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Introduction

This volume contains papers written in the recent past by members of the Ohio State University Department of Linguistics. Each paper focusses on some aspect of syntax or morphology, and in several cases, on the interaction between the two. Various languages and theoretical frameworks are represented.

Dowty's paper is a comparison of categorial grammar and X-bar syntax; he considers how each approach represents syntactic phenomena such as lexical and phrasal category membership, government and agreement, and grammatical function. Jo uses categorial grammar to formalize an analysis of some aspects of Korean case marking. He provides a study of so-called 'double subject constructions' in Korean, and of the relations between the case-marking and grammatical relations which are involved. A different set of facts about Korean case markers receives a generalized phrase structure grammar-style analysis in Yoo's paper; he also considers the classification of particular morphemes as affixal or adpositional. No's paper considers facts about Turkish morphology; he reanalyzes so-called 'suffixes' as consisting of an enclitic copular verb followed by a suffix. He also considers a computational morphology approach from the literature. The word/clitic/affix distinction is also central to Joseph's analysis of elements of the Modern Greek verb complex. Using data from the standard language as well as dialectal evidence, he argues that morphemes traditionally called 'clitics' are correctly analyzed as affixes. Powers's paper uncovers syntactic generalizations about the distribution of certain morphophonological consonant mutations in Welsh, appealing to the notions of defaults and overrides which are discussed at length by Zwicky in the final paper of this volume. Morphophonological rules as well as rules of inflectional morphology form the center of Getz's analysis of a subset of Modern Icelandic noun paradigms; he proposes a set of rules that realize bundles of morphosyntactic features, and shows his analysis to be superior to earlier ones. Zwicky's 'Quicker, More Quickly, *Quicklier' is a study of the rules of derivational morphology which derive adverbs from adjectives, and the rules of inflectional morphology which describe comparative and superlative forms of adjectives and adverbs. He discusses the theoretical assumptions behind these rules, and considers the nature of the interaction between syntax and morphology and between syntax and phonology. In 'What's Become of Derivations? Defaults and Invocations', Zwicky considers possible kinds of interactions between rules of the grammar, illustrating his discussion with examples from both morphology and syntax.

A paper by Ying-yu Sheu, 'A Categorial-Processual Analysis of *xuzi* in Chinese', was originally scheduled to be included in this volume. It has since appeared in print elsewhere.

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Papers in Phonology and Syntax

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Notes on Categorial Grammar and X-Bar Syntax:
Some Fundamental Differences and Similarities

David Dowty

1. Introduction

The purpose of these notes is comparative/pedagogical but not polemical: to compare fundamental notions of category, syntactic structure, and syntactic function in the two theories for the sake of understanding them, not to argue that one theory is preferable to the other (though that might be an enterprise which could eventually benefit from this comparison). These notes are written mainly for the purpose of getting clear(er) in my own mind, and explaining to my students, what the differences are and are not. Only the most fundamental syntactic notions are treated in this version, but it might well be profitable to pursue this study to examine more complex aspects of the theories as well.

For the sake of concreteness, it might seem appropriate to cite particular instantiations of X-Bar theory and of Categorial Grammar as the basis for my comparison. However, there are multiple variants of both theories that are currently of interest to linguists, and the fundamental level of this discussion would appear not to require differentiation among variants (except a few points as explicitly noted), so I will not single out any particular versions. One could take Gazdar, Klein, Pullum and Sag (1985) as a prototype of the X-bar theories I have in mind and the linguistic papers in Oehrle et al. (1988) as a prototype for categorial grammars, but I do not pretend to discuss either of these literally.

