Givón, 1983:18).

Presumably, the speaker would use the structures at the top of the list when the continuity and identification gaps would be small and easy for the hearer to cross. For example, zero anaphora (least marking material) are used to mark the most continuous, non-disruptive topics, and therefore they generally have the minimal RD value of 1. On the other hand, definite NP's (more marking material) are much less often preferred to reinstate referents than are zero anaphora in the minimal distance (1 or 2 clauses).

The present study was undertaken to determine if the continuity hierarchy proposed by Givón is verifiable in Mandarin Chinese discourse and if the cline of points along a continuum of "continuity" would be substantiated cross-linguistically.

2. DATA AND METHODOLOGY

The Mandarin Chinese discourse studied here was taken from a short story in a popular Chinese literature magazine. It was chosen because of its common language and narrative style, which closely resemble spoken Mandarin. Eleven pages containing a total of 1037 main and subordinate clauses were analyzed.

Three of the standard measurements provided by Givón and described above were investigated: Referential Distance (RD), Persistence (PS), and Potential Interference (PI). They are measured in terms of clauses as Givón (1983) proposes. RD assessed the distance from the last mention of a referent to its current mention. The minimal value assigned is 1, in which case the referent last occurs in the immediately preceding clause, and the highest value is arbitrarily set at 20. PS measures the number of successive clauses in which a token is referred to. The minimal value here is \emptyset , indicating a construction that does not persist. There is no maximum value assigned for PS, but one point is given for each successive clause. In measuring PI, we scan the preceding 3 clauses before the referent under concern, "looking for referents that are semantically just as compatible with the predicate of the clause under consideration (i.e. in terms of animacy, humanity, concreteness, agentivity, etc.)" (Givón, 1983:333). A 1 is assigned to those tokens appearing in the relevant distance in which there was only one logically possible referent for the token. A 2 is assigned if there are two or more logically possible referents for the token. A 3 is assigned if there are no likely referents in the relevant distance (e.g. indefinite NP's). Presumably, structures at the top of Givón's hierarchy should have smaller RD and PI values, and larger PS values than structures at the bottom of the hierarchy.

These three measures were taken for every token of each of eight topic-marking structures studied in the Mandarin text and each average measure was calculated. In addition, some other factors such as humanness and case roles, that interact with the topic continuity, have also been taken into consideration. Finally, the Standard Deviations were calculated for RD scores of each of the eight categories in order to permit a precise interpretation of scores within a category.

3. TOPIC-MARKING CONSTRUCTIONS IN MANDARIN CHINESE

The syntactic devices studied include some of those given in Givón's hierarchy which are most relevant to the topic-marking constructions in Mandarin Chinese, i.e. zero anaphora and independent pronouns. Demonstrative pronouns were added to the list. In addition, the domain of full NP's was expanded into five sub-categories: demonstrative+NP's, Names, definite NP's, possessive pronoun+NP's, and indefinite NP's. The structures studied can be illustrated as follows:

1 Zero Anaphora (\emptyset ANA):

Shuānzi tīng le, \emptyset zhuǎn shēn jiù zǒu.
 (Name) hear (asp) turn body then leave
 As soon as Shuanzi heard it, he left.

2 Independent Pronouns (I.P.):

Tā bù xiǎng jiànyù shuí.
 she not want control who
 She does not want to control anyone.

3 Demonstrative Pronouns (D.P.):

Tā yào dāndú qù běifāng. Zhè shì dàjiā hěn bùān.
 he want alone go north this make all very upset
 He wanted to go the North alone. This made everyone upset.

4 Demonstrative+NP's (D+N):

Zhège nǚrén bù xúncháng.
 this woman not usual
 This woman is unusual.

5 Names (NAME):

Yángqīng zhàn le qǐlái.
 (Name) stand (asp) up
 Yangqing stood up.

6 Definite NP's (DEF):

Laoshī ná yībǎ hēi sǎn.
 teacher take a black umbrella
 The teacher took a black umbrella.

7 Possessive Pronoun+NP's (POS+N):

hòulái tā zhàngfū huí le cūn.
 later her husband return (asp) village
 Later, her husband returned to the village.

8 Indefinite NP's (INDEF):

Yángqīng zài gē mài.
 (Name) (prog) cut wheat
 Yangqing was reaping wheat.

Note that Mandarin Chinese does not have articles to code definite or indefinite NP's. In the present study,

the definiteness is distinguished from indefiniteness according to the following criteria: 1) Unique entities such as "the sun," "the Yangtze River," etc.; 2) Givenness, i.e. NP's derive their definiteness from immediate context; 3) Frame evocation, e.g. "Rooms have doors, walls, corners, and roofs. People have arms, legs, hands, and feet." The mentions of "door/s," "hand/s," "arm/s" etc. presuppose definiteness. NP's that are not definite are considered to be indefinite. Sometimes, however, Mandarin uses word order to code definite or indefinite objects, with or without the object marker (OM). For example,

- 9a) Tā dāsùi le hūapíng. (SVO)
 he break (asp) vase
 He broke a vase.
- b) tā bǎ hūapíng dāsùi le. (SOV)
 he (OM) vase break (asp)
 He broke the vase.

Definite NP's are not further divided according to the word order and/or the object marker(OM) since OV order is highly infrequent in Mandarin (Sun and Givón, 1985) and the count of the definite NP's with the OM bǎ is too meagre to be reliable.

4. RESULTS AND DISCUSSION

TABLE 1
 MEASURES OF TOPIC CONTINUITY BY GRAMMATICAL CODINGS

	Ø	ANA	I.P.	D.P.	D+N	NAME	DEF	POS+N	INDEF	T/AV
#TOK	429	67	16	27	275	349	35	416	1614	
+HUM	353	67	0	10	243	52	13	29	767	
-HUM	76	0	16	17	32	297	22	387	847	
AV RD	1.07	1.93	1.44	5.37	7.23	9.38	17.34	19.94	9.24	
+HUM	1.06	1.93	---	4.30	5.74	3.81	15.08	19.76	3.82	
-HUM	1.11	---	1.44	6.00	18.53	10.35	18.64	19.95	14.15	
AV PS	1.66	1.45	0.38	0.70	1.36	0.34	0.29	0.18	0.87	
+HUM	1.83	1.45	---	1.10	1.52	1.31	0.38	0.75	1.59	
-HUM	1.06	---	0.38	0.47	0.19	0.17	0.23	0.14	0.23	
AV PI	1.07	1.13	1.50	1.70	1.56	1.60	1.97	3.00	1.80	
+HUM	1.06	1.13	---	1.10	1.42	1.46	1.87	3.00	1.29	
-HUM	1.11	---	1.50	2.06	2.56	1.63	2.03	3.00	2.26	

Table 1 gives the overall average counts and measures for all the structures. The structures are listed from

left to right according to increased average RD total. Table 1 also indicates human and non-human tokens counted separately for each structure. Their values for each of the three measures are listed for further analysis. Table 2 compares Givón's hierarchy with the 3 measures for each of the structures.

TABLE 2
COMPARISON OF CLINES BASED ON AVERAGE MEASURES

GIVÓN(1983)	AVE RD	AVE PS	AVE PI
Ø Ana	Ø ANA 1.07	Ø ANA 1.66	Ø ANA 1.07
I.P.	D.P. 1.44	I.P. 1.45	I.P. 1.13
...	I.P. 1.93	NAME 1.36	D.P. 1.50
DEF	D+N 5.37	D+N 0.70	NAME 1.56
...	NAME 7.23	D.P. 0.38	DEF 1.60
...	DEF 9.38	DEF 0.34	D+N 1.70
...	POS+N 17.34	POS+N 0.29	POS+N 1.97
INDEF	INDEF 19.94	INDEF 0.18	INDEF 3.00

From Table 2, we see that the averages of structures measured for Mandarin discourse generally fit Givón's topic continuity cline. The zero anaphor construction is the most continuous topic-marking structure of every measure. Of all the tokens counted, 93% have a minimal value of 1. The zero anaphor construction is a very common and frequently used device of reference in Mandarin Chinese. It is strongly preferred in situations where the identity of deleted items can be readily recovered from immediate contexts.

Independent pronouns and demonstrative pronouns are also highly continuous in terms of RD and PI. All tokens counted for I.P. refer to humans, which helps fill up a relatively larger referential distance than can Ø ANA construction since only human pronouns have gender difference, thus a human pronoun can refer back to its referent from a relatively larger distance. The D.P. structure, on the other hand, also has a low RD value since it usually refers to something in the clause immediately preceding or following the construction. The difference between I.P. and D.P. is that the former construction persists much more than the latter because D.P. is used very often in a concluding statement and it thus does not persist.

The construction of D+N is preferred by Mandarin speakers to draw attention of the listener to the very item that was mentioned before. It can be used to mark a disruptive topic/referent and therefore its RD value is fairly large. D+NP's also have a relatively large PI score(1.70) because the demonstratives clearly have a function of disambiguating referents.

Names seem less continuous than the above mentioned structures in terms of RD, since they can refer far back to the referent previously mentioned and make the referent clear. In this particular text, names are very frequently mentioned since their referents are protagonists of the story and therefore they have a high PS score.

Both DEF and POS+N are quite low on the continuity cline. They are close to each other in terms of PS and PI, but they differ greatly in terms of RD. This is because the possessives themselves are known items and the subjects being talked about at hand. In the POS+N construction, possessives in fact bring those otherwise indefinite NP's closer to the topic under concern. Hence they have a much larger RD score(17.34) than DEF(9.38).

Finally, the INDEF is the most discontinuous structure of every measure. This is expected since it is most often used to make the first mention of a referent and thus has larger RD and PI values. INDEF's do not persist since many of them are quickly dropped after the first mention in the discourse.

To sum up, if we divide the above eight syntactic devices into two types of anaphoric forms: pronominals (\emptyset ANA, I.P. and D.P.) and nominals (D+N, NAME, DEF, POS+N, and INDEF), we can see their obvious differences in all the three measures, with pronominals close to the continuous end, and nominals near the discontinuous end. We can roughly postulate a hierarchy based on the average scores presented in Table 1:

\emptyset ANA > PRONOUNS > DEF NP's > INDEF NP's

where Pronouns include I.P. and D.P., DEF NP's include D+N, NAME, DEF and POS+N. The structures on the left of the hierarchy code more continuous/accessible topics than the structures on the right. This conforms, to some extent, to Givón's psychological principle: "Expend only as much energy on a task as is required for its performance" (Givón, 1983:18).

Nevertheless, there are some other factors strongly affecting topic continuity, which are shown in Tables 3 and 4.

TABLE 3
HUMANNESS AND CONTINUITY

	HUMAN	-HUMAN	TOTAL AVE
AVE RD	3.01	14.89	9.24
AVE PS	1.63	0.18	0.87
AVE PI	1.17	2.37	1.80
# TOK	767	847	1614

TABLE 4
CASE ROLES AND CONTINUITY

	SUBJ	OBJ	OTHER	TOTAL AVE
AVE RD	5.75	12.02	16.41	9.24
AVE PS	1.47	0.36	0.31	0.87
AVE PI	1.40	2.43	2.06	1.80
# TOK	895	463	256	1614
+HUM	629	114	34	767
-HUM	266	349	222	847

Table 3 shows a huge difference between human and non-human tokens in terms of the three measures. Humans are much more continuous than non-humans since they tend to be the focus/topic of narratives, while nonhumans are, in most cases, just temporary focus or background information and therefore dropped fairly quickly. Humanness as a more continuous factor can also be seen from the use of coding devices. Pronominals are much more frequently used to code human referents: 82% of Ø ANA and 100% of I.P refer to humans; and nominals have a much lower overall frequency (cf. TABLE 1). This indicates the general continuous nature of humanness, i.e. less coding material is assigned to the more continuous topics/references. On the other hand, Table 4 shows that humanness also interacts with case roles. Subjects are the most continuous of all the case roles: 71% of SUBJ refer to humans, and only 25% of OBJ and 15% of other categories are humans. It is not surprising that SUBJ is more continuous than other categories because the topic tends to occupy the subject position and to persist. Subjects appear able to avoid ambiguity as compared to other categories.

5. SOME PROBLEMS WITH GIVÓN'S CONTINUITY MODEL

The present study shows that while Givón's topic continuity model can be substantiated to some extent, there are nevertheless some problems associated with his measurements of topic continuity/discontinuity.

First, from the comparison of clines based on three average measures presented in Table 2, we see that among the eight syntactic devices measured for Mandarin discourse, only the first (Ø ANA) and the last two (POS+N and INDEF) rank exactly the same in all three measures. The other five vary in their rank orders in each of the three measures. This discrepancy suggests that we are actually dealing with three clines rather than one. Take D.P. and NAME for example. Names can bridge a relatively larger gap than D.P. because they are often used when a previously mentioned person

has been out of the discussion for a while. But for PS, Names(1.36) rank higher than D.P.(0.38), and the PI values of the two are very close to each other. Therefore, while both structures distinctively differ from each other in the functions of RD and PS, they do not differ very much from each other in avoiding ambiguity. What is more, their positions reverse for the functions of RD and PS on the basis of continuity. In other words, Names and D.P. are two very distinct points, though in a reverse position, plotted on functional continua of RD and PS; whereas they are two less distinct points plotted on the continuum of PI.

Secondly, the three measures proposed by Givón cannot always differentiate between the use of distinct syntactic devices in certain situations. For example, 11a) John heard from his friend Peter today. Peter had been working very hard for the company.

b) John heard from his friend Mary today. She had been working very hard for the company.

In 11a) the second Peter was triggered by potential referential interference, the NP(NAME) is used to avoid ambiguity. In 11b) which is exactly the same as 11a) except that Peter has been changed to Mary in the first clause, a pronominal form she is readily used because gender can disambiguate the situation. However, such a difference between the use of syntactic devices cannot be distinguished by any one of Givón's measurements. Both Peter and she in the second clause would be assigned the same values of RD and PI (1 and 2 respectively) since both bridge the same size of gaps and both have a potentially interfering referents within the relevant distance. Why, then, should these two distinct structures have the same values while they are supposed to be far apart in the continuity hierarchy? The model cannot distinguish the two.

One may argue that the above case is not really a counter-example to Givón's model. It is obviously an ambiguity resolution case which can simply be filtered out. But same problems occur in the following sentences where there is no room for ambiguity.

12a) Zhener was born a singer. She liked to sing.

b) Zhener was embarrassed in public. Zhener was spoiled by the miners.

Both 12a) and b) consist of two consecutive clauses and the name Zhener is the only referent in these two clauses. Therefore we expect that the items in the second clauses referring to Zhener would be in pronominal form, which is on the top of the continuity hierarchy. However we still get quite distinct constructions, a pronoun in 12a) and a NAME in b). The question then arises: what has caused the author to use

more marking material (NAME) to fill up the apparent minimal gap between two consecutive referents? The model fails to address such an issue.

Furthermore, let us examine in detail the full range of RD for each of the eight constructions analyzed in the present study. Table 5 shows the distribution of RD within structures as well as their means and standard deviations (SD). While the mean score indicates the pooled average of RD's within each structure, the SD score reflects dispersion of scores so that the variability of different distributions can be compared in terms of the SD's. The closer the individual score of each structure is to its average, the smaller the variation among individual scores, and consequently the smaller the SD, and vice versa. For example, if every individual score in a distribution is equal to its mean, the SD is zero. In other words, the mean score only offers a crude interpretation of pooled scores, the SD permits a precise interpretation of scores within a distribution. This is demonstrated in Table 5.

TABLE 5
DISTRIBUTION OF RD WITHIN STRUCTURES

No. of Clauses	Ø Ana N	I.P. N	D.P. N	D+N N	NAME N	DEF N	POS+N N	INDEF N
1	400	50	11	5	77	63	2	
2	29	6	3	4	34	66		
3		5	2	2	24	8		
4		3		5	18	10		
5		2		4	13	15	2	
6		1			9	16	1	
7				1	7	12		
8					8	7	1	
9				1				
10						9		
11				2	6	1		
12				1	3	14		
13					3			
14					5			
15					2	17		2
16				1	6	5		
17								4
18						11		2
19								
20				1	53	95	29	407
AVE	1.07	1.93	1.44	5.37	7.23	9.38	17.34	19.94
SD	0.25	1.16	0.73	4.85	7.32	7.87	6.09	1.09

We see from Table 5 that pronominal forms behave much more consistently than nominal forms in terms of the range of RD's. Ninety-three percent (93%) of total tokens of Ø ANA, 75% of I.P. and 69% of D.P. have the RD value of 1, which means most of pronominals are used in minimal distance. Their SD's are relatively small (0.25, 1.16, and 0.73 respectively), indicating that scores are distributed fairly closely about the average. The nominal forms, on the other hand, have very different distributions within structures except INDEF whose SD score is 1.09. The other four structures, i.e. D+N, NAME, DEF, and POS+N have their individual scores scattered all along the scale of RD. Their values of SD are extremely large, indicating that their average score distorts the general characteristic of the structures under consideration. In addition, their SD's show that the RD scores of the four structures overlap to a large extent, suggesting that these four distinct anaphoric structures could hardly differ solely in their positions in the discourse, i.e. referential distance. The question again arises: what has caused the differential use of those distinct syntactic devices of reference if referential distance is not really a trigger?

In conclusion, the present study seems to conform to Givón's model since the topic-marking construction in Mandarin discourse, based on the average scores of the measurements, generally fits his topic continuity/accessibility cline. However, a close examination of the data reveals serious problems with Givón's model. Clearly, what is needed is a model which accounts not only the general tendencies of the differential use of the grammatical devices of reference, but also accounts for individual and specific cases. One such model can be found in Tomlin (1986), who argues that syntax of reference is tied directly to psychological processes of attention as reflected in the episode organization of natural discourse data (p.458). The data drawn from a pilot study on Mandarin oral discourse production have demonstrated that the attention model is superior to Givón's model, since the former can not only account for the general trend of differential use of pronominals and nominals, irrespective of referential distance, but also account for those individual cases which were the residue of the latter model. Further investigation on the relations between the use of syntax of reference and attention-shifts is in process. (I gratefully acknowledge the travel assistance provided by the Faculty of Graduate Studies and Research and the Alma Mater Fund at the University of Alberta.)

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"...that part of the city":
Mental spaces and ethnic neighborhoods¹
Jo Rubba
University of California, San Diego

0 Introduction

This paper is about how we interpret locational deictics in discourse processing. Specifically, it addresses a phenomenon referred to by Talmy (1986) as 'decoupling' or 'shifting of the deictic center'. In 'decoupling', a listener must adopt a viewpoint other than one in the actual speech situation in order to interpret a deictic expression used by the speaker. Somewhat informal accounts have been given of this phenomenon in the past (Rauh 1981, Fillmore 1971). The present paper is a preliminary attempt at a more formal account, combining cognitive grammar (Langacker 1987), the theory of mental spaces (Fauconnier 1985) and the theory of cognitive models (Lakoff 1987).

The data in (1) give examples of both 'decoupled' and non-'decoupled' uses of locational deictics. I direct the reader's attention to the italicized deictics *this* and *there*.²

(1) "...or the same with when I go to, like, a Spanish part of town, you know, see everything in Spanish, and I say, well, you know, *this* is not where I belong, and I suppose, I kind of feel like there's like alienation there, you know, they, you know, it's -- it's, I mean I can be *there*, but I don't belong."

The use of *this* and *there* in this segment is interesting in three ways. First, deictics of opposing values -- proximal *this* and distal *there* -- are used to refer to the same 'objective' location: the Spanish neighborhood, as the suitable paraphrases in (2) show:

(2) ...when I go to, like, a Spanish part of town...and I say, well, you know, a *Spanish neighborhood* is not where I belong...I mean I can be *in a Spanish neighborhood*, but I don't belong.

Second, it appears that the more marked usage is the usage of proximal *this* to pick out a location that was, in fact, at some distance from the interview site. Third, within the context of this particular discourse, it seems incorrect to read *this* as referring to any of a number of candidate locations that could be construed as proximal to the discourse site in some way, as (3) shows.

(3) ??? when I go to, like, a Spanish part of town, see everything in Spanish, and I say, well, you know, *your office* is not where I belong

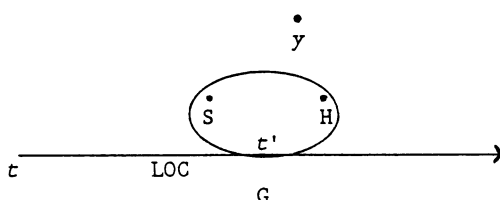
La Jolla
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My primary interest is the second of these three points: the use of a proximal deictic to refer to a location which, as the use of *there* a little later shows, can also be construed as distal -- indeed the distal construal seems to be the more appropriate one, given the 'objective' facts of the interview situation. This is where Talmy's 'decoupling', Fillmore's "taking the other fellow's point of view" (1971:41), and Rauh's "shifting the center of orientation" (1981:46) come in.

1 The semantics of deictics

What factors contribute to our interpretation of deictic expressions? One factor is the inherent semantic content of deictics (see e.g. Rauh 1981). In cognitive grammar terms, a deictic picks out or *designates* some entity -- a person, time, location, etc. -- and specifies a relation between that entity and a reference point within the *ground*. *Ground* is an essential concept here; it is to be understood as including "the speech event, its setting, and its participants" (Langacker 1985:113). (4) gives a composite characterization of the semantics of several deictics.

(4) a.



S = speaker H = hearer t = time t' = time of speech
 G = ground LOC = site of speech event y = element outside of ground

b.	profiling	S	defines	I
		H		you
		t'		now
		LOC		here
		y		that if y is a thing
		y		there if y is a location

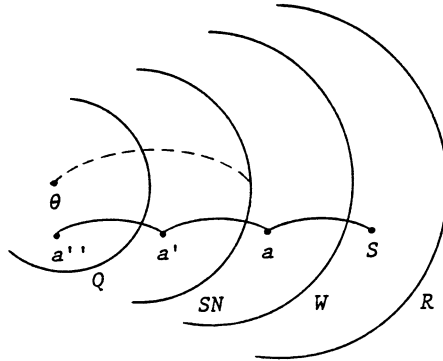
In (4)a., the ground comprises the elements within the oval, as well as the discourse location (marked LOC and construed as coextensive with the oval). As (4)b. shows, profiling different elements within or outside of the ground defines different deictic expressions -- at least in what might be considered their prototypical or most basic senses. Each English deictic expresses one of only two relations, proximal or distal. Talmy characterizes these as being "on the speaker-side or non-speaker side of a conceptual partition drawn through space, time, or other qualitative dimension" (1988:168). This characterization will prove significant at a later point in the discussion.

Now, to interpret deictics, we must have in our representation of the import of the discourse entities and relations between those entities and the ground which jive with the meaning of deictics. But as we have just seen in (1), the actual discourse setting cannot be taken as the ground in every case, although it appears to be the default ground (Fillmore 1971:41-42). My claim is that two notions within cognitive linguistics provide alternate grounds relative to which deictics can be interpreted: *mental spaces* and *cognitive models*.

2 Mental spaces as alternate grounds

Cognitive linguistics conceives of understanding discourse as an active process of constructing a representation of the speaker's intended meaning, through language the speaker uses as well as the exploitation of other knowledge structures. A major strategy employed in constructing this representation is what Dinsmore calls "knowledge partitioning" (1988). In knowledge partitioning, "the information conveyed in a natural language discourse is distributed appropriately over multiple spaces, which function as small, distinct, logically coherent knowledge bases within which objects and relations can be represented, and reasoning processes can be performed" (Dinsmore 1988:1). These are Fauconnier's *mental spaces* (1985). A central claim of my analysis is that by virtue of local reasoning within a space, and by cues which maintain our focus on a particular space (Dinsmore 1987:13-15), we can use a mental space as an alternate ground. Rauh gives a similar accounting, but without the formal apparatus of mental space theory set up by Fauconnier: (from the speaker's point of view) "The encoder gives up his real center of orientation and imagines himself located within an imagined space...He establishes a center of orientation to which he relates objects of the imagined space" (Rauh 1981:45). To illustrate, let us return to the data in (1). A partial, drastically simplified mental space diagram is given in (5) for the segment from the words *when I go* up to the first occurrence of the word *belong*.

(5)



The space marked *R* is the origin space, the speaker's conception of reality (Fauconnier 1985:17). This would include the interview situation and hence the immediate ground for her utterances. *S*, the speaker, is the only element shown in this space, although of course others would be present, for instance myself as her interlocutor. Now the word *when* is a space-builder, instructing the listener to construct a space, marked *W* in the diagram, in which some event or other circumstance may be portrayed by the following clauses. The *I* of *when I go* sets up element *a*, which, by details which must be neglected here, corresponds (by the arc) to the speaker *S*. Within *W*, the location nominal *a Spanish neighborhood* sets up another space, marked *SN*; the relation *go to* implicitly places the element *a'*, corresponding to *a* (hence to *S*) in space *SN*. Then within *SN* we have yet another space. This is a quote space, marked *Q*, set up by the phrase *I say*. The quoted phrase *This is not where I belong* sets up elements *a''* (via the pronoun *I*) and the element marked θ , set up by the nominal *This*. Now the quote portrays an utterance event; as such it will have a ground; the ground for this utterance event is the space *SN*. In other words, as we follow the discourse, we conceive of a person in the Spanish neighborhood uttering the quoted phrase. The speaker is able to exploit *SN* as the ground for the utterance event of *Q* so long as the *when*-space remains in focus. This it will do by default until some cue or a different space-building expression switches the focus to some other space: "all else being equal, the most recent focus space will continue to be in focus" (Dinsmore 1988:19). Such a switch does occur later on with the space-builder *can*. *Can* sets up a different space within which other deictics may occur and receive interpretations according to other grounds. The correspondence of θ to *SN* -- represented by the dashed line in the diagram -- is arrived at by the space construction process depicted in (5) and by local reasoning within the focus space.

So we see how a mental space can provide an alternate ground:

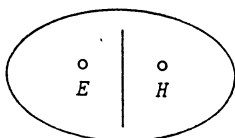
in the *when-space*, states of affairs may hold which do not hold in *R* (for example, the interviewee is in the Spanish neighborhood in space *W*, but in space *R*, she is in my office doing the interview); these states of affairs may offer a basis for interpreting deictics which do not jive with the actual ground. In this case, within *W*, *SN* is construed as proximal to the speaker of an utterance event (*Q*), providing a ground as well as entities bearing relations to it. A reading for the deictic *this* can be obtained by operating *locally* within *W*. We do not have to refer to relations in *R* to find a reading for *this*.

3 Cognitive Models as a source of alternate grounds

Let us turn now to another example in which similar circumstances are set up, but with quite different results. This example illustrates how *cognitive models* can supply alternate grounds. A cognitive model, unlike a mental space, is an enduring representation within which we store our knowledge of some domain. While mental spaces serve an ephemeral function in constructing interpretations of discourse, cognitive models serve a longer-term function of storing and organizing knowledge. Cognitive models are what 'fill up' the origin space *R* -- the speaker's conception of reality. They are very likely to be *invoked* in discourse, but less likely to be *created* in discourse, as mental spaces are. Many definite and deictic expressions exploit cognitive models which the speaker assumes to be shared. For example, reference to *the sun* or *the moon* without previous discourse mention is possible because the speaker may safely assume that her interlocutor shares a particular idealized model in which there is only one sun and one moon, and these are known to everyone. It would be left to a pedant, an astronomer, or an alien visitor from another solar system to remind her that her idealized model does not correspond to current scientific wisdom. Similarly, expressions like *1066* and *all that* require shared models of various domains, in this case the history of Western Civilization, to be of communicative value: an interlocutor must know the significance of the events of 1066 in order to find a referent for *that*.

The particular cognitive model I invoke here is a cultural map of San Diego, shown in highly schematic form in (6).

(6)



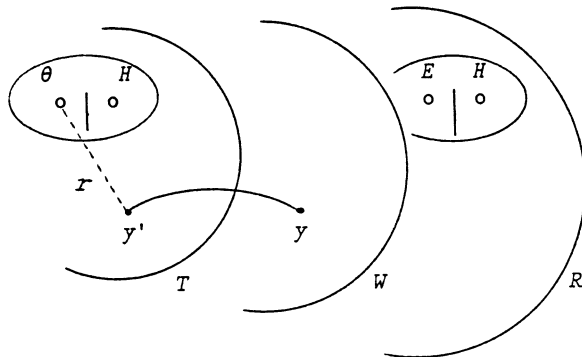
In this model, the territory of San Diego (represented by the ellipse) is subdivided into smaller subterritories, each of which is associated with a particular cultural group (as well as being distinguished in other ways). Some people reserve the term 'ethnic neighborhood' (*E* in (6)) for areas ascribed to non-mainstream cultural groups. Other areas are ascribed to the cultural mainstream (marked *H* in (6)). The reason for the *H* is that this cultural map is *oriented*; that is, the speaker identifies with the mainstream group and therefore with the territory ascribed to them -- her *home* territory (*H* for *home*). Ethnic neighborhoods are construed as *distal* from this home viewpoint -- on the other, 'non-speaker' side of a conceptual partition, to refer again to Talmy's characterization, which in this case is a cultural partition. This partition manifests itself in the implicit boundaries urban dwellers recognize between ethnic and mainstream neighborhoods.

Let us look at a segment from the interview in which this model is invoked. It features in the title of this paper, taken from the segment in (7):

- (7) Q: "... you know, you walk down certain streets in a city, 'n you see most of the shop signs in Asian characters or something; I wonder, how do you feel when you encounter things like that? You know, what are your own -- your own personal gut reactions? When you see a [??] sign in Spanish or..."
 A: [starting over my finish]: "Well -- well the fir -- I guess the fir -- the first thing you think is, um, you know, that you're in *that* part of the city, and I -- I think usually you see that kind of stuff usually in the older part of the city..."

(8) gives a partial space diagram for this segment.

(8)



In my question, I set up a *when*-space *W*, in which she remains in her reply. For the speaker, we assume, this *W* has as its origin space *R*, her view of reality. *R* would include the cultural map shown in (6) and again in *R* in (8). In *W*, she sets up the element *y* with the word *you*, which invokes a role roughly paraphrasable as 'someone' or 'anyone' who shares her world-view.⁴ She sets up an additional daughter-space with the word *think* -- a *thought*-space, marked *T*, attributable to the element *y*.⁵ The phrase *part of the city* sets up a location given as θ . By the relation *be in*, marked *r*, *y* is placed in θ . So we have a circumstance similar to that set up by the discourse segment shown in (1): a potential alternate ground is set up, complete with a thought event, which, like a speech event, takes place within a ground and in which deictic expressions might be used. Indeed in this situation proximal deictics could be used, as shown in (9):

- (9) a. ...the first thing you think is, you're *here* in *this* old part of the city
- b. ...the first thing you think is, you have to be careful *here* in *this* part of the city

But, in fact, distal *that* appears. Now a ground for *that* is available via the mechanism of *inheritance* from a parent space to a daughter space, given as the Space Optimization Principle in (10) (to see how this principle applies in this case, substitute *T* for *M*):

(10) Space Optimization Principle: "When a daughter space *M* is set up within a parent space *R*, structure *M* implicitly so as to maximize similarity with *R*. In particular, in the absence of *explicit* contrary stipulation, assume that

- a. elements in *R* have counterparts in *M*,
- b. the relations holding in *R* hold for the counterparts in *M*, and
- c. background assumptions in *R* hold in *M*." (Fauconnier 1985:91)

By this principle, the cultural map is inherited, providing entities and relations which the speaker can use to interpret *that*, while operating locally within *T*. Inheritance of the cultural map allows one to find a state of affairs which jives with the distal deictic *that*: the construal of the ethnic neighborhood θ as distal to the home territory, which serves as reference point within the inherited cognitive model. This cognitive model, present within the focus space *T*, serves as the ground for *that*.

4 Conclusion

I have made here an elementary proposal as to how we can give a formal account of decoupling or shifted reference-point phenomena, using constructs from cognitive linguistics that are strongly motivated by other aspects of language and language use. Many details of the specific application of the mental space formalism have been neglected due to constraints on the scope of this paper; also, in the course of in-depth analysis of a number of examples from the same discourse segment, it has become clear that as many questions are raised as are answered by applying cognitive linguistic notions to this problem. Nonetheless, it should be apparent that this approach would have much to say about well-known phenomena such as the historical or narrative present and literary devices such as *stil indirect libre*, all of which fall within the realm of linguistic usage and therefore within the limits of linguistic theory (as viewed from the cognitivist perspective). In related work (see note 1), I have used this technique to consider uses of other deictic expressions such as generic *you* and exclusive *they*. Much work remains to be done before the full promise of this sort of analysis is realized, and numerous questions, such as constraints on inheritance or on the use of alternate grounds, remain to be explored. But I hope to have demonstrated, with these first steps, the potential of an approach combining various threads in cognitive linguistics, as well as the importance of the links among semantics, pragmatics, and cultural knowledge to our understanding of discourse processing.

Notes

¹ This paper pursues in greater detail one facet of a project studying the role of cognitive models in reasoning on a sociolinguistic issue, the passage of California Proposition 63 (English as Official Language), reported in Rubba 1988. A lengthier version of the present work was presented in the Cognitive Science 200 seminar at UCSD in November 1988.

I owe thanks to a number of individuals for help with the analysis and the presentation, foremost to Gilles Fauconnier, whose guidance in understanding the mental space framework was invaluable, and to Ron Langacker, who afforded me opportunities to discuss and present the work to others in a research group. My thanks also to Jeff Lansing, Teenie Matlock, Eve Sweetser, and Karen van Hoek, for helpful discussion, and to conferees Paul Kay, Gisa Rauh and Rob Wilensky for insights and corrections. Errors or infelicities which persist despite this excellent help are entirely mine.

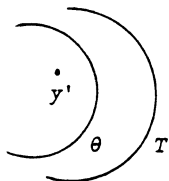
² The data are from a personal interview session with an informant who was being questioned about her personal feelings upon

finding herself in an ethnic neighborhood. The speaker was linguistically naive, and, at the time the interview was done, neither the speaker nor myself was aware that the data would be linguistically interesting.

Of course, other factors not dealt with here are also necessary to the interpretation of deictics. For example, the discourse domain (topic of conversation) will significantly narrow the inventory of candidate interpretations (Fauconnier p.c.). For locational deictics, for instance, whether the topic is neighborhoods or galaxies will have significant impact on 'where' a listener is likely to 'look' for the referent of a given deictic expression.

This is one of the numerous uses of generic you. These uses are amenable to a cognitive model accounting; see Lansing (1989) and Rubba (1988).

This could be shown with θ as a space, with an element y' within that space:



This representation is equivalent to (8), but makes it easier to see how θ could be an alternate ground.

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Syntactic Polysemy and Underspecification in the Lexicon⁰

Eric Schiller

University of Chicago

The term Syntactic Polysemy describes a phenomenon found in a wide variety of the world's languages, where a single lexical item is found in many different syntactic positions. Unlike "zero-derivation", there is great difficulty in determining the underlying root and derived forms, and the semantic relationship between two syntactic uses of the same lexeme is not predictable. In Schiller (1984) it was suggested that the lexicon of a language which has this phenomenon is un-, or at least under-specified with regard to syntactic category membership. This proposal did not fit comfortably with most lexicalist syntactic frameworks, as syntactic properties of lexical items were "projected" from the lexicon into the syntax itself. Without a lexical foundation, the syntactic framework had no information to use in building tree structures.

Within the framework of Autolexical Syntax, however, that concept of the lexicon is not only workable, but brings significant benefits analytically. The purpose of the present paper is to explore those benefits and describe in more formal terms the approach suggested in previous work. Data from Khmer, the major language of Cambodia, will be examined.

The Khmer word baan appears in a variety of syntactic and semantic contexts. It is used as a main verb, an auxiliary verb, a noun, and in other positions as well.

As a main verb, baan means 'to get; obtain', for example:

- (1) khñom cəŋ baan pəŋ mɔ̃n
 I want get egg chicken
 I want to get some chicken eggs.

Another common use of baan is as an aspectual marker of completion.

- (2) miin baan teñ ʔəywan nuh
 aunt get buy things those
 Aunt bought those things.

Jacob (1968) cites three uses of baan :

- i) as a main verb meaning 'to get, to obtain'.
- ii) as an aspectual marker indicating a completed action. McCawley (personal communication) points out the similarity between baan and English "manage". The semantics of baan seem to combine MANAGE and GET. baan has been described as marking a completed past action when taking a VP complement, rather similar to the use of English 'got'.
- iii) in final position 'to be able', as in

- (3) khñom thvəə kaa mʉn baan
 I do work not able
 I cannot work.

This use of baan in final position is interesting. Verbs are not usually found in that position. It might be suggested that this configuration arose just to avoid ambiguity with the aspectual usage, e.g.

- (4) khñom mwn baan thvæ kaa
 I didn't do work.

There are two problems with this analysis. The first is that this sort of ambiguity is not necessarily avoided in Khmer, which relies heavily on context to distinguish between various interpretations of an utterance. In addition, adverbial clauses modifying a proposition are often found at the end of Khmer sentences. So it seems reasonable to adopt the position that when baan is found at the end of the sentence, in an adverbial position, it is behaving syntactically as an adverbial, and assigning a property of, say, possibility, to the entire sentence. In other words, if it walks like a duck, quacks like a duck, and looks like a duck, it probably is a duck.

Our next example demonstrates something resembling prepositional usage, although the constituent headed by baan can also be analyzed as a \bar{V} :

- (5) a. kōāt riən khmae baan pii ʔaatət
 prn. study Khmer get two week
 He studied Khmer for two weeks.
 b. baan pii ʔaatət kōāt riən khmae
 For two weeks, he studied Khmer.

(5b) shows the possibility of fronting of the temporal phrase, while the contrast in (6) is due to the difference in constituent structure, where the phrase is internal to the objective nominal phrase:

- (6) a. kōāt mæl siəwphəu baan pii kbaal
 prn. read book get two head[CL]
 He read two books.
 b. *baan pii kbaal kōāt mæl siəwphəu

In (6a) the books must have been read to the finish, thus bringing into play some of the aspectual nuance found in the auxiliary verb position. This construction might therefore be alternatively analyzed as a resultative construction with baan as the marker (cf. discussion of ʔaoy toward the end of this paper). The grammatical description in Ehrman and Sos (1972) is that this usage is restricted to appearance of baan 'before a quantity of completed work'.

Let us now consider the various uses of the word baan from an Autolexical viewpoint. In the framework of Autolexical Syntax (Sadock 1983, 1985, 1986), the grammar of natural language is represented in a set of autonomous modules (Syntax, Semantics, Morphology, and one or more modules, for example, for pragmatic and discourse representations), each of which contains a representation of an utterance. The Interface is where the representations of the individual modules are compared. The "interesting" phenomena of grammar are those which have representations in two or more components which are not isomorphic. An important, indeed critical, point is that a lexeme need not have a representation in all components. For the purposes of the present paper, only the syntactic and semantic components need concern us, although mention will be made of some purely pragmatic factors.

There is little to say about the morphology. Essentially, Khmer words are all of the same morphological category, and cannot be inflected. Compounding is possible, however, and quite prolific. There are some items which appear to have affixes (prefixes and infixes), but these are simply vestiges of morphology from the era of Old and Middle Khmer, which had productive affixation. New derivations are extremely rare, and it is safe to say that these are formed by analogy. We will therefore assign a default specification in the morphological component such that all lexical items are stems, subject to compounding. There is, however, productive reduplication of complete morphemes (partial reduplication, formerly productive, is completely fossilized now) usually resulting in a semantic nuance of intensification, pluralization or frequentative aspect.

The syntactic representation is a monostratal, non-transformational Context-Free Phrase Structure Grammar with an IDLP framework and slash categories, as in GPSG. Semantics, taken here to be the dimension of predicate-argument structure and quantification (possibly of thematic roles and case as well) will be represented by a tree structure which has dominance relationships but which lacks any intrinsic linear ordering.

The syntax of Khmer seems especially complicated, given the lack of inflection which in other languages can help to solve questions of analysis. Since many words are syntactically polysemous, promiscuously occupying any slots into which their meaning (as opposed to combinatoric semantics) reasonably allows, I will adopt the position of Radical Syntactic Polysemy:

(7) The default syntactic condition is unspecified with regard to syntactic category.

This is to say that words are syntactically free to attach to any terminal node in the syntax. There are numerous exceptions of course, but they seem to be principled. Pronouns are a fixed category, although the situation with reflexives is unclear (Schiller to appear). Borrowed words, especially those of Sanskrit or Pali origin, seem to have fixed lexical categories. (Although many languages, including English, seem to apply some special rules to borrowed words, this is by no means universal. Tibetan is syntactically polysemous without regard to the origin of words ("There is no real distinction between different classes of words, and the same word can be used as a noun, adjective, or verb - all depends on its position in the sentence" (Roerich and Phuntshok 1971)), and even Sanskrit borrowings can be used as any part of speech (Agha p.c.). But in Khmer the pronouns and fixed class borrowings are a helpful diagnostic for syntactic analysis.

In addition, items which are historically the result of the prolific morphological processes which were productive until a couple of hundred years ago belong to a single lexical category. Affixes had nominalizing, causativizing, transitivity and other grammatical functions.

The freedom enjoyed by lexical items is not matched by the set of node admissibility conditions which define grammatical structures in Khmer. The apparent complexity of syntactic expression is, I suggest, a result of attempting to maintain an analysis in which category membership for lexical items is fixed. When one permits the lexical items to occupy a variety of syntactic slots, then the number of

syntactic constructions can be greatly constrained. In fact, the syntax of Khmer, often regarded as horribly complex, may not be so difficult after all, if we permit non-isomorphism of syntactic and semantic trees, and allow items to have no representation in certain components (so that words with purely pragmatic function do not receive a representation in the syntax, for example.) These assumptions are standard Autolexicalist positions.

In most Southeast Asian languages, context is a powerful tool which licenses omission of arguments in syntactic structure and which interacts intimately with both syntax and semantics. In this paper such interactions will not be explored, but two analytical positions must be stated so that the syntactic analysis will not seem deficient.

First of all, responsive particles are treated as lacking both syntax and semantics, and are used for purely pragmatic reasons, to affirm or deny propositions. Specifically, words which correspond to English 'yes' (/baat/ and /caa/, used by men and women respectively) and which are always utterance initial, and /tee/, a final particle used whenever an overtly or covertly negated proposition is part of the utterance or when a question is being asked, will not be assigned syntactic or semantic representations. Some discussion of tee will be presented below.

Also assigned to the pragmatic component(s) are such matters as choice of pronoun (involving a very elaborate status mechanism), honorifics, and illocutionary mechanisms. See Eilfort (PhD thesis in progress) for more on the illocutionary aspects of Autolexical theory.

I have argued elsewhere that a Khmer sentence should be analyzed as a \bar{V} , that is a maximal projection of a head verb (Schiller to appear). The following can be taken as a partial set of the rules required for Khmer by the syntactic component:

- (8) SR1: $\bar{V} \rightarrow (XP) \bar{V}$ (for topic structures)
 SR2: $\bar{V} \rightarrow (\bar{N}) \bar{V}$ (i.e. Khmer is a pro-drop language)
 SR3: $\bar{V} \rightarrow V_{[aux]} \bar{V}$
 SR4: $\bar{V} \rightarrow \bar{V} \bar{V}$ (for serial verb structures)
 SR5: $\bar{V} \rightarrow V (\bar{N})$
 SR6: $\bar{N} \rightarrow \bar{N} (\text{Num}) (\text{Cl}) (\text{Dem})$ (i.e. Khmer is a classifier language)
 SR7: $\bar{N} \rightarrow N (\bar{N}) (A)$
 SR8: $\bar{P} \rightarrow P \bar{N}$
 SR9: $V^n \rightarrow V^n \text{Adv}$
 (Any constituent headed by V can be followed by an adverb)

Note that Khmer is clearly a head-first language. I have omitted discussion of quantifiers for the purposes of this paper, because Khmer shows negative-raising effects and tae 'only' shows rather remarkable clitic-like properties which deserve full discussion elsewhere (e.g. Schiller *f.c.*).

Returning to baan, it may seem that one might extend the notion of GET of the word baan to obtain a passive-like element as well, though few books or dictionaries list such a function. In fact, there is a fairly common construction which parallels the English "get" passive:

- (9) a. Sok baan rōatta kaa cuəy ʔaoy təu riən
 Sok get government help give go study
 Sok got government help so that (he could) go to study.

The various uses of the word clearly share something in common, and deserve investigation in the metaphorical framework of Lakoff (1987). But sticking to just the syntax, on the basis of the data presented above, a first approximation of a lexical listing for baan might be:

- (10) /baan/
 to get $V[\nabla/\bar{N}]$ F^{-2}
 get-passive $V[\nabla/\bar{V}]$ F^{-2}
 to have done $V_{[+AUX]}[\nabla/\bar{V}]$ M
 can-do $A[\nabla/\bar{V}]$ M

where F^{-2} indicates that in the combinatoric semantics, the item is a function which combines with two arguments to form a proposition, while M indicates that in the combinatoric semantics the item is a modifier. The listing above exemplifies the property of Syntactic Polysemy that I claim holds for certain languages. Translation clouds the issue, but it seems clear that these items are related, but not necessarily derived in a traditional sense. There are three reasonable strategies:

1. List every syntactic usage in the lexicon.
2. Have lexical redundancy rules which create lexical items of different categories from a root of a single category.
3. Allow for some sort of underspecification which allows the lexical item to remain syntactically promiscuous.

I think that a combination of the first and the third paths is clearly preferable. The second option is clearly empirically inadequate, since there is a great deal of variation in the degree of syntactic promiscuity. Were the semantic consequences of the zero-derivation process clear, this might be a reasonable try. Even so, one is hard pressed to explain the distribution of various syntactically polysemous items via zero-derivation, as one would have to assume that all speakers of the language chose to apply this optional derivational path to almost exactly the same range of phenomena. Zero-derivation can explain the possibility of syntactically polysemous items, but cannot account for restrictions seen in, for example, the case of baan.

But if we take the third route, we can underspecify the lexical item in a number of different ways, allowing for certain syntactic features (here we adopt the GPSG mechanism of decomposing syntactic categories into feature specifications) to be free in polarity. Naturally many of the uses will become lexicalized over time, and not only in terms of the syntactic category, but also in the form of idioms. We can adopt the position suggested earlier that the lexical syntax in Khmer is underspecified. We can go even further, and suggest that the semantics is a default relationship to the syntax.

A *default*, in the sense intended here, refers to a set of relationships which are presumed to hold between syntax and semantics. For example, a transitive verb is expected to have two logical arguments in the semantic component. An intransitive verb should have a single argument. An adjective or adverb is supposed to modify a semantic constituent. A nominal element in the syntax should be a quantified entity in the semantics.

Since baan appears in a wide range of syntactic and semantic uses, and each of those uses is normal (that is, when found in a given syntactic slot the semantic function is that which is appropriate to that position), what we have then, is the following entry:

- (11) /baan/ GET
 Syntax: [X _v _____ Y]
 Semantics: *default*

The entry shows that the phonological form /baan/ has a general meaning something like 'get' (Generalizing across languages and syntactic forms is difficult without an adequate metalanguage, and this is purely a descriptive device, at present.) which can appear in any syntactic environment which forms a verb phrase. Note that no syntactic category is listed. The syntactic entry allows any terminal node meeting the requirements of the listed specification to accept the lexical item.

Thus the lexical conditions for the word will be met whenever it appears in a syntactic position which holds a normal relationship with the representation of the lexical item in the semantic component. So we can expect that it is possible to use a lexical item as an N, V, A, or P. But if the categorial cabinet is so empty, why then is there such a great statistical tendency to find the word baan used in main verb or auxiliary position? The answer lies in the non-combinatoric semantics, i.e. the real "meaning" of the word. In short, there is no prediction that all items will, in fact, be found in all positions, merely that the underspecification allows it to occupy these positions. A combination of the real "meaning" of the word and the Grounding Principle mentioned below is enough to account for the distribution of most underspecified lexical items. This also leaves open the possibility that two speakers might choose different representations when hearing a string, say, a prepositional phrase construction as opposed to verb+object, which have the same surface syntactic forms in Khmer (see discussion of nəu below). In the following examples, the notation is to be read as follows (using 12a. as an example): The lexical item baan is attached to the node label V, forming a verb phrase when combined with a noun phrase to its right. In (12) I have added a reference to the particular syntactic rule in which the word participates.

- (12) a. baan kaa(r) 'reliable, able, capable, sure to bring good results'
 V: $\bar{V}/_\bar{N}$ (as a transitive verb: SR5)
 kōā baan kaa
 prn. GET act/result
 He is a reliable person.
- b. baan koun proh pii nēāk 'to have two sons'
 V: $\bar{V}/_\bar{N}$ (as a transitive verb: SR5)
 kōāt baan koun proh pii nēāk
 prn. GET child male two persons
 He has two sons.

- c. $\text{baan c\ddot{a}tt}$ 'to become more daring'
 $\text{V:}\bar{\text{V}}/\text{___}\bar{\text{N}}$ (as a transitive verb:SR5)
 kraoy Sok l\text{u}w\text{u} r\text{w}\text{ə}ŋ nih baan c\ddot{a}tt nah
 after Sok hear story this GET heart very
 After Sok heard the story, he became bolder.
- d. $\text{V:}\bar{\text{V}}/\text{___}\bar{\text{V}}$ (as an auxiliary verb:SR3)
 k\ddot{o}at m\text{u}m baan m\ddot{o}k tee
 he not GET come POL
 He couldn't come.
- e. $\text{A:}\bar{\text{V}}/\text{V}\text{___}$ (as an adverb: SR9)
 k\ddot{o}at c\text{ə}ŋ d\text{ə}ŋ thaa n\ddot{e}k naa klah ?aacbaoh chnaotbaan
 he want think say person any some can throw ballot able
 He wants to know who is eligible to vote.

(12a) seems idiomatic, closest in meaning to the main verb use 'obtain', i.e. 'He gets results', which involves an acceptable translation of kaa. (12b) only allows baan to be used as the matrix verb. (12c) is interesting because of the modifier 'very' which must go with the verb phrase, since there is no justification for translating c\ddot{a}tt as 'bolder'. Here baan has its main verb syntactic use encoded in the idiom. In (12d), it seems that the meaning 'can' is as much involved as the completive aspectual meaning, which just illustrates the point that there isn't a set of separate meanings involved here, but rather a single lexical item with a wide but non-divisible range of meanings. In (12e) we find that the ability to cast a vote is predicated from the lower clause, and that no long-distance relationship with the subject of the higher clause is possible.

(12) shows syntactic polysemy on a limited scale, with only verb-phrase forming syntactic functions permitted. tr\text{ə}w has the meanings 'hit, come into contact with, experience, must, should, correct, right', and appears in an even wider range of configurations. It is sometimes claimed to be a marker of Passive, although this analysis has been properly criticized by Lekawatana (1975).

- (13) a. $\text{V:S}/\bar{\text{N}}\text{___}$ (as an adjective)
 c\text{o}m\text{l}a\text{ə}y nuh m\text{u}n tr\text{ə}w tee
 answer that not correctPOL
 That answer is not correct.
- b. $\text{V:}\bar{\text{V}}/\text{___}\bar{\text{N}}$ (as a transitive verb)
 puuthau cr\text{o}lu\text{ə}h m\ddot{o}k tr\text{ə}w c\text{ə}ŋ
 ax slip come hit leg
 The ax slipped and hit his leg.
- c. $\text{V:}\bar{\text{V}}/\text{___}\bar{\text{V}}$ (as an auxiliary verb)
 k\ddot{o}at tr\text{ə}w puukae
 he should be-skillful
 He ought to be skillful.
- d. $\text{V:}\bar{\text{V}}/\text{___}\bar{\text{V}}$ (as an auxiliary verb)
 kh\ddot{n}om tr\text{ə}w t\text{ə}u phsaa th\text{ŋ}ai nih
 I must go market day this
 I must go to the market today.
- e. $\text{V:}\bar{\text{V}}/\text{___}\text{S}$ (as a verb which takes sentential complements)
 k\ddot{o}at tr\text{ə}w chka\text{e} kham
 he experience dog bite
 He got bit by a dog.

- f. V:V̄/___N̄ (as a transitive verb, syntactically)

kōāt trəw krōāp
 prn. experience/hit bullet
 He was struck by a bullet.

- g. N:V̄/V___ (as a noun)

mənuh nuh dəŋ khoh trəw
 man that know wrong right
 That man knows right from wrong.

- h. N:P/P___ (as a noun)

mənuh nuh dəŋ khoh pii trəw
 man that know wrong from right
 That man knows right from wrong.

- i. A:V̄/V___ (as an adverb)

kōāt chlaəy sǝmnuə trəw
 he answer question correctly
 He answers the question correctly.

Since we see the word in every syntactic environment except that of a preposition, we can then provide the following lexical entry.

(14) /trəw/

Syntax: [-P]

Semantics: *default*

There are a few noteworthy observations to be made. First of all, the use of this item in this wide variety of syntactic positions is quite similar to that seen in Thai (a member of the Tai-Kadai family) and Hmong (a member of the Hmong-Mien family). The forms used in those languages may even be etymologically related (Gérard Diffloth and Martha Ratliff, p.c.), though the languages are either completely unrelated to Khmer (following Benedict's Austro-Thai) or very distantly related (as I argued at this very conference two years ago.)

One fact about the use in each language is that it cannot be used as a preposition or as a pronoun. Prepositions and pronouns tend to form closed classes in most languages, and it does not seem unreasonable to take the position that lexical items have the default specifications [- pronominal] and [- prepositional]. A coverb is therefore a case of a verb acquiring the feature [+ prepositional], while cases of nouns becoming pronominal involve the acquisition of the [+ pronominal] feature. A case of the latter is Khmer *khñom*, which was once a noun meaning 'slave' (a meaning preserved in the verbal use of the word as 'to serve') and which is now a first person pronoun.

So if we adopt the position that lexical items are [- prepositional, - pronominal] as a default, we expect then that *trəw* will function in all other syntactic positions, and the data illustrates that this does, in fact, seem to be the case. In addition, there seems to be a pattern that in a modifier position (roughly - to the right of the constituent with which it combines), *trəw* has a semantic core of correctness or appropriateness, but in other positions (to the left of the constituent with which it combines) it seems to have a semantic core of contact, or experience. Of course the modal use counterexemplifies this, but then auxiliaries have semantics rather similar to adverbs. In any event, leaving aside the difficulty of finding a way to express, in English, the central meaning of *trəw*, we come up with the following entry, taking [-Prepositional] as a default:

(15) /trəw/

Syntax: *unspecified*

Semantics: *default*

Now consider another fact which at first seems to counterexample the proposed analysis. We do not find kɨt 'think' used as a noun, although there is no obvious reason why this should not be so. The answer lies in the existence in the lexicon of kɔmnɨt 'thought', a form created during the period of productive derivation. This is an example of a general principle of primacy of the lexicon, whereby one does not create a form if an appropriate form already exists. This explanation applies to most languages, for example English, which lacks a form *fastly.

(16) *If an appropriate lexeme exists in the lexicon, do not use the underspecified form instead.*

It should be mentioned that Jerry Sadock has been working with the idea of primacy of various components, such that where conflicts exist, the more concrete component seems to force a resolution in its favor, e.g. when Morphology and Syntax collide, Morphology wins.

One must keep in mind, however, that Syntactic Polysemy is a phenomenon which appears in natural languages to different degrees, and that no claim is being made that there is complete freedom in the lexicon. It seems that in most languages, personal pronouns form a fixed nominal class. It is reasonable to assume that the process of acquisition of Khmer syntax involves observations that some words, for example the personal pronouns, only appear in a nominal setting, while other words appear with a wider variety of uses. It is relevant, perhaps, that the most promiscuous lexical items are very basic to the vocabulary. In addition to baan and trəw, considered above, here are a few more syntactically polysemous common words with representative examples (by no means an exhaustive list, either of examples, or of examples of examples):

- (17) nəu 'IN'
- a. kɔāt rɔāh nəu phnum peñ
 prn. (a)live in Phnom Penh
 He lives in Phnom Penh.
 - b. kɔāt nəu phteah
 prn. in house
 He is in the house.
 - c. kɔāt nəu rien khmae
 prn. in study Khmer
 He is still studying Khmer.
 - d. nəu knoŋ sɔmot mien trəi craen
 in inside sea have fish many
 In the sea there are many fish.

- (18) ʔaoy 'GIVE'
- a. kɔāt ʔaoy luy khñom
 prn. give money me
 He gives me money.
 - b. som niʔyiey ʔaoy cbah
 please speak so-that clear
 Please read clearly.
 - c. kɔāt thvəə ʔaoy pibaaʔ
 prn. do so-that difficult
 He made it difficult.

- d. ~~kōat~~ teñ trəi ʔaoy khñom
He buy fish for me
He bought the fish for me.
- e. ʔaoy tæ taok khñom təw
give only inexpensive I go
If it's cheap, I'll go.
- (19) daoy
- a. kee mɔɔk daoy laan
prn. come by car
They came by car.
- b. daoy yɔɔbəl khñom kōat trəw təw thvəə kaa
according opinion I prn. must go do work
In my opinion, he ought to go to work.
- c. khñom də daoy tənlee
I walk by/along river
I walk along the river.
- d. siəwphəu nih sɔsee daoy puu Sok
book this write by uncle Sok
That book was written by my uncle.
- e. kōat thvəə daoy piʔbaa
prn. do with difficulty
He did it with difficulty.
- f. kōat trəw rien daoy kōat mʉn cəh khmae
prn. should study becausehe not know Khmer
He has to study because he doesn't know Khmer.

I have no time to discuss these examples, or many others with similar wide ranges of application, but present them for your information. Another word, *təw* will figure in the discussion below.

The theory of Autolexical Syntax is still fairly new, and its ongoing development may be of interest to some of you. But there are immediate benefits in using this framework for descriptive purposes. Perhaps the most important benefit is the elimination of the proliferation of syntactic categories (or, in another framework, cases) which are employed for the description of isolating languages. Let us take an example from Khmer, namely, the grammatical descriptive devices employed in Jacob (1968).

"A noun is a word which may occur immediately following pre-nominal particles (q.v.)."

Her pre-nominal particles are words such as *pii* 'from', *ʔaɛ* 'at', *knɔn* 'in'.

"They may precede noun constructs immediately and thus form adverbial constructs which may occur in several different positions in the various sentence-forms and may be pronounced with separate phrasing..."

She provides a list of 48 items which function as pre-nominal particles. Of those, 27 are syntactically polysemous, and 18 are compounds with at least one part showing syntactic polysemy. So, for example, *nəu-knɔn* : *nəu* is used as a main verb meaning 'to be located at' and is also used as a preposition meaning 'in'; *knɔn* is restricted to pre-nominal positions. *nəu knɔn* is listed, as is each of the components. But in almost all of the listed compounds,

the first component is also available for use as a verb, and the second portion varies tremendously. So the second component can be analyzed as the complement or object of the verb, and often there is evidence to support this. For example, knɔŋ is suspiciously nominal in its form (vestiges of nominal nasal infix). In any event, this heterogeneous group of pre-nominal particles is very hard to define, and thus cannot adequately function as a test for noun-ness. Jacob includes among the functions of these particles that

"They act as ad hoc nominalizers of words of other categories (verbs, numerals, adverbs, and even of miniature sentences)."

In other words, what follows a pre-nominal particle is interpreted syntactically as nominal.

- (20) khñom təu ciə rəhah
 I go be fast
 I shall go quickly.

Now the problem here is that both təu and ciə are generally treated as verbs. Under Jacob's analysis, the latter acts as a nominalizer, although it seems justified only because one can replace ciə rəhah with a garden variety nominal like phtēäh 'house':

- (21) khñom təu phtēäh
 I go house
 I'm going home.

But the analytical difficulties quickly multiply with the addition of a few more words:

- (22) a. khñom təu knɔŋ phtēäh
 I go in house
 I'm going into the house.
 b. khñom dəə təu phtēäh
 I walk go house
 I'm walking home.
 c. khñom dəə təu knɔŋ phtēäh
 I walk go in house
 I'm walking home.

In these examples, təu seems to function sometimes as a verb, and sometimes as a preposition. Other analyses involve the "coverb" concept and this analysis might work for təu, but is less appropriate for knɔŋ, which is sometimes treated as a "relator noun". This latter concept seems sensible in view of the frequent use of the word to mean "inside", or "the inside of..." Suppose we try to simplify our analysis by treating knɔŋ as a noun. In (22c), we have an example of $\bar{N} \rightarrow N$ N which is a frequently seen construction in Khmer. But syntactically, knɔŋ is probably a preposition, since it cannot be modified in any way and cannot take a determiner. We could, of course, try to classify it as a pronoun, but this seems intuitively weird from a syntactic point of view, and in any event it cannot appear in some pronominal positions such as possessor. There is still the possibility of a syntactic class of relator nouns. In any case we can maintain təu

as a verb (in the syntactic representation), with *daə təu* analyzed either as a compound or serial verb construction, a decision which will not be taken here.

In a similar fashion we need not create a lexical category for numeral classifiers, as these can be either nouns or, less frequently, stative verbs. But not all categories can be collapsed into the standard set of syntactic classes of noun, verb, adverb, preposition. Khmer has certain particles which are used only at the beginning of an utterance (such as 'yes', 'no') and a set of emphatic particles. In the analysis proposed here, these items would have NIL syntax, rather than the default case. They can be treated as terminal nodes of a pragmatic or discourse tree. This also applies to the politeness particle *tee* which has sometimes been treated as part of a discontinuous structure of the negative operators *mūn* and *ʔət* in addition to its use as a "question particle". Given the following set of data one can easily understand how *tee* became analyzed as a negative particle.

- (23) a. *khñom min təu phtëāh tee*
 I not go house POL
 I'm not going home.
- b. *look təu phtëāh tee*
 Mr. go house POL/QUERY
 Are you going home?
- c. *look təu phtëāhrūw tee*
 Mr. go house or POL/QUERY
 Are you going home, or not?
- d. *look təu phtëāhrūw mūn təu phtëāh tee*
 Mr. go house or not go house POL/QUERY
 Are you going home, or not?

The last example is a very typical areal construction for questions. By treating *tee* as a pragmatic entity with no syntactic or semantic representation, the remainder of the sentence poses no problem. Again, simplicity within each component is maintained.

In this brief paper an Autolexical treatment of Syntactic Polysemy has been outlined. The claim of underspecification or even possibly underspecification in the lexicon is strong, but not unique to Autolexical Syntax (see, for example, the HPSG application of underspecification in Pollard and Sag (1987)). The combination of Autolexical Syntax with the concept of lexical underspecification gives rise to optimism concerning the description and analysis of isolating languages. Syntactic Polysemy can also be applied to morphologically productive languages such as Nootka, where the roots seem to be syntactically underspecified. Areas of investigation which might benefit from this approach are the problem of serial verb constructions, verb concatenation (cf. Matisoff 1973) and potential explanations for (Hawkins 1983) proposed implicational word order universals.

Endnotes

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Concessive Conditionals in Japanese: A Pragmatic Analysis of the S1-*TEMO* S2 Construction*

Seiko Fujii Yamaguchi
University of California, Berkeley

0. Introduction

A major problem in a study of conditionals is to identify areas of contrast, overlap, and neutralization of conditionals with such related adverbial constructions as temporals, causals, or concessives.¹ This paper will focus on the interaction between conditionals and concessives in Japanese (see Figure 1), and will pay particular attention to an intermediate category of concessive conditionals, and their semantic and pragmatic conditions. This construction, marked by the *TEMO* ending on the verb of the subordinated clause, is illustrated in sentence (1) below.

- (1) Asu ame-ga huttemo ikimasu.
tomorrow rain-NOM fall(CcCd/EVEN IF) go (CcCd: concessive conditional)
(Even if it rains tomorrow, I will go.)

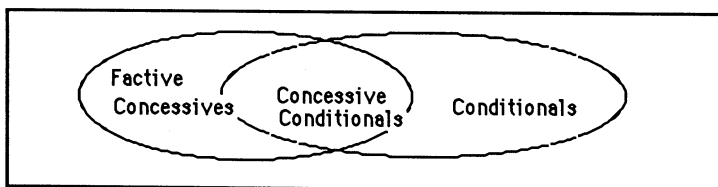


Figure 1

In Japanese, conditionals can be expressed using sentences whose first parts are headed by verbs with the endings seen in (2):

- (2) tabeeba (TABE is a verb stem of TABERU which means "to eat.")
tabetara
taberu to
taberu nara
taberu no nara
tabetemo.

For example, sentence (3) is an ordinary future-predictive conditional sentence:

- (3) Asu tenki-ni nareba (nattara), pikunikku-ni ikoo.
tomorrow good weather-DAT becomeCOND(itional) picnic-DAT goVOL(itional)
(If the weather is good tomorrow, let's go on a picnic.)

In this paper, I will first present some basic prototypes of **Factive concessives** and (**nonfactive**) **Concessive conditionals** in English, and will compare them with their Japanese counterparts. I will then discuss cases that do not neatly fit these prototypes. Under certain contextual conditions, a clause whose form is typically associated with one of these types may be given an interpretation typically associated with another type. When we examine such variation, we will notice

certain discrepancies between expressions in English using *although* (*even though*), *even if*, and *if* and the Japanese counterparts expressed by NONI, TEMO, and TARA or BA. (For a rough schematic summary, see Figure 2.) By exploring these differences, I will show that Japanese contrasts significantly with English regarding the delineation of the concessive conditional category. In order to clarify the parameters which distinguish these English and Japanese expressions, I will compare the pragmatic-semantic conditions placed on the use of the TEMO construction, with those which seem to characterize the use of the English EVEN IF construction.

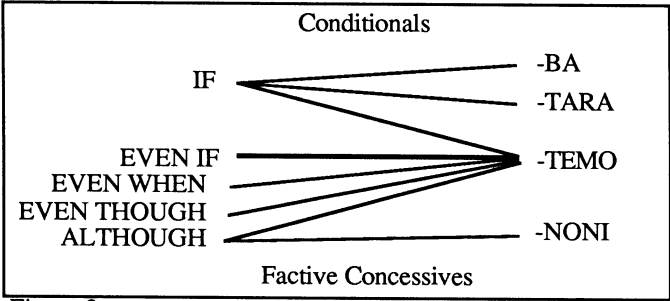


Figure 2

1.0. Ordinary conditionals

To prepare for our examination of concessives and concessive conditionals, let us first try to characterize ordinary conditional sentences.

In prototypical hypothetical conditionals, the truth of the antecedent is not taken for granted by the speaker. In other words, either the speaker does not know whether the antecedent is true, or the speaker knows that the antecedent is not true. For example, in a future-predictive sentence, such as those in (3a), the truth of the antecedent is not known, or in a counterfactual sentence, such as those in (3b), the antecedent is known not to be true.

(3a) **~Kp** (future-predictive)

If the weather is good tomorrow, let's go on a picnic.

Asu tenki-ni nareba (nattara), pikunikku-ni ikoo.
tomorrow good weather-DAT becomeCOND picnic-DAT goVOL

(3b) **K~p** (counterfactual)

If the weather had been good yesterday, we would have gone on a picnic.

Kinoo tenki-ni nareba (nattara), pikunikku-ni itta no desu ga.
yesterday good weather-DATbecomeCOND picnic-DAT goPAST but

I use **~Kp** to indicate the situation in which the speaker does not know the truth value of "p," and **K~p** to represent the situation in which the speaker knows that "p" is false. The letter "p" for "antecedent" comes from the common practice of expressing material implication as an expression of the form "p implies q." Here and elsewhere I will use "P" to designate the antecedent, and "Q" to designate the consequent, in a conditional sentence.

In contrast to examples (3a) and (3b) above, there are many other conditional sentences where the truth of the antecedent may be known and accepted by the speaker, as in (3c) &(3d).²

- (3c) A: I'm going to S.F. this evening.
 B: Really? If you are going to S.F., could you give me a ride?
 (3d) If you are studying that hard sitting up late every night, you will surely pass the exam.
 (3d') Given that you are studying that hard sitting up late every night, - - - .
 (3d') Since you are studying that hard sitting up late every night, - - - .
 (3d') Now that you are studying that hard sitting up late every night, - - - .

Paraphrases of (3d) expressed as sentences which are clearly not conditionals are given as (3d'). In all of these utterances, the speaker concedes the truth of the antecedent in order to build steps in an argument.

This feature -- the speaker's commitment to the truth of the antecedent of a conditional sentence -- is one of the parameters used in the following discussion.

1.1. Factive concessives

Next let us look at prototypical **Factive concessives**, as illustrated in (4).

- (4) **Factive/Past-event/Concessive** **Kp** (known to be true)
 (4.E) Although I studied extremely hard, I did not pass the exam.
 (4.J) Issyokenmei benkyoo sita **noni** siken-ni gookaku sinakatta.
 extremely hard studyPAST (Cc/ALTHOUGH) exam-DAT pass-NEG-PAST

The prototypical factive concessives in Japanese use the particle cluster -NONI as shown in (4.J).³

The basic conditions of Factive concessives as described in this paper include: 1) the truth of the antecedent is taken for granted by the speaker, and 2) the consequent is contrary to some common expectations, given the truth of the antecedent. In example (4), illustrating the first of these conditions, the antecedent, "I studied extremely hard," is presented by the speaker as true. I will denote this by **Kp** (the antecedent is known to be true). In illustration of the second condition, we note that an ordinary interpretation of the sentence requires us to accept a background assumption that normally "if x studies extremely hard, then x passes the exam." The sentence tells us that, contrary to that expectation, in fact "I did not pass the exam."

1.2. Prototypical concessive conditionals: associated pragmatic-semantic conditions

Now we consider **concessive conditionals**, an intermediate category of sentences that are both concessive and conditional. I will present two prototypes: first, the Future-predictive Concessive conditionals, as shown in (5); and second, that of the Counterfactual Concessive conditionals, as shown in (6). In both cases, the TEMO construction is used in Japanese,⁴ and the EVEN IF construction in English.

- (5) **Future-predictive/Concessive conditional** **~Kp** (not known to be true)
 (5.E) Even if he studies extremely hard, he won't pass the exam.
 (5.J) Issyokenmei benkyoo **sitemo** siken-ni gookaku sinai daroo.
 extremely hard study(CcCd/EVEN IF) exam-DAT pass-NEG MOD(ality)
 P(x): x studies extremely hard
 Q(x): x does not pass the exam
 expressed: P → Q (~P → Q)
 background assumption: P → ~Q (If x studies extremely hard, x passes the exam.)

As is the case in the factive concessive example above, sentences (5.J) and (5.E) also presuppose some general tendency that "if x studies extremely hard, then x will pass the exam." But in these sentences, the speaker predicts that "he won't pass the exam," contrary to this general tendency.

Another basic prototype for Concessive conditionals is a (past) counterfactual version of a Concessive conditional, as shown in (6):

- The same conditions discussed above for a Future-predictive Concessive conditional are relevant to this sentence. But here the antecedent is known not to be true by the speaker.

(7)

- A) **paradoxicality**: the fact that the truth of Q is unexpected, given the truth of P, in accordance with beliefs assumed by the speaker to be shared by the hearer.
expressed: $P \rightarrow Q$
expected (prior belief): $P \rightarrow \sim Q$
- B) **reference to the extreme case in an assumed scalar model**:
P refers to "extreme case" for " $P \rightarrow \sim Q$ " within the given scalar model.
("Extreme case" sets up either an upper or lower boundary on a scale.)
- C) **unconditionality**: the fact that the truth of the consequent is not dependent on the truth of the antecedent.
($P \rightarrow Q$) & ($\sim P \rightarrow Q$)

Or, more generally, Q holds true in all cases up to the boundary set up by P.

Even though P is the best case for $P \rightarrow \sim Q$ (expected), the sentence asserts the contradiction of the expected consequent. This implies that the expected consequent ($\sim Q$) would also fail to hold under worse cases of the antecedent ($\sim P$), thus, $(P \rightarrow Q)$ & $(\sim P \rightarrow Q)$ within the given scalar model. In dichotomous situations, Q holds true in both cases (P or $\sim P$), and thus is unconditionally true. However, in situations where there are many values on a continuous scale, an "extreme case" referred to in

the antecedent may not be at the end of the scale of possible values. Rather, P may be at one end of those cases being claimed as having consequent Q (in somebody's belief). In such a case, the sentence may be saying that the consequent Q would occur under all cases along the scale, up to and including P. Thus, P is the "extreme case" of that set; within the context of that set, Q holds unconditionally. Under preconditions outside that set, however, Q may not hold.

The prototypes of concessive conditionals that we have seen so far use the TEMO construction in Japanese and the EVEN IF construction in English. Both Japanese and English versions satisfy all conditions A through C shown in (7) above. Thus, it is easy to believe that the Japanese TEMO construction has the same meaning and function as the English EVEN IF construction. However, that is not quite true. In the rest of this paper, I will explore some significant discrepancies between the Japanese usage of TEMO and the English usage of EVEN IF. These will be presented using three groups of example sentences.

2.1. Concessive conditionals vs. Factive concessives:

unspecified truth value of the antecedent in the TEMO construction

The first group of example sentences, (8) through (10), demonstrates that the S1-TEMO S2 construction does not specify whether or not the truth of the antecedent is taken for granted by the speaker, whereas in the English EVEN IF construction we are required to believe that the speaker does not assume the truth of the antecedent.

Sentences (8a) and (8b) demonstrate this distinct difference. Here, TEMO is best translated as EVEN WHEN, because the probability of antecedent, "spring comes," is virtually 100%. Notice that, in English, to say "even if spring comes" would be very strange in these sentences.

(8)

- (8a) Kono tihoo-de-wa haru-ni nat~~temo~~ yuki-wa tokenai.
this area IN TOP spring-DAT become snow-TOP melt-NEG
(Around here, even when spring comes, the snow does not start melting.)
- (8b) Haru-ni nat~~temo~~ kokoro-wa harenai daroo.
spring-DAT become heart Top clear up-NEG MOD/WILL
(Even when spring comes I won't be feeling better/my mood won't improve.)

The TEMO construction can also be used when the antecedent is clearly factive. For example, in sentence (9) the antecedent is presented as true by the speaker:

- (9) Konnani issyokenmei benkyoo site-~~Itemo~~ siken ni gookaku sinai daroo. Kp
this much ASP(ect)
(Although I am studying this hard, I probably won't pass the exam.) Kp

Consider sentence (5.J) again, presented earlier as a future-predictive Concessive conditional. Although the antecedent of (5.J) *typically* refers to a future occurrence, and is *typically* not accepted as true by the speaker, this is not completely clear -- the speaker may sometimes accept it as true. Adding the adverbial phrase KONNANI ("this much") and the aspectual verb IRU would make clear that the antecedent is factive, as shown in sentence (9) above. The point to be made here is that the TEMO construction does not specify whether or not the truth of the antecedent is accepted as true by the speaker.

To clarify this point, let us refer back to the prototypical factive concessive, in which both the antecedent and consequent are factive past events. (4.J) has been

presented as a prototypical Factive concessive earlier in this paper. (10a) with TEMO expresses almost the same meaning as (4.J), that is, the TEMO construction can also be used even when both the antecedent and consequent are known to be true in the past (10a).

- (10) (10a) Issyokenmei benkyoo sitemo siken ni gookaku sinakatta. **Kp**
 (Although I studied extremely hard, I did not pass the exam.) **Kp**
 => (4.J) Issyokenmei benkyoo sita noni siken ni gookaku sinakatta. **Kp**
 (cf) Counterfactual/Concessive conditional
 (6.J) Issyokenmei benkyoo sitemo siken ni gookaku sinakatta daroo. **K~p**
 (Even if I had studied extremely hard, I wouldn't have passed the exam.)
 (10b) Issyokenmei benkyoo sitemo siken ni gookaku sinakatta yo. **Kp/K~p**
 PART(icle)
 (=> Although I studied extremely hard, I did not pass the exam.) **Kp**
 (=> Even if I had studied extremely hard, I wouldn't have passed the exam.) **K~p**

Notice that, in Japanese, the only difference between the counterfactual sentence (6.J), shown before, and the Factive-concessive sentence using TEMO (10a), is the epistemic modal expression DAROO added at the end of the counterfactual sentence. Actually, even in a counterfactual statement, DAROO could be omitted as long as the sentence is spoken with the right intonation or furnished with some pragmatic particles such as YO, as shown in (10b). The difference in meaning between these two cases is crucial in that sentence (10b) entails that "I did study very hard," in its more usual interpretation as a Factive concessive, while it entails that "I did not study very hard," when it is interpreted as a counterfactual. Nevertheless, in the TEMO construction this difference may not be made explicit. In English, on the other hand, the contrast between Factive concessive (4.E) and (Past) Counterfactual Concessive conditional (6.E) is made clear not only by the tense and modal, but also by using different connectives: ALTHOUGH (EVEN THOUGH) vs. EVEN IF.

However, there are some contexts in which EVEN IF can be used as EVEN THOUGH, that is, EVEN IF can be used even when the antecedent is known to be true by the speaker, as seen in (11) below.⁶ Thus, there seems to be some gray area in English, too, regarding the distinction between unknown and known antecedent (~Kp vs. Kp).

- (11) Even if she IS my mother, I'm not going to help her out. (with emphatic IS) **Kp**
 (=Even though she is my mother)

2.2. Concessive conditionals vs. Ordinary conditionals

The second group of example sentences, numbered (12) through (14), demonstrates another difference between Japanese and English delineation of concessive conditionals. Here I will show that the IF construction can be used in Concessive conditionals as well as in ordinary conditionals. By contrast, in Japanese this boundary is clearer in the sense that concessive conditionals are expressed by the TEMO construction, while nonconcessives are expressed by other constructions such as those using TARA or BA.

In English, there are cases in which IF-clause conditionals are used as concessive conditionals, which can be paraphrased by an EVEN IF clause, as discussed by Fillmore (1987) and König (1986). For example, in an utterance such as (12E) "Will we have the picnic if it rains?" the IF-clause can be interpreted as "whether or not it rains."⁷

- (12) (12.E) Will we have the picnic
- if
- it rains?

(Fillmore)

P: it rains

Q: people have a picnic

background assumption: expected: $P \rightarrow \sim Q$

(If it rains, people don't have a picnic.)

- (12.J) Ame-ga huttemo pikunikku-ni ikimasu ka?
-
- rain -NOM fall picnic -DAT go Q(uestion)

This unconditional interpretation is the usual one for this sentence because our prior belief that "if it rains people normally don't have a picnic" is strong enough.

However, a question of greater interest here is how we interpret sentence (13). This sentence can be interpreted in two different ways: unconditional interpretation as shown in (a) or ordinary nonconcessive conditional interpretation, as shown in (b).⁸

- (13)
- If**
- you study all night, you won't pass the exam.

P(x): "x studies all night"

Q(x): "x does not pass the exam"

- (a) <unconditional interpretation (Concessive conditional)>

 $P \rightarrow Q$ $\sim P \rightarrow Q$ thus Q

(Even if you study all night, you still won't pass the exam.)

or

- (b) <typical conditional interpretation (nonconcessive) (bidirectional)>

 $P \rightarrow Q$ ($\sim P \rightarrow \sim Q$)

In a situation where the speaker thinks that the hearer will fail the exam no matter what, because the exam will be extremely difficult or because it is too late to prepare for it now, the speaker may utter this sentence to express unconditionality, that is to say "in any case the hearer won't pass the exam."

The second meaning is the normal conditional case, which tends to include a bidirectional meaning. This may be expressed in a situation where the speaker knows that the hearer easily burns out by sitting up all night. In this case, the speaker suggests that the hearer should not study all night in order to be better rested so as to pass the exam. In this case, this utterance implies that "if you don't study all night, you have a better chance of passing the exam."

By contrast, Japanese does not exhibit the ambiguity present in English that was discussed above. The concessive conditionals involving unconditionality need to be expressed using the concessive conditional markers such as TEMO, as shown in (14a). On the other hand, as shown in (14b), utterances using nonconcessive conditional markers such as TARA, always receive the typical conditional interpretation involving bidirectionality.

- (14)

- (14a) Tetuya-de benkyoo sitemo siken-ni gookaku sinai yo.
-
- sitting up all night-BY study(CcCd/EVEN IF)exam.-DAT pass-NEG PART.
-
- $P \rightarrow Q$
- (
- $\sim P \rightarrow Q$
-) <unconditional>

- (14b) Tetuya-de benkyoo sitara siken-ni gookaku sinai yo.
-
- study COND
-
- $P \rightarrow Q$
- (
- $\sim P \rightarrow \sim Q$
-) <bidirectional>

Thus, English concessive conditionals can be sometimes expressed using an IF-clause (rather than an EVEN IF clause) and understood pragmatically. By contrast, in Japanese, concessive conditionals are more grammaticized, and thus are usually linguistically signaled (e.g. by the TEMO construction).

3. Concessive conditionals and scalar interpretation: another difference between the Japanese TEMO construction and the English EVEN IF construction

The third and last group of example sentences, numbered (15) through (18), illustrates another important difference between the two languages that has not been pointed out before. These are the cases in which Japanese prefers or even requires the TEMO construction, while in English the EVEN IF construction cannot be used to convey the same meaning. For example, as shown in (15), although it is perfectly natural to say, "Tanaka-san ni attemo, kono koto wa himitsu ni site-oite kudasai," most native speakers of English find, "even if you meet Mr. Tanaka, please keep this secret" to be strange (without a special context).

(15)

Tanaka-san-ni attemo kono koto-wa himitsu-ni site-oite kudasai.
Tanaka-Mr.-DAT meet this matter-TOP secret-DAT make-ASP please do
(you see Mr. Tanaka) TEMO (please keep this secret)
?* Even if you see Mr. Tanaka, please keep this secret.
If you see Mr. Tanaka,

In what follows, I will argue that a **scalar interpretation** is necessary for the EVEN IF construction while it is not necessary for the Japanese TEMO construction. Thus, it is quite common for the Japanese TEMO construction to occur without conditions B and C, as defined in (7) earlier in this paper (see section 1.2.).

In situation (16)⁹, there is a bus stop where Speaker knows buses don't stop on Sundays. One Sunday, someone (Hearer) is waiting there. Since Speaker knows another place where a bus does stop on Sundays, Speaker is going to suggest that Hearer wait there instead. In this situation, the most natural Japanese utterance uses the TEMO construction, such as "Koko de matte-itemo basu wa kimasen yo."

(16)

<There is a bus stop where Speaker knows buses don't stop on Sundays. One Sunday, someone (Hearer) is waiting there.>

(16.J) Koko-de matte-itemo basu-wa kimasen yo. Atira-de omati ni naranai to.
here wait-ASP bus-Top come NEG PART (You should wait over there.)
(you wait here) TEMO (bus won't come)
expected: P -> ~Q (bus will come)

(16.E) If you wait here, the bus won't pick you up.

But if you wait at that other bus stop over there, it will.

(in this context) *Even if you wait here, the bus won't pick you up.

But if you wait at that other bus stop over there, it will.

In English, the natural utterance uses an IF-clause rather than an EVEN IF clause. Thus, it is natural to say "If you wait here, the bus won't pick you up. But if you wait at that other bus stop over there, it will," but it is not natural to say "Even if you wait here, the bus won't pick you up. But if you wait at that other bus stop over there, it will."

There are situations in which the English statement "Even if you wait here, the bus won't pick you up" would be natural, but that would require a special context involving a scale of antecedent conditions correlated with the consequent. For example, Speaker might mean that "even if you wait *HERE* (as opposed to other places) the bus won't pick you up....," indicating that there are many places Hearer could wait, and Hearer picked the best one, but the place is not good enough. Here, Speaker would mean that buses do not stop in this area at all. By contrast, in Japanese the TEMO construction does not require this strong scalar interpretation.

Next, let us consider conversation (17.E), and the Japanese counterpart conversation shown in (17.J):

(17) (17.E)

A: Are we going to the party tonight?

B: Well, I have a headache, so I'd rather stay in bed.

If I go, I won't enjoy it (If I went, I wouldn't enjoy it.)

?*Even if I go, I won't enjoy it. (?*Even if I went, I wouldn't enjoy it.)

(17.J)

A: Konban no paatii doo suru?

B: Atama ga itai kara otonasiku nete-iru koto ni suru wa.

Ittemo tanosiku-nai daroo si.

go(CcCd) enjoyable-NEG MOD

(I go) TEMO (it won't be fun) expected: P -> ~Q(it will be fun)

Speaker B's response, "Ittemo tanosiku-nai daroo," which uses the TEMO construction, is quite natural. Speaker B feels that going to a party is normally supposed to be fun, but today for some reason it does not work that way, and she cannot expect to have fun even if she goes. With the same attitude, she would not say "Ittara tanosiku-nai daroo" or "Ikeba tanosiku-nai daroo." These utterances with nonconcessive conditional connectives would be normal if Speaker B means, "If I go to the party I won't have fun, but if I don't go I will have fun." In the English counterpart situation (17.E), Speaker B's natural response is "If I go, I won't enjoy it" rather than "Even if I go --," and in fact most native speakers find "Even if I go, I won't enjoy it" to be quite unnatural in this situation. This is because the EVEN IF construction requires a scalar context which is lacking in conversation (17).

However, in situations like (18), "Even if I went --" would be a natural response.

(18) C: I'm feeling terrible these days.

D: How come? Listen - University Theater is showing a great movie right now. Why don't we go and see it tonight? You'll feel much better.

C: No, even if I went, it wouldn't help (me feel better at all).

In this situation, Speaker D emphasizes that going to the movie tends to make it more likely for Speaker C to feel better, making explicit an assumed scalar model. Speaker C recognizes and builds on this background assumption, saying "Even if the extreme case occurs that would tend to make me feel better, I wouldn't feel better." Note also that in some situations, a scalar semantic context can exist without its needing to be made explicit in the conversation, such as in "Even if you study hard, you won't pass the exam."

Another way Japanese uses the TEMO construction is to express two (or more) specified alternatives which lead to the same consequent. Examples of such "alternative concessive conditionals" are shown in (19a) through (19c):

- (19) (19a) *Naitemo warattemo happyoo made ato itiniti da.*
 cry(CcCd) laugh(CcCd) announcement until one-day
 Whether you cry or laugh, there is only one day before the announcement.
- (19b) *Benkyoo sitemo sinakutemo onazi daroo.*
 study do(CcCd) do-NEG(CcCd) same MOD
 It would be the same whether or not I study.
- (19c) *Itemo ikanakutemo ii desu.*¹⁰
 go(CcCd) goNEG(CcCd) good
 You may either go or not go.

In these Japanese "alternative concessive conditionals," unconditionality is expressed. However, it is not based on the same type of scalar model that English EVEN IF expressions are based on. In the English EVEN IF construction, unconditionality is entailed by referring to the extreme case in an assumed scalar model (scalar entailment). Thus, condition B, reference to the extreme case in an assumed scalar model, is usually sufficient for condition C, unconditionality (see 7 in section 1.2.). By contrast, in the Japanese TEMO expressions, alternative cases (other possibilities) are recognized in addition to the case expressed in the antecedent, but there need not be a well-understood ordering of the various (expressed and unexpressed) cases.

In Japanese, interrogative (or indefinite) expressions such as DARE (who), DOKO (where), NANI (what), or DONNANI (how), can also appear in the TEMO construction, presenting nonspecific, "free-choice," situations for the antecedent. Examples of such "nonspecific concessive conditionals" (or "universal concessive conditionals") are shown in (20a) through (20c). Here again, unconditionality is expressed without referring to a specific extreme case.

- (20) (20a) *Donnani benkyoo sitemo siken-ni-wa gookaku sinai daroo.*
 how much study(CcCd) exam-DAT-TOP pass-NEG MOD
 No matter how hard I study, I won't pass the exam. /However hard I study, --
- (20b) *Dare-ga yatte-mitemo dekinai daroo.*
 who-NOM do-try(CcCd) cannot do MOD
 No matter who tries it, (s)he will not be able to do it.
 Whoever tries it will not be able to do it.
- (20c) *Doko-o sagasitemo mitukaranai yo.*
 where-ACC look(CcCd) find-NEG PAR
 You won't find it no matter where you look. / Wherever you look, --

Notice that in English, instead of using an EVEN IF clause, subordinate clauses such as those headed by WHETHER OR NOT are used for "alternative concessive conditionals"(see 19); and "WH-EVER --" or "NO MATTER WH-" are used for "nonspecific concessive conditionals" (or "universal concessive conditionals")(see 20).

The above observations -- the fact that the TEMO construction can also be used to express "alternative concessive conditionals" and "nonspecific concessive conditionals" -- support the claim that the TEMO construction, unlike the English EVEN IF construction, does not require a scalar entailment involving a reference to the extreme case in an assumed scalar model.

4. Conclusion

In the TEMO construction, the speaker "concedes" the truth of the antecedent in order to build steps in an argument, yet the speaker's beliefs about the probability of antecedent can vary. In other words, the TEMO construction does not specify whether or not the antecedent is accepted as true by the speaker.

However, what is essential in this construction is the speaker's prior belief about the normal antecedent-consequent contingency relationship shared by the hearer. In the face of such a background assumption, a sentence with the TEMO construction states that this contingency does *not* hold in the particular situation. In other words, in this construction the consequent expressed is contrary to the consequent expected, given the truth of the antecedent.

The speaker's beliefs about the canonical antecedent-consequent relation are also important in English concessive conditionals using the EVEN IF construction, in which unconditionality is expressed by referring to the extreme case in an assumed scalar model. In Japanese however, concessive conditional expressions with TEMO may or may not receive scalar interpretations, and thus may or may not convey a meaning of unconditionality. They often appear where the speaker has some empathy with the hearer's expectations about the antecedent-consequent contingency, but expresses information that is contrary to those expectations. Here, the interpretation does not require the notion of scalar entailment. In other words, it is common in Japanese for concessive conditionals using TEMO to occur even when unconditionality and reference to the extreme case in a scalar model are not relevant.

NOTES

* What I am reporting on in this paper is part of a larger project on conditionals on which I am collaborating with Charles J. Fillmore. I thank him for assistance and inspiration in developing these ideas, and for his comments on an earlier version of my paper. For valuable discussion, my thanks also go to participants in the November '88 Japanese Linguistics Seminar at U.C. Berkeley (especially Yoko Hasegawa and Toshio Ohori) as well as Eve Sweetser and Paul Kay. Of course, I alone am responsible for any errors or omissions.

1 I am indebted to König (1986) for drawing my attention to this.

2 In Akatsuka's (1985) treatment of these cases, she claims that conditional sentences are associated with irrealis, and that "newly-learned information" such as the one involved in example (3c) belongs to the irrealis end of the realis-irrealis continuum.

3 In this sentence, similar meanings could be expressed by other expressions, such as S1 - KEREDOMO S2 or S1-GA S2 although these may be used in slightly different ways in other situations. Discussion of these variations among concessive expressions is beyond the scope of this paper.

4 There are other concessive conditional constructions, such as :

S1-TOMO S2 : Ame ga huroo tomo ikimasu. (Even if it rains I will go.);

S1-TO S2 : Ame go huroo to yari ga huroo to ikimasu. (Whether rain falls or spears fall, I will go.);

S1-GA S2 : Ame ga huroo ga yari ga huroo ga ikimasu. (See above.)

Nanto omowareyoo ga kamawanai. (Whatever they think of me, it does not matter.);

S1 TOKORO DE S2: Ima kara zyunbi-sita tokorode manawanai daroo. (Even if we start preparing for it now we will not make it in time.)

Also, one of the verb conjugation forms in classical Japanese, "izen-kei," is still used (with or without DOMO) to express concessives, as seen below:

Yobe-DOMO yobe-DOMO henji ga nakatta. (Although I called many times, there was no answer.)

Haru ni natta to wa ie mada mada samui. (Although it is already spring, it is still cold.)

While these are also important in examining the overlap between concessives and concessive conditionals, this paper will only discuss the TEMO construction.

⁵ Although I am only presenting future predictive case here, hypothetical concessive conditionals (where the speaker does not know whether or not the antecedent is true) are not limited to future predictives. The following examples are also hypothetical concessive conditionals, but here the antecedent refers to a past unknown event.

<in leaving a message on an answering machine>

E: Did you get there on time yesterday? Even if you did not, don't blame yourself.

J: Kinoo maniatta? Maniawanakatta to sitemo zibun o semenaide kudasai ne.

⁶ This was pointed out to me by Charles Fillmore.

⁷ Other examples of similar cases are:

Few, if any, people can appreciate my dry humor.

It was an informative, if dull, speech.

She has a house that is charming, if not spacious.

In each case, Japanese uses concessive conditional (or concessive) expressions (such as TEMO) rather than ordinary conditional expressions.

⁸ Charles Fillmore and Eve Sweetser pointed out to me that these different interpretations can be signaled by different intonations. In Haiman's (1986) discussion of a similar issue, he states that "the linear order S1 or S2, S3 may have concessive force, but only if this non-iconic relationship is marked by a special intonation which, like the word *even*, overrides the expected causal interpretation of the sentence." He considers such marked intonation to be "the moral equivalent of a diacritic."

⁹ I am indebted to Inoue (1978) for drawing my attention to this situation. However, as she does not discuss a sentence using the TEMO construction, her analysis is not the same as what is presented in this paper.

¹⁰ "-temo ii" (may) and "-NEG-temo ii" (need not / do not have to) are common deontic modal expressions (permissions). Though an important issue, they will not be discussed within the context of this paper.

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What's become of derivations? Defaults and invocations*

Arnold M. Zwicky .

Ohio State University and Stanford University

The enormous success of transformational syntax hinged on the powerful - as it turned out, only too powerful - logic provided by its scheme of derivations (sequences of syntactic representations leading from 'underlying' or 'deep' structures to 'surface' structures), with an attendant scheme of sequential rule application and stipulated 'rule ordering'. The challenge to monostratal syntactic frameworks is to get the effect of transformations entirely via static conditions on syntactic representations, a program that entails devising alternative logics capable of expressing the attested types of interactions between conditions on syntactic form.