2. Lexical vs. phrasal categories

CG has no such distinction between the lexical and phrasal categories as it appears in X-Bar theory (e.g. V vs. V', the former corresponding to a node in a tree that necessarily dominates only lexical material, the latter one that necessarily does not immediately dominate lexical material). One and the same category of CG may contain both basic expressions ('lexical items') and syntactically complex expressions as members (e.g. *walk, persuade Mary to leave*, both of category VP). However, one can distinguish in CG, as Montague did in PTQ, between *Basic Expressions* of a category A, denoted B_A, and *Phrases* of the same category A, the relationship between the two kinds of categories being defined by the rule

(1) For all Cat A, Basic Expressions of A $\subseteq$ Phrases of A

(for all categories A--it being understood that the syntactic rules then recursively define P_A for all A, using the members of A defined by (1) as the base for the recursion). It is obvious that any expression β analyzed by a CG as of category X will correspond in an X-Bar analysis to (i) a phrasal node XP immediately dominating a lexical node X which in turn immediately dominates β, if $\beta \in B_X$ as well as $\beta \in P_X$, or (ii) a phrasal node XP dominating category nodes of the expressions from which β was produced (i.e. its immediate constituents) if $\beta \in P_X$ but not $\beta \in B_X$. Unless X-Bar theory insists on the distinction between (2a) and (2b) being made--or that (2a) rather than (2b) is necessary for other reasons, the two kinds of description would seem equivalent, ceteris paribus.

1
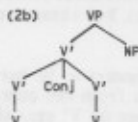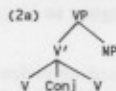
This kind of distinction apparently cannot be made in categorial grammar, because basic expressions cannot be operated on by syntactic rules (e.g. coordinated) independently of their membership in phrasal categories. Though one often sees (2a) in X-Bar analyses, from the point of view of categorial grammar it is necessary to write it only because X-Bar theory does permit the category of transitive verbs (or ditransitive verbs, or other subcategories of verbs differing in their complements) to be a phrasal category. And indeed it will apparently always turn out that analyses like (2a) would be unproblematical in CG if they could be viewed as 'abbreviations' for analyses like (2b), since there will always be phrasal categories in CG of the kind that need to be conjoined (or otherwise combined): according to the above described mapping between the two theories, *every* lexical category has a phrasal counterpart in CG (even categories like Determiner and Complementizer), so there would be far more of them than X-Bar theory allows. Lest this seem like a source for a potential economy argument against CG, recall that the lexical (as opposed to phrasal) categories postulated in the above mapping are 'not really there' in CG. Any possible empirical arguments on the inadequacy of CG on this point would apparently have to hang on showing analyses like (2a) as distinct from (2b) really are necessary (and my hunch is this is not likely). Note also that such an argument would probably have to involve syntax alone and not morphology (i.e. not a case where CG could counter with an independently-well-motivated distinction between lexical and syntactic rules, or between morphological and syntactic operations or rules).
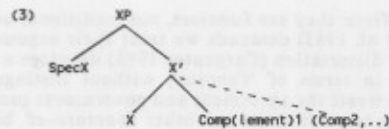
3. Bar-levels

CG does not have (and apparently cannot have in general) anything amounting to a distinction between X' and a corresponding X" category (I will henceforth write XP for the (two-bar-level) X" category but continue to use X' for the one-bar-level) nor any distinctions among greater numbers of bar levels. There is traditionally a phrasal-and-lexical category within NP that functions like N' (called CN), but it is important to realize it has this status because of the unusual relationship between (common) noun and NP (= Montague's T-phrase) within CG, which is neither parallel to the relationship between proper noun and NP nor between lexical verbs (of various subcategories) and VP in CG. CN is usually treated as a primitive category; it is predicative (like VP, denoting a set--or in some theories a property), not individual-denoting (like 'first-order' proper names or pronouns), nor having the same kind of reference as NP (if these are generalized quantifiers). The syntactic relationship between CN and NP is of course mediated by assigning determiners to category NP/CN (which makes Determiner neither parallel to modifiers nor to auxiliary verbs categorially, but more like a functor like VP or Comp or TV or Prep). One has therefore a distinction between coordination at the CN level and coordination at the NP level, between NP anaphora (*it*) and CN anaphora (*one*), and between modifiers of CN (adjectives, restrictive relative clauses, and some PPs) and modifiers of NPs (probably non-restrictive relative clauses)--all the things that a distinction between N' and NP buys you in X-bar theory.