This paper focuses on two types of interactions: preclusion, or suppression, for which the crucial concept is defaulting, and superimposition, for which the crucial concept is invocation. Preclusion corresponds roughly to 'bleeding' interaction, superimposition to 'feeding' interaction, but I will avoid these terms from phonology because they are embedded in an ineradicably derivational framework.¹

1. Morphological background. I will illustrate the analytic points first from morphology rather than syntax.

I assume that conditions on representations (whether morphological or syntactic) are imposed by rules, each rule being an association between a set of formal conditions and a semantic function (and possibly also pragmatic values); in syntax, then, rule is an effective synonym of construction, as this latter term is used in Zwicky (1987, 1988, 1989a) and Fillmore et al. (1988). There are also 'listed' form-meaning pairings (idiosyncratic lexemes in the case of morphology, as well as idiosyncratic syntactic patterns, also known as idioms), rules differing from listed items in that both the formal conditions and the semantic functions in rules are general.

1.1. Defaults. Defaults play a role in morphology whenever there is competition between conditions, either by virtue of their associated meanings (in word formation) or by virtue of their associated phonological shapes (in inflection) or by the two types of competition in concert (in both word formation and inflection).

1.1.1. Dual competition. English derivational morphology (DM) has a number of rules licensing abstract Ns built on ADJ stems: GOODNESS with suffix *-ness* SANITY with suffix *-ity*, CONSTANCY with suffix *-(c)y*, for instance. The default (general, predominant, and productive) rule is the one with *-ness*, which is overridden by various other rules for certain lexemes. English inflectional morphology (IM) has at least two rules realizing the grammatical category (hereafter, gramcat) PSP (past participle) for Vs, one setting the form identical to the PST (past), as in *jumped* and *thought*, the other using the suffix /n/, as in *taken* and *thrown*. The default (general, predominant, and productive) rule is the former one, which is overridden by the latter for certain lexemes. In these examples it happens that the formal conditions in the rules are incompatible, so that there is dual competition, in phonology as well as in meaning. It is impossible to suffix both *-ness* and *-ity* directly to a stem, for instance.

In IM it is not uncommon for one rule to realize a superset (say, 2 SG INDIC or 1 PL INDIC, to choose an example from Hua (Haiman 1980)) of the gramcats realized by another rule (say, INDIC in general, covering the other two SG forms, the other two PL forms, and all three DU forms). When the phonological effects of the two rules are incompatible (as in Hua, where these are suffixes *-ne* and *-e*, respectively, filling the same slot), then of course the more specific rule takes precedence, via the general metaprinciple I will refer to as Panini's Principle.

There is also a general metaprinciple of 'lexical blocking', according to which the existence of a stipulated association of meaning and form for a particular lexeme (as in the PST *went* for GO) precludes associations provided via rules.

1.1.2. Meaning competition alone. Phonologically compatible rules - word formation rules - can be in competition, however, as when prefixal and suffixal causatives are available in the same language (ENLARGE and CHRISTIANIZE, for instance), or when 'zero derivation' and affixation serve as alternatives (CAGE and ENCAGE, or BONE and DEBONE, for instance).

1.1.3. Phonological competition alone. There are also situations where rules - of IM - that are perfectly compatible semantically are incompatible phonologically. I have in mind here the 'slot competition' examples that Stephen Anderson has unearthed. As Anderson (1986:8) says of Georgian, 'the formal markers v- [marking 1 subject] and g- [marking 2 object] are mutually exclusive by virtue of their "competition" for the same formal position'; the v- prefix is the winner here, and since the g- prefix is suppressed, 2 object has zero expression for verbs with 1 subjects.

1.1.4. Parochiality. Note that some of these override-default relationships involve specific rules, but that others - in particular, lexical blocking and Panini's Principle - involve general principles. It is not always clear whether a particular example is of one type or the other. If subregularities in conjugation are analyzed via features, for instance, so that a lexeme like TAKE or THROW is [CONJ 2] while regular Vs lack this feature, then the precedence of the subregular form over the regular one follows from Panini's Principle, though one might instead want to say that the relationship is to be stated directly as one holding between the two rules. It might also turn out that some general principle would predict the winning rule in the Georgian competition (perhaps by reference to the gramcats involved), though I am not sanguine about the possibility; I can see no reason why there could not be a dialect of Georgian with the opposite resolution of the conflict.

What is important here is not in fact whether particular relationships follow from a general principle or require parochial stipulation, but that the relationships hold between rules, not representations.

1.2. Invocation. The leading idea here is that satisfying the conditions placed by one rule requires checking the conditions in a number of other rules.

1.2.1. Invocation by mention. The fundamental way in which invocation plays a role in morphology is, like Panini's Principle, so obvious that it is easy to overlook: Mentioning conditions on the 'inputs' to a rule calls up all the rules and lists that make those conditions satisfiable.

A DM rule applying to ADJ inputs (for instance, the nominalization rule for OAFISHNESS, SWEATINESS, SPEECHLESSNESS, and HAPPINESS) calls up, or invokes, all the conditions relevant for ADJ lexemes (including both the rules for OAFISH, SWEATY, and SPEECHLESS and the listing of items like HAPPY). To pursue the goal of determining whether an abstract N like OAFISHNESS is licensed by the DM rules of English, we must determine, as a subgoal, that OAFISH is licensed as an ADJ.

1.2.2. Calls on rule sets. In addition to input conditions, morphological rules place conditions on the phonology of input-output associations. A rule might stipulate that the phonology of the output is the phonology of the input plus a stipulated suffix, for instance. These association conditions can involve reference to sets of morphological rules, as well as to operations on phonological shapes; see Zwicky (1989b) for further discussion and references. Here I cite three types of examples.

1.2.2.1. DM calling on inflection. There can be DM rules that call for specific inflected forms of an input lexeme, as when a French rule deriving manner ADVs in *-ment* (like FAUSSEMENT 'falsely') builds on the FEM form of an ADJ (like *fausse*, the FEM form of FAUX 'false'), whatever that happens to be.

1.2.2.2. Rules of referral. There can be IM rules that explicitly refer the realization of some set of features to the realization for another, as when the default rule for the English PSP stipulates that the PSP for a lexeme has the same realization as the PST for that lexeme, whatever the latter happens to be.

1.2.2.3. Calls on stems. Both IM and DM rules can refer to specific stems, as in McCarthy's (1981) treatment of the 'patterns' or 'binyanim' in the DM of Arabic, each pattern involving a combination of a CV melody with a vocalism and a root consonantism. When a DM rule stipulates that it uses a particular pattern, the rule or rules describing the conditions on phonological shape for that pattern will be invoked.

2. Some observations. Before extending this discussion from morphology into syntax, I pause to make four metatheoretical observations.

2.1. Theorizing. My intention in section 1 was not to advance a new theory of morphology, nor will I be advancing a new theory of syntax in sections 3 and 5. My discussion is at a different level of abstraction from theorizing proper, since it aims at delineating the properties of expressions, the characteristics of rules, and the relations between rules that an adequate theory must be able to express in its formalism. I take no stand here on the nature of such a formalism.

2.2. Directionality. The temporal metaphors I have used for defaults and invocations run the opposite way from the ones that are converted to theoretical status in processual derivations. An override 'takes precedence' over a default, but a (more) basic representation (the analogue of the default) 'comes before' the derived representation it is mapped into. An invoking rule 'calls up' an invoked condition and so can be said to 'come first', but in processual derivations the latter describes a representation that 'precedes' the one to which the former applies; crudely, invocations work top-down, while processual derivations work bottom-up.

The temporal metaphors for defaults and invocations are dispensable, however. This is straightforward for defaults, but might not be so clear for

invocations, especially given my own inclination to think of rules as applying as in top-down parsing - as checking, for instance, that an expression satisfies the conditions of a particular derivational rule of English by determining that the expression is an abstract N and that it can be analyzed as X plus *-ness*, then checking that X is an ADJ (perhaps by virtue of satisfying the conditions on a derivational rule with ADJ outputs). But this way of thinking of things is a personal bias, and others undoubtedly will find it more intuitive to think of expressions as being built up from elementary expressions, with the conditions invoked in some rule checked 'first' to see if X is an eligible subpart for the purposes of that rule. As with ordinary phrase structure rules, neither way of thinking is somehow right. Rules can be conceptualized statically, as just stipulating a set of conditions that have to be satisfied within the expressions of a language.

2.3. Descriptive power. It might seem that successive invocations of rules and successive overrides of defaults are just derivations run backwards, and (from the metatheoretical point of view) no real improvement over transformations. However, as I pointed out in Zwicky (1986b), a framework built on defaults is less powerful than one built on derivations, in the sense that a default/override analysis can always be translated into a basic/derived analysis while the reverse translation is not always possible without gross loss of generalization.

Indeed, since a derivational framework describes relations between (sets of) representations, it makes available any number of strata of representations at which conditions might be stated. In a purely static framework, where invocations and overrides are relations between rules, there is only one stratum of representations at which conditions can be stated. This is the source of the greater descriptive power of derivational frameworks. If we can do without this power in morphology (and syntax), that is all to the good. The issue is certainly a controversial one - the relational grammarians, in particular, have maintained that there are syntactic generalizations referring to several such strata (Perlmutter 1982) - but I will pursue a nonderivational framework, following the monostratal program of generalized phrase structure grammar (GPSG) (Gazdar et al. 1985).

Note that I have argued, in Zwicky (1986b), that phonological rule interactions, whether these involve two rules of automatic phonology or two morphonological rules, do indeed require the more powerful logic made available by derivations, while it appears that rule interactions in morphology and syntax do not. Monostratality seems to be characteristic of morphosyntax but not of phonology.

2.4. Representations. What should a (morphological or syntactic) representation for some expression contain? Certainly, the information about this expression's properties that is immediately relevant for determining whether (morphological or syntactic) rules are applicable, plus the information that is needed for the purposes of semantic interpretation, of assigning pragmatic values, and of phonology.

If morphological and syntactic rules are viewed, as they are here, as associations of formal conditions with a semantic interpretation function and pragmatic values, then the question boils down to a matter of the information immediately relevant for the applicability of these rules, plus the information relevant to phonology, both for the applicability of morphonological

rules and for 'prosodic domain formation', which associates the (prosodic) domains of automatic phonology with morphosyntactic representations. I suggest in Zwicky (1989c) that considerable insight into morphosyntactic representations might be gotten by considering the needs of phonology. Be that as it may, it is none too clear just which properties of expressions are in fact immediately relevant for the applicability of morphological or syntactic rules.

Presumably, when an expression satisfies some overriding rule, like the /n/ PSP rule, then information about the corresponding default(s), here the referral of PSP to PST, is never relevant. What counts is what actually appears, not what might have appeared instead.

Matters are a bit more complex for invocations. The conditions placed by a rule on expressions can be seen as coming in layers. For instance, an inflectional rule realizing PSP on Vs requires (as a necessary condition) that an expression belong to the category V and (as a sufficient condition) that it belong to the gramcat PSP; these are primary, or layer-1, conditions. A referral of PSP to PST is in layer 2, and a realization of PST via suffixation of /d/ in layer 3.² Now consider the word formation rule illustrated in the compounds *worm-eaten*, *termite-infested*, and *doctor-approved*. It requires (as a necessary condition) that an expression belong to the category ADJ and (as a sufficient condition) that it be composed of two expressions, one of category N and one of category V; these are layer-1 conditions. The requirement that the V belong to the gramcat PSP is in layer 2, a referral of PSP to PST in layer 3, and /d/-suffixation (as in *approved*) in layer 4.

But, given an expression E, just how many layers of conditions that E satisfies are relevant to E's own ability to participate in constructions? I do not believe this question has a simple answer, either 'the first n layers' for some fixed n, or for that matter 'all of them'. I do reject the idea that we should assemble into a single representation all the information about which conditions on which rules E satisfies, no matter what the layer of these conditions - an idea embodied to some extent in the 'analysis trees' of Montague grammar (Dowty et al. 1981:ch. 7), though these are not intended as syntactic representations, and embodied fully in the relational networks of relational grammar and in the R-graphs of arc-pair grammar (Johnson & Postal 1980, Postal 1982), which are so intended. That is, a representation of E is an assemblage of information relevant for the application of grammatical rules to E, not a full trace of the procedures involved in determining E's wellformedness according to those rules.

3. Defaults in syntax. Defaults have played an explicit role in the various 'unification-based' frameworks (Shieber 1986) for syntax, including GPSG and lexical-functional grammar (LFG) (Bresnan & Kaplan 1982). The true role for defaults is rather larger than syntacticians have thought. To begin with, many of the basic/derived relationships between representations in transformational syntax (relationships expressed as a single transformation) translate into override/default relationships between two rules in a monostratal framework (Zwicky (to appear)).

As in morphology, in syntax override/default relationships arise generally whenever there is competition between rules expressing compatible meanings via incompatible formal characteristics - having to do with

branching into constituents, with the placement of properties on words within a construct (including government of, or agreement in, gramcats), or with the ordering of the immediate constituents.

3.1. Dual competition. There are situations where distinct, and formally incompatible, rules express the very same meanings, so that there is competition in meaning as well as form.

For instance, the hierarchical (binary) subject-predicate (SVP) construction in English, as in *I sing badly* and *For me to sing badly (would be no surprise)*, serves as the default vis-a-vis the flat (ternary) subject-auxiliary inversion (SAI) construction, as in *Must I sing?*. The two constructions have the same semantics, involving the application of a function (associated with the VP) to an argument (associated with the subject (SU)). And they are certainly formally incompatible; the SU cannot both precede (as in SVP) and follow (as in SAI) the head V of the clause. That SAI is the special, overriding, construction is indicated by its use in a small but diverse collection of constructions: two interrogative constructions, the yes-no question (YNQ), as in *Must I sing?*, and the information question (WHQ), as in *Which songs must I sing?*; focused negation (FOCNEG), as in *Not a song did I sing*; and two conjunctionless conditional constructions, one counterfactual, as in *Were I in better voice, (I would sing)* and *Had I known your wishes, (I would have sung)*, and one not, as in *Should you want to sing, (we can supply an accompanist)*.

3.2. Panini's Principle again. A somewhat different sort of situation arises in the matching of morphological cases³ to grammatical relations (grels). There are default matchings (NOM to SUs, ACC to DOs, DAT to IOs), which are overridden in many languages by the assignment of 'quirky' cases; in Icelandic (Andrews 1982), for instance, these are ACC, DAT, or GEN for a SU and DAT, GEN, or NOM for a DO.

I assume that for each configuration of quirky case assignment there is a special rule - so that Icelandic has, in addition to a (general) rule, call it #28, stipulating that head Vs are compatible with SUs (not otherwise constrained) and DOs (not otherwise constrained), a (special) rule, call it #97, stipulating that head Vs are compatible with DAT SUs and NOM DOs, another (special) rule, call it #35, stipulating that head Vs are compatible with SUs (not otherwise constrained) and DAT DOs, and so on. Every rule R mentioning a lexical category C induces a subcategorization of C, the relevant subcategory C_R comprising all the members of C eligible to occur in the mentioned slot in R; thus, for Icelandic there is a subcategory V_{28} of garden-variety transitive verbs, a subcategory V_{97} of DAT-SU transitives, a subcategory V_{35} of DAT-DO transitives, and so on. In any event, rules #97 and #35 are semantically in competition with #28 (the semantics for #97 and #35 includes, though not necessarily properly, the semantics for #28), and they are formally more specific than it, both in their argument cases and in their head subcategories, so that Panini's Principle says that they override it.

This treatment presupposes the splitting of 'standard' (nonquirky) case assignment into two parts: rules like #28 in Icelandic, which describe compatibility between a head and constructs bearing specific grels to this head, but mention no case properties of these constructs; and other principles, analogous to the Feature Specification Defaults of GPSG, which

describe default implicational relationships between properties of constructs, in this instance between a *grel* (like *SU*) and a *case* (like *NOM*). Principles of the second sort can be seen as compatibility rules of a degenerate sort, which merely license certain properties as admissible on a construct *X* bearing a particular *grel*, without regard for what other constructs *X* might be compatible with.

Just as there is quirky case, there is quirky agreement, as in the varieties of Somali that have a rule permitting verbs to be FEM SG with PL SUs from a particular declension class which overrides the default scheme of agreement via compatibility in gramcats (Zwicky & Pullum 1983). In quirky agreement, certain agreement triggers require specific nonagreeing properties on their targets. Panini's Principle says that such rules should override rules calling for gramcat compatibility between agreement triggers in general and their targets.⁴

3.3. Formal competition alone. As in morphology (section 1.1.3 above), two syntactic rules can compete solely by virtue of their formal conditions. Consider, for example, the English WHQ and FOCNEG constructions, both of which involve a 'focus initial' (FOCINIT) construction, which focuses on a proform (an indefinite WH lexeme like *WHICH* or *WHEN*, a negative lexeme like *NOT* or *NEVER*, respectively) by requiring clause-initial position for a construct containing the proform, as in *Which cookies have you eaten?* and *Not a single cookie have I eaten*, respectively. Note that both WHQ and FOCNEG involve SAI in addition to FOCINIT. For the most part, there is no problem in saying that an expression must satisfy both the conditions of SAI and those of FOCINIT, but as is well known, a conflict arises when the focused proform occurs within the SU of a clause: FOCINIT then requires that the SU be clause-initial, but SAI requires that an auxiliary *V* precede the SU (perhaps via a default condition requiring that a *V* precede any of its arguments within their construct, as in the VPs of *You have eaten those cookies* and *I have eaten not a single cookie*). FOCINIT wins this competition, and SAI is blocked for focused SUs, the default SVP appearing instead: **Did who eat the cookies?* and **Did not a single person eat a cookie*, but *How many people ate cookies?* and *Not a single person ate a cookie*.

In contrast to the morphological example from Georgian in section 1.1.3, this interaction of syntactic rules, FOCINIT suppressing SAI, might be seen as following from a general principle. The crucial observation is that WHQ and FOCNEG require both a focusing construction and a subject-predicate construction; if it is true that FOCINIT is the only construction English makes available for the kind of focusing seen in WHQ and FOCNEG, then FOCINIT must win over SAI, for structures with SAI alone would fail to be paired with a semantic interpretation. There is no problem for structures with FOCINIT alone, since English provides a 'back-up' construction for combining subject and predicate, namely the default SVP. We would then not expect to come across a variety of English in which SAI suppressed FOCINIT, everything else remaining as in the variety I have been describing.

The point at issue, of course, is the nature of the interaction, not whether the interaction is stipulated parochially or necessitated by universal principles.

3.4. Optionality and obligatoriness. In the framework I have been developing in this paper for syntax (and DM),⁵ there is no natural way to distinguish optionality from obligatoriness, either for rules as wholes or for individual formal conditions imposed by rules. I suppose we could label a rule as obligatory if it happened to be the only option the grammar provided for expressing some meaning. But in general, every rule is an option provided by the grammar for associating form and meaning, and a pairing of an expression with a meaning is licensed by the grammar if every detail of this pairing is licensed by some rule.

It then does not make sense to say that the English rule allowing finite clauses to serve as SU or DO - *That pigs can't fly distresses me* and *I know that pigs can't fly* - is somehow optional in a way that other rules are not. English simply has a number of rules licensing various types of constituents serving as particular grels, the default rule being the one allowing NPs to serve (at least) as SU, DO, IO, and PO [object of P]. It also does not make sense to say that English has a rule describing non-SU finite complementizer clauses as composed of S[+FIN] optionally preceded by the complementizer lexeme THAT, as in *I know (that) pigs can't fly* versus **Pigs can't fly distresses me*. If there are different formal features, there are different rules - in this example, one rule licensing S[+FIN] as DO, and one or more licensing THAT+S[+FIN] as SU or DO.

We might think of ultimate defaults - properties licensed by rules that override no others - as somehow 'obligatory', but of course they are not obligatory in the sense that the conditions they impose must be satisfied. NP is the ultimate default category for SUs, but that does not mean that all SUs must be NPs, for there are rules licensing S[+FIN], several other types of clause (*For pigs to fly would be ridiculous*, *What you said impressed me*), and PP (*Under the rug is a bad place to hide a gun*) as SUs. In English ACC is the ultimate default case for NPs, but that does not mean that all NPs must be ACC, for there are rules licensing at least three other cases (NOM in *I must go*, GEN in *Pat's shoulder hurts*, another sort of genitive in *A friend of mine arrived*).

3.5. Layers of defaults. Implicit in the discussion above is the possibility that syntactic defaults can come in layers, a possibility that is amply realized, for example in the distribution of cases in many languages.

Icelandic, for example, has the (usual) ultimate default case for NPs, NOM. The rule assigning NOM to NPs is overridden by rules associating cases with grels, ACC to DO, for instance. The default DO case rule is in turn overridden by rules for the quirky cases, as sketched above. In Finnish (Nevis 1981), the default DO case rule, imposing ACC, is overridden by quirky case rules imposing GEN in some circumstances and NOM in others, and these are in turn overridden by a rule imposing PART[itive] case on 'partial' DOs, those denoting indefinite quantities, as in the PART example *Syön puuroa* 'I eat porridge' versus the quirky GEN example *Syön puuron* 'I will eat (the) porridge'.

4. Default associations within and beyond the grammar. At this point I must comment briefly about how syntax fits with morphology, with semantics, and with pragmatics.

4.1. Syntax with morphology. There are default associations between syntax and morphology; the default constituency for morphological purposes

is the one provided by syntax, which will then be overridden by conditions on morphological structure, à la Sadock (1985). In particular, the 'words' of morphology will be coextensive with the 'words' of syntax except insofar as they are stipulated otherwise, as indeed they are for bound word clitics and some other phenomena.

4.2. Syntax with semantics. There are default associations between syntax and semantics, a fact that will play a considerable role in the treatment below of invocations in syntax.

4.2.1. (Sub)categories. As Schachter (1985) has argued in some detail, there are (universal) default meanings associated with categories like N and V and with subcategories like MASS (within N) and AUX (within V); it is these default meanings that allow us to identify (sub)categories across languages. These defaults can be overridden by the meanings of particular lexemes, as when dummy N lexemes like *weather* IT and expletive THERE in English flagrantly lack the referential semantics associated with the category N.

4.2.2. Gramcats. There are also (universal) default meanings associated with gramcats like PRS, PL, and DAT; it is these default meanings that allow us to identify gramcats across languages - PRS as the gramcat associated with speech time, PL with numerosity, DAT with the Recipient role via the mediation of the associations both of them have with the IO *grel*, and so on. To say that gramcats can serve as marks of syntactic constructions is to observe that these default meanings can be overridden by the semantics associated with particular syntactic constructions, and by the listing of meanings for specific forms. For example, a quirky government rule assigning DAT case to DOs overrides not only the syntactic rule assigning ACC case to DOs but also the default association of the Recipient role with DAT. Similarly, a construction could impose a PRS V form, a PSP V form, a PL N form, or a COMP[arative] ADJ form without necessarily imposing the semantics associated with PRS, PSP, PL, or COMP.

4.2.3. Triggers and targets. There are (again, universal) default associations, à la Keenan (1974), between semantic functor-argument relations and the constituent pairs participating in syntactic agreement (and government). The default is for a construct representing the semantic functor to serve as the syntactic target for agreement with a trigger construct representing its semantic argument (V heads agreeing with their SU and DO arguments, ADJs with their heads, and so on). And the default is for the construct representing the semantic functor to serve as the syntactic trigger for government of a target construct representing its semantic argument (V heads governing case on their SU and DO arguments, numerals on their heads, and so on).

For agreement, there is also a default association between compatibility in gramcats and compatibility in semantic properties, so that we expect a V agreement target to share not only the gramcats of its SU trigger, but also the semantic properties of this trigger. These semantic properties - for instance, numerosity of the SU referent, in the case of a V with a collective SU like COMMITTEE - are then available to condition gramcats on the target. In consequence, there is a potential conflict between the gramcats imposed by agreement on the target and those conditioned by the semantic properties of the target, a conflict which can be parochially resolved in favor of either

conditioning factor: American English *The committee has decided* (with agreement winning) versus British English *The committee have decided* (with target properties winning).

4.2.4. Anaphors and antecedents. There are also default associations, à la Lapointe (1980, 1983), between anaphor-antecedent pairings and the sharing of gramcats, so that we expect an anaphor to share not only the semantic properties of its antecedent, but also its gramcats and even its purely morphological properties. As in the case of trigger-target associations, there is a potential conflict between the gramcats imposed by anaphor-antecedent sharing and those conditioned by the semantic properties of the anaphor - for instance, between anaphora to a German NEUT[er] N like MÄDCHEN 'girl' via the gramcat-appropriate (NEUT) pronoun ES 'it' or the semantics-appropriate (FEM) pronoun SIE 'she'.

4.3. Syntax with pragmatics. There are also associations - which presumably act as defaults and can be overridden - between rules of grammar (in particular, of syntax and morphology) and a mélange of conventional principles for language use that are often referred to under the heading of pragmatics. I prefer to talk of these principles (following a suggestion of Christopher Culy's) as together constituting a user's manual that accompanies the grammar of a language. The user's manual comes in several volumes, at least two of which concern what I called 'pragmatic values' above, which (like semantic functions) can be default-associated with particular morphological and syntactic rules: (a) a volume dealing with what is conveyed, stylistically and sociolinguistically, by the options made available by the grammar, and (b) a volume dealing with the discourse functions of the options made available by the grammar and saying how the expressions made available by the grammar can be combined into discourses and deployed effectively within them.

5. Invocations in syntax. As in morphology, one syntactic rule invokes, or calls up, others by mentioning conditions that are satisfied via those other rules.

5.1. Mentioning immediate properties. Just as DM rules invoke the rules and lists that license their inputs, so syntactic rules invoke the rules and lists that license the constituent types and grels that figure in them. The English SVP rule, for instance, says that the combination of a SU expression and a VP expression constitutes an S. By mentioning these immediate properties, SVP invokes all the rules that license constituents (NPs, certain PPs, and certain types of clauses) as SUs and all the rules that describe VPs.

5.2. Mentioning contained properties. Unlike morphological rules, syntactic rules place a variety of conditions on proper parts of their immediately contributory expressions. For instance, English has a rule that licenses head Vs (from a subcategory with members INSIST, REQUIRE,...) with clausal DOs whose head V is in the BSE form (*I insist they be admitted*); the condition on the head V is the one at issue here.

In a pure phrase-structure framework like GPSG, all conditions on wellformedness must be locally determined; branching rules are all there is. In consequence, contained properties must be distributed by a scheme of projection from conditions on individual branchings, in the same way that the ordering of individual words and the containment of a word in a construct of

some category (say, NP) are determined by projection from the ordering of sister constituents and the relation of immediate constituency. The requirement of local determination gives rise to schemes of feature distribution - the Head Feature Convention, Foot Feature Principle, and Control Agreement Principle of GPSG, and their correspondents in related frameworks such as HPSG (Pollard & Sag 1987) - whose function is to manage the appropriate projections.

My approach here, as in Zwicky (1989c), is to step back from a discussion of formalisms that might allow the program of local determination to be achieved and to inventory instead the sorts of conditions syntactic rules can impose, without regard to the mechanisms any particular theory should provide to impose them.

5.2.1. Properties of individual words or phrases. A syntactic rule can require a certain property on the head word of a construct (BSE on the head V of S, in the example above); on an edge (first or last) word or phrase of a construct (GEN on the last word of an NP in English, as in *my friend from Chicago's hat*); on some word of a construct (WH on one or more words in the initial phrase in the English WHQ construction, as in *Which people from which departments did you meet?*); on some phrase of a construction (NULL on one or more XPs in a WHQ with initial XP, as in *Which candidates did you reject NP[NULL] without interviewing NP[NULL]*).

Further refinements are possible. A rule might require that exactly one (rather than at least one) unit have a stipulated property, and rules can differ as to just where within a construct they allow a stipulated contained unit to be located, as when the XP[NULL] in WHQ can be any number of clauses down (*Which candidates did you say Jan insisted we reject NP[NULL] ?*), while the WH word has to be in the top level of the initial XP (*People from which departments did you meet?* but **People who teach in which departments did you meet?*). I view it as a pressing task for theoretical syntax to determine just what the full inventory of possible conditions on contained properties is. Here I merely suggest the character of the task, my immediate aim being to observe that, for instance, when a rule requires as one of its contributory expressions an S with an XP[NULL] in it, not only are rules licensing Ss invoked, but so are all the rules that license XPs within Ss.

5.2.2. Property matching between expressions. Much the same is to be said for rules involving conditions that require particular pairs of expressions to match with respect to certain properties. The agreement that holds in English between SU NPs and their Vs, for instance, involving a matching between the person and number gramcats of the head word of the NP and the V, calls up all the rules that determine compatibility between heads and complements (or modifiers) within NPs.

There are at least three types of such conditions: grammatical, or local, agreement (as in SU-V agreement); filler-gap matching (as in the matching of properties between XP and XP[NULL] in WHQ); and antecedent-anaphor agreement (as in the matching between VP and VP[NULL] in VP ellipses: *I don't have to eat the sashimi, but you must VP[NULL]*). Again, it is a pressing task for theoretical syntax to map the world of conditions: the locations of the matching expressions, both with respect to one another and to other material; the properties that expressions must have to be eligible for matching; and the properties that have to match. There is a wealth of

theory-specific treatments of these topics, of course - the 'binding theory' of GB, the Control Agreement Principle of GPSG, Jacobson's (1984) phrase-structure treatment of 'connectivity' in filler-gap pairings, Barlow's (1988) attempt to unify local agreement and anaphoric agreement in a single framework, to cite just a few important discussions - but no useful pretheoretical characterization of the terrain.

5.3. Explicit invocation. It could be argued that the invocations in the previous sections are entirely implicit in a correct statement of the rules involved. But there are others that appear to require explicit statement as separate conditions on constructions. These come in several varieties, the first echoing a type of morphological invocation, the others representing types of phenomena that are either rare or genuinely unparalleled in morphology.

5.3.1. Calls on construction sets. Parallel to the morphological rules in section 1.2.2, there are syntactic constructions that involve generalizations across sets of other constructions.

The English passive rule (call it #81), for instance, licenses a class of VPs (*seen through a telescope*, *given two awards*, *slept in*) by explicit reference to the full set of VPs involving objects of certain types. In checking that a VP is licensed by rule #81 we need to check that it satisfies the conditions in some other rule licensing VPs, except that it is missing some top-level object (DO, IO, or PO, respectively, in the examples above).

In the same vein, modifiers of Xs are, in general, licensed by rules as optional constituents of constructs of category XP, that is, by reference to all the rules that describe XPs. Adverbial modifiers of Vs (like *today* or *quickly*), for instance, are licensed by a rule that makes explicit reference to the full set of VPs. In checking that a VP (like *attract penguins today* or *bang the drum quickly*) is licensed by this rule we need to check that it satisfies the conditions in some other rule licensing VPs, except that it has an additional adverbial (so that as a secondary goal we must verify the VP-hood of *attract penguins* and *bang the drum*, respectively).

And the primary rule that defines a VP constituent (in those languages that have one) involves a generalization across the rules expressing compatibility requirements on V heads with various sets of arguments, in that the rule says that a VP is composed of a V head and all of its non-SU arguments. In checking that a VP (like *are penguins on my porch* and *was given two awards*) is licensed by this rule we need to check that its head V and arguments satisfy the conditions in some compatibility rule for Vs (so that as a secondary goal for *are penguins on my porch* we must verify that BE is licensed as compatible with some class of SUs and two other arguments that can be instantiated as *penguins* and *on the porch*, and as a secondary goal for *was given two awards* we must verify that BE is licensed as compatible with some class of SUs and a passive - that is, #81-type - VP (*given two awards*)).

Note first that I am assuming (as in Zwicky (1989a)) a partial separation of rules describing the compatibility between heads and their syntactic arguments (or their modifiers), on the one hand, from those describing the packaging of material into constituents - a distinction reminiscent of

LFG's separation between f-structure and c-structure, but viewed here as a distinction between types of rules rather than types of representations.

And note that the constructions calling on construction sets include the bulk of those for which GPSG has been inclined to posit metarules, but quite a different proposal is being made in the GPSG framework - where metarules predict the existence of one set of rules on the basis of the existence of another set - from the view I am suggesting here, where (given a finite set of syntactic rules in any (variety of a) language) the applicability of one rule to an expression entails the applicability of other rules to that expression.

5.3.2. Calls on specific constructions. Many syntactic constructions invoke other specific constructions, which can be picked out by ad hoc names like 'FOCNEG' (for the English focused negation construction) or by equally arbitrary indices like #81 (for the English passive VP construction).

Examples have already appeared in other contexts. As I pointed out in section 3, for instance, English YNQ calls for SAI (rather than getting the default SVP), while WHQ and FOCNEG call for both SAI and FOCINIT.

English has a number of compatibility rules permitting a V head, a SU, and a VP complement. Some of these place rather modest requirements on the VP. For instance, there is such a rule asking only that the VP have a head V in its BSE form, as in *Lynn must be successful*; its V subcategory comprises the modal Vs, like MUST. Others are more demanding, right up to the point of wanting a specific VP construction. One such compatibility rule calls for a passive VP, that is, for a VP satisfying the conditions of rule #81, as in *Chris was given two awards*; its V subcategory comprises only BE and GET. Another calls for a perfect VP, as in *Pat has traveled to Spain*; its V subcategory comprises only HAVE.

5.3.3. Secondary stipulation. It is also possible for a rule to stipulate conditions at two layers, explicitly invoking one or more secondary conditions as well as its primary conditions.

5.3.3.1. Secondary stipulation of grels. Many constructions - essentially, those corresponding to the 'relation changing' rules of TG - involve two layers of stipulated conditions on the grels holding among their parts.

For example, the English subject-to-object raising (SOR) construction (as in *I believed it to be raining* and *I believed there to be problems with your theory*) involves primary conditions requiring a V, its SU, its DO, and an infinitival VP complement to it - plus the secondary stipulation that the DO expression must satisfy the conditions appropriate for a SU of the VP complement. As these very examples illustrate, weather IT and expletive THERE can occur as the DO in SOR (though not as the DO in most other constructions); their acceptability depends on their having the properties of a SU of the VP complement: **I believed there to have rained*, **I believed it to have been problems with your theory*.

Indeed, SVP itself involves a secondary stipulation, since it licenses the combination of a SU with a VP having a compatible head and arguments.

I assume that, in the default situation at any rate, these invoked conditions can be predicted from the semantics, in particular the semantic functor-argument organization, of the construction, in a fashion similar to the

default syntax-semantics associations sketched in section 4. This is my reinterpretation of the various 'semantic theories of control', as in Dowty (1985), and of 'semantic' accounts of the agreement that accompanies control, as in Dowty & Jacobson (1989). Dowty & Jacobson propose that the agreement here is fully semantic, and this is an attractive position in many ways, but it seems that the invoked conditions must sometimes be stated in the syntax, since what is required there is syntactic as well as semantic congruence, as is evidenced by the differential behaviors of dummy IT and THERE just illustrated. (This does not mean that syntactic conditions must always be invoked. We can treat Equi-type constructions, for instance, as involving identification of arguments only in the semantics, as Sag & Pollard have suggested in their recent work on HPSG.)

5.3.3.2. Secondary stipulation of categories. Constructions can also involve two levels of stipulated conditions on the categories making them up.

SAI in English, for instance, combines a SU and not just any compatible VP, but only a VP with head V and certain types of arguments, largely complement VPs (and then, of course, not all of these, but only such a VP with a head V belonging to a particular subcategory, namely AUX). It is a characteristic of 'liberation' analyses of constituent combinations (Zwicky 1986a) that they involve secondary stipulation of this sort.

5.4. Invocations by idioms. Individual idioms invoke specific constructions, in two rather different ways - with respect to their internal composition and with respect to external distribution.

First, idioms are 'parasitic on' syntactic constructions, in the sense that each idiomatic expression instantiates one or more constructions in its language. The English idiom BE TO 'visit', as in *I've been to Vienna* instantiates a construction with a copular head V and a spatial adverbial complement, as in *I've been in Vienna*. And dubitative COME ON and GO ON, as in *Aw, come on!* and *Go on! I don't believe it!*, instantiate the V+P construction in *The light just went on* and *The gun went off*.

Second, idioms are subject to conditions restricting them to occurrence in particular syntactic constructions, even though their internal composition would not predict such restrictions. BE TO 'visit' is limited to the perfect construction in my variety of English: **I'll be to Vienna this summer*, **I was to Vienna last summer*. And dubitative COME ON and GO ON are limited to the imperative: **He came on* 'He expressed doubts about some matter'. One-word idioms - which is to say, individual lexemes - are well-known to be subject to such conditions, as when the SOR verbs RUMOR and REPORT are limited to the passive: *They were rumored to be spies*, **People rumored them to be spies*.

5.5. Layers of invocations. It should be obvious that invocations in syntax pile up in layers, just like invocations in morphology (section 2.4) and defaults in syntax (section 3.5). A sentence like *Must I be kissed?* instantiates SAI at layer 1, which means that at layer 2 *I* must satisfy a SU condition and *must be kissed* a VP condition, which means that at layer 3 the head V MUST has to be compatible with *I* as its SU and *be kissed* as its infinitival complement, which means that at layer 4 the head V BE must be compatible with *I* as its SU and a *kissed* as its passive VP complement, which means that at layer 5, *kissed* must instantiate a VP that has a PSP

head V and is missing an object, which means that at layer 6 there must be a rule licensing a VP with head V KISS and a DO.

6. The big picture. It is all very well to allude to defaults, of several different kinds, coming in layers, and to invocations, also of several different kinds, also coming in layers. But what is the scheme by which a full set of rules, standing in various relations of overriding and invocation, interact with one another?

It is known that a program of this complexity can give rise to a number of nasty technical difficulties.⁶ An explicit logic of override/default relationships between rules is needed, and an explicit logic of invocand/invocatum relationships as well. Still, it is possible to discern a general interactional scheme that is implicit in my remarks in this paper. Each rule has both a syntactic side and a semantic side, and I will treat them separately.

On the syntactic side, the ideal scheme is for all conditions, at whatever layer of invocation, to be obligatorily satisfied; that is, they must unify with one another. Default rules apply insofar as their conditions do not conflict with properties required by primary or invoked conditions. Remaining properties are free to vary.

Consider the way SOR works in Icelandic (Andrews 1982). As in English, the rule requires no specific case on the DO; the default associate of the DO *grel*, namely ACC case, is then what will normally appear. Also as in English, the rule explicitly invokes a condition that the DO must be licensed as a SU of the infinitival VP, so that all the rules placing conditions on SUs and their head Vs are thereby invoked. Most of these compatibility rules mentioning SUs require no specific case on the SU, so that the default NOM case for the SU *grel* appears, but there are special rules (involving specific subcategories of Vs) requiring other cases, for instance the DAT. When the lower V in the SOR construction is one of the DAT-SU Vs, the DO will then have to appear in the DAT.

On the semantic side, the ideal scheme is for semantic conditions placed at the primary layer of the syntactic wellformedness check to be obligatorily satisfied, and for semantic conditions placed at any later layer in the syntactic wellformedness check (whether this involves invocation, defaulting, or free instantiation) to be satisfied so long as these do not conflict with conditions at any earlier layer.

Thus, the semantics of an idiom overrides the semantics of its contributory constructions, insofar as there is a conflict, and an invocand can treat some invocatum as a pure formal characteristic, as when the English imperative construction is invoked in the primary construction of *Kiss a pig and have your life changed*, with the declarative conditional semantics of the invocand overriding the imperative semantics of the invocatum. And, as in sections 4.2.1 and 4.2.2, default semantics for (sub)categories (like N and MASS) and for gramcats (like PL and PSP) appears so long as this does not conflict with constructional semantics.

In fact, essentially the same scheme works for phonological properties directly associated with syntactic constructions (the 'shape properties' of Zwicky (1989c)) - that is, for accent patterns and segment mutations that serve directly as marks of constructions (rather than expressing grammatical categories that themselves serve as such marks). As much as possible, such

properties required at earlier layers are simply superimposed on those required at later ones, as when the forestressed (strong-weak) pattern of English N+N compounds like *linguistics library* is superimposed upon the stress patterns of the words making them up. But there are constructions placing requirements that can, or even must, conflict with those at later layers - in which case, the superordinate phonology overrides the subordinate, just as its semantics does. For a fairly spectacular example, consider Poser (1984:sec. 2.1.5) on Japanese N-N compounds: 'If the second member of the compound contains three or more morae, and if it is unaccented or accented on the final syllable, the compound is accented on the first syllable of the second member.' The superordinate accentual requirement predominates, even though conflicting requirements subordinate to it actually serve as conditions on its applicability. (As for the default: 'If the second member is accented elsewhere, its accent becomes the accent of the whole compound.')

Here, then, is another universal interactional principle, another way (in fact) in which the more specific takes precedence over the more general: Requirements in an invoking rule override those in an invoked rule.

NOTES

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1. The terms originate with Kiparsky (1968); see Schane & Bendixen (1978:82) for a reasonably careful exposition.
2. I make no absolute claims here about how many layers of invocation there are and what conditions are imposed in each layer.
3. All references to 'case' hereafter are to morphological cases, not to any more abstract notion.
4. It is admittedly oxymoronic to call these phenomena quirky agreement, given that they present themselves as disagreements in gramcats. Quirky agreement is one of two routes by which gramcat mismatches (see Barlow (1988:sec. 3.4) for a compact compendium of examples) can arise when matching would be expected, the other being failure of an agreement rule to apply.
5. Things are different for IM, which I have been treating as realizational. As in Zwicky (1989b), all forms of a lexeme are assumed to be identical to the lexeme's (primary) stem unless specified otherwise by some IM rule realizing some set of gramcats via operations on a stem. Each such rule is normally 'obligatory' in the sense that the conditions it expresses must be satisfied unless the rule is blocked by a condition on its operations or is suppressed by another rule; otherwise, we would predict (incorrectly) that the stem is available as a variant of every inflected form of a lexeme. However, sometimes this is exactly the desired effect, as when we need to describe dialects of English for which the appearance of the suffix /z/ realizing PL for Ns is

variable, a lexeme like BIRD having alternative PL forms *bird* and *birds*. This is optional rule application in IM.

6. See Gazdar (1987) for some discussion of the problems default schemes alone can generate. Some of these evaporate when grels are integrated within the descriptive framework, and others when defaults are consistently viewed as relations between rules rather than between properties. No doubt there is plenty of trouble left.

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PARA SESSION
ON
THEORETICAL ISSUES
IN
LANGUAGE
RECONSTRUCTION

Phonetic Laws and Grammatical Categories¹

M. B. Emeneau

University of California, Berkeley

The discovery and statement of phonetic laws were for long a most important part of historical grammar. Reconstruction of earlier stages of a related group of languages, a 'language family', is based on the assumption that the recent languages are continuants/descendants of one earlier language, which is no longer extant in spoken form (though in some instances it may have been recorded). In some instances there is evidence for intermediate stages between the earliest and the latest languages.

Despite all recent disclaimers, I think it is still true that in historical grammar the various language stages are stated in terms of what since the 30s of this century have been called 'phonemes'. Certainly, phonological units of some kind are still operated with by practitioners of diachronic analysis. It is these units by use of which forms at all historical levels are stated. It is still true too that 'phonemes change', however one may interpret this postulate. The statements of such changes are 'phonetic laws'.

Who invented the term is of no present concern. From 1876 on, the term and the slogan 'regular phonetic change' were the trademark of a group of German scholars who dealt with the relationships of the languages included in the Indo-European family. Phonetic laws had been stated before then, since the early years of the 19th century, and much detailed statement of such relationships had been established. In the 1870s and 1880s exact statement of the methodology involved was debated with enthusiasm and acrimony. The debate centered around (among other points) the doctrine developed by scholars called then and since the 'Neogrammarians', viz., phonetic laws operate without exceptions; if exceptions are found in the data, the conditions for such exceptions must be looked for, and so on until all the phonological changes have been stated in terms of their conditioning. The Neogrammarians recognized that interdialectal and interlanguage borrowing also must be taken into account as producing exceptions to the basic laws.

But one type of exception caused much trouble and the Neogrammarian solution has led to debate ever since. One of their contemporaries, Georg Curtius, claimed (as early as 1870) that some exceptions to regular phonetic change were conditioned by the grammatical categories

of the exceptional forms. To the Neogrammarians this type of conditioning was anathema (this invidious term is justified by the acrimony of the debate on the matter). Their position (as stated by Bloomfield 1933, p. 364) was that phonetic laws were 'purely phonetic process[es] ... neither favored nor impeded by the semantic character of the forms which happen to contain the phoneme'. Curtius had been analyzing classical Greek data. In Greek, IE *s is deleted between vowels, but remains after voiceless stops (and in some other conditioned positions); e.g. *snusó- 'daughter-in-law' : Skt. *snuṣā*, Gk. *nuṓs*; *geno/es- 'race, kind', genitive Skt. *jánasas*, Gk. *géneos*. But in the aorist -s- remains between vowels; e.g. *etímēsa* 'I honored', *ephilēsa* 'I loved'. Similarly also in the future, with suffix *-s-. IE *y likewise is deleted between vowels; the optative suffix *-oy- appears in *légoimen* 'we would say' and most other members of this paradigm, but also in *légoien* 'they would say'. Brugmann's final analysis in 1885 was that the 'irregular' appearance of -s- and -i- (< *-y-) was due to restoration based on forms in which these sounds were 'regularly' retained (e.g. *égrapsa* 'I wrote', *épleksa* 'I wove', *égeusa* 'I gave a taste' [< *egeus-sa; *-ss- > -s-]; *légoimen*). This is 'analogical restoration'. 'Analogy', whether resulting in restoration or innovation, became in the Neogrammarian theory the all-important twin of regular phonetic change. Curtius's attempt to add grammatical conditioning as an alternative to phonetic conditioning in the statement of phonetic laws became heterodoxy to Neogrammarians.²

If conditioning by grammatical category was driven underground, as, e.g., in the type of statement represented by Bloomfield as noted above, and continuing down to treatments by such scholars as Dyen, Hall, and Hockett in the 1960s, there seems nevertheless to have been something of a hankering for the Curtius position. Robins, e.g., wrote (1978, p. 3): 'in some respects Brugmann is perhaps not so far from Curtius as is sometimes thought; ... Curtius would make the grammatical functions of the /-s-/ and the /-i-/ the direct cause of their survival, while Brugmann argues that the retention of such sounds, which otherwise disappeared in intervocalic position, was due to analogic association with paradigmatically associated forms like /édeiksa/ and /légoimen/'. This seems like whistling in the wind: stressing the mention of 'grammatical functions'/'paradigmatic association' in the statement of the two positions hardly brings them close together so long as Brugmann insists on 'analogic association'.

We should note that this debate, with all its clean-

cut opposition, originated and was specifically argued in the milieu of Indo-European studies, as was stated by Collinge, who (1978, p. 84) wrote of 'practical rigour applied to copious detail in limited areas', the 'limited areas' being the IE languages. Nevertheless, Bloomfield used the Neogrammarian doctrine to great advantage in Algonquian studies, and scholars concerned with other language families have followed suit. But in Finno-Ugric, a language family that has been cultivated diachronically even a little longer than Indo-European, concerned scholars have apparently never adopted the Neogrammarian doctrine in the matter of demanding phonetic conditioning and neglecting grammatical categories as conditioning factors in phonetic change. Anttila (1972, p. 79), in a section headed 'Grammatical Conditioning of Sound Change' (pp. 77-84), says: 'Clear evidence for grammatical conditioning comes from Baltic Finnic and Lapp; and, in fact, Finno-Ugric scholars have always used such information, even while it was theoretically undesirable in the main stream of linguistic inquiry', which was of course Indo-European studies. He gives a very straightforward example, for which apparently no other explanation (e.g. analogical) is possible: 'in Karelian, word-final nasals have dropped unless the nasal is the sign -n "gen. sg.", as in venehe-n "of a boat"; and there are other examples included in his discussion.