The thing to remember is that nothing analogous to the category CN exists within VPs or PPs or APs, according to most CG analyses. To be sure, there are predicted to be multiple hierarchically embedded 'levels' within such phrases in CG, because of the possibility of adding a modifier to create a higher phrase of the same category, but these are phrases 'at the same bar level'. And within VPs (and some APs and even PPs) there can be multiple arguments of the head V (etc.), which generate internal hierarchical structure (this time, structure often NOT found in the corresponding X-bar analysis), but these are not analogous to V' (or A' or P'--if it exists) as found in X-bar theory either.
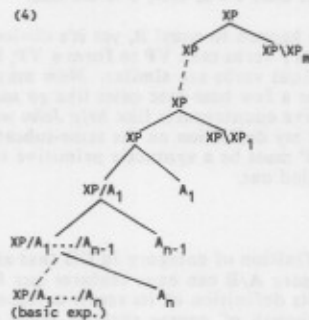
As it has sometimes been suggested, N' appears to be better motivated empirically than V' (or A', etc.)--i.e. motivated as genuinely *distinct* from the corresponding 2-bar level category, even to the point of causing doubt in the existence of V' etc.--this might be a place where CG could try to argue for empirical superiority.

On the other hand, an apparent major difficulty for CG lies in the relationship among proper nouns, common nouns, and NPs: accounting for the distributional and morphological similarities among these expressions, in a way compatible with the 'standard' CG category assignments (i.e. those required by their semantics), since these categories are not 'automatically' connected in the way that they are in X-bar theory. How is it that both proper names and common nouns (but not determiners) are heads of their phrases for purposes of morphology, but determiners are (probably?) not, for example? (See below on 'heads'.) Now, semanticists often have a story to tell about the complicated semantic relationship among these three categories, which can be ontogenetic (Partee and Rooth 1983, Dowty 1982, Ladusaw, p.c.)--i.e. an explanation in terms of the need for children to be able to acquire language in steps) or yet more abstract and intricate, in terms of 'fluid' types (Partee 1987), but it remains to be seen how this can be elaborated and motivated in such a way as to cash in on the morphosyntactic generalizations about NPs that X-bar theory claims to capture (or alternatively, to be argued that the strong parallels between NP and other phrasal categories that X-bar predicts are actually somewhat otherwise).

In summary, X-Bar theory postulates that (at least) this kind of structure is common to NP, VP, AP, (and maybe S or other categories).

(3)

$$
\begin{array}{c}
XP \\
\diagup \;\; \diagdown \\
SpecX \qquad X' \\
\diagup \;\; \diagdown \\
X \qquad Comp(lement)1\ (Comp2,...)
\end{array}
$$

While CG offers instead this kind of 'schema', in which $A_1,...A_n$ are arguments of XP, and $XP \backslash XP_1,...XP \backslash XP_m$ are modifiers of XP:

(4)

$$
\begin{array}{c}
XP \\
XP \qquad XP \backslash XP_m \\
XP \\
XP \qquad XP \backslash XP_1 \\
XP/A_1 \qquad A_1 \\
XP/A_1.../A_{n-1} \qquad A_{n-1} \\
XP/A_1.../A_n \qquad A_n \\
(basic\ exp.)
\end{array}
$$

CG would seem to agree with X-Bar theory on the cross-categorial relationships among X, X' and Complement, and also that modifiers can be added at multiple levels to create a phrase of the same level, and similarly for coordination, but differ in that (i) if *Determiner* is a Specifier, then its relationship to NP and N' (= CN) can be reconciled in CG with what X-bar theory says about it, but that this 'specifier' relationship probably does not exist elsewhere; (ii) in CG auxiliary verbs are not specifiers of VP but are the heads of VPs taking other VPs as complements (and GPSG agrees with this position of course, though it adopts X-bar theory in other ways)--a kind of possible exception being found in the 'type-raised modal' analysis of Bach (1979) and Dowty (1979) (modals as (S\NP)/VP, all other verb phrases

being VP of a lower type) which gives modals and possibly all tensed auxiliaries a status something like 'Specifier'; (iii) CG, unless its 'binary' nature is diluted by the addition of flattening principles, will have as many additional constituent groupings within an XP as the head of XP has arguments numbering more than two (i.e. *give Mary a book* has an additional sub-constituent not found in *see Mary*).

4. Grammatical categories vs. grammatical functions

4.1. Heads

(It's not completely clear to me what status 'head' has in this typology, but I'm including it here anyway.)

The obvious way to think of heads in terms of CG is that functors are uniformly heads of the constituents they form with their arguments if this worked, it would be a great advantage of CG, since you could in effect predict from semantic considerations (sometimes) what the head was going to be (or vice-versa from morphosyntactic ones)--a very highly predictive feature of a theory, potentially.

The equally obvious problem is modifiers: they are functors, but traditional usage of the term 'head' (cf. Zwicky 1985, Gazdar et al. 1985) demands we treat their arguments as heads, not modifiers. (Bob Carpenter in his dissertation (Carpenter 1988) develops a theory where all such generalizations are stated in terms of 'functor', without distinguishing modifiers from 'real' heads; Bach (1983) also treats the agreement and government properties of modifiers without formally distinguishing between them and other functors--cf. below.)

One could try defining head by saying (making the type-token distinction only implicitly, in a way familiar to linguists):

(5) In [A/B B] of category A, A/B is the head except where A = B; then, B is the head.

The problem with this is there are cases where A does happen to equal B, yet it's obvious A/B is the head and B its complement--for example auxiliary verbs take VP to form a VP; but the auxiliary verb is traditionally considered the head. Equi verbs are similar. Now maybe the *subcategory* is different in most cases, but there may be a few base-base cases like *go soak your head*, *run get the beer*, and there are certainly transitive counterparts like *help John wash the dishes*, *see Mary win the race*, so I wouldn't want to pin my definition on the same-subcategory/ different-subcategory distinction. This implies 'head' must be a syntactic primitive in some sense or other, if modifiers need to be explicitly singled out.

4.2. Inherent functor features

One interesting question for formalizing a definition of category in CG that allows a 'modern' system of features is whether a functor category A/B can have features qua functor category, or only features defined for A (as part of its definition of its result category) and features defined for B (ditto argument category)--though of course each of these can be recursively complex in the same way: this theory implies all your features are ultimately defined on one of the primitive categories, so there are no features peculiar to complex categories. (Carpenter, at least, uses such a restricted theory of features.) The other theory would merely regard 'Argument Category' and 'Result Category' as two category-valued features that go into defining a category (like SLASH in GPSG), possibly among other features as well. (Bach 1983 explicitly allows for 'inherent' features for complex categories, though he doesn't actually use them, though Zeevat, Klein and Calder 1987, Uszkoreit 1986, and Karttunen 1986 do make use of inherent features.)

Now although it might be technically possible to treat 'head' as a feature definable on a primitive category (still without distinguishing A/A from A/B), I believe the definition would be awkward and would have unintuitive consequences. But rather than open the door to just any arbitrary inherent functor features, maybe one should consider (for the time being) 'head', alongside 'direction of slash', which is likewise necessarily an inherent functor feature if it exists at all, to be the *only* inherent features.

A simple way to formalize such a theory would be as follows:

(6) 1. The Primitive categories are .... (finite list).

     2. If A and B are any categories, A/B and A\B are categories.

     3. If A is a category, A//A and A\\A are categories.

The idea is that A//A is the category of modifiers--each syntactically distinct but of the same semantic type as the corresponding A/A (where the second A is a complement). 'Head' is then defined by saying:

(7) (i) in [A/B B], A/B is the head, and
     (ii) in [A$_i$//A$_j$ A$_j$], A$_j$ is the head.