The most modern linguistic theory abandons the Neogrammarian limitation of the conditioning factors of change to purely phonetic ones. Most instructive (and probably the most authoritative) is Postal's 1968 treatment of the stand of generative grammar. In his Aspects of Phonological Theory (pp. 233-44), he presents a collection of quotations which set forth the Neogrammarian position on 'regular phonetic change', labeling the doctrine (rather confusingly) as that of 'modern linguistics', meaning apparently 'American structuralism'; the authors run from Bloomfield (1933) to Dyen, Hall, and Hockett in the 60s. He then (p. 240) distinguishes two views on regular sound change as regards 'the kinds of environments' in which they occur. '(PI) Autonomy' is the Neogrammarian view which he rejects: 'the view that no regular sound changes require reference to morphophonemic or superficial grammatical environments'; '(PII) Non-Autonomy' is 'the view that some regular phonetic changes take place in environments whose specification requires reference to nonphonetic morphophonemic and/or superficial grammatical structure' (the emphasis in the statements is his). This latter is Postal's own view,

which he clarifies at some length, saying: 'generative grammar, which recognizes many rules with nonphonetic environments and likewise claims that such rules may therefore be added over time and thus play a role in describing sound change'. Presumably, the phrase 'superficial grammatical structure/environments' means what we have been discussing.

Since the Neogrammarian view did not admit of non-phonetic conditioning as a determinant of phonetic change, there was little stimulus leading to a search for contrary examples. Indeed, the need to explain otherwise some possible cases of non-phonetic conditioning (e.g. the Greek aorist) led, so Postal thought (p. 334, fn. 3; though with some slight reservation), to the classification of some instances of regular phonological change as 'analogy'. He says: 'I think that the term "analogy" has been used very misleadingly to refer to cases of perfectly regular phonological change in which part of the conditioning environment involves Surface Constituent Structure; i.e. changes which happen only in nouns, or only in verb stems, etc.' Postal's lead was followed by King (1969, pp. 119-27), who used as example the classical Greek data already discussed. Anttila (1972, pp. 98-9) discussed the classical Greek future with its suffix *-s-*, and wrote: 'sometimes morphological iconicity is so strong that sound change does not enter at all', and suggests a possible statement for Greek: 'intervocalic *s* drops, unless it means "future"'; he added that the aorist and the dative plural (suffix *-si*) are to be included.

Other generative theorists have provided similar treatment. Kiparsky (1971, p. 609) writes: 'It has long been noted that sound changes can depend on grammatical categories. We can add that particular kinds of grammatical categories are going to block sound changes from taking place'; this is in a summary of 'conditioning factors', with no examples given. Relevant examples, as in Postal, King, etc., are sometimes opaque or even controversial-sounding. Postal's example from Mohawk (1968, pp. 245-54) seems convincing: the proto-Mohawk-Oneida **kw* sequence, like a number of other consonant clusters, has in Mohawk an epenthetic [e] inserted, except when the cluster means '1st person plural'. Anttila and Kiparsky have drawn much material from the Finno-Ugric languages; one example from Anttila is given above.

Considering this sketch of the history of theoretical attitudes to grammatical categories as conditioning for phonetic change, it would seem that an explicit study of the typology of rules for change would be

desirable. This is not the object of this paper; the presentation of further examples of changes conditioned by membership in grammatical categories should be welcome, and I present several. They range from one case that cannot be explained otherwise, viz., Tamil expressives, to several for which in the past phonetic conditioning was provided of a very uncertain nature. For these the admission of grammatical category as the condition for exceptional phonetic change now seems most economical. One of these has to do with Indo-Aryan numerals; the other involves English forms that have as initial the voiced dental fricative θ .

Expressives, especially in Tamil

Once it becomes admissible to look for grammatical or semantic categorics as possible determinants of phonological change or structure, the data that are usually referred to as 'onomatopoetic' or 'symbolic' need no longer be skittishly treated as somehow marginal. Synchronically, structure will be found and often will be amenable to phonological statement. Hock 1986 (especially pp. 177-9 and 287-90), following after such treatment as that in Bloomfield (1933, pp. 244-6), has considerable discussion of English, German, and Hindi material. He starts with forms that have reference to various types of sound (p. 177; e.g. English clatter, clack, clang, clap, clash, crack, crash, splash, splatter, etc.) and of visual effects, especially of light (pp. 288-9; e.g. flicker, glimmer, glisten, glitter, etc.). He mentions 'other areas of vocabulary', and might have found much in English, e.g. his heart fluttered, she (a menopausal woman) had a hot flash (anglicé a hot flush). Most of Hock's treatment is synchronic, attempting to find statements of structure, though he makes tentative forays into the history of the English material.

There have been studies, both synchronic and diachronic, which have added much in a generalizing direction that Hock might have taken into account, though the prevailing diachronic interest of his work probably inhibited this somewhat. Diffloth 1976 made a very searching morphological and semantic study of data from Semai, an Austroasiatic language of Malaysia, which is rich in relevant material. In 1969 I had studied pertinent data from Kota, a Dravidian language of South India, and began a comparative study of parallel data in the Dravidian family, especially South Dravidian, including Tamil, and in Indo-Aryan; this was reprinted in 1980 (pp. 250-93), and some programmatic remarks were made in the same volume (pp. 6-9), suggesting that all (or most) of the languages of Southeast, East, and Central

Asia have elaborate structures of this kind. I had already in 1951 (pp. 159-200) made a collection from dictionaries, with preliminary analysis, of such formations in Vietnamese; Thompson (1965, pp. 154-72) treated the problem with a very different analytical methodology.

Study of the more exotic languages has already made it clear that the pertinent material usually belongs to a morphological-syntactic class that is distinct from other major classes of the language; this was found in Semai and in the Dravidian languages, the morphology being quite distinct from that of verbs and of nouns. In phonology it has sometimes been determined that the category has different rules from the rest of the language. This has been demonstrated for Semai. It has not yet been completely demonstrated for the Dravidian language Tamil, but there is clear evidence looking in that direction. E.g., though Tamil forms in general, nouns and verbs, apart from some borrowed Indo-Aryan forms, do not have voiced stops, retroflex consonants, or *l* in initial position, some of the 'onomatopoetic' forms do. A complete study of Tamil data is desirable; this must be undertaken with or by Tamil speakers,³ since the Tamil writing system has no way of indicating voiced stops as contrasting with voiceless. Consequently, the otherwise very adequate Tamil Lexicon writes with initial voiceless stops those onomatopoetics which in the standard colloquial have initial voiced stops and which comparison with etyma in other languages of the family (such as Kannaḍa or Telugu) shows had initial voiced stops in reconstructed Proto-South-Dravidian or even Proto-Dravidian; e.g. (DEDR 2576; etyma with *j-* in Kannaḍa, Telugu, Pengo, Maṇḍa, Kui, Kuwi) Tamil *jilujilu* 'to feel chilly'.⁴ It should be noted that the Tamil Lexicon records old literary occurrence (even in the earliest texts, the Sangam) for some of the pertinent data, but the use of the normal writing system in the whole of the literary record prevents recognition and notation of initial voiced stops in such old forms when they happen to be vouched for in the modern standard colloquial (or in dialect usage).

It is even possible that Hock's 'onomatopoetic verbs' of English, tabulated by him on p. 177, should be identified as a lexical class of distinctive semantic type, part of whose identification is phonological, statable in terms of initial and final combinations of consonants and consonant clusters.

The relatively impoverished systems that have been investigated among the European or Indo-European languages hardly give a glimpse of the richness of the

semantics of this category as it is met and recorded in some other languages (including in fact the Indo-Aryan languages). In my dealing with Dravidian and modern Indo-Aryan material (1969, p. 284 = 1980, p. 263) it was clear that terms relating to sounds and visual/light effects formed only a small part of the material. I ventured a semantic statement: 'the class denote[s] varied types of sensation, the impingement of the material world, outside or within the person, upon the senses--not merely the five conventionally identified senses, but all the feelings, both external and internal'. There were many types of sound and of light effects, but also many such items as 'sudden motion', 'trembling', 'irritation in the throat', 'heavy sensation as of bad digestion', 'mental agitation or confusion', 'smiling', 'a dog's snapping', etc., etc. Diffloth's Semai examples are even more exotic: 'appearance of a long line of people carrying heavy loads', 'continuous wavy lines seen in one glance', 'irregular flapping circular movements (as of a tortoise's feet struggling to escape)', 'appearance of nodding constantly', etc., etc. It becomes obvious that the usual terminology such as 'sound imitation', 'sound symbolism', 'onomatopoetic' has little universal value, and Diffloth's terminology (1976, pp. 263-4, fn. 2), of which 'expressives' labels the most inclusive class, is preferable; I adopted it in my later treatment (1980, p. 7) and use it from here on.

Hock (pp. 177-9) made a tentative start at historical treatment of the English 'sound' and 'light' words, finding that the most tempting solution was in terms of analogy. This seems to be a Neogrammarian avoidance of historical explanation of phonological change as conditioned by grammatical/semantic category. And yet it is now possible to cite Tamil expressive forms in which membership in this class blocks the Tamil historical palatalization rule. By this rule⁷ Proto-Dravidian initial *k- becomes Tamil c- when it is followed by one of the front vowels *i, *I, *e, *E; the rule is blocked when a retroflex consonant follows the front vowel. The rule operates elsewhere than in the expressive class; there are exceptions (not too numerous), some to be found in words borrowed from Kannaḍa (in which there is no palatalization), some still requiring study. The blocking of the palatalization rule in expressives has already been stated by Annamalai 1968, but since he neglected the appearance of initial voiced stops in some of the expressives (writing, e.g., only k- and not g- in forms in which the voiced stop occurs), reexamination of his results is necessary (but cannot be undertaken here in detail except for those with velar stop initials). It is possible too that the palatalization

rule needs some slight addition involving alveolar consonants as a blocking factor in general; this requires detailed investigation elsewhere. It should be noted too that Telugu has a palatalization rule almost identical with that of Tamil, with the difference that the presence of a retroflex consonant (or perhaps also an alveolar consonant) following the front vowel does not have the blocking effect that it has in Tamil (and Malayalam). It has been suggested too (Krishnamurti 1961, p. 25, §1.59), because initial g- sometimes is found in Telugu instead of *k- palatalized to c-, that the initial voicing occurred before the onset of the palatalizing rule and that only *k- (and not g-) was affected. Some of the Tamil expressives have initial g- rather than k-; whether Krishnamurti's Telugu suggestion is needed for these Tamil unpalatalized forms with g- is not yet clear.

In spite of the uncertainties affecting some of the pertinent Tamil data, scrutiny of the data (in DEDR) finds no palatalization in any of the expressives which have etyma beginning with a velar stop--whether the expressives have initial k- or g-, and whether an alveolar consonant following the front vowel might or might not be a factor blocking palatalization in words that do not belong to the expressive category.

The data are as follows,⁶ beginning with three items which, if they were words of other categories, would certainly have palatalization.

DEDR 1515 Tamil kiccukicc-enal, kiccukicc-enal 'chirping' : k- in Malayalam, Kannaḍa, Tulu, Telugu (kikakica).

DEDR 1516 Tamil kiccukiccu mūṭṭu 'to tickle (transitive)' : Toda kiskwiṭ- id., kiskwiṭ- 'there is tickling' (with dative).

DEDR 1594 Tamil kettukkett-enal, ketaṅketam-enal 'palpitation of the heart through fright' : Kannaḍa kettu 'to quiver, shiver, tremble', Tulu kittuni 'to flutter, be in agitation'. The Tamil forms are not known to my informant; the Tamil Lexicon records them as 'local', i.e. from some (unidentified) local dialect.

DEDR 1593 Tamil girugir-enal 'creaking (of door)' : Tulu kirikiri, girigiri, Telugu kirakira. The Tamil item is not in Tamil Lexicon or DEDR, but is given by Annamalai 1968, p. 16 (of course with k-).

DEDR 1595 Tamil girugir-enal 'giddiness' : g- in Kannaḍa, Tulu, Telugu.

DEDR 1575 kilukilu, gilugilu 'to rattle' (also as noun 'a child's rattle') : g- in Kannaḍa, Telugu.

Three expressives in which a retroflex consonant following a front vowel blocks palatalization as it would in words of other categories may be noted, since

in one, DEDR 1545, a Telugu etymon also retains its initial velar unpalatalized, suggesting that the rules given for expressives in Tamil may apply also to Telugu (complete study of the Telugu data has not yet been undertaken).⁷

DEDR 1545 Tamil *giṅgiṅ-enal* 'tinkling' : in Kannaḍa and Tulu *k-* and *g-*, Telugu *kiṅakiṅal-aṅu* 'to tinkle'.

DEDR 1530 Tamil *giṭugiṭu* 'to tremble, shiver' : an etymon only in Malayalam.

DEDR 1531 Tamil *giṭugiṭu* 'to rumble' : an etymon only in Malayalam.

The conditioning, then, for the blocking of the palatalization rule in Tamil is membership in the category of expressives, no phonological conditioning being possible.

Indo-Aryan numerals

It is notorious that in the modern Indo-Aryan languages (NIA = modern Indo-Aryan), except for the geographically separated Sinhalese, the numerals below 100 are extremely 'irregular', requiring for their description a complete listing of forms from 1 to 100 or a very complex set of generative statements. For their learning, whether for native speakers or foreign learners, a most unusual effort of memory is necessary. A glance at any grammar of Hindi, Bengali, Gujarati, Marathi, or any other language of the sub-family is enough to demonstrate this; an excellent modern synchronic study of the Hindi data is available in Bright 1972.

These numerals derive historically from a much simpler Old Indo-Aryan (OIA) / Sanskrit (Skt.) system, whose irregularities are no greater than those that are found in other Indo-European languages of the older period. Statement of the diachronic rules for derivation of the NIA numerals from those of OIA will be complex, but has not yet been completely attempted. Here we take for granted various 'regular' changes and only look at what is one of the most important of the 'irregular' rules that must be stated in going from OIA to Middle Indo-Aryan (MIA) in the teens, i.e. 11 to 18.⁸ In OIA these are compounds of the units (1 to 8) plus *daśa* '10', with a very few statements needed about the shape of some of the units, viz., *eka*- '1' → *ekā-*, *dva*- '2' → *dvā-*, *tri*- '3' → *trayā-*, *ṣaṣ*- '6' (irregular in its inflection) → *ṣoḍaśa*, *aṣṭa*- '8' → *aṣṭā-* (no change in *catur*- '4', *pañca*- '5', *sapta*- '7'); the OIA forms are: *ekādaśā* '11', *dvādaśā* '12', *trayōdaśā* '13', *caturdaśā* '14', *pañcadaśā* '15', *ṣoḍaśā* '16', *saptadaśā* '17', *aṣṭadaśā* '18'.

The regular rule for the representation of OIA inter-

vocalic -d- in MIA is that it is retained in Pali, and in the literary Prakrits (Pkt.) it is in general deleted (or in Jain writings replaced by a 'weak' *ṣ*); e.g. Skt. *hrdaya-* 'heart', Pali *hadaya-*, Pkt. *hīa-*, *hiṣa-*; Skt. *udaka-* 'water', Pali *udaka-*, Pkt. *ua-*. So far as I know, no special study has been made of what happens to -d- when it is initial in the second member of a compound; certainly there is not available any complete collection of data. Turner-Turner's 1971 dictionary material (pp. 170-1, s.v. -d-) yields a very few pertinent items. These show the same development as in simplex words; e.g. CDIAL 4371 Skt. **grāma-dāra-* 'village boy', Pali *gāmadāraka-* id., Pkt. *gāmāra-* 'rustic, fool' (< **gāma-āra-*); CDIAL 7799a Skt. *para-dēśa-* 'foreign country', Pkt. *paraśa-*; similarly in verbs (with initial d-) plus prefixes, and in noun derivatives therefrom; e.g. CDIAL 8668 Skt. *pradēśa-* 'a direction, region, country' (< *pra-diś-* 'to point out [e.g. a direction]'), Pali *padēsa-*, Pkt. *paśa-*; CDIAL 7836 Skt. *pari-dā-* 'to give, grant', noun *pari-dāna-*, Pkt. *pariyāna-* 'general gift'; CDIAL 11734-5 Skt. *vi-dār-* 'to tear to pieces', Pali *vidār-*, Pkt. *viār-* 'to split'.

In contrast with these regular developments, the teen numeral compounds in the literary Prakrits have intervocalic -d- of Sanskrit and Pali replaced by -r- (which remains down to the present in the NIA languages except for those of the far Northwest). There are differences in detail in the various Prakrits, especially in the first members of the compounds (the units), but also in that -ś- (of *daśa*) appears as -s- in most of MIA, but as -h- in *Māhārāṣṭrī* Prakrit (and in the latest MIA stage *Apabhraṃśa* and then in the modern languages): *ēkkārasa*, *ēgārasa*, *ēāraha* '11' (Hindi: CDIAL 2485 *igārah*, Bright 1972 *gyārah*), *bārasa*, *bāraha* '12', *tārasa*, *tāraha* '13' (*trayā-* replaced by **trayā-*), *pañnarasa*, *pañnaraha* '15', *sattarasa*, *sattaraha*, (also *sattara*) '17',⁹ *aṭṭhārasa*, *aṭṭhāraha*, (also *aṭṭhāra*) '18'.

It should be noted that in the Prakrit inscriptions of Aśoka (c. 260 B.C.) the few instances of teens all have -d- and not -r-; so also in *Gāndhārī* Prakrit (*Dhammapada* and *Niya*). But in the *Hāthīgumphā* inscription (? 2nd century B.C.), there occurs *paṇḍarasa-vaśāni* '15 years', with -r- (for *pañca* > *paṇḍa* '5', cf. Hindi *pandrah* '15' and other forms in CDIAL 7662, and Woolner 1928, p. 206). In the Pali texts, as we have them, there is only -d- in these forms. These, as well as forms with -r-, are given by Geiger (1916, p. 103, §116.2) and Turner (1966, s.vv.). However, von Hinüber

(1986, pp. 167-8, §§400-2) reports that Aggavaṃsa's grammar Saddanīti (A.D. 1154; written in Burma) gives -r- forms (Ēkārāsa, etc.) for Pali; von Hinüber's interpretation is that such forms ('das echte mi. Wort') have been eliminated from the text manuscripts by Sanskritization ('Sanskritismus'), which, to be sure, is seen often enough in Pali (see, e.g. Emeneau 1978, p. 117, col. 1 top = 1988a, p. 158).

Alongside of these numerals which show anhistorical development -d- > -r-, there is another group of forms showing the same change and not definable in terms of phonetic conditioning. These are in Sanskrit bahuvrīhi compounds of various pronominal stems plus several noun derivatives of dṛś- 'to see', these nouns meaning 'appearance'; an example is the compound tādṛś- or tādṛśa- 'having that appearance', i.e. 'like that'. The pronouns that occur as first member of the compound are: tā- 'that', yā- 'which' (correlative of tā-), kī- 'which?', ī- 'this', ētā- id., anyā- 'other' ('like another, different'), mā- 'me', tvā- 'you sg.', asmā- 'us', yuṣmā- 'you pl.'. In addition, there is sadṛś-, etc. 'like, resembling' (with the comitative prefix sa-), which already in a Vedic ritual (śrautasūtra) text has become sādṛśa- (by analogy with tādṛśa-).

In MIA we find such forms as tāṛisa-¹⁰ alongside of the regular tādīsa-; the latest MIA (Apabhraṃśa) has tāisa, derived by regular deletion of -d-. For yādṛśa- Prakrit has yāṛisa- and jāisa- (< *jādīsa-); Gāndhārī Prakrit (Nīya) has yadriśa- with -d- (-ri- < -r-). For īdṛśa- the various Prakrits have īṛisa-, īdisa-, īisa- (and also forms with ē- instead of ī-, thought to be analogically derived from demonstrative ēsa-, etc.). And so on for other compounds. Caillat 1980 studied the whole problem in great detail, using the identifying term (Englished by me as) 'pronouns and adjectives denoting similarity'. It is clear from CDIAL and Caillat that the change d > r appeared earlier in these forms than in the numerals, since the Aśoka inscription at Girnar (in Kathiawar; c. 260 B.C.) has tāṛisa-, yāṛisa-, and ētāṛisa-, while the parallel forms in his other inscriptions at other localities have -d-. On the other hand, on the whole the modern languages do not have for the 'similarity' words forms derived from the MIA -r- forms, but rather forms derived from the MIA -d- forms with deletion of -d-. In the Pali texts -d- forms are the norm, but the grammarians, including Aggavaṃsa (as above for the numerals) and the earlier Kaccāyana (so Geiger 1916, p. 59, §43), teach also -r- forms (Caillat 1980, p. 36). But Caillat points out that in Pali verse, which in general is presumed to be

of some age ('de facture ancienne'), there are examples of sarisa- (< sadṛśa-) and sarikkha- (< sadṛkṣa-). In fact, as is easily seen from CDIAL 13118-20 and Caillat, the forms with sa-, which is not in origin a pronoun, have a different history than forms with a pronoun as first member: sari, etc. 'like' with -r- are the only forms that are found in NIA (except for Sinhalese, which has sē derived from a -d- form).¹¹

Historical explanation of d > r in these two classes of words, the teen numerals and the 'pronouns and adjectives denoting similarity', has not often been attempted. Turner (1937/1975) included the numerals in an article in which his chief concern was to investigate Indo-Aryan data in which phonetic changes that later were normal appear sporadically at an earlier period. This may well be the correct explanation for some of his data. Concerning the instances of our present concern, he makes a statement (1975, p. 367) about a 'tendency for an intervocalic dental to become a spirant [he intends *ʃ*] resulting in *r*'. However, since -d- did not become -r- later or elsewhere in the Indic material,¹² we can only find that Turner's general thesis has no real pertinence for our present data. His statement made in passing (1975, p. 361) that 'gabbling in the recitation of series of numbers has had some influence in producing such abnormalities' is of some interest, but has no relevance for the 'similarity' words.

Otherwise, Berger (1955, pp. 42-4; following Meillet and Jules Bloch [see Caillat 1980, p. 36, fn. 14]) attempts an historical solution on Neogrammarian lines. He posits dissimilation of -d- to -r- in forms that have a preceding dental, viz., tādṛśa- and tvādṛśa- yield tārisa-, and among the numerals saptadaśa yields sattarasa (presumably through *sattadasa), dvādaśa yields bārasa through an intermediate *dvārasa, and trayōdaśa yields tērasa through an intermediate *trēdasa/*trērasa. On the basis of these forms he derives all the other forms by analogy.¹³ This explanation is summarized/ followed by Caillat (1980, pp. 35-6), and also by Turner in his posthumous addition to CDIAL (1985, p. 48, no. 5760; following Caillat). Berger attempts no phonological explanation of r from d, such as Turner ventured. Von Hinüber (1986, p. 167, §400) sums up his report of these recent treatments with the phrase 'eine nicht befriedigend erklärte Lautentwicklung'.

Instead of this complicated use of analogy following dissimilation, the latter in itself being an irregular and sporadic process and not otherwise exemplified (at least in CDIAL), I prefer the type of conditioning that I discuss in this paper, that by membership in a gram-

matical/semantic category, in this case two categories, viz., the teen numerals and Caillat's 'pronouns and adjectives denoting similarity'. If this sort of explanation is admissible, it is certainly simpler than Berger's.¹⁴

English words with initial

Another set of data which, being conspicuous, begs for explanation but has not yet received any completely satisfactory solution, comes from English. We know from Grimm's Law that Indo-European (IE) initial *t- should appear in modern English as þ (spelled th); so it does in such words as thin (: IE *ten-, *t_n-), thatch (: IE *teg-, *tog-), thigh (: IE *tewk-), thirst (: IE *ters-, *t_rs-), thorn (: IE *t_rn-), thorough (: IE *ter-, *t_r-). On the other hand, a considerable group of words spelled with initial th preceding a vowel,¹⁵ and of the same IE origin (*t-) is pronounced in modern English with ð, i.e. the voiced fricative corresponding to voiceless þ. This group is more easily listed than defined. The list follows, with some of the obvious inflectional forms and derivatives and compounds enclosed in parentheses: thou (thee, thy, thine); they (them, their, theirs); this (these), that (those); the; there (thereafter, therein, thereto, therefrom, thereby, thereof, therefore ['for (= because of) that'], etc.), thence (thenceforth), thither; then; thus; than; though (although); beside that, a demonstrative pronoun and adjective, we should mention that in its use as a relative pronoun (the man that we saw) and in its use as a conjunction (I said that he was here); 'empty' use of there in such sentences as there was a man that I knew may also be mentioned.

That ð and þ are contrasting phonemes in English hardly needs demonstration, even though minimal contrasts are rare; cf. thy : thigh, thou : thou[sand], teeth : teethe, mouth (noun) : mouth (verb).

The historical origin in IE terms being what it is, a difference in the conditioning to produce a split and to yield the two results has of course been looked for. The scholarly literature is clear that no other Germanic language has anything comparable to this English split in the development of IE initial *t-. The chronology of the development in English is not nearly so clear, and in fact the only really certain evidence that I have found in the reference books (see Dobson 1957, pp. 2-6, 936) is that found in a Welsh transcription of a Hymn to the Virgin in early modern English. The spelling conventions used in writing Welsh are applied to the English text, and in those words of our list that

occur in the text (their, there, this, these, they, the, thee are listed by Dobson) the spelling is almost always dd- (i.e. ð-). The chronology of the Welsh documents is not exact, resting on a number of undated manuscripts. Dobson (p. 3) says that we have 'English pronunciation ... as it sounded to a Welshman about, or rather somewhat before, 1500'; elsewhere (p. 936) he says that the fourteenth century was when the voicing of the fricative occurred. It seems clear also that in Old English the initial þ was not voiced. I have found no more exact statement of the chronology than this.

Dobson and others, e.g. Sweet (1888, p. 191, §730), Jordan (1934, p. 183, §207), Moore-Marckwardt (1966, p. 139, §124.1), and Hock (1986, p. 87, §5.3.1, and pp. 48f., §3.6), attribute the exceptional development to occurrence in unstressed contexts of certain of the words, especially 'this, that, the, etc.' (Hock, p. 87, calling them 'clitics'), or 'the, that, then, though' (Sweet, p. 191), or 'thou, thee, this, that, then, than, thither' (Jordan, 'in unbetonten Worten'), or 'the weak forms of the words this, that, then, etc.' (Dobson, p. 936), and then from these by analogy in all the occurrences and in all the rest of the list. This might be so, but more exact statement would seem to be called for. Of the items in our list the only ones that could justly be characterized as usually unaccented or clitic are the article the, the conjunction than, that when it is a relative pronoun or a conjunction, and there in its 'empty' initial use. For all the others it is difficult to construct examples in which they are not accented somewhat, but usually rather heavily, with the possible exception of the 2nd person and the 3rd person pronouns subject and non-subject (thou, thee, they, them). The four forms that are usually unaccented seem a slight basis for such extensive analogical blending (contamination, or whatever it is to be called), especially since the historical connections of some of the forms must have been as unclear or unknown to 14th century speakers as they are to modern speakers.¹⁶

It is notable too that others have shied away from this explanation, usually in favor of identifying all our forms as a 'class', membership in which conditions the exceptional change. So Jespersen in 1891; in Selected Writings of Otto Jespersen (pp. 593-4) he lists most of the forms with a statement of the change; ¹⁷ he says nothing more, except to attempt to date the change, and so really only identifies the class. Turner (1928/1975) in a wide-ranging collection of exceptional phonetic developments in pronouns in many languages finally mentions the English data (1975, p. 317), listing 'the,

that, this, then, there, though, etc.'. He then concludes: 'The above examples show that we may reasonably ascribe a peculiar treatment to the initial of a pronoun'. Whether or not we may judge this a 'universal', we may at least note that Turner was willing to ascribe the English development to membership in a grammatical category.

Whorf (1956, p. 76) wrote of the occurrence of English ~~ð~~ initially only in the class (he called it a 'cryptotype') of 'demonstrative particles (the, this, there, than, etc.)', omitting the 2nd person singular pronoun. This undated synchronic discussion had not appeared in print earlier, but in 1945 he had published a paper on 'grammatical categories' which looked in the direction we are interested in (but only synchronically). Lehmann (1962, p. 72), in a section on writing, uses the example this in saying: 'the restriction of /~~ð~~/ primarily to a small set of morphemes similar in use, and to initial position in these'. He has nothing further, and his use of 'primarily' gives one pause as to whether he intended our whole class. Bloomfield (Morton)-Newmark (1965, p. 293) write: '[after 1600] initial /~~θ~~/ was replaced by /~~ð~~/ in a number of common words (all "pointing" words) like the, they, that, this, there, and so forth'. Disregarding the faulty late chronology, we may note the outright identification of membership in the class as the condition for the change.

Finally, I think we may regard as somewhat ambivalent or ambiguous Leonard Bloomfield's statement (only synchronic, to be sure; 1933, p. 147): 'Vocal gestures ... Less striking deviations from the phonetic pattern sometimes occur in words whose meaning resembles that of a pointing gesture. In English the initial phoneme [~~ð~~] occurs only in words of demonstrative and related meanings, such as this, that, the, then, there, though'. Thus to shunt off this class of words (neglecting also the 2nd person singular pronoun) to a position outside the normal structure of the language, allowed Bloomfield to ignore the historical problem involved (as I think he did).

It remains to find a term for this class. To point out that it contains all the pronouns, personal,¹⁸ relative, and demonstrative (including demonstrative adjectives) that begin with a dental fricative, plus the definite article, and a number of 'pronominally derived function words', viz., adverbs and conjunctions (then, though, that), is an attempt to class all the list as somehow 'pronominal'. That this is an attempt to motivate a fairly late change by an etymological connection in a much more distant past seems obvious.

That than and though are etymologically connected with the demonstratives is true enough, but can the speakers who made the change have had any efficient sense of this connection? It is tempting to think that a simpler solution would be to define the class negatively as 'all words of this phonological shape (having initial dental fricative followed by a vowel) and not being nouns, adjectives, or verbs'. Whether this is acceptable I leave to others to determine within their theoretical systems.¹⁹ But I think I have pointed to a prime instance where membership in a grammatical category is the condition for a sound change.

In discussion after the delivery of this paper, it has been pointed out to me²⁰ that my statement above, that 'no other Germanic language has anything comparable to this English split in the development of IE initial *t-', is incorrect. In modern continental Scandinavian (NContSc.; i.e. Danish, Swedish, Norwegian) there remain as such the initial fricatives f- and h- that result in Old Germanic by Grimm's Law from IE voiceless stops in labial and guttural position. The IE voiceless dental stop *t-, however, having become the fricative þ- in Old Germanic, results in NContSc. in the stops t- and d-. This split is entirely parallel in its incidence to that seen in modern English þ- and ð-. Problems are raised by the Scandinavian phenomena, e.g. why the dental stop differs in its development in this position from the other stops. Chronologically, the English and the NContSc. developments take place at slightly different periods. Haugen (1976, p. 266) summarizes the Scandinavian chronology: 'þ > t in Da[nish] by 1300, in Sw[edish] by 1400, in Nw [i.e. Norwegian] by 1450', without giving dates for þ > d in 'words that were frequently unstressed'. This dating seems late for Scandinavian, as spoken in northern England, to have had any influence on the English development, which in any case yielded quite different results phonetically. But, be that as it may, these two Germanic languages show the same split according to grammatical/semantic category. Whether a unified treatment is possible (? parallel 'Sapirian drift' in fairly closely related languages), remains a problem.

Notes

1. For material, discussion, and bibliography I must record my gratitude especially to Mrs. Kausalya Hart and Professors B. A. van Nooten, Herbert Penzl, and Gary Holland. They are of course not responsible for my errors or misjudgments.
2. If I do not explore Hugo Schuchardt's writings on this subject, it is largely because I am sure that he said nothing about Tamil expressives or Indo-Aryan

numerals. He may have discussed the English words with initial voiced dental fricative, but none of the modern treatments of this topic refers to him.

3. Through the kindness and expertise of Mrs. Kausalya Hart I have been able to check this point for a small section of the Tamil material in her dialect, which is the standard colloquial Tamil as spoken by the middle range of castes in Madurai (I think this is a correct statement; for the dialect problem, see Emeneau 1988b, p. 243, §6.3, and literature quoted there).

4. Tamil has a symbol for *j* different from that for *c*, found in a very few words, mostly borrowed (it is called a 'northern letter', as if used only for Indo-Aryan borrowings); for this item the Tamil Lexicon writes both, but my informant uses only *j*-.

5. The rule operates also in Malayalam, for which the blocking in the corresponding expressive category has not yet been investigated.

6. DEDR 1590 is not known to my informant.

7. DEDR 1597 Telugu *ceṛalceṛal-āḍu* 'to be angry or furious' and *ciraciṛa* 'sullenness, ill-humor' would seem to go against the blocking rule, but the items in entries 1597 and 1961 may not have been sorted correctly.

8. Skt. *nava-daśa* '19' is almost completely replaced in MIA by forms that are literally '20 less 1'.

9. I would have to invoke analogy with the forms for '17' to explain Pkt. *sattariṃ* '70' (< Skt. *saptati*; in NIA, Hindi *sattar*, etc.). See fn. 13 below.

10. The old suggestion that *tārisa-* is cognate with Greek *tēlíkos* has been rejected finally, presumably because of MIA coexistence of *-d-* and *-r-* forms; see Caillat 1980, p. 33, Berger 1955, p. 44, and Mayrhofer 1956, p. 494, s.v. *tādīk*.

11. For borrowing of *sari* in the Dravidian languages and the rich development there, see Emeneau-Burrow 1962, p. 31, entry 147.

12. A very few (sporadic) examples have been collected by Pischel (1900, p. 172, §245) and by Brough (1962, pp. 255-6, no. 259). In the present context, they must still remain exceptions requiring explanation.

13. In connection with this explanation he uses the word 'Verhaspeln', with which cf. Turner's 'gabbling' quoted above. —Berger also thus derives *sattariṃ* '70', beside *sattati*, from *saptati*, by dissimilation. See fn. 9 above.

14. Hockett 1958, p. 258, writes: 'Numbers higher than one have some substitute-like properties and are perhaps to be so classed'; he does not proceed further.

15. 'Preceding a vowel' must be specified, since th-preceding r or w is always voiceless.

16. Verner's Law has several times been mentioned as somehow similar to this change. However, in detail the two are different (the position of the phonemes with reference to the accent—and what of the nature of the accent in the two changes?), and the chronological gap is great. This suggestion seems not very useful.
17. Pp. 579-616 are a chapter on 'Voiced and voiceless fricatives in English', identified as an English reworking of his Danish dissertation of the year 1891. —I have found nothing relevant in Wyld 1936 or in Chomsky-Halle 1968.
18. Note that I include the 2nd person singular pronoun. Apart from Jespersen, Jordan, and Dobson, the scholars quoted obviously did not do so in their statements, thereby neglecting the historical problem presented by this pronoun.
19. Or this is merely an ad hoc label of the kind discussed by Ohala 1985, pp. 234f.
20. I am grateful especially to Professor Gary Holland, who brought the Scandinavian data to my attention and guided me to the pertinent bibliography.

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Clitics in Homeric Greek: *less* evidence
that PIE was head-final
Chris Golston
University of California, Los Angeles

Proto-Indo-European is commonly reconstructed as an SOV language with head-final VPs, NPs and PPs; this reconstruction is based on the head-final VPs, NPs and PPs claimed for many of the early daughter languages. I will try to show, following Friedrich (1975), that one of the oldest IE daughters, Homeric Greek, had no syntactic category that can properly be called a PP; that many other early IE daughters are similar to Homeric in this respect; and thus that there is little reason to reconstruct head-final PPs for the parent language. Since the alleged postpositional nature of these daughters is often taken as evidence that PIE was head-final, the claim that PIE had no PPs (head-final or otherwise) can be taken as *less* evidence that PIE was head-final.¹ If I am correct in asserting that PIE had no PPs, the literature on the purported development from postpositions to prepositions in IE (Lehmann 1974; Holland 1976; Aitchison 1979) stands in need of serious revision.²

The paper is organized as follows: I suggest that (1) the positioning of P with respect to NP in Homeric is not head-like, (2) the optionality of P in [P NP] sequences is not head-like and thus, (3) Ps in Homeric are not syntactic heads. I suggest that (4) the positioning and optionality of P in Homeric show that P is a *modifier* of NP; specifically, I interpret Ps in Homeric as special clitics³ that constitute a 'phrasal morphology' following work by Zwicky (1977), Klavans (1980) and S. R. Anderson (1987). (5) To support this clitic analysis, I discuss the phonological evidence that Homeric Ps were clitics. (6) I offer a similar analysis of Mycenaean Greek, yielding a fairly unified treatment of early Greek, and discuss the transition from early to Classical Greek; I claim that Classical Greek probably did have PPs and propose an analysis of the change from early to Classical Greek. (7) I look at Holland's 1976 data from Osco-Umbrian, Latin, Vedic, and Hittite and conclude that it supports the hypothesis that PIE had no PPs.⁴

The idea that Homeric had no PPs is not new. Friedrich (1975) suggests that sequences of [P NP] in Homeric are dominated by NP rather than PP. He sees P as a 'locative auxiliary' of the noun phrase rather than the head of a PP. The positioning of P in Homeric, discussed by Holland (1976), lends support to Friedrich's analysis. Following Holland's format, I list the types of [P NP] sequences found in Homer in Table 1. Holland notes (1976:415) that "adpositions do not occur after sequences of adjective plus noun or noun plus adjective in these poems."⁵ A further generalization can be made on the basis of this data, however: P can occur only as the first or second word in the noun phrase. This allows for the last two examples in Table 1 which, strictly speaking, would not be predicted from Holland's generalization.⁶

Table 1: [P NP] sequences found in Homer

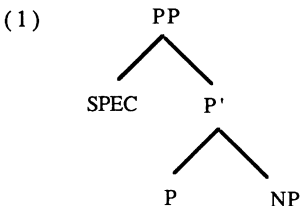
pN	<u>epi</u> pónton		
	on sea	'on the sea'	Il.2.665
pAN	<u>epi</u> oínopa pónton		
	on winey sea	'on the winey sea'	Il.2.613
pNA	<u>epi</u> neeusì thoéesin		
	on ships running	'on running ships'	Il.16.201
Np	néas <u>ép'</u>		
	ships on	'on ships'	Il.2.150
NpA	néas <u>épi</u> glaphurás		
	ships on hollow	'on hollow ships'	Il.16.840
ApN	thoàs <u>epi</u> néas		
	fast on ships	'on fast ships'	Il.24.1
ApNA	emà <u>pròs</u> doómata kalà		
	my to house pretty	'to my pretty house'	Od.8.41
ApAN	phíleen <u>es</u> patrída gáian		
	dear in paternal land	'in my dear fatherland'	Il.16.832
ArtpN	tóon <u>ek</u> neéoon		
	the from ships	'from the ships'	Il.16.366
Np&N	neóon <u>apo</u> kai klisiáoon		
	ships from and tents	'from ships and tents'	Il.16.45

The sequences of [P NP] found in Table 2 are those unattested in Homer. Again, the generalization seems to be that P cannot occur later than second position in the noun phrase.

Table 2: [P NP] sequences not found in Homer

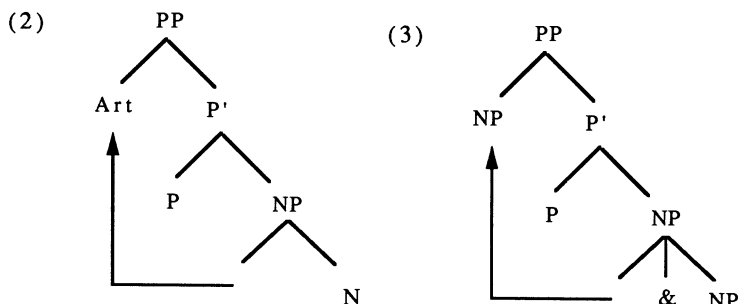
*ANp	*ANAp
*NAp	*AANp
*ANpA	*N&Np
*NApA	etc.

I would like to claim that the positioning of P with respect to NP found in Homer is not head-like. I have argued elsewhere (Golston 1988) that it is difficult to derive the data in Table 1 from a PP structure, whether prepositional or postpositional. To see why, consider the structure in (1):

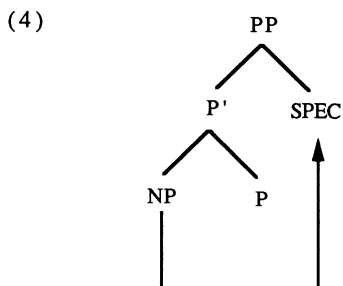


The data in Table 1 can be accounted for by postulating a position to the left of the preposition to which some element of the NP may move--we

may call this [SPEC, PP] (cf. Jackendoff 1977 and Riemsdijk 1978). The problem with such an analysis is that it predicts the *unattested* data in Table 2 as well: in order to keep the unattested data out, a stipulation along the following lines must be made: [SPEC, PP] may contain at most one word. But this I take to be an ad hoc way of getting the results required. And the analysis still has its problems: notice that the last two examples in Table 1 would require moving an *article* out of its NP (2) and moving a noun phrase out of a conjoined noun phrase (3), a violation of the Coordinate Structure Constraint (Ross 1967):



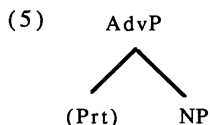
Notice that base-generating head-final PPs (4) is equally problematic: first, the only structure in Table 1 that could be base-generated is [Np]--all others would have to be derived by movement. Second, we would need an ad hoc stipulation that for NPs longer than one word either the entire NP or all but one word of the NP must move to [SPEC, PP].



I take these problems in deriving the observed data as evidence against solutions which treat sequences of [P NP] in Homeric as PPs: the positions available to P in Homeric are not head-like positions.

The optionality of P in Homeric is also not a head-like feature and provides further evidence for Friedrich's claim that Ps in Homeric are modifiers of NPs rather than heads of PPs. Generally, one expects the head of a phrase to be a necessary part of the phrase: NPs have nouns, VPs have verbs, and PPs have adpositions. But, as is often noted,

Homeric Ps are optional. Thus Horrocks (1980) treats Homeric P as an optional 'particle' modifying an NP:



The point here is that the grammaticality (and syntactic category) of the structure is not affected by the presence or absence of the P--something we would not expect if P were the head of the phrase. Ps in Homeric are used merely to "emphasize or define more clearly certain case relations" encoded morphologically on elements of the NP (Pharr 1959:326). Smyth provides examples (metà, eks and pará are the Ps):

metà dè mneestéersin éeipe he spake among the suitors...specifies the meaning with greater certainty than mneestéersin éeipe. So ho Helleénoon phóbos may mean *the fear felt by the Greeks* or *the fear caused by the Greeks*; but with eks or pará the latter meaning is stated unequivocally.

(1920:§1637). In particular, Ps are often used in Homeric to disambiguate 'composite cases' (Smyth 1920:§1279). A composite case is the result of collapsing two morphologically separate cases into one. PIE had a number of distinct cases that were merged in the Greek case-system:

PIE		Homeric
ablative, genitive	»	genitive
dative, locative, instrumental	»	dative

The Homeric Genitive may thus have either an ablative or a genitive reading and the Dative either a dative, a locative or an instrumental reading; since the case-marking is semantically somewhat ambiguous, Ps may be added to tease out the required meaning. In general, 'the prepositions define the character of the verbal action and set forth the relations of an oblique case to the predicate with greater precision than is possible for the cases without a preposition' (Smyth 1920:§1637). It is in this sense that we may understand Friedrich's term 'locative auxiliary'.

The positioning and optionality of P in Homeric suggests that it is not a head: how then may we account for this positioning and optionality? I have suggested elsewhere (Golston 1988) that Homeric Ps are best seen as phrasal affixes--phrase level counterparts to the morphological case found on words (S. R. Anderson 1987 and references therein). Their positioning may be defined in terms of the parameters of clitic placement set forth in Klavans (1980). [P NP] sequences in which P is initial may be defined as in (6); [P NP] sequences with P in second-position are captured in (7):

- | | | |
|-----|--------------------------|---------|
| (6) | Domain of Cliticization: | NP |
| | Initial/Final: | Initial |
| | Before/After: | Before |
| (7) | Domain of Cliticization: | NP |
| | Initial/Final: | Initial |
| | Before/After: | After |

(6) states that a P is attached to the Initial (left) edge of a noun phrase, immediately before the first word; (7) states that a P is attached to the Initial edge of a noun phrase immediately after the first word. If we allow the third parameter to have both values (Golston 1988), (6) and (7) can be collapsed into (8). (8) yields all the data in Table 1 and none of the unattested data in Table 2 with no need of ad hoc stipulations:

- | | |
|-----|-----------------------------|
| (8) | <u>Homeric P-placement</u> |
| | Domain of Cliticization: NP |
| | Initial/Final: Initial |
| | Before/After: Before/After |

The positioning of P thus is fairly straightforwardly accounted for by treating P as a clitic.

The optionality of P is also less problematic if P is seen as a modifying affix on noun phrases. Noun phrases may appear either with morphological case alone (nominative, accusative, dative, genitive) or may appear with morphological case plus a P that modifies it--this is especially common when the morphological case is not sufficiently specific. It is worth pointing out, perhaps, that this optionality of phrasal affixation has no clear parallel in word-level affixation; nevertheless, optional phrasal affixes seem less anomalous than optional syntactic heads.

It remains to be shown, of course, that Ps in Homeric are phonological clitics--i.e., phonologically cliticize onto adjacent words.⁷ Sommerstein (1973:156-8; cf. also Allen 1973:307) claims for Classical Greek that "all 'true' prepositions are lexically atonic"⁸ and the same is usually assumed for Homeric. There are two essentially orthographic reasons for assuming that this was the case for Greek. First, a small class of ten words in Greek appear without any graphemic tone-marking (< ' > = high, < ` > = low, < ^ > = falling) and are thus taken to be atonic; it is assumed that these words were pronounced as part of the following word. Three of these words are Ps, namely en 'in', eis 'into' and eks 'out of'. Second, there is the phenomenon traditionally called 'anastrophe' (the 'turning around' of the accent; Smyth 1920:§175, Pharr 1959:§326). Consider the accentuation of the P epi in (9) and (10):

- | | | | |
|------|-----|-----------------------------|-----------------------------|
| (9) | NpA | né eas <u>épi</u> glaphurás | |
| | | ships on hollow | 'on hollow ships' II.16.840 |
| (10) | ApN | thoàs <u>epi</u> né eas | |
| | | fast on ships | 'on fast ships' II.24.1 |

In (9) epi has a high tone on the penult; in (10) it has a low tone on the ultima--the relevant difference between (9) and (10) is whether the noun precedes or follows the P. Whatever the phonetic/phonological reality that underlies this graphemic distinction, it seems to be one that comes under the general heading of clisis; for this reason, it is usually taken as evidence that most or all Ps in Greek were phonological clitics (see Holland 1976:416 for discussion and references).