(This is of course a disjunctive definition--as Venneman and Barlow's definition also is, as pointed out by Hawkins 1984 (see Hocksema p. 59)--but that would not be too bad if it turned out that one needed to ascribe properties to one of the two subtypes separately from the other.) Note also the Greenberg universal word order tendency is easily described as a tendency to put heads and non-heads in the same order (i.e. in VO languages, functors tend to precede arguments, but modifiers tend to follow arguments; vice-versa for OV's.) In describing agreement and government in morphology, one would then want to treat A/B and A//B differently; cf. discussion of Bach (1983) below.

A more difficult question is whether the notion 'head' is really needed in a categorial theory of syntax. Pace Zwicky (1985), Bach (1983) argues that the notion 'head' is unnecessary for describing generalizations about inflectional morphology involving agreement, government, and selection in a categorial grammar with a well-developed system of morphosyntactic and morphological features, and he provides a significant fragment of modern German inflectional morphology and syntax formalized in this theory. Briefly, Bach's system works as follows. Morphosyntactic features are defined (essentially, though not in these terms) as attribute-value pairs (i.e. pairs consisting of a feature and its (unique) feature-value), and primitive categories are sets of these. A functor category A/B is then defined as an ordered pair consisting of a set of argument feature-value pairs (defining B) followed by a set of result feature-value pairs (defining A). Bach's general form of a syntactic rule incorporates principles of Government, Agreement and Inheritance ('Percolation') (cf. p. 79) and is stated as in (8), which is taking as recursively defining F(x), the morphological form of every derived expression x:

(8) If $\alpha \in A/B$, $\beta \in B$, and o is the associated syntactic operation,
     then $\delta \in A$, where $\delta =$
          o(G(α), H(β)) and
          F(δ) = I(F(α), F(β))

     where:

     G = agreement and must be a function on F(β)
     H = government and must be a function on F(α)
     I = percolation and must be a function on (F(α), F(β))

In other words, the functor expression α (in A/B) will, in the combined expression, acquire 'agreement' morphological features that depend on features of its argument β (cf. Keenan's principle 'functors agree with their arguments'), and the argument expression β (in B) will acquire features governed by its functor α. In addition, the derived expression can 'inherit' features from both inputs: Bach's principle for this (cf. p. 81) says, roughly, that if the result category shares some feature(s) with the argument category, then the feature values of these shared features are inherited from the argument to the result; the feature values defining the category of the resulting expression are otherwise those specified in the result-category symbol of the functor (i.e. A in A/B).

In this system, endocentric modifiers are simply stipulated to have the feature set $\langle\emptyset, \emptyset\rangle$, i.e. no government features and no (lexically inherent) agreement features: then in the context of this system, they are 'completely transparent with respect to the features of their arguments'.

In fact, we can almost take the feature set $\langle\emptyset, \emptyset\rangle$ as defining an endocentric modifier (and therefore indirectly determining 'head'): we cannot quite, because there is nothing in Bach's theory which insures that only expressions of A/A receive this feature set, rather than, say some expression of A/B for $A \neq B$ (which would be rather heads of non-endocentric constructions that just happen not to govern any features or have any inherent features with which other functors must agree). So (endocentric) modifiers must be expressions of A/A or A\A which have features $\langle\emptyset, \emptyset\rangle$, and heads can in turn be defined in terms of these. The question to ask is, does Bach miss any generalizations by not being able to refer to heads directly? Within the context of his theory, it is not obvious that he does. That should be a starting point for a close examination of this issue, which is beyond the scope of the present discussion. Carpenter's treatment should provide a second example, formalized in a somewhat different way. Note that Zwicky (1985) (like Hoeksema 1985) is concerned with 'head' in derivational morphology as well as inflectional morphology and syntax, whereas Bach (and probably Carpenter) is/are not.

4.3. Grammatical functions

Much traditional grammatical wisdom has it that grammatical categories (noun, NP, Adverb, PP, etc.) and grammatical functions (subject, direct object, modifier, time adverbial, free adjunct, etc.) are distinct notions and should not be confused; some linguists (Arnold Zwicky, p.c.) would still seem to want to give such a principle the status of an a priori methodological assumption that is fixed before questions of the form of a linguistic theory can begin to be discussed. (Grammatical functions are of course taken to be definable in terms of other notions, such as constituent structure and linear order, in some theories but as primitives in others, such as relational grammar and LFG, but this statement applies equally to both kinds of theories.) However, categorial grammar would seem to ignore this boundary between category and function, since it provides characterizations of at least some grammatical functions (and some would argue, of all grammatical functions necessary in linguistic theory: Dowty 1982) in its category assignments and constituent structures.

For expressions used as arguments, the grammatical function of the expression is determined not by the category of the argument itself but by the functor that is combined with it in a particular sentence: below are some examples. Note two important caveats here: we say 'expression used as argument' and not 'argument category', since expressions of the same category, say the 'NP' category S/VP, can be used sometimes as arguments and sometimes as functors by the same grammar; similarly, position in the grammatical structure of a sentence is relevant, since argument expressions of the same category can have multiple grammatical functions within a single sentence. English word order is used for the sake of familiarity below, but it is to be understood that the definitions are essentially in terms of functor-argument relations, not linear order.

For expressions used as functors in a particular situation, on the other hand, grammatical function (or at least part of it) is defined by category. There are two main kinds of these: *modifier of A*, where the functor is A//A or A\\A, and cases where the functor is a non-modifier. In that case, there may be some traditional name for the functor's grammatical function (such as 'predicate') but in most cases there will not, a traditional term existing only for the corresponding subcategorization frame, if even that (as in the case of the grammatical function of (VP/VP)/NP in [(VP/VP)NP NP]). Because grammatical category and grammatical function must coincide for functors, a functor expression which has more than one 'grammatical function' must be assigned to more than one syntactic category, e.g. VP-modifying adverbs and S-modifying adverbs must be assigned to different categories (cf. just below); this characteristic has been viewed by some as an undesirable property of CGs.

(9) Examples of grammatical functions defined by categorial grammar (categories used as variables over expressions):

  a. In [NP NP\S], NP has the grammatical function <u>subject</u> and NP\S has the function <u>predicate</u>.

  b. In [VP/NP NP], NP has the grammatical function <u>direct object</u> and VP/NP has the function transitive <u>verb (phrase)</u>.

  c. In [(XP\\XP)/NP NP], NP has the function <u>object of preposition</u>.

  d. In [VP/VP VP], VP has the function <u>VP complement</u>.

  e. In [VP/S' S'], S' has the function <u>sentential complement.</u>

  f. In [S S\\S], S\\S has the function <u>sentential modifier</u>.

  g. In [VP VP\\VP], VP\\VP has the function <u>VP modifier</u>.