It seems reasonable, then, to analyze Homeric Ps as clitic elements of a phrasal morphology rather than as syntactic heads. Doing so allows us to treat the odd placement of P, the optionality of P and the phonological cliticization of P as related rather than as purely coincidental phenomena. An adequate analysis of Homeric Greek, however, should also be accountable to Homeric's older sister Mycenaean and to its niece Classical Greek, to which I now turn.

Holland remarks that "Mycenaean Greek, in contrast to Homer, seems to show no trace of the postpositional use of the particles (Ps)... This fact is surprising because of the early date of the tablets, yet Mycenaean syntax in general seems to represent a later stage in the history of Greek than does the syntax of Homer" (1976:416). Mycenaean is problematic for Holland because he treats sequences of [P NP] in Homeric as archaisms: if they are archaisms in Homer, we should expect a higher percentage of them in Mycenaean since Mycenaean texts predate Homeric texts by centuries--but Mycenaean has no 'postpositions'.

How might the proposal outlined above approach this problem? Notice first that the Mycenaean facts (P precedes all elements of the NP) form a proper subset of the facts of Homeric. In fact, they are covered by the parameters given above as (6), repeated here as (11):

(11) Mycenaean P-placement

Domain of Cliticization:	NP
Initial/Final:	Initial
Before/After:	Before



What is not attested for Mycenaean is the position defined when the third parameter is set at 'After' rather than 'Before', i.e., the settings given in (7); simply put, Mycenaean allows only one position for P whereas Homeric allows two. On this approach, the placement of P in Mycenaean is neither more nor less archaic--it is simply more restricted. This should not be surprising given the nature of the Mycenaean corpus (laundry lists) as opposed to the Homeric (epic poetry).

Holland and others (Lehmann 1974; Aitchison 1979) discuss the change from early (Mycenaean/Homeric) Greek to Classical Greek as part of a long shift from a head-final to a head-initial language.⁹ Postpositions in Homeric are taken to be an archaism from PIE--as Greek became more head-initial, head-final PPs became less common and finally disappeared altogether (except for conscious postposing in Classical poetry). If PIE and early Greek had no PPs, as I have suggested,

a different scenario must be proposed for the change from early to Classical Greek.

We may begin by noting that Classical Ps differ markedly from Homeric Ps: they may *not* occur in second-position within the noun phrase and they are *not* optional. Thus the two facts that supported a non-head clitic analysis for Homeric are lacking in Classical¹⁰--I conclude from this that Classical Greek had true PPs. Ps in Classical continued to be phonological clitics, but were no longer positioned by the clitic parameters in (6) - (8); instead, they were positioned by the regular syntax as heads of PPs. Thus the change from Homeric to Classical involved a reanalysis of [P NP] sequences from [P NP]_{NP} to [P NP]_{pp} (Golston 1988).

Table 3: The change from Homeric to Classical

HOMERIC	»	CLASSICAL
<u>Rule A</u>	»	<u>Rule B</u>
Domain of Cliticization: NP		PP → P NP
Initial/Final: Initial		
Before/After: B/A		
<u>Output</u>	»	<u>Output</u>
NP		PP
		
(P) NP		P NP

How did this reanalysis come about? The percentage occurrence of second-position Ps in the Homeric corpus is only 7.85% (Haggett 1902:182); assuming that this reflects the spoken language to some degree, it could well have allowed for a syntactic reanalysis of Ps from phrasal affixes to heads of phrases. A generation of speakers that treated Ps as heads of PPs would produce no structures that would be considered ill-formed by older generations of speakers, though they would fail to produce some of the structures these older generations produced. Schematically (Table 3) the 'Homeric generation' uses rule A to place clitics--this results in sequences in which P precedes the entire NP roughly 90% of the time; the 'Classical generation', exposed only to the output of rule A, infers rule B (incorrectly). As a result, the 'Classical generation' only has output in which P precedes the entire NP; the change goes unnoticed and the reanalysis is complete.

I would now like to extend the case I have made for Ps in early Greek to PIE. Doing so involves showing that the positioning of P found in Homeric is also found in other early IE daughters and that the optionality of P found in Homeric is also found in other early IE daughters. There seems to be little dispute among Indo-Europeanists that the optionality of P was common to all of the earliest daughters. Szemerényi, for instance, states that

[The] so-called prepositions were at first, and partly even in historical times, independent adverbs. *The IE noun, with its clear morphology, was quite capable of expressing the various relations intended by the speaker. At the most, an adverb could be added to define the meaning of the case-form more specifically.* The accusative, e.g., could originally be used to denote the goal, a use that in Latin survives with the names of cities and small islands (Romam, Cyprum) and with a few nouns (domum, rus). But the meaning could be specified: in urbem 'in the city--into (it)', ad urbem 'to the city--towards (it)', etc.

(1968:24, my emphasis; cf. also Lehmann 1974:118ff).

The comparative evidence for PIE first/second position of P within NP can be found in Holland (1976). He notes that Oscan and Umbrian allowed P to follow either N or A, but not both (1976:419) and cites the examples in Table 4.

Table 4: Umbrian [P NP] sequences

Np	asa- <u>ku</u>	Ila 39
	'at the altar'	
pNA	<u>pre</u> -veres treplanes	Ia 2
	'before the Trebulanian gate'	
NpA	tuta- <u>per</u> ikuvina	Ia 5
	'for the Iguvine community'	
ApN	testru- <u>ku</u> peri	Ia 29
	'at the right foot'	
*ANp		
*NAp		

Latin examples of second position P are perhaps best known. Typical are cases like magna cum laude 'with great praise'. Second position, as Holland points out, is most common in early poetry, from which he cites the data in Table 5 (1976:420).

Table 5: Latin [P NP] structures

NpA	arbusta <u>per</u> alta	Ennius
	'through the high trees'	
NpAA	damno <u>cum</u> magno meo	Plautus
	'with my great injury'	
ApN	magna <u>cum</u> cura	
	'with great care'	
*ANp		
*NAp		

Again, P does not occur later than second position in Latin.

P *does* occur later than second position, as well as in first and second position, in Vedic Sanskrit.¹¹ Holland gives the data in Table 6 (from Delbrück 1900:105-106 and Delbrück 1888:440-470):

Table 6: Vedic Sanskrit [P NP] sequences

pAN	a trtiyat purusat	TS 5,4,10,4
	'to the third generation'	
NpA	rodasi <u>antar</u> urvi	RV 7,12,1
	'between the two broad worlds'	
ApN	ubhe <u>anta</u> rodasi	RV 4,7,8
	'between the two worlds'	
ANp	imani lokan <u>ati</u>	SB 1,2,1,12
	'beyond these worlds'	
NAp	jatan ubhayan <u>antar</u>	RV 4,2,2
	'between the two races'	

Holland cites such data as evidence that PIE had postpositions. How might we account for this data using Klavans' clitic placement parameters? Klavans' parameters cannot be manipulated to define 'third-positon', so it seems as though her parameters are too strict. But this is not the case. At least for the data Holland cites, there are only 3 positions of P in Vedic, and none of them is third-positon: they are first-position, second-position and final. A structure like ApN is, of course, ambiguous between being second-position from the left and penultimate; thus, at the most we have 4 positons attested in Vedic: first- and second-position, penultimate and final--or, to state it another way, immediately before or after the first or last word in the NP. Using Klavans' parameters and assigning double-values (Golston 1988) to the second and third we get:

(12) Vedic P-placement

Domain of Cliticization:	NP
Initial/Final:	Initial/Final
Before/After:	Before/After

At first glance (12) would seem to allow innumerable clitic positions--closer inspection, however, reveals that it allows only the four required (x = word, (c) = clitic position): [NP (c) x (c) x x x x (c) x (c)]NP.

Holland's Hittite data, given in Table 7, is straightforwardly accounted for on such an analysis, since it has only final Ps.

Table 7: Hittite [P NP] sequences

Np	HUR.SAG-i <u>ser</u>
	'on the mountain'
ANp	ANA LU.MES KUR Amurra <u>ser</u>
	'because of the people from Amurru'
*pN	
*pAN	
*ApN	
*NpA	

The Hittite rule of clitic-placement is given in (13):

(13) Hittite P-placement

Domain of Cliticization:	NP
Initial/Final:	Final
Before/After:	After

The position of P in early Greek, Latin, Osco-Umbrian, Vedic and Hittite, then, is compatible with a Klavans-type clitic analysis in which P is not the syntactic head of a phrase but acts as an (optional) modifier of NP. Such an analysis allows for P-placement using rules that have been motivated independently for other languages (Klavans 1980)¹²; it fits well with the observation that early IE Ps were optional (Friedrich 1975; Horrocks 1980), which is hard to account for on an analysis which treats them as heads; and it fits well with the observation that Ps were phonological clitics--a fact that must be purely coincidental on an analysis which treats them as heads. This type of analysis has the further advantage of not having to exclusively postulate either prepositions or postpositons for the parent language, in line with Friedrich's observation that "PIE was probably ambivalent, with preposing [of P] somewhat more frequent and less marked" (1977:470). Finally, an analysis which does not treat early IE Ps as heads of phrases weakens claims that PIE was head-final. If Ps were modifiers of NPs rather than heads of PPs, they are irrelevant for reconstructing the headedness of the parent language.

NOTES

(1) I do not mean to imply that PIE could not have been head-final, merely that it had no PPs that were head final (because it had no PPs). It is of course plausible that PIE had VPs of the form [...V]vp and NPs of the form [...N]NP.

(2) I should say at the outset that I am deeply indebted to Gary Holland's detailed 1976 paper "The Shift from Postposition to Preposition: Evidence from Early Greek"; although I disagree with his analysis, my analysis is very much built on the data he presents there. I would also like to thank Cheryl Chan, David Cline, Ed Keenan, Donca Minkova, Aaron Shryock, Emily Sityar, and Bob Stockwell for fruitful criticism and discussion.

(3) 'Special clitics' are distinguished from simple clitics in that the latter are positioned by the regular (non-clitic) syntax whereas the former require special rules of clitic placement (Zwicky 1977; Klavans 1980; Kaisse 1985; see S. R. Anderson 1988 for discussion).

(4) I will not discuss here the interesting question of the relation of IE preverbs to IE Ps; I argue in Golston (1988) that both preverbs and Ps are elements of essentially the same phrasal morphology and should be treated by similar rules of clitic placement.

(5) In a paper presented at this year's (1989) BLS meeting, Holland cites only one exception to this rule in the *Iliad* and *Odyssey*.

(6) An interesting example for either generalization is the following:
 A&pN&AN teúkhesí te ksùn páasi kaì agkhemákhois hetároisin
 armor & with all & close-fighting companions
 'with all his armor and close-fighting companions' Il.16.248

Here ksún occurs in what is apparently third position; but te is a clitic (note that there is no tone on it) and thus part of the preceding word--in essence, ksún is still in second position. This seems to demand that te be positioned prior to the positioning of ksún.

(7) To claim that Ps in Homeric are positioned by rules that govern the position of clitics is essentially to claim that Ps in Homeric *are* clitics.

(8) By 'true' Sommerstein refers to one of two traditional classes of P in Greek, usually called the 'proper' prepositions. Proper Ps in Greek may also serve as pre-verbs; they are distinct from another class of Ps called 'improper prepositions'--these may not serve as pre-verbs. The distinction has no bearing on the discussion at hand. Improper prepositions are treated as special clitics in Golston (1988).

(9) These authors are aware that Classical is not a direct descendant of Mycenaean/Homeric; nevertheless, it is tempting to speculate on the syntactic changes involved *as if* it were. And it is certainly possible that Proto-Classical was like early Greek in the relevant respects.

(10) Mycenaean also lacked second-position Ps, of course; but the optional status of Ps in Mycenaean is unclear--none of the authors I consulted report on it either way. I hope to find evidence for their being optional in Mycenaean but have none at present.

(11) For interesting data on Old Indic see P. K. Anderson (1979); also Klavans' (1980) discussion of how his data fits into her approach and Golston (1988) for discussion on the similarities between Old Indic and Homeric.

(12) Klavans does not allow for the doubly-valued parameters I have used; but I take this extension of the theory as a necessary and plausible one.

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Verb Agreement, Head-Marking vs. Dependent-Marking, and the 'Deconstruction' of Tibeto-Burman Morpho-Syntax*

Randy J. LaPolla
University of California, Berkeley

0. Introduction Since the mid-1970's, the question of whether or not a verb agreement system¹ (VAS) should be reconstructed for Proto-Tibeto-Burman (PTB) has been a controversial topic, but because of the large amount of work published arguing in favor of reconstructing a VAS for PTB, especially by James J. Bauman (1974, 1975a, 1975b, 1979) and Scott DeLancey (1980, 1983, 1988, 1989, to appear), many people have begun to accept the existence of a VAS in PTB as received knowledge. In a recent paper on verb agreement systems in Tibeto-Burman, Scott DeLancey states that 'There can no longer be any serious doubt that a system of verb agreement must be attributed to Proto-Tibeto-Burman (PTB)' (DeLancey 1988:1). Though the number of papers supporting this position is quite large, I would like to raise several serious doubts about the theoretical and methodological basis for reconstructing a VAS for PTB, and at the same time argue for the use of functionally and typologically based theories of grammar, as exemplified by the head-marking/dependent-marking distinction developed in Nichols 1986, in diachronic syntax and syntactic reconstruction.

The essential characteristics of the VAS that the PTB-VAS proponents argue for are, according to DeLancey (to appear, p. 6), 'the personal suffixes 1st person *-*ŋa*, 2nd person *-*na*, and a split ergative agreement pattern in which agreement is always with a 1st or 2nd person argument in preference to 3rd, regardless of which is subject or object.' In fact, we do not always find these same suffixes even in those languages that do have suffixal VASs, and in many languages the agreement system is prefixal. I also do not agree that PTB was ergative, or even that agreement with speech act participants (SAP) over non-SAPs constitutes ergativity, split or otherwise.

1. Geographic/Genetic Distribution An argument often made in favor of a PTB-VAS is that 'this pattern is manifested in at least one language in every recognized subbranch of the family except for Lolo-Burmese and Karen' (DeLancey 1988:1). This is not as solid an argument as it may seem. As Thurgood (1984b:3) points out, 'Tibeto-Burman subgrouping is in its infancy; not only does the composition of lower-level units still pose numerous questions, but the composition of higher-level units remains almost completely open.' With the large number of languages in TB (Bauman 1979 puts it at over 200), the 20 or so languages that have VASs are nowhere near a majority, and almost all of them are in the Rung (Thurgood 1984a,b), Kiranti, or Kuki-Chin-Naga branches of TB. The possibility that these languages form a higher-level grouping cannot be dismissed. For example, Ebert (1988) has argued for a Kiranti-Rung genetic

grouping. I will not argue further the question of higher-level genetic affiliation, but will look at other factors.

These languages are almost all geographically contiguous, forming a ring around the edge of the Tibetan plateau from northwest China down along the southern edge of the plateau, including the Himalayan region, forming what Sun (1983, 1985) refers to as an 'ethnic corridor', an area of large-scale language contact, multilingualism, and mutual influence, and a path along which many of the nationalities moved when they migrated south. Language contact, shared innovation within a subgroup, or a combination of the two then all are possibilities, yet Bauman (1974, 1975a) gives only the following possibilities for the development of the TB VASs: native (i.e. PTB) development, borrowing from Munda (an Austroasiatic group), borrowing from Indo-Aryan, and the Turanian hypothesis (the idea that all of central and eastern Asia's languages except the Indo-European ones are related). He states that '[n]o other possibilities seem forthcoming, with the doubtful exception of independent innovation wherever the feature appears.' (1974:118). The other logical possibility, and the one that seems most likely to me, that one or more languages in the family innovated a VAS and it spread geographically (possibly aided by similar features in local non-TB languages), has never been explored in any of the literature arguing for a PTB-VAS. Only Thurgood (1985) comes close to recognizing this possibility, in a discussion of subgrouping (p.378, fn. 4):

... many similarities between closely-related languages are what Sapir [1921/1945, Ch. 8] called "drift"; that is, the common starting point provided by a common origin often conspires with universal tendencies to provide parallel but historically quite independent paths of development among genetically related languages. The picture is further complicated by the areal convergence produced by wide-spread multilingualism. Finally, the detection of borrowing is more difficult between related languages.

Later in the same work, in a bracketed note, Thurgood's tone is a bit stronger: '[Note: it is already clear that at least some of the innovation patterns here are due at least in part to parallel but independent development.]' (p.399).

Throughout South and Southeast Asia we see the spread of areal features (either through outright borrowing or by (morphological) calque) of all types, such as tone systems, phonetic inventories, noun classifier systems, double causativization, and word order patterns, yet nowhere other than in Thurgood's footnote is this possibility mentioned.²

2. Time Depth Those languages that do not have verb agreement systems, possibly 90% of all TB languages, have *no trace whatsoever* of ever having had one.³ These languages include four of the five languages for which we have writing systems more than two hundred years old, the best examples being Tibetan (7th cen.) and Burmese (13th cen.). It is highly unlikely that Tibetan and Burmese

would both have lost every trace of their VASs while Tangut (12th cen.) had a totally regular, etymologically transparent VAS that shows no signs of age. In Tangut (Kepping 1975, 1979, 1981, 1982) the agreement morpheme marks that SAP (i.e. 1st or 2nd person) most affected by/involved in the action of the predication:

SUBJ	OBJ	PRONOM. CLITIC	INTRANSITIVE		FREE PRONOUNS	
1	2	-na	1sg.	-ŋa	1sg.	ŋa
1	3	-ŋa	2sg	-na	2sg	na
2	1	-ŋa	3sg	Ø	3sg	Ø
2	3	-na				
3	1	-ŋa				
3	2	-na				
3	3	Ø				

Agreement is with the SAP even when the SAP is the indirect object or the possessor of the object if it is the only SAP in the sentence (Kepping 1982). These facts make it clear that agreement is related to SAP affectedness, and not grammatical function. This system also was optional, and does not seem to have been used in anything like the majority of clauses even in the Tangut texts that Kepping studied. Kwanten (1982) in fact could not find any trace of it in two Tangut texts he studied.⁴

The etymological transparency of the VASs (the independent pronouns become attached to the verb) and their clear discourse function marking the most salient speech act participant⁵ (Ebert 1987; DeLancey 1981) show that they are relatively recent grammaticalizations of discourse prominence.

A possible example of evidence within the history of one language⁶ for the development of a VAS is the Singpho dialect of Jingpo, mentioned by DeLancey (to appear, p. 22) as a case of how rapidly a language can completely lose an agreement system. This dialect is ‘spoken well to the west of the other dialects’, and ‘the time of separation of Singpho from its eastern siblings can hardly be even as much as a millennium’ (p. 22). It seems to me more likely that that dialect, out of range of the areal features to the east, never developed a VAS at all. If this were the case, it would give us a time depth of less than 1000 years for the development of the VAS, just what we would expect judging from the Tangut data.

3. Theoretical/Methodological Considerations

3.1 Reconstruction methodology The discussion of Tangut points up a difference in methodology between myself and most of those supporting a PTB-VAS: DeLancey, Bauman, LaRaw Maran (e.g. 1978) and others reconstruct the most complex system possible based on the data from a few languages, and consider those languages that have the most complex systems, such as Gyarung, as the most conservative (DeLancey, to appear, p. 7). For example, Bauman

(1974:134) suggests that a complex system such as that for Nocte, with a tense-aspect split, is closer to the original PTB VAS than a simpler system such as that of Tangut or Kham, languages which would supposedly have 'leveled out' the tense-aspect system.

I feel that we should reconstruct only those features for which we can show no clear line of development, i.e. opaque = archaic; we should reconstruct only those shared patterns for which we can find no motivation.⁷ This is what I mean by the term 'deconstruction' in the title of this paper: morphology is built of grammaticalizations (cf. Hopper 1987; Thompson 1988), so we should strip back the layers of grammaticalization from the grammar until we can go no further. What is left is what we should 'reconstruct'. In this way it could be said that we do not *reconstruct* a language's morphological system, we *deconstruct* it.

3.2 Grammaticalization The methodological difference just mentioned also highlights a difference in the understanding of the way grammaticalization works. I follow Lehmann (1985) in assuming that grammaticalization involves the 'attrition' (loss of integrity) of a sign, so that as grammaticalization progresses, there is a lessening in the phonological and semantic weight (including demotivation) of a sign so that the stages will be as follows (Lehmann 1985:309):

lexically empty noun	>	free personal pronoun	>	clitic personal pronoun	>	agglutinative personal affix	>	fusional personal affix
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Along with attrition there is the concomitant 'paradigmatization', 'obligatorification' (loss of paradigmatic variability), 'condensation' (reduced scope), 'coalescence' (increased bondedness), and 'fixation' (loss of syntagmatic variability) (Lehmann 1985:305-309). We see advanced stages of all of these processes in the complex VAS languages, the prime example being Jingpo (Maran 1978). This is part of the reason why I feel that among the VASs that do exist in TB languages, Tangut should be considered the most archaic and least grammaticalized. Maran (1978), on the other hand, argues exactly the opposite position, that morphology is 'stripped loose' and then becomes lexicalized, and that the highly complex and rigid morphology of Jingpo is closer to the archaic pattern. Bauman (1974:137) has all of the transitive suffixes 'initiating in a syncretic system', and tries to show how non-syncretic affixes develop from syncretic ones.

3.3 The Question of Ergativity⁸ It does not seem proper to me to speak of, for example, the Tangut VAS as an ergative or split ergative system, as it is clearly not marking semantic role or grammatical function, but simply discourse prominence. Even Kepping, who supports the idea of PTB ergativity, says that 'verbal agreement too [as well as noun marking⁹] gives us no grounds for assigning Tangut to either the nominative or the ergative type.' (1979:267). If we

accept Du Bois' (1985, 1987) association of absolutive marking with the information status 'new' and accusative marking with discourse pressures to mark the topic, then this should be seen as an accusative system rather than an ergative one, since these clitic pronouns are typical of the most unmarked topics (Lambrecht 1986). A similar line of reasoning is followed by Givón (1980), who considers ergative morphology to be semantically based on the contrast of agent vs. non-agent, which is in conflict with discourse-pragmatic pressures towards the pragmatically based nominative morphology.

The type of agreement system we are talking about here is very clearly one based on person rather than clause syntax or semantics. This gives us no grounds for assuming ergativity in the proto-language. An interesting extension of the classic paradigm in Dulong (a phonologically very conservative language — LaPolla 1987) gives us further evidence that semantic role and grammatical function are not the main factors in the oldest TB agreement paradigms. In general, the pattern of agreement in Dulong (Sun 1982) is similar to that in Tangut in that agreement is with the most affected SAP, regardless of semantic role or case, but the marking is a bit different. There is a prefix, *nw-*, that is generally considered to be the reflex of the PTB 2nd person pronoun **na*. The problem for those attempting to reconstruct a VAS for PTB is that this prefix is also used in clauses where no 2nd person argument is involved. This same pattern occurs in several other languages as well, such as Dumi Rai (though with an *a-* prefix) and Rawang (a language closely related to Dulong, but which has an *e-* prefix). This leads DeLancey (to appear, p. 33) to remark 'it is impossible (as far as I, or others who have looked at the individual languages, can see) to assign any coherent function to the prefix in any of the languages' (i.e. Dumi Rai, Rawang, and Dulong). If we look carefully at the distribution of this prefix, we can see that it occurs only and in every case where a SAP is involved (as an argument, oblique, or possessor), but the speaker is *not* the agent of the clause. This innovation could be seen to be the beginnings of a role-marking system (though marking what role something *isn't*, rather than what role something *is*), but the basis for agreement is still affectedness, as can be seen from the fact that in some cases where both SAPs are involved in a clause the agreement can vary depending upon whose involvement the speaker wants to emphasize (Sun 1982:93-94).¹⁰

Another language where the basis of agreement is still pragmatic is Hayu. Boyd Michailovsky (1988:111-113) has shown that the verb agreement system in Hayu is clearly not ergative (though the language has ergative marking on the nouns), as agreement is with whichever argument is highest on the person hierarchy $1 > 2 > 3$, *regardless of case role*.

In terms of methodology there is also the problem that in most of the papers on TB VASs, (Sherard 1986 is a welcome exception), comparisons are done on highly simplified and selected parts of total agreement systems, and little is said of how the affixes are really used. For example, Bauman (1979:423) gives neat paradigms for Vayu and Chepang, comparing the intransitive subject and transitive

object suffixes of each language to show how ergative they are, with only a parenthetical aside mentioning that these correspondences only hold when the subject of the transitive clause is 3rd person. As we have seen in Tangut, the basic pattern of agreement is with any SAP in the sentence, regardless of role, if the other participants in the clause are non-SAPs, clearly a pragmatic rather than a structural principle. This type of paradigm comparison then is of no use in trying to prove ergativity.

Nichols (1986:114) has suggested that '[h]ead-marked patterns contribute to a flat syntax which minimizes intra-clause and inter-clause structure, freeing a language to concentrate on the grammaticalization of discourse prominence and cohesion. In fact it turns out that it is precisely for head-marking languages that a number of traditional grammatical questions prove to be somewhat moot, because pragmatic and discourse relations (rather than strictly syntactic relations) are being grammaticalized.' As the older agreement systems are clearly pragmatically-based grammaticalizations of the discourse prominence of SAPs, there is no justification for reconstructing an ergative system of agreement for PTB.

4.0 Head-marking vs. Dependent-marking Nichols 1986 outlines the facts and implications of head-marking vs. dependent-marking morphology based on a careful survey of sixty languages. Nichols did not make reference to any languages in TB, but the bulk of TB languages (those without VASs) are solidly dependent-marking; those languages with VASs, a type of head marking, also have many dependent-marking features. The question, then, is which is older, the dependent-marking type or the head-marking (actually mixed) type? Nichols found that in several respects 'head-marking patterns appear to be favored and universally preferred' (p. 101). She suggests that based on her study, '... in the event that we have two clearly related languages with clearly cognate morphology, one of them strongly head-marking and one strongly dependent-marking, we should reconstruct the dependent-marking type' (p. 89). This then is one typological argument for not reconstructing a VAS for PTB. Two further arguments, also based on typological data, support this view.

4.1. The Continuum of Marking Types There is a continuum across the TB VAS languages in terms of the strength of head-marking. We can see for example the beginnings of head-marking in Angami Naga (Giridhar 1980), where only kinship and body-part terms are head-marked for possession (and only certain stative verbs have person agreement), and its full development in Gyarong (Qu 1984), where all nouns (and verbs) can be head-marked. This is in concord with Nichols' observation that the development of head-marking of nouns for possession will begin with cases of inalienable possession. We see the same process of dependent- to head- or double-marking (and not the opposite) through cliticization of pronouns occurring in other language families, such as the Oregon Penutian groups (Silverstein 1979), and the Pama-Nyungan languages of Australia.

In the latter, just as in TB, there is 'cliticization of pronouns, ... loss of core cases, and expansion of the head-marked treatment of inalienable possession' (Nichols 1986:99).

4.2. The Development Process There are many ways for head-marking to develop: 'they may arise as isolating languages become agglutinating, and pronouns are cliticized to verbs ... or they may develop from dependent-marking languages, through migration and clisis' (Nichols 1986:88). It is just such cliticization of pronouns to verbs that we see in the TB VAS languages. We can see the development of very similar VASs in other parts of Asia (e.g. in Turkic and Mongolian languages — Comrie 1980a, and in eastern Siberian languages — Comrie 1980b), and in North America and Australia, as mentioned above. Dependent-marking, on the other hand, evolves only 'through extensive use of boundary shifting ... so that the adposition becomes an affix on its former dependent', as occurred in the western languages of the Uralic family (Nichols 1986:88). We see no evidence of this process in TB morphology. In fact in a language such as Written Tibetan, the occurrence of modifiers between the head and the postpositions would effectively block this type of reanalysis. The dependent-marking system, or at least a non-head-marking system, must then be the original pattern. Bauman (1979:430) suggests that there is a drift away from what he has defined as ergativity, but not towards accusativity, rather towards 'non-ergativity', as there are no unequivocally accusative TB languages. He sees this 'non-ergativity' as the endpoint of historical change in TB. I would propose the opposite: that TB began as a morphologically simple 'role-dominated' (Foley & Van Valin 1977) language (similar to Chinese (LaPolla 1988a,b), with which we must eventually link it), whose daughter languages later developed various means of coding either pragmatics (Tangut), grammatical function (Kuki-Chin), or semantic role (Tibetan — Andersen 1987), or some combination of these three.¹¹ For me, then, the typical Lolo-Burmese role-dominated system is closest to the original PTB system of grammatical relations, rather than being the most degenerate, as assumed by those supporting a PTB VAS.

5. Conclusion I have here argued, using the question of Proto-Tibeto-Burman agreement system as an example, that in doing morphological reconstruction, what we should do is not build up morphological systems, and often end up engaging in 'paradigm stuffing', but in a sense we should *deconstruct* the systems that we have evidence for, to strip back the layers of transparent grammaticalization to arrive at an opaque core. Typologically and functionally based theories which point out the direction of grammaticalization allow us to do exactly that.

*I am greatly indebted to Scott DeLancey, Gary Holland, Martine Mazaudon, Boyd Michailovsky, Johanna Nichols, Graham Thurgood, and Robert D. Van Valin, Jr. for their very helpful comments on earlier drafts of this paper. I especially want to thank Martine, Boyd, and Johanna for the tremendous amount of time, energy and insight they afforded me during the writing of this paper, from the first abstract to the finished product. Any mistakes or errors of judgement, though, are of course my own.

¹By 'verb agreement system' I am only referring to the marking of participants in the clause with clitic pronouns, not to evidential systems like that in, for example, Lhasa Tibetan.

²Bauman (1974:144) does mention areal (Lolo-Burmese and Barish) influence as a possible reason why some VASs *don't* have the complex number distinctions that other languages have. Those without such distinctions would supposedly have 'leveled out' the distinctions because of contact with the morphologically simpler languages.

³By 'trace' here, I mean either some remnant of an originally full system which no longer has any agreement functions, possibly some phonological alternation in the verb stems, or unexplained verbal suffixes (cf. Wolfenden 1929 on the possibility that some TB verbal prefixes were originally pronominal).

⁴Two other Tangut scholars, Nishida (1964-66) and Sofronov (1968), have also analyzed Tangut as a non-pronominalizing language (both cited in Kepping 1975 and Kwanten 1982).

⁵The coding of speaker-hearer involvement is marked in various ways aside from this particular agreement pattern in many TB languages; see for example Caughley 1980, Toba 1980, and Watters 1980 for three different systems within Nepalese TB languages.

⁶There is one other case, that of Tiddim Chin (Henderson 1957), but I am not sure what to make of it. In Literary Tiddim Chin there is no trace of the proposed PTB suffixal agreement system, though there are pronominal prefixes for both nouns and verbs. Colloquial Chin, on the other hand, prefixes nouns, but suffixes verbs, as in Kiranti. The puzzle is that rather than assuming the formal literary style to be more conservative, Henderson seems to be suggesting that the colloquial style is more conservative, as she suggests that perhaps 'pronominalization is after all a genuine Tibeto-Burman family trait' (p. 327).

⁷Cf. the following quote from Meillet (Watkins 1969:17), pointed out to me by Gary Holland:
La grammaire comparée doit se faire en utilisant les anomalies — c'est à dire les survivances — bien plus que les formes régulières ... Les traités de grammaire comparée ont souffert de ce que, pour la restitution de l'état initiale, l'importance attribuée aux formes normales des états de langue historiques est trop grande.

⁸I am taking as the minimum definition of ergativity a system in which the S & O roles are consistently marked the same way (possibly zero) while the A role is marked differently, *because of the fact that they are those roles*. I am dealing here only with marking on the verb, a type of head-marking, not the marking of ergativity on the NP, a type of dependent-marking.

⁹There is an optional 'special marker' after the NP that is the agent in certain constructions, but it is still semantically transparent as literally meaning 'do action' (Kepping 1975:226-7), so I do not think it represents any trace of the supposed PTB ergativity, especially as there is also a topic marker for intransitive subjects and an unrelated accusative marker for transitive objects which can be used in the same clause as the agent marker. All of these markers are used only when the context would be ambiguous without them (Kepping 1979:272).

¹⁰As Martine Mazaudon has pointed out to me (pers. com.), the possibility of choice such as that in Dulong might be more common in TB languages than has been noted, as linguists are often loath to report variation that would confuse a nice neat system!

¹¹The development of the *nw-* prefix in Dulong (see §3.3) is also consonant with this hypothesis.

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Computerized Tools for Reconstruction in Tibeto-Burman

John Lowe & Martine Mazaudon

*UC Berkeley & CNRS, Paris**

The methodology of reconstruction involves a series of steps, repeated cyclically, starting with the gathering of data from modern languages, their comparison, and the establishment of a list of potential cognates on the basis of similarity of form and meaning. This is analyzed to propose a set of sound correspondences in the modern languages and a first hypothesis on the identity of the proto-phonemes which could be posited for each correspondence. Hypothetical proto-morphemes are then reconstructed. At this point it is advisable to verify that the modern forms can actually be regularly derived from the posited protoforms through the supposed sound-laws, in order to check the internal consistency of the model of proto-language and evolution hypothesized on the basis of the limited amount of data first analyzed. There follows a series of revisions of cognate matching, modern correspondences, reconstructed segments and reconstructed morphemes, the extent of which depends on the degree of closeness of the languages and the intuition and experience of the linguist who made the first set of hypotheses. The cycle is repeated several times with more data.

Automating part of the process has two advantages. First, the internal consistency of the proposed model of proto-language and evolution can be checked more thoroughly. One might hope that it would also be done more easily and more quickly, but anyone with some experience of automation will know that this is not necessarily so. The process will be slower at first, but the result will be better, because the machine tolerates no inconsistencies, although uncertainty can be allowed for, as we will see below. In the later stages of the research, when more data is integrated and the model is already refined, some gain in the speed of analysis may be realized. The second benefit of automation arises after obvious cognates have been noted with the naked eye; at this point the computer can generate additional comparisons, based on form only, between words which have diverged in meaning. The acceptance or rejection of these suggestions lies entirely with the linguist at this stage, as no automation of semantic analysis has been developed. Figure 1 outlines our conception of this methodology and the computer objects with which we have implemented it.

This paper is a report on work in progress, and is thus tentative. Indeed, the project is by nature constantly evolving. Since we are developing a *research* tool, rather than a demonstration or teaching tool, all parts of the model, including the programs and the data files, are constantly revised, as they are progressively improved by being made more consistent with each other. Ultimately, when the model reaches perfection (in an ideal world), it ceases to be useful, as its flawless functioning would signify that it had come to constitute an adequate and complete description of the phonological evolution of the languages considered, and the study would be over! The protoforms at that point would be perfectly computed from the reflexes.

Methodological steps in reconstruction Computer data files

- | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• gathering of data from modern languages• comparison and establishment of<ul style="list-style-type: none">a list of potential cognates on the basis of similarity of form and meaning• sound correspondences between the modern languages and potential proto-phonemes• list of hypothetical proto-morphemes | <ul style="list-style-type: none">• Dictionaries (in machine-readable form)• Cognate file
• Table of Correspondences
• Cognate file (enriched with proto-morphs) or Proto-language file |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Methodological steps in reconstruction Computer programs

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">• deriving modern forms from the proto-forms through the correspondences in a systematic way• addition-of-data-cycle (more cognates by form and meaning)
• refining reconstructions of individual etyma and proposing new ones | <ul style="list-style-type: none">• input: proto-language file
 output: modern forms
• input: dictionaries
 output: potential cognates by form
• input: cognate file
 output: proto-forms |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 1: "Traditional" methods of reconstruction and their computer analogs

1.0 ENVIRONMENT

1.1 LINGUISTIC ENVIRONMENT

We began developing our model using a subgroup of Tibeto-Burman, the Tamang group of the Bodic Division of Sino-Tibetan in Shafer's classification, about which we know enough to be able to supply potential sound correspondences and reconstructions for most of the phonological system, and where there remain enough unsolved problems to provide an incentive to try new methods, and more seriously to give a real-life research situation where everything is not already known. ¹

We have taken full advantage of the basic monosyllabicity of the Sino-Tibetan morpheme, and initially restricted the data treated to monosyllabic forms. This allows the inclusion of almost all the verbs in the Tamang subgroup and about half the nouns, which is a sufficient amount of data to get significant results. We have also taken advantage of the more or less "isolating" structure of the subgroup, which means that morphemes combined in words remain basically unchanged (in particular we have no vowel harmony between root and suffix, as occurs in Eastern Himalayish languages).

On the other hand, we have had to accommodate some structural difficulties that might not have arisen in other language families (like Oceanic languages); in particular the sound laws are so sensitive to context that most authors writing on Sino-Tibetan diachronic phonology have adopted statements in terms of syllabic constituents instead of phonemes. ²

1.2 PROGRAMMING ENVIRONMENT

The current implementation of the checking program, which we regard as a prototype, operates in the MS-DOS environment. The checking program is written in PC-SPITBOL, a version of SNOBOL 4. The Duke Language Toolkit provides the ability to display special characters; BLS and PRINT3 were used to produce hardcopy. Some of the input data was initially entered into HyperCard stacks on Apple Macintoshes. All data was converted into a common format for processing under MS-DOS. The format used is compatible with Lexware, a software package which assists in the processing of lexicographic data. Some of the data preparation tasks were accomplished using Lexware.

The initial design and development of the program was done on a Macintosh using HyperCard. However, to speed development we switched to SPITBOL, a programming language which provides extraordinary pattern matching capability and greatly reduced programming time. Also, as SPITBOL is a compiled language it has a substantial performance edge over HyperCard.³

2.0 THE MODEL: ASSUMPTIONS AND STRUCTURES

Structurally, our computer model is composed of two sets of data files (protoforms at one end and modern reflexes -- both computer generated and attested -- at other end), and an active component, which incorporates two pieces of linguistic information, the Table of Correspondences and the Syllable Canon.

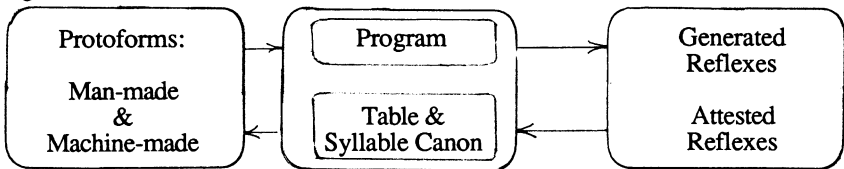


Figure 2: Components of the Model

2.1 TABLE OF CORRESPONDENCES

The Table of Correspondences reflects the linguist's conception of the etymological relationship between phonotactically significant portions of words in the languages compared.

The Table (see Figure 3) contains two types of information. First, on the right side, the correspondences observed between a number of related languages are stated in terms of phonemes, features, or groups of phonemes. Each line of the Table we will call a correspondence.⁴ Secondly, on the left side of the Table, we list the reconstruction proposed for each correspondence [column 3], with the particular syllabic and phonological contexts where the correspondence can be observed [in columns 2 and 4 respectively]. The letter in the second column, which codes the phonotactic characteristics of the correspondence, links the correspondence to the Syllable Canon (which is described below in section 2.2). At the extreme left is a line number, which is used by the algorithm to identify the correspondence.

A question mark in a language column or two reflexes separated by a comma indicate an unknown reflex or unexplained variation.

Proto-Environment				Observed Correspondences in Modern Languages							
1	2	3	4	5	6	7	8	9	10	11	12
#	Slot	TGTM	Context*	Ris	Sahu	Tag	Tuk	Mar	Syang	Gur	Man
3	T	B	/ _ U	2	2	2	2	2	2	2	2
5	T	B	/ _ W	4	4	4	4	4	4	4	4
31	R,V	a		a	a	a	ə	ə	ə	a	ʏ
35	R,V	wa		wa	wa	wa	o	o	o	o	ɔ
36	R,V	wa	/th _	o	?	o	o	o	o	u	a
37	R,V	wa	/s _	wa	a	a,wa	ə	ə	o	a	ʏ
172	V	a	/ _ P	a	a	a	ə	o	o	a	e
183	I,G	w		w	w	w	w	w	w	w	w
99	O	gr	/A _	kr	kr	w,h	t	k	g	kr	kr
100	O	gr	/B _e	kr	?	h	?	?	?	?	?
101	O	gr	/B _i	k	k	k	t	k	g	gr	hɿ,khr
102	O	gr	/B _	kr	kr	kr	t	k	g	kr	hɿ=rh
186	O	gr	/B _w	k	∅	h	t	k,t	k,t	kr	hɿ
90	I	g	/A _	k	k	k	k	k,g	k,g	k	k
91	I	g	/B _	k	k	k	k	k	g	k,g	kh
131	L	r	/P _	r	r	r	r	r	r	r	r
159	I	r		r	r	r	r	r	r	r	r

* U = [-voiced], W = [+voiced], P = [+labial], A B 1 2 3 4 are tones

Figure 3: Excerpt from the Table of Correspondences

2.2 SYLLABLE CANON

The syllable canon is a statement of the phonotactics of monosyllabic morphemes in the proto-language.⁵ It provides a means for us to analyze syllables into distributionally defined constituents. We call these "slots" and the members of a slot "fillers." Note that fillers need not be individual phonemes but may be comprised of sequences of phonemes. "Slots" may be suprasegmental (e.g. tone). The occurrence of a particular slot in a syllable may be optional, in which case the slot is parenthesized. Square brackets are used to indicate that one of the slots contained within must occur. However, a null element is possible, and this is indicated by a comma followed by nothing.

The "slots" which we have presently retained as potentially significant for the evolution of the Tamang group of languages are the following:

O = onset	L = liquid {r,l}	R = rhyme	F = final consonant
I = initial consonant	V = vowel	G = glide {j,w}	T = tone

and the Proto-Tamang Syllable Canon has been established as in Figure 4: ⁶

[T,][O(G),I(L)(G),][R,VF]

Figure 4: Proto-Tamang Syllable Canon

To interpret, syllables may or may not have tone (depending on whether they are root or suffix, and on whether we *want* to consider tone or not at a given stage in the study); a syllable is minimally composed of either a Rhyme or the sequence of a Vowel and a Final consonant; this can be preceded by an Onset with optional Glide, or an Initial consonant with optional Liquid or Glide, or nothing.

A morpheme may have more than one analysis according to the canon for reasons we will clarify in section 3.1 below. For example, the parsing of the word ***Bgrwat** 'hawk,eagle' could be realized in several ways, as shown in Figure 5:

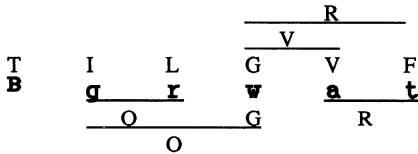


Figure 5: Parsing according to the Syllable Canon

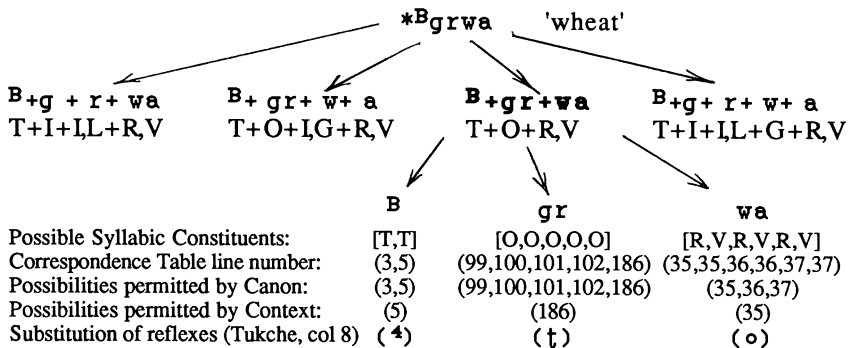
2.3 THE ALGORITHM

The algorithm we use to propose forms is "bidirectional". That is, it can either:

- given a reconstruction (a "protoform"), compute the expected or regular reflexes (outcomes) in daughter languages.
- given a form in one of the modern languages, propose reconstructions which would produce the form as a regular reflex.

Computing reflexes from a protoform

In both cases, the same procedures are followed, at least conceptually. We shall consider the generation of reflexes from a reconstructed form first. As an example consider the parsing of the proto-form ***Bgrwa** 'wheat' according to the Table of Correspondences and Syllable Canon stated above.



Output in Tukche Thakali:

ʈo

Figure 6: "Tokenization" of a protoform

Starting at the left of the form, the computer selects successively longer initial substrings of the given protoform and attempts to match them with one or more entries in the "TGTM column" of the Correspondence Table. When a match occurs, the matching correspondence sets (i.e. rows of the Table) are recorded by their row numbers and the substring is removed from the form. The matching process is repeated recursively with the remaining portion of the form. In this way all parsings which are permissible according to the table are produced. The parsing of the protoform results in zero or more "tokenized" versions of the original form. Each token in a tokenized form is composed of pointers to one or more rows of the Correspondence Table (represented in Figure 6 as parenthesized lists of row numbers); that is, a segment of the protoform may have different reflexes in daughter languages depending on the syllabic and phonological environment. Next, each element of each token is combined with the elements of the other tokens comprising the tokenized form. Combinations which would result in a violation of the Syllable Canon or the phonological context for the element are eliminated. Note that permitted phonological environments and permitted syllable types are stated exclusively in terms of the proto-environment. To produce reflexes in daughter languages, the row numbers are replaced with the corresponding phonological elements from each language's column.

Comparing generated forms with attested forms

In this way, for each reconstructed etymon, we derive one or more reflexes for each daughter language. This output is compared to the attested forms, and those sections of the Table and Syllable Canon which permit the generation of forms contradicted by the data are corrected or eliminated.

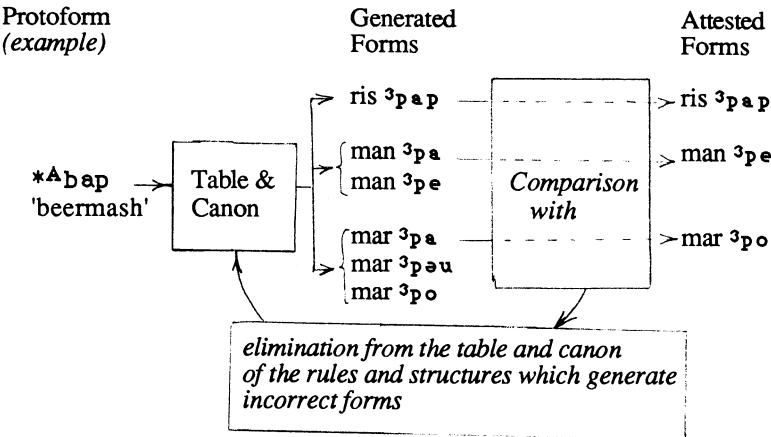


Figure 7: Computing reflexes from a protoform as a means of checking the model

After a number of repetitions of the cycle illustrated in Figure 7, the algorithm should generate all and only the attested forms.

Computing protoforms from reflexes

Conversely, the program can also "reverse engineer" protoforms on the basis of one or more reflexes in modern languages. In this case, the computer

recursively tokenizes the modern form according to the reflexes listed in that language's column of the correspondence table. In this way, lists of protosegments from which the daughter reflexes may have derived are accumulated. By combining the elements of the tokenized forms as described above, a set of protoforms is generated. Once again, only those forms which meet syllabic and contextual constraints are retained.

The program generates and stores a separate set of possible proto-forms for each daughter language reflex. Then, if this process is applied to a set of presumed cognates in several languages, the program can compute the "set intersection" of the sets of possible protoforms and determine which protoforms (if any) produce all the reflexes through regular correspondences (see Figure 8).

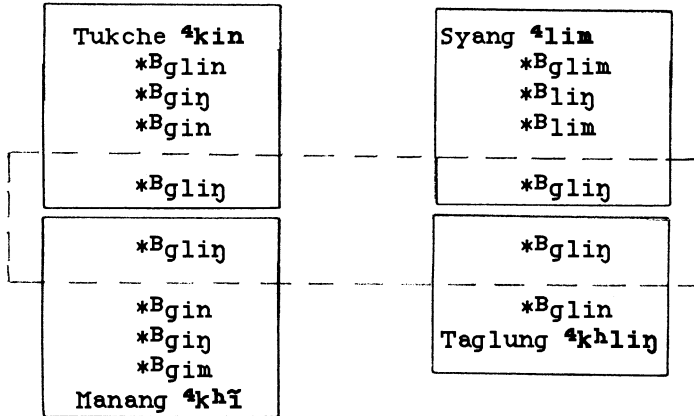


Figure 8: "Triangulating" on protoforms: **Bglin* 'snow' in Proto-Tamang

The problem of computational complexity:

The drastic reduction in the complexity of TB monosyllables in general has an unfortunate consequence in the computation of protoforms: since modern reflexes may derive from any of a large number of protosegments, it may be necessary to generate a large number of reconstructions. For example, Gurung *pli* requires that over 200 protoforms be tested. Of course, syllabic and contextual constraints reduce the number of valid reconstructions in some cases. Ideally, no matter how many forms are evaluated, only the possible ones according to the model should be retained. This, however, assumes that the Table and algorithms are nearly perfect. Thus, this combinatorial explosion poses a significant problem both for the computer, which must have the processing and memory capacity to test all the alternatives, and for the linguist, who must deal with this "noise" in the output data. The performance problems are purely technical and can be solved if necessary with supercomputers. The "noise" problem may require the development of other heuristics, such as global rules, to reduce the volume of output.

2.4 THE DATA

The program has both an interactive mode and a batch mode: input can come either from the keyboard or from data files. A limited amount of data preparation is required for batch mode operation.

- The *transcription* of each language input file has to be consistent with the one used in that language column in the Table and must be linearized in a way that is consistent with the Syllable Canon.

- The proliferation of generated forms (mentioned above and illustrated in Figure 7) makes it advisable to reduce *redundancy* in the input data as much as possible. In semantically arranged word lists, commonly used in comparative work, polysemous items may be listed multiply, without being distinguished from true homonyms (which have a different etymology). The preferred data format for input in our algorithm is thus the classical dictionary format, where each entry reflects the linguist's analysis of the item as a single lexeme.⁷

- We cannot expect to have perfect data on all the languages involved before starting reconstruction, so some incompleteness and imprecision should be tolerated. But the *imprecision should be precisely coded*. For instance tones ¹ and ² are not distinguished in the source on Tukche Thakali for monosyllabic nouns and are both transcribed as tone ¹. We preprocessed this file, replacing tone ¹ in that context by tone ^H (i.e. indistinct "high" tone).

Of course, this type of pre-treatment of the data implies a careful philological evaluation of the sources. It should be emphasized also that using the output of the programs in a meaningful way requires a good familiarity with the linguistic data treated.

3.0 LIMITATIONS AND IMPROVEMENTS

The computer tools we have developed so far only claim to check the internal consistency of a linguistic model which states 1) that a set of modern languages are genetically related, 2) that they can reconstruct at the level of a common ancestor in the guise of a given list of protoforms, and 3) that *one way* that this relationship can be described is via the Table of Correspondences and Syllable Canon.

While the development of a checking tool remains our primary goal, we believe that with our model we can test the efficacy of a variety of theoretical approaches to the data with a minimum of apparatus. It is clear to us that the ways in which correspondences are coded in the Table, for example, reflect choices made on the basis of some sort of theoretical framework. We would like that framework to mirror linguistic reality insofar as we understand what that reality is.

3.1 ANALYSIS OF THE TABLE STRUCTURE

3.1.1. *Phonemes, clusters, features*

In the Table, we have used two different types of statements simultaneously: correspondences on the basis of individual phonemes and correspondences in terms of "slot-fillers", which allow clusters of phonemes. One of our aims is to discover if there is any motivation for choosing one representation (or analysis) over the other. Analysis on the basis of phonemes reflects the "classical" segmental approach favored in Indo-European linguistics; the Onset + Rhyme analysis is typically used by Asianists. The "Asianist" approach reflects an underlying position against the strict localization of features on individual phonemes. It may be of interest to note that "prosodic" theory (in the Firthian sense) has received its best support from Asian languages.

A rigorous analysis of the internal structure and economy of the Table would help discover whether or not the differences of approach are motivated by differences in the typology of the languages themselves. Our research on this point

could make a modest contribution towards realizing the goal, mentioned by Prof. Emeneau in his contribution to this volume, of making an "explicit study of the typology of rules".

Figure 9 presents the "classical" representation of the evolution of PTam *Bgrwa by means of four segmental rules.

Proto-Environment				Observed Correspondences in Modern Languages							
1	2	3	4	5	6	7	8	9	10	11	12
#	Slot	TGTM	Context	Ris	Sahu	Tag	Tuk	Mar	Syang	Gur	Man
91a	I	g	/B_r	k	∅	h	ɬ	k	k	k	h
131a	L	r	/k,k ^h ,g_w	∅	∅	∅	∅	∅	∅	r	ɹ
31a	R,V	a	/w_	a	a	a	o	o	o	o	ɔ
183a	G	w	/_a	w	w	w	∅	∅	∅	∅	∅

Figure 9: Alternative statement of the correspondences for *grwa

Compare this with the synthetic "cluster" versions presented in correspondences 186 and 35 cited in Figure 3. In this case no generalization is gained by the "analytical" coding, since the two interacting rules in each pair are so specific that the input for one is the context for the other and vice versa.

At another level of analysis, considering the example in Figure 10 below, we may observe that if we were able to represent correspondences in terms of *features*, instead of phonemes, we could state 121, 126 and 91 as a single rule describing the devoicing of initial stops in Gurung. It would remain to be decided whether or not such features should be strictly linearized, as in the "classical" model.

3.1.2 Exceptions

Including or excluding a correspondence from the Table reflects another theoretical decision: how specific can a rule be and still count as a sound-change rather than a single word history? Or to say it differently, when do you have to move out of internal causality (inside the phonological system) and look for external causality (analogy, language contact)? Simple statistics will not answer this question. A genuine sound-change sequence may be exemplified only once because data is insufficient, especially in the case of a complex sequence of multiply conditioned changes. An example would be Gur ɬɰrɛ 'young man', regularly derived from Proto-Tamang *Bɰj on by such a long list of context-sensitive rules that the only convenient way to code it in the Table would be as a whole syllable!

3.2 COMPLEXIFICATION OF THE MODEL

The development of PTam *dɰt into Gur ɬti 'to pick up' (Figure 10) illustrates another flaw of our model: it assumes that sound changes occur in one step. This unrealistic view leads to the postulation of *ad hoc* unnatural rules like 121c to ensure proper output from the reconstructed input.

Certainly, rules 121c and 77 do give the correct result (as illustrated in the "one-step" model), but 121c is totally *ad hoc*. Why should the devoicing of initial stops (rules 120, and 121a) [paralleled by similar rules for labials and velars],

which is blocked before a vowel under proto-tone *B (rule 121b) [also paralleled by similar rules for labials and velars], fail to be blocked only for the dental stop, and only in the context of the proto-rhyme *ut (rule 121c)? The chronological succession of changes symbolized in (b) is the only way to make sense of this development. Note that (17) and (75) are independently required and context-free.

Line #	Slot	TGTM Context *	Ris	Sahu	...	Gur	Man
17	R,V	wi				i	
75	R	ut				wi	
77	R	ut	/t,d	-		i	
120	I	d	/A	-		t	
121	I	d	/B	-		t,d	
121a	I	d	/B	-	G,L	t	
121b	I	d	/B	-	Vowel	d	
121c	I	d	/B	-	ut	t	
126	I	b	/B	-		p,b	
91	I	g	/B	-		k,g	

* G = glide, L= liquid

(77 + 121c)

(a) *Bdut → 4ti

vs

(75) (121a) (17)

(b) *Bdut → *Bdwi → *4twi → 4ti

'one-step' model

'real-life progressive change'

Figure 10: The chronology of sound change: TGTM *Bdut > Gur 4ti

The modifications required to incorporate this reality into the model could be symbolically represented by a sequence of Tables, which would parallel the chronology of changes.

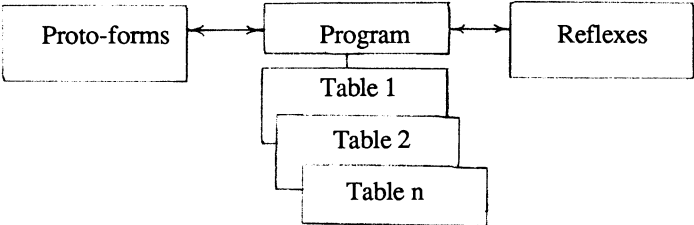


Figure 11: Complexification of the model

4. CONCLUSION

While it may seem at first that turning to automation to help in linguistic research implies that we expect linguistic processes to follow exceptionless, rigid principles, we hope we have shown that quite the opposite is true, and that, in our view, the computer is most useful as a means of keeping track of a large number of possibly divergent hypotheses and observations, permitting us to delay making generalizations until such time as they are justified by an adequate analysis of a sufficient amount of data.

Notes

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After completion of this paper and its presentation at BLS 15, it came to our attention that a similar project had been conducted on Algonquian languages by John Hewson, at the Memorial University of Newfoundland (Hewson 1974).

1. Shafer (1955) refers to this group as the "Gurung Branch" of the Bodish section of the Bodic division. We have established that it covers four ethnic groups: Tamang, Gurung, Thakali, and Manangba (or Manangke), whence the shorthand denomination of the language group as TGTM in the body of the paper. Dialects are designated by an abbreviation of the name of the village where they are spoken: ris. Risiangku, sahu. Sahugaon, tag. Taglung, tuk. Tukche, mar. Marpha, Syang (unabridged), gur. Gurung (Ghachok village), man. Manang. For more details see Mazaudon 1978.

2. See Matisoff's description of the canonic form of the ST morpheme as a "bulging monosyllable" (Matisoff 1989:163).

3. MS-DOS is a registered trademark of Microsoft Corporation, PC-SPITBOL is a licensed product of Realia Corporation, copyright R.K.B. Dewar 1983, 1984. Apple, Hypercard, and Macintosh are registered by or trademarks of Apple Computer, Inc. Lexware was written by Robert W. Hsu at the University of Hawaii.

4. The transcription follows the principles of the IPA. The phonetic font used in this paper was designed by Stephen P. Baron for STEDT.

5. When the model is expanded a canonical form for polysyllabic morphemes will be established. It will probably not be a sequence of monosyllabic canons.

6. This is not yet completely accurate, as a structure OGG has to be allowed in limited cases, unless a new composite filler for the G (glide) slot (G=jw) is introduced in the Table.

7. The algorithm pretreats redundant data by compacting homophonous entries (whether polysemous, or genuine homonyms into single entries with a list of different meanings. This reduces computing time, but does not help with the "noise" generated by the lack of prior lexical analysis. Thus the usefulness of the output is dependent of the quality of the input (mass still does not compensate for quality...)

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ERRATIC DERIVATIONAL OR COMPOSITIONAL DESIGNS AS CLUES TO WORD ORIGINS

Yakov Malkiel

University of California, Berkeley

1. My purpose is to present to you three less than closely connected word-histories---better still, three diachronically skewed reports on Romance word-families and their ramifications. The common denominator is the fact that the words' vicissitudes can be explained only in part through appeal to straight phonology. These otherwise disparate lexical families cluster around certain key-words, which I herewith introduce to you in their respective pristine, i.e., Latin forms: first, uerēcundia 'bashfulness, restraint, modesty'; second, the group of personal pronouns, in the ablative case, with the particle cum, meaning 'with', standing in postposition to them, e.g., mēcum 'with me', tēcum 'with thee'; third and last, an unexplained derivational model, which involves Spanish nouns and adjectives in -ilón flanking verbs with infinitives in -er and -ir, e.g., com-ilón 'big eater', dorm-ilón 'sleepy-head' alongside com-er 'to eat' and dorm-ir 'to sleep'.

2. The connection between modern Sp. vergüenza 'shame' and its prototype in Antiquity uerēcundia has become somewhat hazy, through interplay of several circumstances. First, vergüenza, despite its relative length, is unanalyzable to the naïve speaker, in sharp contrast to most abstracts serving to describe human behavior, such as tern-ura 'tenderness', amistad 'friendship', atreuimiento 'boldness', brusquedad 'gruffness'; uerēcundia, in contra-distinction, was transparently tripartite, containing a verbal nucleus uerē-, which we dimly recognize in E. (to) re-verē; an adjectival, or adjectivizing, element -cund-;² plus the nominalizing suffix -ia, familiar from abstracts such as inert-ia 'idleness' or modest-ia 'moderateness, discretion'. One further complication stems from the fact that, cast for the role of the intermediate stage (if not exactly the mid-point) between ancient uerēcundia and modern-day vergüenza, one encounters in the Middle Ages, interchangeably, either vergüença or vergüēña (predominantly spelled -uenna).

2.1. Over a long period of continued productivity vergüenza has given rise to a number of suffixal derivatives, remaining firmly at the center of this newly-grown family; it is also conspicuously present in various widely-used idioms familiar to any native speaker from childhood. The present-day phraseological and derivational contour of the word under study can be thus illustrated: vergüenza 'shame, shyness, embarrassment' as the focus of the entire structure; the phrases tener vergüenza (de) 'to be ashamed (of)'; colloquial es una mala vergüenza 'it is a shame, it is too bad'; the exclamation ¡qué vergüenza! 'for shame!'; the affixal derivatives vergonzoso 'bashful, shy' (person), 'shameful' (actions), also applied, as a zoonym, to the armadillo, because that species rolls up in a ball when pursued; the rarer vergonzante, apt to qualify a beggar; the two high-frequency reflexive verbs avergonzarse (de) 'to be ashamed (of)' and desvergonzarse (con) 'to be impudent, insolent (to)', flanked by active avergonzar 'to put to shame' and by the past ptc. desvergonzado, used adjectivally or nominally: 'impudent, shameless (person)'; desvergüenza 'impudence', the polar opposite of vergüenza; plus a racier variant, namely sinvergüenza, adjectival or nominal, but under any circumstances focusing attention on the disparaged bearer of the lack of an esteemed quality, hence 'brazen, shameless' or 'scoundrel, rascal', accompanied by an even more colloquial and distinctly modern-sounding sinvergüencería 'brazenness, impertinence'.³

2.2. The picture here sketched out is utterly at variance with the description one can offer of the place occupied by uerēcundia in its own lexical space, at the peak of Roman culture and power. That ancestral word belonged, hierarchically, to the very periphery of its far-flung family rather than occupying the latter's center. This subordinate status flows from its set of relations with the adj. uerēcundus 'restrained'; with the secondary verb uerēcundāri 'to show modesty'; and, above all, with the primary verb uerēri 'to display reverence or respect for' beside reuerēri 'to feel abashed before', a distinctly reverential verb indeed.

2.3. This entire edifice was doomed to collapse, perhaps on account of the fragility of deponential verbs past the summit of Latin (except for dispersed vestiges of gerundival uerend-u, -a in Italian dialects). As a result, OSp. vergüenca became an isolate, an atypical situation for any word of that ilk, I repeat (observe the contrast to loc-ura 'craze'/loco 'crazy'). An additional two-edged reason for the isolation was the system-wide recession of the suffixes -ia and -cundu/-bundu.⁴

2.4. A certain unevenness of the phonological trajectory uerēcundia > vergüenca makes itself felt as soon as one compares it to the near-parallel shift of the phytonym nastur-ciu, *-tiu 'kind of cress' to OSp. mastuerco. A /s/ after a sonorant, to be sure, was as admissible at the height of the flowering of Old Spanish as was its voiced counterpart /ʒ/, except that in the case of *nasturtiu the genesis of /s/ was expected, to the point of predictability, while it was not immediately foreseeable in the case of uerēcundia, given the presence of voiced d instead of voiceless t, in the critical segment. This anomaly made vergüenca a prize exhibit in the celebrated controversy surrounding the "Old Spanish Sibilants".⁵

2.5. The discovery of the OSp. doublet vergüeña, which receded during the 15th century, caused embarrassment for the Neogrammarians in the absence of any differentiating evolutionary factor. Aside from going back to the same prototype, vergüenca and vergüeña had an identical range of meaning and shared the patterns of most affixal offshoots, including the adj. vergoñ-oso, parallel to vergonç-oso, and the verbs a-, en-vergoñ-ar---to the striking exclusion, however, of the negative members of the word-family: des-vergüenca, vergonçado, sin-vergüenca remained unrivaled. Two possibilities of accounting for this lacuna come to mind: Either the items ushered in by des-, sin- sprang into existence at a fairly late date, when vergüeña had ceased to be truly procreative; or the -nca variant produced a welcome phonosymbolic effect alien to its counterpart in -ña.⁶

2.6. What about the state of affairs in neighboring Portuguese? There, vergonha, desvergonha; the verbs a-, en-, and des-a-vergonhar; the adj. vergonh-oso, in the company of the expected adverb; plus the phrase sem vergonha display strong resemblances to, and only moderate discrepancies from, their Spanish counterparts. Note one complication: Until the 16th century vergonça (i.e., the counterpart of OSp. vergüenca), with its own set of offshoots, was also in use along the Atlantic Coast.⁷

2.7. An ensemble of three mutually independent circumstances foils any attempt to account for vergüenca/vergonça in a single, simple manner. Could this be another instance of multiple causation?

First, the parallel variants vergüeña/vergonha are readily understandable on the side of phonology, provided the posited starting point is not Class. ue-rē-cun-di-a, but post-Class. Folk Lat. /verekundja/: Consonantized i triggered a medial triconsonant cluster, /ndj/; next, a built-in tendency of Romance weakened the least resistant, namely second, member of that group, to the point of leading speakers to pronounce /nj/ and, eventually, /ñ/. Witness, in Italian (specifically, in Tuscan), vergogna and in French, obsolescent vergogne (overshadowed, it is true, by honte, a borrowing from Frankish, surrounded by hybrid hont-eux and the verb se honter, initially soi honter);⁸ also noteworthy is OPtg. rigonha 'wrath', a hapax legomenon, from irācundia.⁹ Vergüeña/vergonha thus appear to represent the mainstream of events; but what, in that event, about vergüenca/vergonça?

2.8. Second, one may want to take into account the significant intricacy of Rome's socio-educational structure. Among certain groups of speakers (e.g., magistrates and teachers), there could well have prevailed the tendency to use an alternative, retardatory style of pronouncing this key-word of exhortation. Since /ʒ/, as audible in late-medieval di-, de-zir 'to say' or fazer 'to do, make' (from parental dicere and facere, in this order), was not yet readily available in embryonic Hispano-Romance, as an alternative to the folk-speech skipping of the /d/ in -ndia, it is conceivable that the more privileged or pretentious nuclei of speakers experimented with the closest approximation within easy reach. It so happened that another affricate, namely /s/, was at that juncture already in existence, being perceptible, e.g., in words shaped like (in-, ex-)tunc-ce 'then', cf. Sp. entonces beside OSp. (en-, es-)tonce(s) and Ptg. então alongside OPtg. entom. Arguably, a leap from "endangered" or "unstable" /ndj/ to /n's/ was executed instead of one, more logical, to */nʒ/ by way of escape from the threat of an unprestigious course of events, namely the rise of the loose pronunciation /ndj/ > /nj/

> /ñ/. An alternative direction of escape, no doubt similarly motivated and conducive to the dyadic cluster -nd-, is visible in OProv. vergonda, for a while coexistent with vergonha (which later also manifests itself in Cat. vergonya). The alternative reappears in OFr. vergonde, which has left scattered traces in modern French: dévergondé 'brazen', plus the abstract dévergondage.

2.9. Third, and once more independently, an advantage to the analyst accrues from viewing, as a subsidiary factor, the crystallization of suffixal gamuts (typically, but not exclusively, Ā-Ī-Ū) in regional varieties of Folk Latin and early Romance.¹⁰ In aiming to find examples, one easily suffers from an embarrassment of wealth. Thus, to convey the idea of 'equipped, provided with', Romans had at their ready disposal the suffix -tus, var. -sus, outwardly resembling the past participle; the preceding long vowel was conditioned by the declension class of the respective noun, thus: alātu 'winged', from ala; crīnītu 'hairy, long-haired', from crīne; cornūtu 'horned', from cornū. Yet, in a daughter language such as Spanish, each of the three reflexes -ado, -ido, and -udo carries with it a unique semantic message and sometimes engages in a subtle interplay with an appropriate prefix. Thus, a-mulat-ado 'mulatto-like' signals resemblance; de-sabr-ido 'tasteless' connotes deprivation; while forz-udo 'robust, stout' suggests excess of physical prowess or power.¹¹ Then again, Latin authorized its speakers to oppose -ānu to -īnu, and both of these to -ūnu, as one gathers from urb-ānu 'relating to (the refinement of) the capital city', from urbs, urbe; mar-īnu 'referring to the sea', from mare; and apr-ūnu, capr-ūnu, ceru-ūnu 'reminding one of a male animal known for the odor it emits: the wild boar, the he-goat, the stag'; Spanish has preserved -ano, -ino, combining them even with Amerindian primitives (peru-ano, and-ino), yet, above all, has expanded the realm of -uno, extending it to all sorts of animal names and beyond (lacay-uno).¹² Given the steady accumulation of such preeminently triadic gamuts, does it not stand to reason that the uninterrupted growth of derivational models such as -antia and -entia (witness inf-antia 'babyhood', dol-entia 'sickness') might have stimulated some speakers to fool around with *uerēcuntia?¹³

2.10. For good measure one is tempted to throw in, by way of concluding possibility, the off-chance of some purely lexical pressure, which might, e.g., have spread from a certain substandard or taboo word not further identifiable at this instance. Such a blend or merger could easily have become operative in deflecting uerēcuntia from its straight course. In that eventuality, *uerēcuntia, launched as a tentative substitute for -cuntia, is likely to have involved some crude joke, or pun, or coarse sexual allusion easily associable with blushing. One expects to encounter such twists at every step in the speech---anything but polished---of legionaries stationed in camps. Conceivably, the joke, having run its course during the aftermath of the Punic Wars, had evaporated by the time the Roman armies seized Southern and, thereafter, Northern Gaul. Recall that, in a variety of languages, the same word or word-family, according to the context in which it lends services, can suggest something as harmless as 'restraint, discretion, modesty, bashfulness' and, at the same time, something as scandalous and shocking as 'shame', often with undeniable sexual overtones. For a typological parallel, cf., in Russian, стыд (a) 'feeling of shame', flanked by стыдлив 'bashful', yet (b) 'revolting action or attitude' (= срам, позор), accompanied by (po)стыднѣ 'ignominious', 'contemptible', etc., which, to be sure, are less vituperative than overtly negative безстыдство 'brazenness', безстыдничать 'to engage in vulgar behavior', comparable in tone and content to Sp. sinvergüenza, Ptg. sem vergonha. One is also reminded of Lat. uerenda side by side with pudenda, the latter also used in English veiled discourse ('external genital organs, vulva'); of the practically parallel use of Sp. vergüenzas 'privates'; and of referentially germane lexical items, such as L. cunnius, E. cunt, which are, incidentally, not too far removed, along the phonic axis, from uerē*cuntia, *-cunnia, as here hypothesized. In case this argument has any merit, uerē*cuntia and *-cunnia would represent a pair of socially differentiated pre-Romance variants of Class. -cuntia, except that, unlike the situation described above, *-cuntia, far from corresponding to the upper socio-educational layer, might involve a downright vulgarism.

2.11. The last point on my agenda for Section 2 is the casting-about for any cogent reason why, after centuries of wavering, Lusophones opted in favor of vergonha, rejecting its competitor vergonça, while the Castilians, conversely, generalized vergüenza, by the same token repudiating vergüença. We have already toyed with the idea that in Spanish a slight phonosymbolic advantage of

vergüença over its rival (especially in exclamations such as: ¡Qué vergüença! ¡Eres un sinvergüença!) could have been operative. To grasp the Portuguese gambit in reverse direction, one may appeal to the recently-identified phenomenon of 'excessive self-assertion'.¹⁴ Between roughly 1400 and 1600, the Portuguese aristocracy and middle class came close to being bilingual, much as Catalonia has been over the last two centuries. In an exaggeratedly puristic effort to rid Portuguese of any words (or constructions) which, though actually native, gave the embarrassing impression of having been imported from Spanish and, in the process, superficially adjusted, the patriots tended to eliminate them. If so, vergonça became the victim of its suspiciously close resemblance to Sp. vergüença.¹⁵

3. The next issue on our program is the gradual decay of a morphosyntactic pattern that once flourished amid Class. Latin personal pronouns (to be specific, mē, tē, sē, nōbīs, uōbīs) combined with the postposition cum 'with'. Whether used as preposition (cum amīcō 'with, in the company of, a friend'), or intercalated between qualifier and noun (magnā cum laude 'with high praise'), or else postposed, as here, cum governed the ablative case in Antiquity. Less felicitous, even if sponsored, as late as the early 'thirties, by a Meyer-Lübke, was the tradition of treating mēcum and the other members of the set as so many autonomous lexical units.¹⁶

3.1. The opening gambit, projectable onto the temporal level of Folk Latin, was the replacement of nōbiscum 'with us' and uōbiscum 'with you' by nōscum, uōscum, vestigially attested.¹⁷ The process lends itself to several explanations, by no means mutually exclusive. One is free to surmise that the monosyllabicity of mē, tē, sē favored the reduction of bisyllabic nōbīs, uōbīs to nōs, uōs; or one can contend that the suitability of the subgroup mē, tē, sē for lending service as accusatives and ablatives alike, after the decay of certain better differentiated archaic forms of the paradigm,¹⁸ stimulated influential groups of speakers to endow the other subgroup, namely nōs and uōs, with a similar functional latitude; finally, the precipitate decline, in the "sermo plebeius", of dative and ablative forms, generally speaking, may have swept away nōbīs and uōbīs, even where seemingly congealed in idiomatic combinations with -cum. The strict exclusion from this tightly organized paradigm of the units matching 'him', 'her', 'it', and 'them' (as against 'him-, her-self', etc.) will cause small surprise to those aware of how sharply Latin, in general, tended to separate 3d-person pronouns of this category from the remainder of the set, unless reflexivity was involved.¹⁹

3.2. Direct Romance continuators of the meanwhile re-structured pentad mēcum(m), tēcum(m), sēcum(m), nōscu(m), uōscu(m) are spatio-temporally confined to (a) Hispano-Romance (including several successive phases of their growth); (b) Old Italian; and (c) several South Italian dialects of any period; i.e., on balance, to a mere minority of the better-known branches of written and spoken Romance, with the pervasive tendency to raise the inherited ē to i throughout the singular and, in parallel fashion if to a less sweeping extent, the ō to u in the plural. The mere appeal to the verb 'to raise' in this context alerts one to the likelihood that genuine metaphony or Umlaut (a label which precisely means 'vowel-raising') is here involved---a suspicion that might stand the chance of hardening into a certainty if the same vowel changes could be shown to have similarly hit other words closely akin in their phonological arrangement.

3.3. In contemporary Spanish, the singular subgroup migo, tigo, sigo, which snugly fits the description so far supplied, is still clearly recognizable as echoing parental mē, tē, sē except that the final segment -go, surely as a result of the voicing and subsequent spirantization of the intervocalic velar consonant, has been irreversibly separated from con, the normal representative of parental cum, and consequently denuded of all meaning, thus exemplifying the status of an "empty morph". Its original function has been taken over by con-, interpreted in its role of prefix (or opening component of a compound). In the plural, -co, the arrested counterpart of -go, as expected after s, has been resolutely cast off; as if by compensation, but actually serving a separate purpose, m. otros, f. otras 'other' have been added; cf. Fr. nous autres Anglais 'we Englishmen', without, it is true, any differentiation of gender so highly characteristic of contemporary Spanish. The close cohesion of nos and otros, etc. prompts Hispanophones to write them as a single word, separating them from less tightly conjoined con; conversely, conmigo, unaccompanied by otro, more easily lends itself to being

spelled as a single word.

3.4. Winding our way back from the splash of this big leap to the less exciting step-by-step realizations of evolutionary trends, we are now in a position to aver that the relative autonomy of as many as four processes involved, namely: (a) vowel-raising; (b) preservation or abandonment of the semantically fading word-final segments -co, -go traceable to the ancestral postposition; (c) transfer of the key-message 'with' to word-initial position (co-, con-); plus, so far as the plural is concerned, (d) addition or omission of the word-final ingredients otr-os, -as, marked as to gender and number, has been the chief cause of a proliferation of competing (or overlapping) possibilities. One can distinguish among the following principal varieties:

- (A) Basic type, in every respect most conservative: me_{go}, te_{go}...nosco, vosco, peculiar to past stages (abstention from vowel-raising, preservation of -co, -go and their continued endowment with meaning, failure of con- to be prefixed, absence of -otr-os, -otras);
- (B) Transposition of the carrier of the 'with' message: comigo...connosco ~ coñusco (hesitant vowel-raising, observable in the singular rather than the plural; downgrading of -co, -go to a pair of empty morphs; continued resistance to intrusion of -otr-os, -as);
- (C) Abandonment of older Sp. comigo, coñusco, two items marked by weakly-contoured word boundaries, in favor of more easily segmentable conmigo, con nosotros (a string of lexico-morphemic losses depletes the ranks of items characterized by a raised vowel o > u, while sparing e > i; or by the segment -co, while sparing -go; or by -ñ- caught in alternation with -n-; invasion of the turf by gradually more and more mandatory -otr-os, -as);
- (D) Superior conservatism of Portuguese vis-à-vis Spanish shows in these idiosyncrasies: -otr-os, -as, although freely available, fall short of full standardization; convosco is kept in the West of the peninsula, while in the Center it yields ground, at first, to convusco (the partner of coñusco), and is subsequently altogether dropped there.

3.5. All in all, one can tentatively set off the following stages for Spanish, allowing for overlaps and for certain regional distinctions: (α) me_{go} and (β) migo; (γ) co(n)mego beside (δ) co(n)migo; (ε) coñusco giving way to con nosotr-os, -as, similarly con vusco; and eventually, (ζ) the innovation usted(es) 'you' (heralded, where appropriate, by con), for polite address, entering the arena.²⁰

3.6. Given this foreknowledge, we can now revert, with better prospects of success, to the key questions already hinted at: Can the changes (mēcum >) me_{go} > migo, (uōscum in lieu of uōbiscum) > vosco > vusco, etc. be ascribed to the agency of metaphony? The safest reaction to this query is to answer it in the negative, and to fall back instead on lexical contamination or inflectional analogy. For the object cases of the stressed personal pronouns the individual Romance vernaculars, based on the provincial varieties of colloquial Latin, selected as their model either the accusatives/ablatives or the datives of the parent tongue, i.e., either mē, tē, sē... or mihī, tibī, sibī. Hence the familiar contrast between Fr. moi, toi, soi... (from older mei, tei, sei...) and Sp. mí, tí, sí... We can now assert that the shift me_{go} > migo (and its counterparts) illustrates mihī > mī's impact on mēcum, etc.

While a shift like sē(go) > sí(go) was being executed, it was liable to have secondary repercussions outside the narrowly pronominal domain. In Portuguese, ancestral sē(n)su 'perception, feeling, sensation', advancing past the phase seso(s) 'brain(s)', was ultimately pushed in the direction of siso; Spanish, in contrast, has kept sesu(s) unaltered.²¹

3.7. There occurred yet other vowel shifts in Peninsular pronouns seemingly isomorphic, but in reality motivated by not at all identical causes, differently oriented, and anything but synchronous. Thus, post-medieval separation of masculines from neuters among demonstrative and indefinite pronouns for which, under a set of circumstances not yet fully explained,²² there suddenly arose a demand amid late-medieval speakers of Portuguese (though not their Spanish contemporaries), rapidly led to the coinage of isto, isso, aquilo, tudo in lieu of preceding esto < istu(d), esso < ipsu(m), aquelo < accu + illu(d), todo < tōtu(m), as against unaltered (m.) este /e/ ~ (f.) esta /ɛ/; (m.) esse ~ (f.) essa; (m.) aquêle ~ (f.) aquela; (m.) todo ~ (f.) toda. This peculiar development occurred at such a late date as to have become amenable to direct observation. Spanish, I repeat, had no share in it,

continuing to tolerate, past the watershed of 1500, triads on the order of (m.) este ~ (f.) esta ~ (n.) esto, or resorting to tricks such as lo veo todo, which in its impact matches Ptg. vejo tudo.²³

4. The concluding problem of concern to us centers about a handful of Spanish deverbals in -ilón, flanking -er and -ir infinitives; e.g., com-ilón 'big eater', dorm-ilón 'sleepy-head', mord-ilón 'sharp-toothed', romp-ilón 'having a habit of breaking', beside com-er, dorm-ir, mord-er, and romp-er. Regionally (e.g., in Peru) one also runs into a few items ending in -alón, hugging -ar verbs, among them convers-alón 'chatty', peg-alón 'given to beating', tropez-alón 'stumbling easily', while in Mexico and sections of Central America counterparts in -elón, bracketed with -er infinitives, are reported to have surfaced: com-elón 'big eater', mord-elón as a facetious designation of 'a (bribe-taking) traffic cop'---two additional witnesses to the vogue of suffixal vowel gamuts.²⁴

4.1. At the outset, Latin formations in -ō/-ōne were, typically, denominal: ped-ō/-ōne 'foot soldier', later 'road-builder', from pēs, pēde 'foot' (cf. Sp. peón). Subsequently, vernacular derivatives from verbs, with (m.) -ōn respond-ōn, -ona 'ever-ready to reply', extracted from respond-er; grit-ōn, -ona 'vociferous', elicited from gritar, a phonosymbolically orchestrated verb, rather than from the corresponding noun grito, including the adverbial phrase a gritos; mand-ōn, -ona 'accustomed to giving orders', from mand-ar. All derivatives geared to the composite (or, better still, expanded) suffixes -ilón, plus the rarer -alón and -elón, turn out to be deverbal.

4.2. While searching for some suitable attachment, and having made sure that pan-Hispanic dorm-ilón could plausibly have acted as the leader word (and thus tendentially have imposed its characteristic penultimate vowel even on derivatives from com-er, mord-er, and romp-er), we stumble over It. dorm-igliare 'to dose', to which dorm-iglione, -a 'lazy riser' and dorm-iglioso, -a 'sleepy' seem to be subordinated. By experimentally reversing this hierarchy, we propose dorm-iglione as the leader of the contingent of Italian cognates; this move gives us the obvious benefit of the word's ready comparability with Sp. dorm-il-ōn. Could fairly isolated Sp. dormilón then have been a borrowing from better-integrated It. dormiglione? For all its instantaneous seductiveness, this hypothesis, on second thought, loses much of its plausibility. We happen to know a good deal about Italianisms in Spanish, absorbed, as a rule, between 1400 and 1700; they relate to such facets of culture and material civilization as: titles, forms of address, interjections, names of games, plays, and pastimes, features of travel and of rural living, the home and its interior design, garments, jewelry and adornments, cuisine, intimate life, moral qualities, contagious diseases, not to mention terms of fine arts, all sorts of performances, and literary crafts, armed forces and lay-out of fortifications, fleet and merchant marine, etc.²⁵ With all these domains dorm-il-ōn, obviously, has nothing at all in common.

4.3. Could dormilón, alternatively, involve *dormirón (from the infin. dormir), with dissimilation of the second r to l, as in carcel 'jail, prison' (from carcere) and in mármol 'marble' (from marmore), also in corcel 'steed' from borrowed OFr. corsier (=mod. coursier) < cursāriū, akin to currere 'to run'? While the rule (or mere tendency) thus invoked is tenable,²⁶ its application to the case at hand would be unrealistic, since no derivatives are known to have split off from integral infinitive forms in Spanish, except where habitually substantivated infinitives were involved, as with pesar-oso 'sorrowful, uneasy' and poder-oso 'powerful'.

4.4. Having staggered through two blind alleys, we may now forgivably turn our attention to an, at first glance, entirely different set of circumstances. The Latin inventory of zoonyms included uesper-t-iliō 'bat', from uesper 'evening'---the name of an animal notoriously active by night, yet shockingly sleepy by daylight; for the roots of intercalated -t- observe the adj. uesper-t-inus 'belonging to evening' (cf. G. 'abendlich', R. 'večernij'), while the segment -iliō reminds one of pap-iliō 'moth, butterfly' familiar from Fr. papillon. The preservation of uespertiliō in two Romance-speaking peninsulas, the Apennine (OIt. vipistrello, mod. pipistrello) and the Iberian (Ast. esperveyu, Gal. espetello, either one extracted from the parental nominative picked in exceptional preference to the oblique case) allows one to visualize Sp. *dormilar (which could have given rise to dormilón) and It. dormigliare (which defensibly underlies dormiglione) as having been independently transmitted from a common source in Folk Latin---a jocose elaboration on dormire suggestive of the erratic behavior of that animal (which not a few folks in those distant centuries held to be a bird)---namely,

the bat. This impression is reinforced by the existence of dormiller in French and of dormilhar in Old Provençal, which jointly form a territorial bridge between the two aforementioned peninsulas, and thus encourage us to push back into Antiquity the putative date for the mintage of the common ancestor.

5. To compress our stray impressions so far gathered and to cast into bolder relief the intended message: In all three cases here scrutinized, phonological arguments applied in isolation failed to lead us as far as one might, in an optimistic mood, have initially hoped for. Appeals to phonology alone sufficed to account for OSp. vergüēña and Ptg. vergonha, but to justify more successful vergüēña and less lucky vergonça, attention had to be riveted also to entirely different alliances of forces active in language growth, including the possible crystallization of an ephemeral suffixal vowel gamut -antia/-entia/*-untia. The change of mēcum to meço and thence to migo or, via analogy (or symmetry, or plain parallelism) the shift of nosco to nusco, etc., or else the transmutation of sē(r)su to seso and from there, in Portuguese alone, to siso, cannot serve as valid bits of evidence for the agency of metaphony, at least not under the given set of conditions: archaic meço became migo under heavy pressure from mí 'me', but the unraveling of that knot also required careful study of compositional models involving con, as post- and pre-position, and also otro. Finally, dormilón as the leader of a small group of Spanish colloquialisms ending either in -ilón or, less commonly, in -alón, -elón requires meticulous study of an unprecedented suffix, the starting point of whose zigzagging itinerary is best placed in the name of a strangely behaving animal, namely Lat. uespertiliō 'bat'. Should the solutions here cautiously advocated in the end turn out to be correct, then nobody should rejoice more in this than the true phonologist, whose path, as a result of the cleaning process here undertaken, may well have become less cluttered.

Endnotes

¹ In picking illustrations of modern-day usage, I have checked my memory against the information provided by standard dictionaries, mono- and bi-lingual, including those compiled by Figueiredo (1925), Reynolds (1962), Ušakov (1935-40), and Williams (1955). My principal sources for Latin were: Ernout & Meillet (1959-60) and Glare (19[68]-82).

² -Bund- and -cund- were the twin adjectival suffixes not transmitted into Romance, except as weakly characterized ingredients of individual words, chiefly Latinisms (cf. Fr. moribond, Sp. moribundo). Latin examples of the two series were plentiful: fā-cundus 'eloquent', fe-cundus 'fertile, abundant', irā-cundus 'hot-, quick-tempered, resentful', iū-cundus 'delightful'; gaudi-bundus 'rejoicing', mīrā-bundus 'amazed', pudi-bundus 'bashful', uagā-bundus 'strolling around'.

³ Corominas (1957:713), additionally, lists the 19th-century Latinisms (in)verecundo and verecundia and several vernacular items of marginal importance, including sinvergonzón and poca vergüenza, the latter flanked by Cat. pocavergonya. He further documents medieval desvergonç-ar(se) and -amiento as well as isolated occurrences of vergonçar, envergonç-ar and -amiento. The syntax of a- and des-vergonçar was previously studied with microscopic precision by Rufino José Cuervo (1886: 806-7; 1893: 1190-91).

⁴ The recession of -ia, however, was carried out less energetically than is usually assumed. There was sufficient time, Meyer-Lübke argued in both editions of his influential dictionary, for *spiss-ia 'thickness, tightness' and *strictia 'narrowness, contraction' to have sprung into existence in Gallo-Latin (1911-20, 1930-35: §§ 8159, 8302, 8305), while OSp. premia, which underlies mod. premio 'tight, close, troublesome, strict, rigid, slow, heavy, dull' and the corresponding abstract in -idad, was independently traced back to Hispano-Latin usage. For circumstantial discussion of this point, with full use of the phrases a premia, por premia, sin premia, salir de premia, etc., see Malkiel, 1953-55: 108-11).

⁵ The chief protagonists of that controversy---after a short play-off in Paris---were A. Horning (1883), R. J. Cuervo (on two occasions), J. D. M. Ford, J. Saroïhandy, and O. J. Tallgren-Tuulio; but A. Mussafia, G. Baist, W. Meyer-Lübke, R. Menéndez Pidal, J. Subak, and yet other investigators each also played a role in the dispute. For a partial summary of the results (and of the issues left unsolved) see two earlier papers of my own (1971: 1-52; 1982: 586-600).

⁶ It is helpful to remind oneself of the long-prevalent pronunciation of the *ç* as /s/; cf. G. zischen, a verb applying to reproachful or reprobative interjections uttered by spectators, or to R. cykat' ['sýkat'] 'to shout in threatening manner'. Conversely, the /ñ/ is widely associated with tenderness; cf. Sp. niño 'little child', ñoño 'delicate, plaintive', 'decrepit, impaired by age' < *noño.

⁷ In Galician, vergoña and its word-family (adjectives in -oso and -ento; -ar verbs ushered in by a-, des- or en-, etc.) prevail by a wide margin over vergonça and its system of satellites. Nevertheless, traces of vergonça have been discovered at Redondela; avergonzarse is characteristic of Pontevedra; conversely, in Lugo and Orense vergoña and its prongs clearly prevail. Speakers left undecided have at their disposal numerous synonyms of, e.g., avergonzar(se). For details see Carré Alvarellos (1933) and Crespo Pozo (1963), s.vv.

⁸ Dévergondage was preceded by dévergondement, and dévergondé for a while stood in competition with desvergogné, not to elaborate on its rivalry with éhonté, from honte. The leading French dictionaries, starting with Hatzfeld, Darmesteter, Thomas' (1890-1900), supply excellent information on the early use of the individual variants, but stop short of accurately defining the relation between vergogne and vergonde.

⁹ The etymology, which goes back to Cornu (1882: 95), is the more dependable as rigonha occurs in the translation of a passage of a Church Latin text, in which irācundia actually was used. The disappearance of the "dangling" (i.e., word-initial) front vowel can be explained away through application of the Lex Ascoli; the -rā- > ri- step (to say the least, unusual) may, in turn, lose some of its strangeness through appeal to the elimination of (ī)rācundu.

¹⁰ Romance linguists have demonstrably been operating with the concept of vocalic gamuts, in regard to suffixal derivation, for over a century. For details see two articles of mine awaiting publication (Forthcoming a and b).

¹¹ There exists a whole congeries of fairly recent writings, most of them middle-sized notes or short articles, on words entering into these three series. The latest approximation to a synthesis is Dworkin's monograph (1985), of which I prepared a lengthy critical appraisal (1986: 282-301).

¹² Over the years, I have devoted several consecutive inquiries to the three series here alluded to (1950: 17-45; 1959: 241-90; 1988: 409-34). The analysis developed there can be advantageously contrasted with the methods put to use by Hanssen (1913: §§ 270, 292); Alemany Bolufer (1920: §§ 21, 27, 107, 110, 170); and Alvar & Pottier (1983: § 309).

¹³ Galician-Portuguese shows the parallel development of -anca and -enca at its most effective. In Castilian, the diphthongization of ĕ in -entia > -ienca (cf. OSp. semienca 'seed') may have crippled that parallelism, but this thwarting process has little to do with the late-antique crystallization of *uerēcuntia. The Latin -ientia variant, as in sapientia 'wisdom', had little bearing on the evolution here surveyed, except among words transmitted through learned channels. Some segments of my (1945: 41-186) monograph bear re-formulation.

¹⁴ See forthcoming c and the epitome published in 1989: 44, under No. 117d.

¹⁵ I discuss similar chains of events in certain forthcoming publications; the reasons adduced are summarized in (1989: 42-43, under Nos. 114 and 115). The analysis of uerēcundia here offered differs in several respects from the approach I had recourse to on a preceding occasion (1944: 501-20). For a critical reaction to those early stirrings of my curiosity see Piel (1949: 283-85).

¹⁶ Even though, in his comparative phonology, the Vienna Romanist correctly interpreted co(n)migo as influenced by mī, and conusco as patterned on comigo (1890:§§ 120, 147), he proceeded somewhat capriciously in his dictionary, by arranging for separate entries for mēcum, tēcum, sēcum (1930[-35]:§§ 5450, 8610a, 7771a), yet neglecting to accord a similar quota of attention to nōbiscum, uōbiscum. The course taken by French, radically at difference with whatever is observable in the two peninsulas, cannot be separated from the rise in Romanized Gaul of the adv. avuec < ab (or ad) hoc, comparable to G. dazu, Fr. davantage, which eventually was called upon to function as a preposition (avec) and thus to act as an heir to con.

¹⁷ E.g., in the Appendix Probi (§§ 220-21). Baehrens (1922: 124-25), in discussing at some length the relevant passage, not only mentions [O]It. nosco, vosco beside Sp. conmigo, contigo, but also adduces arch. quīcu(m) 'with whom' and its occasional elaboration conquīcu in epigraphic context. He further documents instances of confusion of accusative and ablative (with the former usually emerging as the winner) after other prepositions, e.g., with prae echoing propter; the ambiguity of sē proved contagious in the widespread inscriptional formula pro se et suos 'for himself and his kinsfolk'.

¹⁸ For details see Sommer (1914:§§ 261-62), Kent (1946:§§ 308-10), and Ernout (1953:§§ 148-53). Even though reduplicative mēmē and mēd (its -d due to transfer from id 'it', illud 'that there', quid 'what') for a while were used interchangeably in accusative and ablative, their differentiation, had it been wanted, might easily have been achieved. Mihī, at the start, was at a certain disadvantage as a result of its lack of structural affinity with tibi and sibi; but the loss of -h- and -b- abolished the differentiating feature, making mī, tī, sī eligible for a new role in nascent Luso-Hispano-Romance.

¹⁹ By the same token, the---increasingly prominent---non reflexive 3d-person pronouns in Romance can be bracketed with demonstratives: The progenies of ille, iste, and ipse clearly belong together, and the first two groups, moreover, share a certain susceptibility to adoption of either ecce- or accu- as a prefixed deictic element. In addition to aquei medieval and classical Spanish boasted aqueste, etc. Old French can here serve as a helpful foil to Spanish (Meyer-Lübke, 1913:§§ 264-65).