  h. In [CN CN\\CN], CN\\CN has the function <u>noun modifier.</u>

(The list is not exhaustive). Some familiar grammatical categories do not appear as such in CG: for example, Adverb, Adverb Phrase, Preposition, and Prepositional Phrase do not exist in exactly parallel form in CG: rather, there are only the phrasal categories S-modifier (S\\S), VP-modifier (VP\\VP), and so on, each of which may contain both solitary lexical expressions ('S-adverbs', 'VP-adverbs'), as well as complex phrases consisting of an adverb and modifier ('Adverb Phrase'), a preposition and object (e.g. [(S\\S)/NP NP], a 'Prepositional Phrase'), a preposition and two complements ([(VP\\VP)/NP)/Adj NP Adj], e.g. *with the president absent*) or a sentence and adverbial subordinating conjunction (e.g. [(S\\S)/S S], an 'adverbial subordinate clause'). However, we can usually give cross-categorial characterizations in CG that correspond to the traditional classes, e.g. the category 'Preposition' can be said to correspond to (X\\X)/NP in CG, i.e. prepositions are words that combine with a following NP to form a modifier of any category. It could conceivably be regarded as a deficiency of CG that it 'predicts' that (some or all) prepositions could idiosyncratically form modifiers of certain categories but not others (say of CN and S but not VP), whereas it may be a (nearly or absolutely) universal fact about languages that in any language which has the category at all (cf. Schachter 1985), PPs modify S, VP, CN and probably various subcategories of these indiscriminately. Of course, many lexical items generalize with greater or lesser productivity across various grammatical (sub-)categories, and the means for describing this will have to be adopted in any event (and various such systems have already been proposed), so it's not clear any important generalization need be lost if one appeals to schema such as (X\\X)/NP as lexical categories. On the other hand, other kinds of modifier (adverb and adverbial subordinate clauses) are now known to need to be divided into 'VP-Adverbs' vs. 'S-Adverbs' for various descriptive reasons (Stalnaker and Thomason 1973, McConnell-Ginet 1982, Ernst, ms.), so it's clear these kinds of modifiers have to be kept distinct in general.

So far, however, there is no real problem for the clear-cut distinction between grammatical category and grammatical function: even if certain categorial relationships

'correspond' to definitions of grammatical functions, the purist can maintain that the actual 'grammatical functions' themselves can still be regarded as of a different kind, on a different plane, as it were. If a problem arises, it would probably be with phrases such as *every Thursday* in the context (10):

(10)   Mary met John every Thursday   in the garden
                        Thursday morning
                        this Thursday
                        the first Thursday
                        after Easter

One can imagine a purist insisting that the phrases *every Thursday* etc. belong to the category NP (and to no other category) because (i) they have the internal syntax of a NP, and (ii) they share ordinary NP distribution (e.g. *This Thursday is my birthday*); the 'adverb-like quality' of this phrase, it would be argued, is a matter of grammatical function, not grammatical category, and it would be a confusion of category with function to call these Adverb Phrases (or NPs exhaustively dominated by AdvP).

However, not just any NP can appear here (**Mary met John a false proposition in the garden*), but only one referring to an interval of time; note also that a few temporal phrases require a preposition *on* or *in* in such contexts (*Mary met John *(in) January in the garden*) and *on* (or *during*) *can* occur optionally with all of the 'bare NP' phrases. Since these are clearly adjuncts, by their distribution and by their semantics, CG requires us to assign them to a modifier category such as S\\S or VP\\VP (though of course they may be derived from NPs by an 'adverbialization' rule or by combining with a 'phonologically null' preposition): the option of calling them 'NPs' apparently does not exist in this theory. If this is indeed a case where phrase structure grammars either demand assignment to category NP or offer an analytic choice between NP and an adverbial category, then some might want to argue that CG here forces the correct choice. (See McCawley 1988 for detailed discussion of two further views on this data; note that, like CG, McCawley takes the 'external syntax' of adverbially-used NPs as relevant to determining their category, not just their internal syntax.)

5. Category raising and head-agreement-government generalizations

Systems of categorial grammar are of course now widespread in which so-called 'Category Raising' takes place (several examples are in Oehrle et al. 1988); either as a lexical process (i.e. expressions are entered in the higher type in the lexicon, but no general rule exists for changing an arbitrary category) or as an unrestricted 'syntactic' (and possibly recursively self-feeding) process. Category Raising reverses the functor-argument relationship between two expressions and so would wreak havoc with any generalizations about agreement and government in terms of category, unless countermeasures of some kind are taken.