²⁰ Only a modicum of sources can here be briefly identified. Williams (1962, 1968:§ 140.3) provides an overview of old and modern Portuguese variants and discusses the rivalry between co- and com- before migo, but remains inexplicit about the relation of e- to i- forms. Examples of OPTg. comego ~ cōmeço, comigo, migo, nosco, sigo, tigo, vosco can be culled from Rodrigues Lapa (1970: 24, 25, 62, 67, 97, 103, 110). Earlier, an equally valuable network of textual references for OPTg. comego, comigo, con migo, con nosco, consigo, contigo, convosco, convusco, meço, migo, nosco, sigo, vosco ~ vosqu', and vusco was established by Michaëlis de Vasconcelos (1905-20: 20, 21, 22, 53, 56, 60, 86, and 94). After 1500, the margin of wavering among Hispanophones dwindled to co- ~ con- before -migo, according to Keniston (1937: 56). Lloyd's flawless bird's-eye view presentation of the entire problem (1987: 278) derives its extra strength from mention of Leon. nosco, vosco; whatever his source on that score, it was not the celebrated monograph by Staaff (1907: 271) who, while meritoriously documenting from charters OLeon. connusco and convosco, -vusco, slipped in espousing J. Cornu's untenable conjecture (1884: 291).

²¹ See Malkiel (1988b: 44-55). A cross-connection with esso > isso, esto > isto may have been operative (see the following); however, it was Spanish rather than Portuguese that, in the end,

advanced mesmo to mismo 'same'.

²² See Malkiel (1981: 91-107). One suspects that the differentiation of the stress vowels in (m.) êste /e/ and (f.) esta /ɛ/, etc. could have acted as the prime stimulus for the transmutation of (n.) esto into isto, but this motivation does not hold for todo > tudo, which must consequently be categorized as an instance of analogically caused repercussion.

²³ Considerations of space prevent me from examining in depth the Italian evidence. In the Southern dialect zone, forms with and without con- (its nasal subject to assimilation to the following consonant) are seen to alternate. In the Abruzzi, Rohlfs observed the use of /meko/, /nosko/; in Southern Lazio he recorded comméco, cottéco; to justify metaphonic miecu, tiecu in Northern Calabria and Lucania, he saw himself forced to operate with [*]mĕcu, [*]tĕcu (1949: 61-62). Schuchardt's magisterial note on It. a teco meco 'you or I' (uttered in a defiant tone) follows the semantic decay of this phrase, after it percolated into Southern German (Techtel-mechtel 'secret understanding' > 'confusion, chaos') and, from there, even into Czech: tlachy-machy 'rumor mongering'. Equally fascinating is Schuchardt's allusion to Basque teke-meke 'provocation', except that he stops short of reconstructing convincingly its all-important itinerary (1907: 30-31).

²⁴ I owe knowledge of several items, chiefly those ending in -elón, to John F. Levy (pers. comm.), who, as a child, overheard them in Mexico City, but recently derived pleasure from re-acquainting himself with a few through a thoroughly updated dictionary (Smith et al., 1971). Levy correctly remarks that Mex. vacil-ón 'merrymaker, reveller' can be only indirectly invoked in the context of -ilón. The most successful collector of relevant colloquialisms has been, over the years, Beinhauer, roughly from 1930 until 1968 (passim).

²⁵ While details of Terlingen's Utrecht dissertation, devoted to this topic (1943), were subjected to criticism by J. E. Gillet and, in a more severe vein, by J. Corominas and other reviewers, the cultural ambit of the flow of borrowings he circumscribed turned out to be reliable.

²⁶ For exemplification see Posner (1961: 105-24); and for criticism, Togeby (1964: 642-67, esp. 665-66). The relation between Gallo-Rom. -el, -(i)er and Sp. -el was studied in searching detail by A. K. Levy (1967: 296-320).

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HISTORICAL LINGUISTICS AND LINGUISTIC THEORY:
REDUCING THE ARBITRARY AND CONSTRAINING EXPLANATION

Marianne Mithun

University of California, Santa Barbara

It is sometimes assumed that since speakers lack direct access to the histories of their languages, theoreticians seeking to understand human linguistic capacities should ignore these histories as well. Yet we know that speakers acquire arbitrary systems they would not create in a single stroke. Simply because learners accept some synchronic arbitrariness, we need not reject the opportunity to understand the cognitive forces that mold their languages in the first place.

Languages are the way they are not only because of static design principles: they are much more than simple one-to-one reflections of innate cognitive structures. No natural human language that we know of was created instantaneously by a single mind. Learners begin their task with a full inherited system as a point of departure, a system that was shaped by previous generations of speakers. Only by untangling the successive adjustments and innovations contributed by each do we have an opportunity to both appreciate and delimit the actual creative abilities that make languages the way they are.

Several kinds of abilities stand out as we trace the histories of languages. First, we know that learners willingly absorb a substantial amount of seemingly arbitrary structure and substance. They happily learn relics and archaisms, lexical items whose internal structures no longer correspond to general grammatical patterns or whose meanings no longer equal the semantic sums of their parts. They quickly assimilate apparently arbitrary formal and grammatical categories.

Second, we know that learners perceive some of this arbitrariness and set about repairing it, reinterpreting and remodeling parts of the systems they are confronted with. Of course no learner rebuilds a system in its entirety. Languages are at the mercy of a multitude of speakers with a variety of experiences, and they are sufficiently rich systems that they will always invite change from multiple points of entry. Change will always be universal.

Third, a key ability speakers display is the capacity to routinize operations in order to distribute attention effectively. This is especially evident in two processes: lexicalization and grammaticization. By lexicalization, the storing of morphologically or syntactically complex expressions as single lexical items, both speakers and hearers can bypass repetitious morphological and syntactic calculations of constructions that recur frequently. By grammaticization, the solidification of grammatical categories, speakers can automate the decisions they make most often. Both lexicalization and grammaticization may appear superficially to create arbitrariness, since they can

obscure structural and semantic transparency. In fact, their power to organize the deployment of consciousness sets them among the most functional of all diachronic processes.

Change creates differences among languages, and differences are sometimes dismissed as peripheral to the understanding of innate human language abilities, since they are not universal. If we restrict our attention to synchronic similarities among languages, however, we may never observe more than a static reflection of a subset of human language abilities. The changes speakers make may seem to involve accidental features of language, but they are seldom arbitrary. In reconstructing the events that produce differences, we gain an opportunity to observe the results of human minds working creatively to mold language systems: linguistic abilities in action. In what follows, examples will be discussed of the relevance of the diachronic dimension to synchronic explanation in several areas: the concrete shapes of morphemes, their meanings, the nature of grammatical categories, and principles determining their arrangement.

1. The shapes of morphemes

Among the aspects of languages often considered the most arbitrary are those that are the most concrete. The particular shapes of morphemes, for example, are often dismissed as so variable as to be without general interest. They are obviously not innate. Relationships among the shapes of morphemes within a language, however, can often point the way to the identification of quite non-arbitrary dynamic language capacities.

In Mohawk, a Northern Iroquoian language of Quebec, Ontario, and New York State, all verbs contain pronominal prefixes referring to their core arguments. The prefixes distinguish two cases, three persons, inclusive and exclusive first person, three genders in third person, and three numbers. The total number of agent, patient, and transitive pronominal prefixes is thus large: over sixty. Most of the prefixes have several forms. The neuter singular agent 'it', for example, is usually *ka-*, but before vowels *a*, *e*, and *ə* it appears as *w-*.

(1) Mohawk*

<i>ka-hnekihrha'</i>	'it drinks'
<i>i:-w-e's</i>	'it is walking around'

A partially similar morpheme *-wa-* can be isolated in first and second person prefixes. It indicates plurality.

(2) Mohawk

<i>te-wa-hnekihrha?</i>	'we all (inclusive) drink'
<i>yak-wa-hnekihrha?</i>	'we all (exclusive) drink'
<i>se-wa-hnekihrha?</i>	'you all drink'

Since Mohawk contains so many prefixes, but only nine surface consonants, the resemblance between the neuter allomorph *w-* and

the plural marker *-wa-* seems likely to be due to chance. Their lack of an obvious semantic relationship supports this conclusion.

A diachronic investigation of the forms, however, shows their resemblance to be more than accidental. First consider their shapes. In third person pronouns, the plural morpheme is *-ti-* before consonants.

(3) Mohawk

ra-ti-hnekíhrha? 'they (masculine) drink'
ra-hnekíhrha? 'he drinks'

The neuter plural pronoun is a fused form in Mohawk, but compare the neuter pronominal prefixes in a related language. Seneca shows the same *ka-/w-* allomorphy for the neuter singular pronoun.

(4) Seneca (Myrtle Peterson p.c.)

ka-:nékeha? 'it drinks'
i:-w-e?sa 'it is walking around'

The neuter plural pronoun in Seneca is *wati-*.

(5) Seneca (Myrtle Peterson p.c.)

wa-tí:-neke:ha? 'they drink'

Since the plural marker is *-ti-*, the neuter plural *wati-* suggests that the original shape of the neuter pronoun was *wa-* before consonants. In both languages, the *a* disappeared by regular rule before vowels *a*, *e*, and *ə*, the only contexts in which the form now appears in Mohawk. The *a* of the plural marker disappears in the same contexts: note Mohawk *ítawe* 'Let's go!'. The neuter and plural morphemes thus originally had exactly the same shape: *w(a)*.

To retrieve the semantic connection between the modern neuter and plural markers it is necessary to delve back further in time. The Iroquoian languages are remotely related to two other groups: Siouan and Caddoan. Most of the Siouan languages contain a verbal prefix *wa-* (or a cognate) that indicates the involvement of an indefinite patient in an otherwise transitive event.

(6) Mandan (Kennard 1936: 33)

wa-éka?e he '(he) heard **something**, it is said'
εka?e he 'hear-quotative'

(7) Santee (Martha St. John, p.c.)

wa-špáwaye 'I'm cooking (**something**)'
bó špáwáye 'I'm cooking potatoes'

(8) Winnebago (Lipkind 1945: 17)

wa-rúc' 'to eat **something**'
rúc' 'to eat it'

- (9) Osage (La Flesche 1932)
wa-báha 'to signal (display **something**)'
bahá 'to show, display'

- (10) Biloxi (Einaudi 1976: 78)
a-duti 'eat **something**'
duti 'eat'

The Siouan prefix is not a pronoun. It reduces the valence of a verb. The second verb in each pair above is transitive and can appear with a separate nominal object, but the first cannot.

The Siouan indefinite patient detransitivizer has evolved semantically in two different directions. In some languages, it now marks an indefinite participant in any role. Note its use in the Mandan example below to mark an indefinite intransitive agent.

- (11) Mandan (Kennard 1936: 40)
óti warópæktek '**something** might enter the lodge'
wá:ksa '**something** must have happened'

The subsequent development of this prefix to a referential definite pronoun would be a short step. It is not uncommon across languages for indefinite markers to develop into referential pronouns. (See Mithun 1988a.) The Caddoan languages, for example, contain first, second, and indefinite third person pronominal prefixes ('someone'), but no definite third person prefixes. The indefinite pronoun can be reconstructed for the family as a whole (Chafe 1976). In modern Caddo, the indefinite pronouns are used not only for unidentified individuals, but to refer to one's in-laws, already a step toward definite referentiality.

The Proto-Caddoan indefinite agent pronoun **yi-* has cognates among all of the Northern Iroquoian languages including Mohawk. Northern Iroquoian **ye-* has retained the indefinite meaning 'someone' but it has also developed an additional meaning: 'she'. The Proto-Caddoan indefinite patient pronoun **yu-* is cognate with the Northern Iroquoian neuter patient prefix **yo-* 'it'. An Iroquoian cognate of the Proto-Siouan indefinite **wa-* probably developed into the Mohawk neuter agent *w-* by the same process.

The Proto-Siouan prefix **wa-* evolved in another direction in a number of Siouan languages. The indefiniteness of the prefix has resulted in a blurring of number. The prefix has developed a distributive sense, spreading events over indistinct participants.

- (12) Dakota (Martha St. John, p.c.)
wa-špáwaye 'I'm cooking **things**'

- (13) Biloxi (Einaudi 1976: 78)
nk-a-da 'I gather **things**'

In a few of the languages, the prefix has developed into a full-fledged number marker, a not uncommon step from a distributive

(Mithun 1988b). Note the use of *wa-* to indicate plurality of third person direct and indirect objects in the verbs below.

- (14) Ponca (Boas and Swanton 1911: 915-6)
wa-čána'aⁿ 'thou hearest (about) **them**'
čána'aⁿ 'thou hearest (it)'
- (15) Winnebago (Lipkind 1945: 22)
wa-rahé 'thou buriest **them**'
rahé 'thou buriest (him)'
- (16) Ioway-Oto (Whitman 1947: 244)
wa-gíwaxúñie 'they sacrificed (it) to **them**'

The Caddoan languages retain traces of a similar development. A morpheme *wa-* appears in Pawnee and Wichita as a distributive (Parks 1976, Rood 1976). It has further developed into a number marker in two of the languages, although in different ways. In a few Wichita verbs, it marks duality of subjects. In Caddo, it marks plurality of third person animates.

Comparative evidence thus indicates that the homonymy between the Mohawk neuter and plural markers is not accidental after all. Both probably descended from an original indefinite detransitivizer **wa-* cognate with that reconstructed for Proto-Siouan. On one side, the prefix was reanalyzed as a general indefinite neuter pronoun, then a definite one. On the other, it was interpreted as a distributive marker, then a plural. Each of the steps in this development reflects a semantic extension that is not uncommon cross-linguistically (Mithun 1989). The link is undoubtedly no longer present in the minds of modern Mohawk speakers, but the diachronic account does explain why a piece of the modern language is as it is in terms of individual, motivated reinterpretations.

The unraveling of this development also provides evidence of the actual kinds of reanalyses speakers make. Some of these are semantic, like the generalization of indefinites to definites, or of distributives to plurals. Others are formal. Recall that in Mohawk the allomorph *w-* alternates with *ka-* according to phonological context. *ka-* has an interesting history of its own, similar to that of *wa-*. Prefixes of this shape also appear in modern Siouan, Caddoan, and Iroquoian languages. In Mandan (Siouan), it is an agentive nominalizer: *ka-ro're* 'one who spoke > speaker' (Kennard 1936). In Biloxi (Siouan) it is part of the indefinite pronoun: *ka-wa* 'someone' (Einaudi 1976). In Pawnee (Caddoan), it is an iterative: *ka-ka?uc* 'to bite repeatedly', *karu* 'to make **them**' (Parks 1976). In Caddo (Caddoan), it combines with another prefix to indicate plurality of objects: *haka-* (Chafe 1976). In Cayuga and Tuscarora (Iroquoian), it marks plurality of third persons: Cayuga *he-ká-ə?* 'they will go'. At a certain point in Northern Iroquoian, the prefixes *wa-* and *ka-* had become so similar semantically that speakers reinterpreted their alternation as a formal one: *w(a)-* before certain vowels, *ka-* elsewhere.

2. The meanings of morphemes

In Central Pomo, a language of Northern California, many verb stems contain prefixes like those below.

(17) Central Pomo (Frances Jack p.c.)

<i>léy</i>	'for a group to die'
<i>daléy</i>	'clean all up, as gathering up all the nuts with hands'
<i>maléy</i>	'wear out the sole of the shoe'
<i>p^haléy</i>	'for water to wash everything down, as dirt from bank'
<i>baléy</i>	'buy out'
<i>č^haléy</i>	'win everything in gambling'
<i>čaléy</i>	'wear out a cushion or hole in pants'
<i>qaléy</i>	'eat something all up'
<i>sléy</i>	'drink something all up'
<i>hléy</i>	'mash something all up, as when pounding acorns'
<i>šléy</i>	'pick everything off, as fruit from branches or seafood from rocks, or dip all liquid out'
<i>p^hléy</i>	'for wind to carry everything away'
<i>mléy</i>	'burn'

The exact meanings of the prefixes are clearer in some verbs than in others, but certain regularities emerge. The prefix *da-* often means 'by pushing', especially with the hands, *ma-* 'by stepping', *ča-* 'by sitting', *qa-* 'by biting', *s-* 'by sipping or sucking', *h-* 'by poking or jabbing', etc. The prefixes sometimes contribute a causative meaning as well, as can be seen above.

The prefixes are pervasive in the lexicon, but their meanings are not always translatable by a single English gloss. Consider the prefix *š-* in the verbs below.

(18) Central Pomo (Frances Jack, p.c.)

<i>šq^háan</i>	'dragging something along'
<i>šʔól</i>	'pull a card out from a pile in a card game'
<i>šlíw</i>	'for tide to go down, water to recede'
<i>šk'ún</i>	'close, as a door, gate, trunk, book, etc.'
<i>šq^hát'</i>	'rip, tear, pull something apart'
<i>šlóščiw</i>	'pull something off with a yank'
<i>šdíw</i>	'pull a bucket out of a well, string beads'
<i>št^háw</i>	'open a door or gate, untie something'
<i>šdíw</i>	'hold something by the handle, as a purse or basket'
<i>ščéw</i>	'catch something, hook it, tie it up'
<i>št^háw</i>	'dangle something to estimate its weight'
<i>šyól</i>	'stir something with a handled instrument'
<i>šyúʔčiw</i>	'start picking fruit from branch, collecting seaweed'
<i>šyéw</i>	'stop weaving, picking fruit, collecting seaweed, etc'
<i>šdíč'</i>	'pick up a burden off the ground to carry on back as in a burden basket with a tumpline'

All of the verbs seem to involve pulling, dragging, dangling, hooking, etc., certainly related notions.

Compare the verbs in (19) containing the prefix *p^h-*.

(19) Central Pomo (Frances Jack, p.c.)

<i>p^h báw</i>	'split wood'
<i>p^h yú?čiw</i>	'start chopping wood, or start to hit something'
<i>p^h yéw</i>	'stop chopping wood, etc.'
<i>p^h t'ún</i>	'drive in a peg to stop a leak'
<i>p^h t'éeč'</i>	'hammer a nail into the wall'
<i>p^h tós</i>	'knock something down by swinging with a stick'
<i>p^h láš</i>	'miss a ball when swinging'
<i>p^h k'ún</i>	'blow shut, nail shut'
<i>p^h t'ólčiw</i>	'blow over something spillable'
<i>p^h t^h áw</i>	'blow open, as wind on door'
<i>p^h líw</i>	'wave in the wind'
<i>p^h t^h áw</i>	'flap in the wind'
<i>p^h diw</i>	'fly'
<i>p^h dúut'</i>	'blow, as on soup or fire'
<i>p^h déen</i>	'flying along, watching, caring for'
<i>p^h ?ól</i>	'glance over'
<i>p^h nép^h new</i>	'look over critically'
<i>p^h yéq'</i>	'impress visually'
<i>p^h wíw</i>	'see'
<i>p^h yáaq'</i>	'recognize'
<i>p^h t' áw</i>	'appear, seem'

The range of meanings attributable to the prefix *p^h*- are a bit more diverse, but a common thread can be discerned, some kind of movement along a path by arms, air, or sight.

Now compare the verbs in (20) containing the prefix *m-*.

(20) Central Pomo (Frances Jack, p.c.)

<i>mtós</i>	'kick'
<i>mt'ólčiw</i>	'knock over with the elbow or foot'
<i>mséc'</i>	'sniff at something'
<i>mláš</i>	'miss when trying to kick, or miss in marbles'
<i>mdéen</i>	'dancing along, or fire burning along'
<i>mt'éeč'</i>	'catch fire'
<i>mbáč'</i>	'burst open, as from swelling from heat or frost'
<i>mt'ún</i>	'clogged, as a hole clogged with dirt'
<i>mk'ún</i>	'be constipated'
<i>myú?čiw</i>	'begin to ache'
<i>mlólčiw</i>	'melt'
<i>mt' áw</i>	'cooked'
<i>myól</i>	'cook various things together in same pot'
<i>mčów</i>	'chaf'
<i>mt'óy</i>	'blister'
<i>mt^h áw</i>	'unravel'

The common semantic thread is in some cases less obvious here. Metaphoric extension linking kicking, sniffing, elbowing, marble shooting, catching fire, bursting, clogging, constipation, aching, heat, frost, and unravelling moves from the predictable to the far-fetched, but the boundary is not altogether clear.

Comparative evidence from related languages in the Pomoan family sheds light on how some of this system came to take its current form. Central Pomo underwent a phonological change whereby all pretonic vowels except *a* disappeared from initial syllables. (See Oswalt 1964.) The vowel loss caused considerable syncretism among the instrumental prefixes. In his description of Kashaya Pomo, Robert Oswalt lists prefixes similar in form and meaning to the Central Pomo prefixes described above. The Central Pomo prefix *š-* is cognate with both the Kashaya prefixes *č^hi-* and *š^u-* according to regular phonological correspondences.

(21) Kashaya (Oswalt 1960)

č^hi- 'by holding a small or constricted part of a larger object', often 'by an instrument with a handle'

č^hi^de·du 'to carry or drag something by a handle, to lead someone by the hand' and commonly 'to carry in a sack held by the neck and slung over the shoulder'

š^u- 'by pulling, by alternately pushing and pulling, with a long flexible object'

š^uh^táw 'to pull open (a door) (-ht^ha- 'to open')

Sally McLendon lists a pair of cognate prefixes with the same meanings in her grammar of Eastern Pomo.

(22) Eastern Pomo (McLendon 1975)

k^hi·k^hó· 'tie up something'

k^hi·dí·l 'pack on back'

š^u·dí·l 'lead child along by hand, animal along by rope'

The modern Central Pomo prefix *š-* thus descended from two separate prefixes, one meaning 'by hooking/catching/dangling', the other 'by pulling'. Their separateness is often still evident in speakers' descriptions of meaning. In translating the verb *š^tháw*, for example, Mrs. Jack said, "That can be used in two ways. One way, it means opening something, like pulling open a door or a gate. The other way, it means untie something."

The Central Pomo prefix *p^hi-* also has at least two sources. Its Kashaya cognates are *p^hi-* and *p^hu-*.

(23) Kashaya (Oswalt 1960)

p^hi- 'with the side of a long object, with the eyes, with an axe, hammer, etc.'

p^hi^hc^háw 'to knock over with the side of a long object'

p^hi[?]táw 'to look, to seem, to appear, ...'

p^hu- 'by blowing'

p^hu^hc^háw 'to blow over'

A similar pair of prefixes exists in Eastern Pomo.

(24) Eastern Pomo (McLendon 1975)

p^hi·dák^h 'break up/open something with an instrument such

as an axe'

p^hi·qó· 'recognize through sight'

p^hu·šú·l 'blow'

p^hu·dí·l 'fly'

The Central Pomo prefix *p^h-* is thus the modern reflex of two different prefixes, one meaning 'by swinging, with the side of a long object, or by seeing', the other 'by blowing'.

The Central Pomo prefix *m-* has Kashaya cognates *mi-* and *mu-*.

(25) Kashaya (Oswalt 1960)

mi- 'with a small projection near the end of a long object, with the toes, with the nose, by kicking, by smelling, by counting, by reading'

mihc^haw 'to kick over, to knock over with the toes'

mišew 'to smell'

mu- 'with energy—kinetic, thermal, photo, or psychic; by a quick movement, with something moving quickly, with heat, with light, or with the mind or emotions'

muʔt^haw 'to be cooked'

moʔbow 'to swell from being inflamed (as an infection), to swell or rise from being cooked (as bread in the oven)'

These correspond to a similar pair in Eastern Pomo.

(26) Eastern Pomo (McLendon 1975)

mi·bá·k^h 'kick open'

mi·qó· 'identify by smelling'

mu·dá·k^h 'override melon to split open by itself'

The modern Central Pomo prefix *m-* thus has two ancestors, one meaning something like 'by means of a protruding end', the other 'by internal force, etc.'.

Historical information can thus play an important role in constraining our theories about the human language capacities that mold language. It can, as in the Central Pomo example, save us from overhasty hypotheses concerning the scope of synchronic metaphorical extension, as from swinging to blowing. Of course without further historical information, it is difficult to determine whether the Proto-Pomo **p^hi-* was itself the reflex of two separate forms, one meaning something like 'by swinging' and the other 'by seeing', or the product of metaphorical extension.

It is possible that modern Central Pomo speakers have begun to remotivate some of the prefix homophony on new grounds, reinterpreting some pairs of homophones as single morphemes. Identification of such reinterpretation adds valuable information to our investigation of the actual processes that mold linguistic structure. Without the diachronic dimension, however, it would be impossible to distinguish the genuine metaphorical extensions that speakers make creatively from reinterpretation of existing forms.

An awareness of the diachronic events underlying modern

structures can tell us still more about the special language abilities of speakers. The loss of most vowels from initial unstressed syllables in Central Pomo seems like a perverse development, particularly since it causes the collapse of eight highly productive categories into four. If language change is motivated, why would speakers permit this loss? The omission of unstressed vowels might result in some economy of energy, but the semantic cost seems prohibitive. In fact, the loss is not so devastating when another factor is considered.

The Central Pomo prefixes are derivational: they provide a means of creating new lexical items. They are highly productive, but speakers know not only what a particular combination of prefix and root would mean, but whether it currently exists in the lexicon or not. They know its particular usages. Many combinations occur frequently in so many contexts that their meanings are relatively general, but when speakers translate most complex verbs, they provide very specific contexts in which the words are used. The verb *š-ʔól*, for example, means literally 'evoke by pulling', but the verb is used specifically when drawing cards from a deck. The combinations in which the prefixes appear are lexicalized, stored as units in speakers' minds. The loss of pretonic vowels is more a loss from full words than a loss from prefixes. It affects hearers' ease of word recognition more often than their semantic calculations.

3. Grammatical categories

An important area of language that is often considered particularly arbitrary is the central portion of grammar where speakers have the fewest options. The category of subject is highly grammaticized in English, for example, so that English speakers must specify a subject even when there is nothing for it to refer to, as in weather expressions like *It is raining*. The subject must be the first major constituent in the sentence, even if it is nearly meaningless. Yet assuming that the most rigidly grammaticized area of a language is the most arbitrary is often a superficial view.

A number of languages encode the roles of primary participants not into categories corresponding to English subjects and objects, nor into ergatives and absolutes, but into categories sometimes labeled agent and patient. The semantic motivation for these labels can be seen by comparing the forms of the first person pronouns in the Central Pomo sentences below.

(27) Central Pomo (Eileen Oropeza, p.c.)

a *ʔaa* *qaanémaač'in* *múʔu*
 1.AGENT as was talking to 3.PATIENT
 'As I was talking to him ...'

b *čáač'* *ʔel* *ʔoo* *ʔihla* *kay* *baaqówba*
 man the 1.PATIENT again too see and
 'The man saw me again, too, and ...'

- c *ʔaa nánaan.*
 1.AGENT was struggling
 'I was struggling.'

- d *ʔoo dáawadan.*
 1.PATIENT was wanting
 'I was craving (it).'

The subject of (27a) is agentive, so it has the same form as the agent subject of (27a), while the subject of (27d) is not actively in control, so it has the same form as the patient object of (27b). The categories seem all the more semantically motivated when it is noted that certain predicates can appear with either an agent or patient argument, depending upon the degree of control attributed to this participant. (See McLendon 1975 and O'Connor 1987 for similar examples from other Pomoan languages.)

(28) Central Pomo (Frances Jack, p.c.)

- a *(ʔaa) k'luuk'luučla.*
 1.AGENT cough-SEMELFACTIVE-SPEAKER.ACTION
 'I coughed.' ('I tried to and did.')

- b *(ʔoo) k'luuk'luučya.*
 1.PATIENT cough-SEMELFACTIVE-IMMEDIATE
 'I coughed.' ('Before I knew it, I had to cough.')

In many languages with agent and patient categories, however, case is so rigidly grammaticized that speakers have no choice in any given context.

In fact for many languages of this type, the terms agent and patient have been avoided as grammatical labels on the grounds that the categories are not always well motivated semantically. All arguments classed in the first category do not function uniformly as agents, and all those in the second do not function uniformly as patients. It is felt that the categories should be labeled with more arbitrary, less functional names, corresponding to their arbitrary grammatical status. Apart from terminological questions, dismissing them as arbitrary can be premature. The seeming arbitrariness can be due to several factors.

3.1. Imprecise understanding of functions

In some instances, the precise function of the category grammaticized has simply not been fully understood. In Central Pomo, the verbs *lóow* 'fall' and *ʔtʰál* 'be sick, hurt' typically appear with patients. Yet in recounting an accident to a friend, a speaker systematically used agent pronouns with these verbs.

(29) Central Pomo (Eileen Oropeza p.c.)

- a *ʔaa kʰárwi hʔow lóow. ...*
 1.AGENT car-IN from fall-PRF
 'I fell out of a car.'

- b *ʔaa ʔtʰál tʰín min ʔčʰáaw híhdumma.*
 1.AGENT hurt not like sit say-PRF=FACTUAL
 'I sat there like I wasn't even hurt, they said.'

Catherine O'Connor has pointed out that with Northern Pomo verbs of this type 'the P-case is associated with an expressive function and the A-case is associated with what intuitively seems to be an affectless, reportive mode' (1987: 202). This description fits Central Pomo well. The agent case is the unmarked case. Only nominals referring to human beings with whom the speaker indicates a certain empathy appear in the patient case. The distinction between agent and patient case is highly functional, but part of the function is easy to overlook. It is not uncommon for grammatical categories to have complex functions.

3.2. Lexicalization

Sometimes a finer description of function still does not remove the seeming arbitrariness of grammatical categories. An example of this can be seen in Mohawk. Arguments are distinguished in the Iroquoian languages, as in the Pomoan languages, essentially according to their roles as agents or patients. The category is marked on the pronominal prefixes within each verb.

(30) Mohawk

katsherón:nis
 k-atsheruni-s
 1.AGT-dress-HABITUAL
 'I get dressed up'

wake?nikónhrhens
 wak-ʔnikuhr-ʔ-s
 1.PAT-mind-fall-HABITUAL
 'I forget'

Case is highly grammaticized: speakers have no choice of case in any particular construction. In general, the categorization appears straightforward. Verbs meaning 'run', 'jump', and 'make' appear with agents, while those meaning 'sleep', 'smile', and 'be sick' appear with patients. Transitive verbs appear with a combination of each. In a few instances, however, the case assignment appears countersemantic. Such an example is the Mohawk verb 'throw'. One would certainly expect a thrower to be categorized as an agent, but this verb invariably appears with a patient. (Neuter patients are not marked in transitive prefixes.)

(31) Mohawk

wakátie's
 wak-ati-eʔs
 1.PAT-throw-HABITUAL
 'I throw (it/them)'

wakátion
 wak-aty-ʔ
 1.PAT-throw-STATIVE
 'I have thrown (it/them)'

Historical considerations indicate that this case marking is not accidental. The most common verb for 'lose' in modern Mohawk is built on the root *-ahty-* 'disappear': *wak-ahty-ni*: 1.PATIENT-disappear-DATIVE = '(it) has disappeared from me' > 'I have lost it'. A second term for losing is the verb in (31) above: *-ati-*.

Both terms are documented in missionary records. Note the entry below for 'j'ai perdu ma bourse' in a dictionary from 1826.

(32) Mohawk (Marcoux ms, 1826)

<i>Sakátion</i>	<i>ou Sakahtónni</i>	<i>nak8ísta</i>
wakátyu	(or) wakahty:ni	nakhwísta?
wak-ati-yu	wak-ahty-ni	ne ak-hwíst-a?
1.PAT-lose-STAT	1.PAT-disappear-DAT.STAT	DEF 1.PAT-metal-NOM
'I have lost (or) it has disappeared from me my money.'		

The verb *-ati-* with the meaning 'lose' actually goes back much further than 1826. In some of the Iroquoian languages, like Seneca, it now means only 'throw', but in others, it persists with both meanings, 'lose' and 'throw'. Both meanings persist in Tuscarora, the most distantly related Northern Iroquoian language. (Tuscarora probably separated from the other Northern Iroquoian languages several thousand years ago. The sequence ?*n* is the Tuscarora reflex of Proto-Iroquoian **t* in this context.)

(33) Tuscarora (Elton Greene p.c.)

əwaká:ʔni?

ə-wak-aʔni-ʔ

FUTURE-1.PATIENT-lose/throw-PUNCTUAL

'I will lose (it)'/ 'I will throw (it)'

Synchronically, the use of patient pronouns with a verb meaning 'throw' seems arbitrary, but there is a clear historical explanation. The verb *-ati-* initially meant 'lose'. It appeared with semantically motivated patient pronouns referring to the loser. Over time, the meaning of the verb was generalized to include getting rid of things with or without intention. The use of patient prefixes with this root had already become established and continued after the meaning of the verb was generalized. This persistence confirms the fact that speakers did not recreate these morphological structures every time they spoke. Once words are lexicalized, speakers usually simply select them. This automation may on occasion give the appearance of arbitrariness, suggesting that the grammatical categories are not functional. In fact, the automation of frequently recurring constructions is highly functional, allowing speakers to focus their attention on new aspects of their message rather than on recalculations of familiar forms.

3.3. Grammaticization

Case assignment sometimes seems arbitrary for other reasons. In Mohawk, as in most such languages, some participants are clearly more agentive than others, but all are classified equivalently by the grammar. A man who slays an enemy may seem more agentive than a baby who watches birds, but both may be expressed by the same masculine agent pronoun. In fact, strict categorization is highly functional in itself. The grammaticization of case into two distinct categories, agent and patient, permits speakers

to avoid spending time weighing the precise degree of agency involved in every proposition they express and distracting hearers with nonessential details. When details are desired, of course, there are alternative means within the language to express them.

Grammaticization also often involves markedness. The line of demarcation between two categories is not necessarily halfway between their prototypical functions. Often one category serves as a default option, so that unless there is clear motivation for assigning something to the marked category, it is automatically relegated to the unmarked one. Markedness is also functional: it reduces the effort speakers exert in pondering borderline cases.

Grammatical case in Mohawk could be interpreted as arbitrary for still another reason. Indicative verbs are obligatorily inflected for aspect: habitual, punctual, or stative. Some verbs are inherently stative and appear only in the stative aspect, but most other verbs can appear in all three.

(34) Mohawk

ká:rats
k-arat-s
1.AGENT-lie-HABITUAL
'I lie down'

rários
ra-ryo-s
M.AGENT-kill-HABITUAL
'he kills, he is a killer'

enká:rate'
q-k-arat-?
FUTURE-1.AGENT-lie-PUNCTUAL
'I will lie down.'

wahário'
wa-hra-ryo-?
FAC-M.AGENT-kill-PUNCTUAL
'he killed (it)'

waká:ratoñ
wak-arat-q
1.PATIENT-lie-STATIVE
'I have lain down'

rório
ró-ryo
M.PATIENT-kill-STATIVE
'he has killed (it)'

These stative verbs exhibit an interesting case arrangement. Note that the pronouns appear in the agent case with the habitual and punctual forms, but in the patient case with the stative forms. (Recall that neuter participants are not represented in transitive prefixes.) This case shift within paradigms seems arbitrary, but a semantic rationale can easily be found for it. For most verbs that appear in three aspects, the stative aspect focuses on a resultant state over which the major participant no longer exerts active control. Once I have lain down, I am no longer acting, I am simply lying, undergoing the continuing effect of an earlier event. Once he has killed, he is exerting no further effort. This interpretation may well have been the motivation for the initial grammaticization in the first place.

The use of patient case with all stative verbs of this type is highly grammaticized. Speakers have no choice. This grammaticization is as functional as the original solidification of the two categories. The choice of case is routinized, freeing the consciousness of both speaker and hearer from dwelling on those

decisions that are made the most often, to focus on more novel aspects of the message.

A synchronic description of the Central Pomo and Mohawk case systems in immediately functional terms would thus be superficial. When the diachronic dimension is added, however, and the highly functional processes of lexicalization and grammaticalization recognized, the motivation behind the step-by-step creation of the synchronic system becomes clear.

4. The shapes of grammatical systems

An area of grammar in which speakers have almost no choice is in the relative order of morphemes within words. As Bybee (1985) has shown, the orders of morphemes are not completely random. Cross-linguistically, the order of affixes within words tends to reflect their degree of 'relevance' to the root: those whose meaning most directly affects or modifies the root tend to appear closest to it.

A purely synchronic approach to the ordering of morphemes can leave unexplained much that is motivated, however. Morphological patterns are rarely assembled all at once; categories tend to be grammaticized in stages. Students working with Lakshota in field methods classes, for example, sometimes raise the question whether the determining factor in the ordering of pronominal affixes is grammatical relations or animacy. In Lakshota, a Siouan language of South Dakota, first and second person agents and/or patients are specified by means of verbal prefixes as below.

(35) Lakshota (Stanley Redbird p.c.)

Agents		Patients	
<i>wahí?</i>	'I came'	<i>wahíxpaye</i>	'I fell'
<i>yahí?</i>	'you came'	<i>nihíxpaye</i>	'you fell'

Lakshota contains no pronominal prefixes referring to third person singular participants. To identify third persons, speakers use separate nominals, demonstratives, or preceding context.

(36) Lakshota (Stanley Redbird p.c.)

hé hí? 'that one (he/she/it) came'

Transitive verbs involving third persons contain the same prefixes as intransitives without them.

(37) Lakshota (Stanley Redbird p.c.)

<i>awáhi</i>	'I brought (it)'	<i>španáye</i>	'(he) burned me'
<i>ayáhi</i>	'you brought (it)'	<i>španíye</i>	'(he) burned you'

The discussions of the principles governing affix ordering usually involve transitive verbs with combinations of prefixes. Combinations of first person singular agent with second person patient are expressed by a single fused prefix *č^hi-* 'I/you', so they provide few clues to this question.

(38) Lakhota (Stanley Redbird p.c.)

špač^hiye 'I burned you'

Other combinations of agent and patient are expressed by means of series of prefixes, however.

(39) Lakhota (Stanley Redbird p.c.)

špa-má-ya-ye 'you burned me' (1.PAT-2.AGT)
ME-YOU

hená špa-wič^ha-wa-ye 'I burned them' (3.PL.PAT-1.AGT)
THEM-I

hená špa-wič^ha-ya-ye 'you burned them' (3.PL.PAT-2.AGT)
THEM-YOU

On the basis of paradigms like these, Lakhota third person plural object markers are posited to occur first and second person subjects last. Because of the fused form *č^hi-*, either the order THIRD-FIRST-SECOND person or PATIENT-AGENT could be hypothesized.

(40) Ordering by Person

Ordering by Grammatical Relations

3	1	2
	<i>ma</i>	<i>ya</i>
	1.PAT	2.AGT
<i>wič^ha</i>	<i>wa</i>	
3.PL.PAT	1.AGT	
<i>wič^ha</i>		<i>ya</i>
3.PL.PAT		2.AGT

PATIENT	AGENT
<i>ma</i>	<i>ya</i>
1.PAT	2.AGT
<i>wič^ha</i>	<i>wa</i>
3.PL.PAT	1.AGT
<i>wič^ha</i>	<i>ya</i>
3.PL.PAT	2.AGT

An investigation of the diachronic development of the system sheds light on the dilemma. First and second person pronominal prefixes can all be reconstructed for Proto-Siouan with the orders still found in Lakhota. A portmanteau morpheme for first person agent acting on second person patient can also be reconstructed. A third person plural marker cannot. This is not surprising. It is common cross-linguistically for only first and second persons to be represented by verbal affixes. First and second persons, whose identities are inherently established by the discourse context, are seldom specified by separate noun phrases. They are most often represented by unstressed pronouns, likely candidates for morphological fusion. Third persons, by contrast, are usually introduced by full noun phrases. In many languages, they are subsequently referred to by nothing at all, unless emphatically contrasted with other entities, when they may be represented by demonstratives. In such languages, there are few immediate candidates for third person pronominal affixes (Mithun 1988a).

Number was grammaticized in the Siouan languages sometime

after person. Plurality is shown in a different area of the verb in Lakhota than person, by a suffix *-pi*. Cognates of the Lakhota plural suffix can be found only among the more closely related Mississippi Valley Siouan languages, such as Assiniboine, Winnebago, and Ponca. The Lakhota prefix *wičʰa-* 'them' is not precisely coordinate in function with either the first and second person agent and patient prefixes, nor the plural suffix. It is used only for third person human direct objects. It was grammaticized more recently than both the person prefixes and the plural suffix. It does not appear at all in Winnebago or Ponca, and its source is still transparent within Lakhota: the noun *wičʰá* means 'man'.

The position of the prefix *wičʰa-* before the first and second person markers thus does not reflect a general cognitive schema at all; it is a result of the fact that number was grammaticized more recently than person and case. The order of grammaticization is itself not arbitrary. It is explicable in terms of general principles of diachronic development.

5. Conclusion

When we are aware of the diachronic dimension in the shaping of languages, much that might otherwise be discarded as arbitrary becomes explicable in terms of individually motivated developments. An understanding of the histories of languages constrains our hypotheses about human language abilities by allowing us to distinguish structures that speakers can absorb from those they create. It permits us to separate sequences of cognitive steps involving formal and semantic inference, reinterpretation, reanalysis, lexicalization, and grammaticization, from single cognitive leaps. Diachrony is certainly not the only explanation for why languages are the way they are, but without an appreciation of the diachronic dimension, we will miss much in our attempts to understand the human abilities that creatively shape language.

Note

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The origin of nominal classification

Johanna Nichols
University of California, Berkeley

1. Introduction. Greenberg (1978) proposes that gender agreement markers are diachronically renewed, or created in the first place, by numeral classifiers turning into demonstratives turning into articles. A numeral classification system is thus the crucial trigger for the rise and continued existence of gender systems. This scenario is an appealing one in that it explains the rise of the elaborate, shape-based, classifying gender systems of the Niger-Congo family in Africa, a cross-linguistically unusual type of system and one thus in need of explanation. However, while this analysis has a good deal of a priori plausibility and explains exactly that which is most in need of explanation, the typological and geographical distribution of gender in the world's languages raise questions about its typological plausibility. The present study examines gender systems and other types of nominal classification in the light of two broader concerns -- *whole-language typology*, the investigation of typological features in relation to other parts of the language's grammar, and *geography*, the study of location and areality -- and suggests a different origin for gender systems. I will follow Greenberg 1978, Weitenberg 1987, and Corbett 1987 in basing my analysis on the structural properties of noun classes rather than their semantics, and Greenberg 1978 in assuming that what requires historical explanation is the rise of the formal markers for gender and their participation in agreement rules, not the semantics of the classes.

This study is part of a larger project on the typological and geographical distribution of grammatical structures. It samples the world's languages geographically, by choosing a representative sample of continental and subcontinental areas (provided they are adequately described); then, within each selected geographical area, it takes a total sample (i.e. gives an exhaustive survey) of the surviving language families, choosing one well-described language from each family of the age of the major Indo-European branches. The database consists of 119 languages from the following areas: North America, Mesoamerica, northern Eurasia, the ancient Near East, sub-Saharan Africa, Australia, and the central Pacific (Micronesia and Melanesia). 40 of these languages -- one-third of the sample -- have gender or other nominal classification. They are shown, by area and with relevant grammatical information, in the Appendix.

I will use the following terms. *Agreement* is the copying or similar overt duplication of grammatical features, specifically the duplication of gender from a gender-bearing noun on another word in the sentence. It is necessary to distinguish three *levels of categorization*, any or all of which may be marked by agreement or other inflection in a given language. At the lowest level of categorization, the *concord class* is the most concrete and specific formal categorization a noun can have in a given language. For instance, Luganda *o-mu-ti* 'tree' and *e-mi-ti* 'trees' represent two distinct concord classes. Typically, the singular and plural forms of a single word will belong to two different concord classes in such a language. *Gender* is a more abstract notion: a given word usually belongs to only one gender, so that singular-plural concord class pairings constitute genders and the Luganda word for 'tree' can be said to belong to a gender marked by concord class *-mu-* in the singular and *-mi-* in the plural. A gender is thus a

grouping of concord classes, which are assigned by some principle (here, and typically, singular vs. plural). A *macrogender* is a set of genders assigned by some principle, usually natural gender (sex or animacy). There are thus three levels at which nouns may be categorized, each higher level describable as rules or principles for assigning the categorizations of the next lower level: a macrogender assigns grammatical genders according to natural gender, and a gender assigns concord classes according to number. The following examples illustrate the notions of concord class, gender, and macrogender for Chechen.

<u>Noun</u>	<u>Gloss</u>	<u>Concord marker</u>	<u>Gender</u>	<u>Macrogender</u>
vaša	'brother'	v	masculine	human
vežari:	'brothers'	b		
jīša	'sister'	j	feminine	human
jīžari:	'sisters'	b		
hiexarxuo	'teacher'	v, j	masc/fem	human
hiexarxuoj	'teachers'	b		
bworz	'wolf'	j	J	
bjerzaloj	'wolves'	j		
bwos	'color'	b	B	
bjesnaš	'colors'	d		
surt	'picture'	d	D	
sūrtaš	'pictures'	d		

The Chechen system is not unlike that of a Bantu language, except that Chechen has four concord markers which combine in different ways to yield six genders (closely related Batsbi combines the same four markers in more ways and has eight genders), while in Bantu languages the number of concord classes is greater than the number of genders. (Another language which has more genders than concord classes is Wishram; others with more concord classes than genders are Orig, Maung, and Nasioi.)

Not all languages distinguish all three levels, so a single generic term will usually suffice. I will use *gender* both as the label for categorizations in languages not distinguishing three levels and as an analytic generalization whenever it is not necessary to talk specifically about concord classes or macrogenders. 'Class', 'classification', and 'categorization' will have looser meanings, referring to any kind of subgrouping within nouns, including those not relevant to gender. In making typological comparisons, e.g. of the number of classes, I have attempted to count specifically gender classes in the strict sense (although this runs against the grain of grammatical tradition in some areas: for example, the Africanist tradition generally counts concord classes, not genders, for the Niger-Congo languages).

Since languages mark gender agreement in a variety of different places -- on

articles, on attributive adjectives, on the noun itself, on verbs, etc. -- I will speak of the *locus of gender marking*. The table below shows the range of possible loci of marking stated in terms of whether the word bearing the gender marker is the syntactic head or a syntactic dependent of the gender-bearing noun. This kind of breakdown is relevant because, as will be argued below, the directionality of agreement -- from heads or to heads -- seems to be one of the factors limiting or favoring the rise of gender systems.

Loci of gender marking (relative to the gender-bearing noun). Gender markers are underlined.

a. On neither head nor dependent

On the noun itself:	Luganda	o- <u>mu</u> -ntu 'man'	a- <u>ba</u> -ntu 'men'
		o- <u>ku</u> -tu 'ear'	a- <u>ma</u> -tu 'ears'

On anaphoric pronouns:	French	il 'he'	elle 'she'
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b. On a syntactic dependent

Article or determiner:	French	<u>la</u> maison	<u>le</u> nom
	Dyirbal	<u>bayi</u> yara	<u>balan</u> dugumbil
		man	woman

Attributive adjective:	Russian	nov- <u>a</u> ja kniga	'new book'
		nov- <u>y</u> i dom	'new house'

Possessor:	Maung	<u>mada</u> nahi	mada larnalg
		Art-V I	Art-V ear (V) 'my ear'

c. On a syntactic head

Possessed:	Maung	wulag-biridj	da galmar
		IV-GEN mouth	IV cave
		'mouth of cave'	

Verb:	Chechen	san vaša ču- <u>vel</u> ira	'my brother came in'
		san jiša ču- <u>jel</u> ira	'my sister came in'
		my Bro/Si in-came	

2. Typology of nominal categorization. Patterns of nominal categorization manifested by the languages in my sample can be broken down into four categories, plus one anomalous type sharing features of two categories. This taxonomy is based primarily on the consideration of what word requires agreement (or analogous formal response) in some other word. To distinguish this principle from various kinds of government, etc., I speak of the *mandating* of agreement. We thus have three structural factors to monitor: which word lexically *bears* gender, which word is the locus of agreement or *responds* to classification of some other word, and which word *mandates* agreement or some other response. To a considerable extent, the semantics of the categories and the number of

classes follow from these purely structural principles of mandating, bearing, and responding to nominal classification.

For each of the types of categorization to be given here, the defining properties are listed first, then secondary or incidental properties.

2.1. **Gender** systems have the following properties:

Gender is borne by nouns, in which it is lexically inherent. It is mandated by the loci of agreement themselves: certain contexts, certain parts of speech, and certain construction types require agreement in a given language, and there is a good deal of variation from language to language in what contexts require agreement.

There are few classes, typically in the range of 2 to 8. The mean is 3.9 in my 40 languages. The mode, interestingly, is 2, with 18 two-gender languages.

The classes almost always include a masculine/feminine or human/nonhuman opposition.

They are marked by agreement, either within the NP headed by the gender-bearing noun or outside of it on the verb or a head noun or on an anaphoric or personal pronoun. They may or may not be marked on the gender-bearing nouns themselves (in 18 of the 40 languages they are marked on the nouns). Most languages mark gender in more than one place. For instance, Burushaski marks it on pronouns, attributive adjectives, and verbs, and to a lesser extent on the noun itself; Elamite marks it on the noun and the adjective; Wishram marks it on the noun, on pronouns, on head nouns in possessive phrases, and on verbs; languages like Luganda and Fula mark it in almost every locus surveyed here (as well as others, such as adverbs and numerals). In some languages it is marked only on dependents (e.g. French, Akkadian, Nasioi), in some it is marked only on heads (Cree, Gitksan), but in most it is marked on some combination of dependents and heads.

Gender classification of nouns is largely arbitrary, except within the human macrogender if there is one.

Gender classification of nouns is lexically fixed, except within macrogenders in which it is determined by natural gender and may be fluid. The Chechen word for 'teacher', shown above, is an example of fluid gender classification in the human macrogender.

The languages with gender have moderate to high morphological complexity. Although in principle isolating languages could use separate particles or grammatical words to mark gender (as many isolating languages do to mark number: Dryer 1987), no isolating language in my sample (and no isolating language outside of it I am aware of) does this. However, non-isolating languages do sometimes use separate grammatical words to mark gender: the gender-marking words of Dyirbal, described above as articles, as well as the articles of French, are examples. It is presumably the notion of agreement, rather than the notion of nominal categorization, that is incompatible with the isolating type.

Gender is strongly areal. Most of the languages having gender occur in what I will call 'hotbeds', which I define as areas in which most languages have gender, gender is found in languages of more than one family, and the formal implementation of gender -- the number of classes, the loci of marking, prefixal or suffixal marking, etc. -- takes more than one form. (This definition precludes, e.g., regarding the territory of the Algonquian languages, all of which have a uniformly implemented gender distinction, as a gender hotbed. It does allow Europe to be regarded as a gender hotbed: although the presence of gender in Europe is due entirely to the spread of Indo-European, a daughter stock of Indo-European is comparable to the Algonquian family in age, and the formal implementation of

gender differs from branch to branch in modern Indo-European.) Gender hotbeds occur in Africa (where languages of the Afroasiatic, Niger-Kordofanian, Nilo-Saharan, and Khoisan families exhibit gender); in the ancient Near East (Elamite, Sumerian, perhaps Hittite, Hittite, and Semitic languages such as Akkadian); and in northern Australia (where most of the northern Australian families have gender). These hotbeds are ancient, while the one in Europe is more recent, as just noted.

Languages with gender located outside of hotbeds will be called *outliers*. Of the 40 languages with gender in my sample, 14 are outliers and 26 in hotbeds. Outliers often give evidence of distant or former connection with hotbeds: for instance, Tunica and Yuchi both have gender and suggest an earlier hotbed in the American Southeast; the Northeast Caucasian languages may represent the periphery of the gender hotbed of the ancient Near East; the gender of Burushaski may have areal connections to the gender of Indo-European languages in the area (in my sample, Waigali of the Kafir branch of Indo-Iranian); and so on. The figure of 14 outliers includes the clear outliers (e.g. Ket, Wishram) and the less clear instances.

2.2. Numeral classifier systems have the following properties. (My survey of numeral classification was not particularly systematic, and I rely on Allan 1977 for some of this description.)

Numeral classification is mandated by numerals (and occasionally also possible or required in other construction types, e.g. with demonstratives).

The classes are not marked by what one could call agreement. Usually there is a separate word which is called a classifier; less often (e.g. in Nasioi in my sample) the classifier is fused to the numeral so that there are several shape-based numeral classes.

There are many classes, minimally 20 and up to around 200.

The classes almost always involve shape categories.

Classification is fluid and quite clearly semantic.

The languages with numeral classifiers are generally more or less isolating in type.

Numeral classifiers are also strongly areal in distribution, perhaps more strongly so than gender. Apparently there are only two hotbeds of numeral classification: a large one centered in Southeast Asia and extending well into the Pacific, and a smaller one centered in Mesoamerica and extending into the western Amazon basin. I know of no outliers other than Yurok and the Algonquian languages (and they are genetically related).

2.3. Predicate classification systems. The classic example of predicate classification, and the only example in my sample where it is systematic, is provided by the Athabaskan languages, where the stem of the verb responds to the shape classification of the S/O. Predicate classification is mandated by the verb. The classification is fluid and quite clearly semantic, and both the fluidity and the particular semantic classes resemble those of numeral classifier systems.

2.4. Covert animacy systems involve the special, sometimes almost gender-like, treatment of animate or human nouns. (I will use the term 'animate' loosely here for convenience. The actual membership of the class can vary from language to language: all animates; higher animates; humans only; kin terms only.) They have the following properties.

There is no agreement, hence no mandating of agreement. Animacy is borne by nouns and marked only in selection, neutralization, and the like. For instance, in a number of languages animate nouns are privileged to function as subjects of both transitive and intransitive verbs while inanimates cannot be subjects of transitives (e.g. Hittite and

Diegueño in my sample). Distinctions in number often apply only to animates: for instance, in Washo plural marking is regularly used only for nouns referring to humans; in Karok, Gitksan, and Nasioi, only human nouns can take plural marking; Chitimacha distinguishes singular from plural in only about thirty nouns, which include kin terms and other human nouns. (These and other examples are discussed again in S4.4 below.) A subset of animates -- kin terms -- with or without other nouns takes inalienable possession in many languages (see S4.1 above). Animate nouns may be marked by distinctive declension classes, including distinctive patterns of case neutralization (e.g. Russian, where in the first declension the animate nouns syncretize genitive and accusative while inanimates syncretize nominative and accusative; for the place of animacy in the Russian gender system see Mel'cuk 1980, Corbett 1987).

In some sense there is only one class: the closed or delimitable set of human or animate nouns. The non-human or inanimate nouns have the nature of a residual category rather than a positive class.

Covert animacy systems occur in languages of all morphological and syntactic types. They have no demonstrable areality. They represent a cognitive universal -- the hierarchy described by Silverstein 1976 -- which is likely to crop up in formal marking wherever the opportunity presents itself.

2.5. None of the above. There are other kinds of categorization of nouns which are not relevant to this study, such as declension classes and alienable/inalienable possession (except that either may be relevant insofar as it helps implement a gender or animacy system).

2.6. Anomalies. The following three examples combine the features of gender and numeral classification.

In languages of the Niger-Congo family (Luganda and Fula in my sample), the gender systems are anomalous. There are many classes (12 or more genders, 20 or more concord classes), some of which are clearly based on shape. There is a certain amount of fluid classification. Gender marking is used on numerals. The number and semanticity of the classes, and the use with numerals, suggest numeral classifiers; but there is agreement, multiple marking in the sentence, marking elsewhere than on or with numerals, and sufficient lexical fixation to justify regarding these systems as gender.

In Yagua and other languages of the western Amazon (Payne 1986, 1987), not in my sample, numeral classification shows similarities to gender. Classes are numerous, shape-based, and used primarily with numerals; but classifiers are also affixed to modifying adjectives in the NP and to predicate nominals. The Yagua system and the Niger-Congo systems are similar in many ways, although the Yagua system is closer to numeral classifiers while the Niger-Congo pattern is closer to gender.

Chamorro has a type of numeral classification which resembles gender in involving few classes and centering on animacy rather than shape. Contemporary Chamorro uses Spanish numerals and has no classification, but Costenoble 1940 was able to find elderly speakers who remembered the native system. They had three numeral systems, for animates, inanimates, and linear measures. This example is pathological in some respects -- the subsystem was dying, and may not have been elicited in its entirety -- but nonetheless it provides us with an example of an anomalous system showing properties of both gender and numeral classifier systems.

3.0. Distribution. The following table shows the frequencies of various loci of gender marking and two morphosyntactic typological features, for four groups of

languages: the entire sample of 119 languages; the 40 gender languages; only the gender outliers; only the hotbed gender languages. Marking type is the overall morphosyntactic type of the language as defined in Nichols 1986: D = predominantly dependent-marking, dbl = double or split marking, H = predominantly head-marking. Alignment is the dominant clause structure: accusative, ergative, stative-active, or hierarchical (= H; this is the alignment type in which the marking of grammatical relations is so strongly influenced by person-number categories that it is difficult to classify it as one of the other types).

<u>Languages</u>	<u>no.</u> <u>langs.</u>	<u>Locus of gender:</u>			<u>Marking type:</u>			<u>Alignment:</u>			
		<u>Neut.</u>	<u>Dep.</u>	<u>Head</u>	<u>D</u>	<u>dbl</u>	<u>H</u>	<u>Acc</u>	<u>Erg</u>	<u>St-A</u>	<u>H</u>
All	119				35	45	36	68	24	16	5
Gender	40	34	35	30	10	20	8	22	8	5	3
Outliers	14	9	11	17	3	5	6	2	6	4	2
Hotbeds	26	25	24	13	7	15	2	20	2	1	1

These figures show that the favored places, cross-linguistically, for marking gender are on modifying adjectives in the NP (24 instances in my sample) and on the verb (24); the noun itself (18) and personal or anaphoric pronouns (16) are also common. Gender agreement on articles or similar words is not common (8 instances), if only because articles themselves are not found in all languages. Marking of possession on the head (possessed) noun in a possessive construction is cross-linguistically common, but rarely (6 instances) involves gender agreement; usually there is person-number agreement. As noted above, dependent-marked, head-marked, and neutrally marked patterns of gender agreement are about equally common, with a slight dispreference for head marking (34 : 34 : 30). The same balance is found in the two-gender languages and in the languages with many genders.

There are interesting differences between languages in gender hotbeds and outlier languages. In neither head/dependent marking nor alignment do gender languages stand out among the world's languages: there is some preference for the double-marking type and a strong preference for the accusative type in both sets of languages. The same tendencies are visible, in somewhat exaggerated form, in the gender languages in hotbeds. The outliers, however, are distinctive: they favor head marking and non-accusative alignments. The loci of gender marking are also distinctive: gender languages overall give roughly equal preference to head, dependent, and neutral marking of gender, with a slight disfavoring of head marking, but the hotbed languages disfavor head marking while the outliers favor it. Finally, the languages with elaborate gender classification occur only in hotbeds (languages with 10 or more genders occur only in Africa).

The most general conclusion to be drawn is that the areal pressure of a hotbed favors gender marking regardless of circumstances, while outside of hotbeds gender is not common and seems to be favored by a set of typological properties which are unusual, individually and as a set. Especially since a number of gender outliers are language isolates whose histories are unknown, it is difficult to tell whether the distinctive type features of the outliers are to be regarded as factors favoring the survival of gender or factors favoring its rise. If we assume they are factors favoring its rise, or more generally that, as factors favoring gender, they are somehow relevant to understanding its

rise, we can say that marking of gender on the noun itself is much less important than marking in agreement (9 instances to 11 + 17), that head-marking agreement is more conducive to gender than dependent-marking agreement (17 to 11), and that languages with a good deal of head marking and non-accusative alignment are conducive to gender. (Head marking and non-accusative alignment are themselves associated, as my larger project has shown.)

The factors probably to be associated with the rise of gender in languages, then, are, most importantly, location in or near a hotbed, and then a preference for head-marking morphology and non-accusative alignment.

4. Crossover between gender and numeral classification. Greenberg's explanation of the rise of gender requires the possibility of transition from one type of classification to the other, but in fact there is very little evidence for this in my sample. Gender and numeral classification rarely cooccur in languages; the only language in my sample with both is Nasioi, and Payne 1987 mentions western Amazonian languages which have both. Furthermore, gender hotbeds and numeral classification hotbeds almost never overlap (and when they do it is overlap of peripheries, not overlap of centers, as in India as described by Emeneau 1980). Therefore, if we look to numeral classification as a source of gender systems we disregard geography.

The only clear evidence for a possible transition from numeral classification to gender comes from the western Amazon. Languages like Yagua could eventually become Bantu-like in their gender systems, if the use of classifiers on modifying and predicative parts of speech were expanded to more loci, if classification became clearly a matter of agreement (e.g. if marking in more than one place per sentence became common), and if use with numerals became optional or restricted (e.g. to only some numerals, as it is in Bantu languages). Thus an origin in numeral classification could conceivably explain the distinctive nature of the Niger-Congo gender systems. However, that gender exists at all in Niger-Congo can be explained by geographical factors: Africa is a gender hotbed, and we would expect to find gender systems in this family.

My field work in Northeast Caucasian languages suggests that native speakers expect gender classification of inanimates to be based on shape, even when they demonstrably are not. Chechen speakers will sometimes point out that words of the B gender refer to round objects, as some of them in fact do, although many do not and names of many round objects belong to other classes. If there is a speaker expectation that gender classes will be shape-based, then analogical reclassifications over time will probably lead to just such a situation. Therefore I propose the following scenario for the rise of elaborate and shape-based gender systems like those of central Africa: The language already has gender. The system is sufficiently elaborate that there is more than one class of inanimates. The morphological implementation of gender favors speaker awareness: e.g., the gender classes may be marked by transparently agglutinative affixes; fluid gender marking in a human macrogender may suggest that the markers are fully semantic and interchangeable; etc. The poetic canon may exploit gender as a basis for metaphor and simile (as that of Chechen does). It is significant that in this Chechen example the folk expectation of shape-based semanticity for gender centers on round objects, a category that figures prominently in shape-based numeral classification and renewal of classifier systems (Greenberg, this volume; also Allan 1977:301).

There is no evidence at all in my database for a transition from gender to numeral classifiers. The closest we come is the moribund Chamorro counting system, which

collapses to a three-way, animacy-based opposition reminiscent of gender classification but does not thereby give rise to gender.

In summary, then, the only evidence for crossover between systems -- the anomalous Niger-Congo and western Amazon shape-based elaboration of genders -- could conceivably come from regrammaticalization of numeral classifiers; but there is equally compelling evidence that gender systems can be semanticized under the right set of conditions. In any event, crossover between systems seems unable to account for the rise of gender outside of hotbeds; and for any comprehensive account it is the outliers that most require explanation (since every hotbed must have been founded by what was then an outlier).

5. Evidence for the spontaneous rise of gender. What we need to explain is the rise of the non-elaborate gender system in the outlier language. Since minimal gender systems always seem to focus on oppositions like animate/inanimate, human/nonhuman, and masculine/feminine, it makes the most sense to seek the origin of gender in the grammaticalization of covert animacy subsystems. Since these involve a universal cognitive hierarchy always available for potential implementation, grammaticalization could presumably take place wherever morphological circumstances were right, i.e. in the absence of a hotbed. I suggest that all we need is a covert animacy system, a potentially recruitable formal distinction, and pre-existent agreement patterns for gender to arise. The following are some examples illustrating the actual or plausible or potential rise of gender in this way.

(1) Spontaneous generation of categories: Gender arises out of number agreement. This seems to have happened in the Kiowa-Tanoan family, where nouns have inherent number, an affix switches the inherent number, and lexical classes of nouns are thereby set up. (For Kiowa see Watkins 1984:78ff.)

(2) Spontaneous generation of fillers. Markers in a person/number-based agreement system can easily be renewed by substitution of independent pronominal forms for the affixal pronominal forms. (For instance, some languages of the Numic branch of Uto-Aztecan replace inherited *i-*, first person singular prefix and clitic, with the independent form *ni* 'I'.) If third-person pronouns make any animacy distinction, then if they renew old affixes a gender system will thereby be set up.

(3) Spontaneous generation of slots. Cliticization of pronouns can be the first step in development of an agreement system; if the pronouns make any animacy distinctions, or if renewal implements an animacy distinction, gender agreement is thereby set up. Or agreement may develop by reanalysis of roots or stems as containing agreeing affixes: elsewhere I have argued (Nichols, in press) that accidental alliteration of frozen former prefixes in verbs with noun initials gave rise to gender agreement, and hence to gender, in Northeast Caucasian.

In all of these scenarios, lexical classification of nouns is the consequence rather than the cause of agreement. In all of them, agreement (typically in person-number) is pre-existent, and when it picks up or formally renews relevant pronominal or formal categories, gender classification of nouns is thereby set up. I know of no example where gender-like lexical classification of nominals clearly preceded the rise of agreement.

Once an agreement system is set up, gender classes can expand; and they may also semanticize, as they have in the Niger-Congo family and as may be imminent in Northeast Caucasian. The opposite development is reduction of classes, loss of agreement, and loss of the gender system, as has happened in English.

6. Conclusions. It is important to make clear what does and what does not require explanation on the interpretation given here. There is a group of changes for which the mechanism needs to be described but the ultimate motivation for the rise of gender does not need individual explanation. Rise of nominal classification per se is one such example: the classes are epiphenomenal to the agreement rules (although once a gender system is set up the principle of classification may become a driving force to expand and semanticize the system). The rise of gender in a language in a hotbed is inherently likely and does not require explanation; we need only seek the mechanism of implementation. The rise of animacy-based classes is also inherently likely; if classification materializes, it will almost certainly seize on the universal animacy hierarchy, which any language is likely to grammaticalize, if only covertly, in some form somewhere. Small gender systems are to be expected; it is the large and elaborate systems that are unusual and require explanation. (I have argued that they are secondary developments of smaller systems.)

On the other hand, the following changes require not only an account of the historical mechanics but an explanation of motivation as well. The rise of numeral classifiers, which are much more strongly areal than genders, requires explanation; the mechanism is obviously grammaticalization of semantically generic nouns, but why this kind of grammaticalization should center so firmly on numerals, with almost no tendency to expansion, needs explanation. The rise of complex gender systems, and those based on shape, requires explanation, and I have offered one above. The rise of gender systems in outliers requires explanation; I have suggested that it is the (potential, even likely, but by no means automatic) consequence of covert grammaticalization of animacy, availability of recruitable formal markers, a pre-existent agreement mechanism, and the right kind of morphosyntax.

In summary, establishing and motivating the origin of a gender system requires reference to geography (was the protolanguage in a hotbed?), morphological type (was there inflectional morphology? agreement?), and morphosyntactic type (was it head-marking or not? accusative or not?), i.e. to areal, contextual, and structural factors. The right semantic classification will be the automatic consequence of these formal factors.

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Legend to Appendix: "Y" = yes, occurs. Under H/D type: "H" = predominantly head-marking, "2" = double or split marking, "D" = dependent marking. Under Alignment: "N" = neutral, "A" = accusative, "E" = ergative, "S" = stative-active, "H" = hierarchical.

Appendix: Languages having genders

Genders	Neutral		Dependent			Head		H/D type	Align-ment	Out-lier?
	N	Pro	Art	Adj	N	N	Y			
NORTH AMERICA										
Cree	2					Y	Y	H	H	Y
Gitsan	2						Y	2	E	Y
Kiowa	4	?					Y	H	H	Y
Quileute	2		Y		Y		Y	2	A	Y
Tunica	2	Y		Y		Y	Y	H	S	Y
Wishram	6	Y	Y			Y	Y	H	E	Y
Yuchi	5		Y		Y	Y	Y	H	S	Y
NORTHERN EURASIA										
Burushaski	4	y	Y		Y		Y	2	E	Y
Chechen	6	y			Y		Y	D	E	Y
French (coll)	2		Y	Y	Y			2	A	
Ket	3			Y	Y	Y	Y	2	S	Y
Russian	3	Y	Y		Y		Y	D	A	
Waigali	2				Y		Y	D	E	Y
ANCIENT NEAR EAST										
Akkadian	2	Y			Y			D	A	
Elamite	2	Y			Y			2	S	
Hittite	2	Y	Y		Y			D	A	
Sumerian	2		Y				Y	2	E	
AFRICA										
Amharic	2		Y				Y	D	A	
Dizi	2	Y	Y		Y			D	A	
Fula	15?	Y	Y		Y	Y	Y	2	A	
Hausa	2				Y		Y	2	A	
!Kung	5		Y					2	N	
Lugenda	12	Y	Y		Y	Y	Y	H	A	
Maasai	2	Y						2	A	
Nama	3	Y	Y				Y	D	A	
Orig	6	Y			Y			2	A	
Oromo	2		Y		Y		Y	D	A	
Sandawe	2				Y			2	A	
OCEANIA										
Konua	2	Y			Y		Y	H	A	Y
Nasioi	7				Y	Y		2	S	Y

	Neutral		Dependent			Head		H/D	Align-	Out-
Genders	N	Pro	Art	Adj	N	N	V	type	ment	lier?
AUSTRALIA										
Djingili	4			Y				D	E	
Dyirbal	4		Y					D	E	Y
Gunwinggu	4	Y		Y				2	A	
Malak-Malak	4	Y		Y			Y	2	A	
Mangarayl	3	Y		Y				2	A	
Maung	5		Y	Y	Y		Y	2	A?	
Nunggubuyu	6	Y	Y	Y			Y	2	H	
Tiwi	2			Y			Y	H	A	
Ungarinjin	5		Y				Y	2	3	
Warnderang	6	Y	Y	Y				H	A	
TOTAL		18	18	8	25	3	6	24		

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Some historical sources of partial reduplication

Mary Niepokuj

University of California, Berkeley

The processes by which reduplication can arise in a language generally have not been considered interesting enough to deserve much comment. Linguists assume that since the formal process often is iconically related to the meaning conveyed, then the process must have arisen spontaneously. Speaker A would say something like 'That's a big, big dog' or 'I walked and walked yesterday,' and Hearer B would immediately understand what 'big, big' or 'walked and walked' meant. As such syntactic combinations catch on, reduplication becomes grammaticalized; the doubled words fuse and are stressed as a single word, one of the two morphemes may be reduced in ways common to the process of grammaticalization, and so on. Under this analysis, all instances of partial reduplication historically first entered the world via full reduplication and then were gradually eroded phonologically. Similarly, if the meaning expressed by reduplication in a given language is not clearly iconic, it must have been so at an earlier stage, and the meaning must have shifted.

This generally accepted view is inadequate in a number of respects. First of all, typological comparisons of partial reduplication in a large number of unrelated languages permit a number of generalizations about the phonological shape of the affix. An example of such a generalization is the claim in Steriade (1988), following McCarthy and Prince (1986), that affixes created via partial reduplication must consist either of a light syllable or of a single metrical foot, with the exact composition of the foot varying from language to language. Steriade states,

To review then, prosodic weight requirements fall into two major classes: the requirement that the affix be a foot-sized domain and the requirement that the affixal unit not be independently footed. The second class may only correspond to a light syllable. The first case gives rise to various other options, corresponding to different foot types: the monosyllabic and disyllabic foot, the bimoraic and the polymoraic foot (p. 80).

Assuming that Steriade at least describes a strong tendency in the world's languages to form reduplicative affixes of this shape, the questions to be addressed from the standpoint of historical linguistics are what constraints on historical change would achieve such a consistent result and why the creation of reduplicated affixes would differ from the creation of other grammatical affixes in this respect. After discussing some patterns of change which result in partial reduplication, I will

discuss several cases where partial reduplication is not the descendent of original full reduplication. The fact that such cases exist points to the need for caution in assuming that partial reduplication is always the descendent of full reduplication.

The following forms are examples from languages which permit the reduplicative affix to be a single foot. When the base is itself a single foot, it is copied entirely. When it is longer, however, the copy is truncated so that only a foot remains.

1a) **Makassarese** (McCarthy & Prince (1986:31))

ballak	ballak-ballak	'house'
tau	tau-tau	'person'
kaluarak	kaluk-kaluarak ¹	'ant'
balao	balak-balao	'rat'

1b) **Manam**

laʔo	laʔo-laʔo	'go'
ʔulan	ulan-lan	'desire'
salaga	salaga-laga	'long'
moita	moita-ita	'knife'

Note that in Manam the foot is bimoraic rather than bisyllabic.

The forms in (2) come from Tarok, a Benue-Congo language, in which stems reduplicate to express third person singular possession.

2) **Tarok** (Robinson 1976).

ñdākāl	ñdākāl-dākāl	'his mat'
āfinī	āfinī-finī	'his thread'

Robinson cites the forms above and adds, '...if the stem has three or more syllables, reduplication may be optionally abbreviated so as to apply to the last two stem syllables only' (p. 207). This stage of optional truncation clearly provides a transition between a period of full reduplication and a subsequent stage of partial reduplication. When and if the optional truncation rule becomes obligatory, Tarok will exhibit the same kind of reduplicative process as the languages seen in (1).

This kind of truncation is different from the kind of phonological reduction seen in more familiar examples of grammaticalization (see Givón (1971) for examples). The questions are, then, what factors constrain the historical development of these affixes so that the final result is so consistent cross-linguistically, and why do reduplicative affixes differ from other affixes in this respect? Examining other examples of truncation suggests an answer to these questions.

Truncation is commonly found in two other areas cross-linguistically: formation of hypocoristics and vocatives, and compounding. Data from Zuni and Madurese showing compound truncation are seen in (3).

3a) Zuni (McCarthy & Prince (1986:61-2))

tukni	tu-mok ^w k ^w 'anne	'toe-shoe = stocking'
melika	me-k ^w 'isso	'Anglo-negro = black man'
pacu	pa-lokk'a-ak ^w e	'Navajo-be:gray = Ramah Navajo'

3b) Madurese

usap	sap-lati	'wipe-lip = handkerchief'
urin	rin-tua	'person-old = parents'

Compounds in general are strikingly similar to fully reduplicated forms in that both cases involve conjoining two stems rather than conjoining a stem and an affix. This similarity surely accounts for the fact that both of these formations may acquire a rule of truncation, and that grammatical affixes in general do not.

The question of why truncation is constrained in so many languages to leave a single foot is somewhat more complex. The answer may lie in the recoverability of the underlying form: a foot may be the minimum amount which can still permit recovery of the underlying stem. Examining the third set of forms which permit truncation, hypocoristics and vocatives, provides evidence in support of this analysis. The forms in (4) are hypocoristics: (4a) contains forms from French, and (4b) contains forms from Japanese.

4a) French hypocoristics (Steriade (1988:75))

Isabelle	i.za.bel	iza, zabel, zabe
Dominique	do.mi.nik	domi, minik, mini
Marie-Claude	ma.ri.klod	mako
Marie-Alice	ma.ri.a.lis	mali, malis
Laure-Lise	lor.liz	loli

4b) Japanese hypocoristics (Poser (1984))

hanako	hana-tyaN
akira	aki-tyaN
taroo	taro-tyaN
syuusuke	syuu-tyaN
ti	tii-tyaN

Note that in (4a) all forms are a single foot. Furthermore, as Steriade (1988:148) notes, if the name is a compound, the hypocoristic must preserve a syllable from both members, probably to aid recoverability. The forms in (4b) are also foot-based; if a name originally is shorter than a foot, it is lengthened to fit the foot template. In this case, the constraint on recoverability has become rigidified into a templatic requirement which can lengthen as well as truncate forms.

A second piece of evidence concerning the role of feet in recoverability may be found in the English rule of expletive insertion seen in

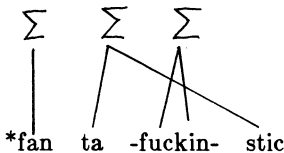
forms like *abso-bloomin-lutely*. Attested examples,² as well as ungrammatical forms, are seen in (5).

5) Expletive Infixation

amalgam-bloody-mated
 emanci-motherfuckin-pator
 Su-fuckin-matra
 e-bloody-nough
 *fanta-fuckin-stic
 *ca-fuckin-terwaul

As McCarthy (1982) noted, the constraint on Expletive Infixation may be stated as follows: the expletive may be inserted between feet, but not inside of a foot. McCarthy explained the constraint as the result of the autosegmental principle that association lines may not cross; (6) shows the prosodic structure of an ungrammatical example.

6)



A more functionally-oriented explanation is that the maintenance of foot structure makes the recovery of the underlying lexical item easier.

Similarly, in languages which have polysyllabic forms which undergo reduplication, constraining truncation to leave a foot behind is a way of guaranteeing recoverability. Of course, given that the truncated affix is attached to a full version of the stem in question what is recovered is not so much the stem itself as it is the underlying structure of a pair of conjoined stems.

Another very common form of partial reduplication is that in which the affix contains a copy of the initial consonant or cluster of the stem, and a prespecified vowel. The vowel is usually but not always high. Some examples are given in (7).

7a) Akan

High tone	Low-High tone	
ba	biba	'come'
so?	suso?	'light'
don	dunnon	'soak'
haw	hihaw	'trouble'

7b) Yoruba (Pulleyblank (1988:256))

gbóná	gbígbóná	'be warm'
dùn	dídùn	'be sweet'
tóbi	títóbi	'be big'

7c) Salish (Haeberlin (1918))

The vowel of the reduplicating-syllable of the diminutive may either be the same in quality as the stem vowel of the simplex or it may show a shift. The most common shift of this kind is that to an *i*-vowel. This diminutive reduplication with *i*-shift is a very persistent feature in the Salishan dialects and seems to be common to most of them... The most frequent vowel-shift in the diminutive of Clallum is that to /a/.

7d) Tillamook (Reichard (1959))

han ^h luin	'arm'	hu-han ^h luin	'little arm'
sæns	'stone'	k-su-sæns	'gravel'
t'iɣkhu	'man'	du-t'iɣlhu	'boy'

na ^v -	'fetch'	ni-na ^v -ən	'he will keep coming after'
sæc'	'cut'	t si-sæc'-ən	'she is cutting repeatedly'

Explanations of the prespecified vowel in the Niger-Congo forms have been suggested in Hyman and Voeltz (1971) and Faraclas and Williamson (1984). Hyman and Voeltz cite data suggesting that the reduplicating vowel is a reduced vowel in Fe^hfe^h Bamileke, and that the fact that it is reduced accounts for the ease with which it assimilates to adjacent consonants. Faraclas and Williamson argue that the reduced reduplicated vowel assimilates to the degree of stricture of adjacent consonants as well; they suggest that the glide interface, where high vowels and glides interchange, is the unmarked value for stricture, and consequently that that is the value assigned to a reduced vowel. In their framework, high-vowel reduplication arises first in reduplicated forms of monosyllabic CV-roots, and then may spread to reduplication of longer roots as well.

While these phonological explanations of the prevalence of high-vowel reduplication undoubtedly provide some of the motivation for this development, they do not account for cases like Clallam, where the fixed vowel is *-a-*, nor for cases like Tillamook, where frequentative reduplication is characterized by *-i-* while diminutive reduplication is characterized by *-u-*. A further factor must be invoked to explain the commonly seen pattern of reduplication with a fixed vowel in the affix: the well-known historical drive in speakers to reduce allomorphy. Fixed vowel reduplication is the outcome of a kind of levelling. At first blush it seems a bit strange to talk about allomorphy when describing reduplicated affixes, since each stem would seem to have a unique allomorph of the reduplicated affix; support for this analysis comes from the fact that this sort of fixed vowel is seen in the most reduced kind of reduplication, that in which the affix is smaller than a prosodic foot and consequently does not permit the recovery of an underlying structure of two conjoined stems. Prespecifying the vowel of the reduplicative affix makes the form of the affix much more predictable. The historical drive to reduce paradigmatic alternation, along with the phonological factors others have suggested, more fully explains why so many languages develop fixed vowel reduplication.

At this point it is instructive to consider two cases where partial reduplication did not arise from original full reduplication. The first of these cases is seen in (8).

8) Nyakyusa

-okya -okikye
-tufya -tuffye
-ibwa -ibibwe (Bastin (1983))³

In Nyakyusa, a Bantu language, in many cases the suffix reconstructed as **-ide* substitutes a copy of the final stem consonant for the original **-d-* of the suffix. Clearly the partial reduplication seen in this instance did not arise from originally doubling a stem. If confronted with the data in (8), however, a linguist would be tempted to assume that these forms arose originally through reduplication. The fact that the suffix expresses perfectivity is particularly cautionary, since a notion of completed action and hence possibly a durative state is well within the range of what many scholars would assume is a 'normal' semantic value for reduplication. If a form is reduplicated, so the thinking goes, then it must originally have had an iconic value such as duration of action in order for the reduplicated form to arise at all; the semantic value then must have shifted to something less clearly iconic. The Nyakyusa data strongly argue for the need for caution in positing an origin like this simply because the form looks like a case of reduplication.

A further example of partial reduplication for which iconic reduplication need not be invoked as a source was presented in Niepokuj (1987). In that paper I argued that the reduplicated present-tense class found in Sanskrit and Greek arose primarily due to the presence of root-final laryngeal segments in the roots which could form a present stem in this way. In the proto-language, I argued, present-tense reduplication was very infrequent and unsystematic, as exemplified by the Hittite root *mema-* 'to speak,' where the reduplication is symbolic of the repeated movements of the mouth in speech. At some time during the prehistories of Sanskrit and Greek, however, reduplicating present tense classes were formed, and the primary determiner of membership in the class was the presence of a root-final laryngeal segment. The forms cited in the Appendix are evidence. These are all the roots for which a reduplicated present-tense form has been attested. 70% of the roots in Vedic and nearly 80% of the roots in Greek are normally reconstructed to roots which had ended in laryngeals, or roots of the sequence laryngeal-semivowel which routinely metathesized under conditions described by Winter (1965). By comparison, in the Vedic verbal class (Class 6) which consists of those roots which form a stem by suffixing a stressed thematic vowel to the root, the percentage of roots which ended in a laryngeal is slightly less than 20%. Similarly, a rough attempt to calculate the percentage of laryngeal-final verbal roots in Pokorny showed the percentage of such roots again to be around 20%.⁴ I explain the preponderance of laryngeal-final roots in the reduplicating present class in the following way. When the laryngeal segments were lost during the prehistories of Sanskrit and Greek, the loss occurred on an item-by-item basis. For a given root containing a laryngeal, in certain environments the laryngeal

would be realized as zero, in other environments as a consonant, and in other environments as an unstressed vowel.⁵ For each root, at some point speakers would re-analyze the underlying form so that the root no longer contained a laryngeal segment. When the first few roots were in the process of losing their laryngeals, speakers resorted to reduplication, probably because the reduplicated stem plus tense affixes strongly resembled the canonic segmental shape of the regular thematic verbs. Because of this association between laryngeal-final roots and reduplication, the laryngeal was treated as a phonological marker of roots which would use reduplication to form stems. At this point, the process spread separately in both Sanskrit and Greek. The primary motivation for reduplicating a form was thus its phonological shape; the forms need not have had any particular semantic value other than normal present tense.

One issue which remains to be addressed is the relation between historical analyses of reduplication such as this one and synchronic surveys of reduplication such as Marantz (1982), McCarthy and Prince (1986), and Steriade (1988). As I mentioned at the beginning of this article, such surveys have discovered a number of generalizations concerning the shape of reduplicative affixes; I have suggested some historical explanations to account for these recurring patterns. Historical discussions such as this one also have a bearing on recent theoretical discussions of synchronic phenomena; in particular, this paper has a bearing on the implicit assumption in Marantz (1982) that all cases of superficial reduplication can be analyzed as full melodic copy and association to a template, and on the claim made in Steriade (1988) that partial reduplication must always be analyzed as complete copying of the base plus truncation and/or segmental insertion. This assumption that superficial partial reduplication is underlyingly full reduplication plus some formal mechanism to pare down the stem is so prevalent that Pulleyblank (1988:265-266) needs to provide evidence that deverbal noun reduplication in Yoruba (see (7) above for data) is not in fact underlyingly reduplication, but instead is spreading of the stem-initial consonant. His analysis is certainly reasonable in this instance; what is striking, however, is the assumption that, in the absence of evidence to the contrary, a situation such as the Yoruba deverbal noun reduplication should be treated underlyingly as full copying of the melody plus some process of association or truncation. Given the various historical paths by which structures which look like reduplication but which never actually involved reduplication can arise, any case which can be analyzed as an instance of something other than copying of a stem should be so analyzed. An analysis which invokes spreading requires less theoretical apparatus than one which requires copying of the stem; linguists, and, presumably, speakers ought to prefer such an analysis in the absence of evidence requiring the more complex mechanism of copying.

Steriade (1988) differs from the Marantzian copy-and-association model in a number of significant ways; she argues that prosodic structure is copied along with the segmental melody, and is then subject to rules of truncation and/or segmental insertion to produce the desired affix. She argues that one flaw in the Marantzian approach is 'the artificial distinction created by this model between total and partial reduplication' (p. 88) and states, 'There is good reason to maintain the view that total and partial reduplication differ only minimally. In some cases, it can be

directly proven that what surfaces as partial reduplication begins derivationally as total reduplication...'(p. 88). While it is true that synchronic derivation need not recapitulate historical development, the fact that diverse historical paths can result in superficially similar forms suggests that theoretical frameworks which insist on a unified treatment of all instances of whole and partial reduplication make overly strong claims. Instead of claiming that all cases of partial reduplication should start out derivationally as total reduplication because this derivational path is necessary in some cases, I argue that total reduplication should be invoked only in those cases of partial reduplication which absolutely require such a mechanism.

Appendix

Sanskrit Data (3rd sing. present unless otherwise specified)

a) No laryngeal; offer no evidence concerning present reduplication

ninikta	'wash, purify' (2nd sing. imperative)
piprghdī	'mix' (2nd sing. imperative)
dīdesāti	'point'
mamatsi	'to be exhilarated, exhilarate'
sasāsti	'sleep'

b) Clear evidence for final laryngeal

jīghrāti	'smell'	*gh ^w reh ₂ -
pībati	'drink'	*peh ₃ -
dādadhāti	'put'	*dheh ₁ -
mīmāti	'bellow'	*meh ₂ -
jāhāti	'leave'	*gheh ₁ -
jīgāti	'go'	*g ^w eh ₂ -
mimītas (3rd dual)	'damage'	*meih ₁ ^x -
sīsāti	'sharpen'	*keh ₃ ^x -
rarāsva (2nd sing. middle)	'give'	*reh ₁ -
ninīthās (2nd dual)	'lead'	*neiñ ₁ ^x -
dādāti	'give'	*deh ₃ ^x -

mimate	'measure'	*meh ₁ -
juhūmāsi (1st pl.)	'call'	*gheuh ₁ -
tiṣṭhati	'stand'	*steh ₂ - ^x
māmandhī' (2nd sing. imperative)	'think'	*mneh ₂ - ^δ
dīdyati (3rd pl.)	'shine'	*deih ₂ -
dīdhye (3rd sing. middle)	'think'	*dheih ₂ - ^x
pīpihī' (2nd sing. imperative)	'swell'	*peih ₂ - ^x
tītarti	'cross over'	*terh ₂ - ^x
jīgharti	'sprinkle'	*ghreh ₁ -i
pīpartī	'fill'	*pelh ₁ -
sīsarti	'flow'	*serh ₁ -
īyarti	'go'	*h ₁ erh ₁ -
bibharti	'bear'	?*bher(-)h ₁ -

c) Metathesized forms

suṣvati (3rd pl.)	'press out'	*seh ₁ w-
pipīte (3rd sing. middle)	'drink'	*peh ₂ -i-
jihīte (3rd sing. middle)	'leave'	*gheh ₁ -i-
rirīhi (2nd sing. imperative)	'give'	*reh ₁ -i-
?cikeṣi	'note'	*keh ₁ -i-

d) Set forms; no other evidence for laryngeal

yáyastu (3rd sing. imperative)	'be heated'
viviktás (3rd dual)	'extend'
jiharti	'take'
vavákṣi, vivasti	'be eager'

e) No laryngeal

bábhasti, bápsati	'devour'
mimikṣvá (2nd sing. imperative middle)	'mix'
vavartti	'turn'
sísakti	'accompany'
vívakti	'speak'
vivekṣi	'sift'
juhoti	'sacrifice'
piprghdī' (2nd sing. imperative)	'mix'

Greek Data (1st sing. pres. unless otherwise specified)

a) Clearly laryngeal-final; athematic

τιθῆμι	'place';	compare Skt. dádhāti
δίδωμι	'give';	compare Skt. dadāti

ἵστημι	'stand';	compare Skt. tīṣṭhati
ἵημι	'send'	*ieh ₁ -
δίζημι	'seek'	*dieh ₂ -
δίδημι	'bind'	*deh ₁ -
βιβάτι (Doric 3rd sing.)	'go';	compare Skt. jīgāti
ἑλθε (2nd sing. imperative)	'be gracious'	*selh _x -
πίμπλημι	'fill'	*pelh _x -
πίμπρημι	'kindle'	*perh ₁ -

b) Thematic

τίκτω	'beget'	*tek-
ἵζω	'sit'	*sed-
πίπτω	'fall'	*peth _x -
γίγνομαι	'become'	*genh ₁ -

c) *-ske/o forms

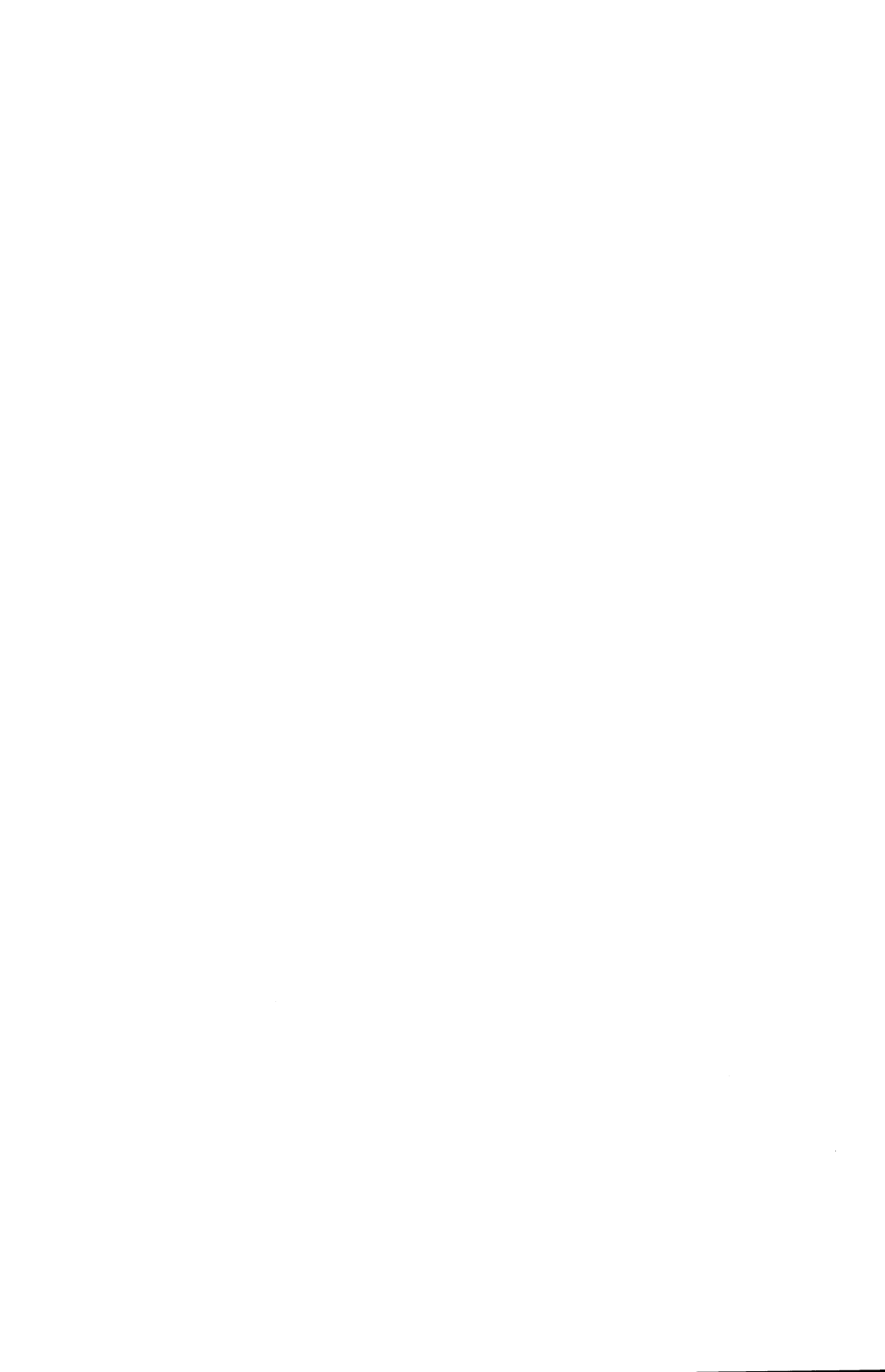
βιβάσκω	'go'	*g ^w eh ₂ -
μιμνήσκω	'remember'	*mneh ₂ -
βιβρώσκω	'drink'	*g ^w erh ₃ -
τιτρώσκω	'wound'	*terh ₃ -
κικλήσκω	'call'	*kleh ₁ -
ἱλάσκομαι	'appease'	*selh _x -
διδάσκω	'teach'	*dens-

Endnotes

- 1) McCarthy and Prince note that the *k* at the end of the reduplicative prefix of longer words is underlyingly *ʔ*.
- 2) McCarthy notes that the attested examples are taken from McMillan (1980).
- 3) Bastin does not supply glosses for the cited forms.
- 4) The estimate was obtained by opening Pokorny at random and counting 100 consecutive verbal roots.
- 5) For evidence that just such a state of affairs is attested in Avestan, see Beekes (1988).
- 6) A root **man-* 'think' can also be reconstructed; it is possible that the Vedic reduplicated form is based on this root rather than on **mneh₂-*. Since the native grammarians cite the set forms *manitá-* (past passive participle) and *manitva*, and since the Greek forms *μῆμνημαι* and *μιμνήσκω* clearly derive from the form of the root with the final laryngeal, I posit **mneh₂-* as the root from which the Vedic form is descended.

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