5.1. Type polymorphism

There are basically two ways to have the category-raising cake and eat it too: first, one can relegate all type-raising to the semantics and so leave the true syntactic categories unaffected: this is sometimes called the 'type polymorphism' approach (see e.g. Partee 1987). For example if the fundamental form of the grammar has the categories e (name) and S\e (VP), and if by type-raising the category e is reinterpreted as denoting functions from S\e denotations (NPs, in their semantic role as quantifiers), then for syntactic purposes S\e nevertheless continues to count as 'functor' and e as 'argument'. This might appear to be a strange strategy to a logician working with categorial grammar, since for her the whole point of using the categorial notation to name categories is that the logical type of the category is automatically made apparent. But for linguists interested in the natural language generalizations of word order and morphology that on the one hand seem sensitive to the functor-argument distinction in a basic way but are apparently unaffected by type raising (if semanticists are right in identifying the points at which it occurs), this is a natural

kind of theory to pursue (even if we turn out to need a 'double' notation for categories and types of expressions to avoid confusion).

5.2. 'Structure-preserving' category raising

Another possibility would be to incorporate category raising as an operation which does indeed change syntactic category but try to add to this a mechanism for making systematic concurrent changes in the organization of agreement and government morphology for that category, etc. so as to preserve the apparent morphological and syntactic relationships among expressions that existed before category raising--much as Dowty's (1989) analysis of non-constituent conjunction carefully preserves word order in spite of category raising. This looks less practical on the face of it, but who knows whether it could be made workable in some reasonably elegant and ingenious way?

6. Other topics

As mentioned at the beginning of these notes, only the most fundamental properties of the two approaches are treated here. A full comparison of them would necessarily involve a number of other issues which are more complex, because language itself is more complex in these phenomena, because there is not a single approach in categorial grammar (or in X-bar theories) but several mutually incompatible methods, or because semantic as well as syntactic issues are involved. These include but probably should not be limited to:

   i. the use of context-free operations only vs. use of more complex operations such as 'wrapping' (cf. Bach 1984).
   ii. (closely related) the use of non-context free operations vs. the use of metarules and 'flattening' rules to capture discontinuous (bounded) dependencies.
   iii. The use of functional composition in CG to capture non-normal constituents, as in clause union or non-constituent coordination, vs. ways of describing these in X-bar theories.
   iv. The use of feature-passing vs. movement transformations vs. functional composition to describe unbounded dependencies.
   v. The use of unification in some versions of CG and HPSG vs. other methods of feature matching.

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Double Subject Constructions and Marked Case Assignment in Korean*

In-hee Jo

1. Introduction

The so-called 'double subject construction' (hereafter DSC) of Korean has attracted many linguists' attention since it is contrary to usual linguistic assumptions for a simplex sentence to have two subjects. Despite the attention it has received, however, its morphosyntactic characteristics have been poorly understood. A closer analysis of the constructions roughly classified as DSCs will reveal that not all the nominative-case marked NPs bear the grammatical relation 'subject' and that apparently similar constructions require quite different syntactic treatment. In this paper, I will examine the case marking of Korean with respect to the DSCs and address some other issues concerning DSCs. Then it will be claimed that the surface case markings must be distinguished from grammatical relations such as subject and object. It will also be pointed out that adjectival predicates behave differently from nonadjectival predicates in case assignment.

In section 2, a general pattern of case assignment in Korean will be sketched. Section 3 is devoted to the discussion of DSCs. First, it will be noted that previous characterizations of DSCs are not clear enough to distinguish DSCs from other, similar constructions. For a more precise syntactic characterization of DSCs, in section 3.1 a distinction between DSCs and topic constructions will be drawn, based on the kinds of predicates allowed in them. In section 3.2, previous attempts to derive DSCs from a non-DSC source (i.e. a possessive construction) will be examined and rejected. In section 3.3, the subjecthood of the nominative NPs will be examined on the basis of subject honorification, and it will be claimed that the second nominative NP in the psychological verb construction does not have the grammatical relation of subject. Throughout the discussion in section 3, I will argue that adjectival predicates behave differently from genuine verbs: only adjectival intransitive predicates figure in DSCs, and adjectival transitive predicates assign their object NP the nominative case. In section 4, an apparent alternative case assignment in a multi-verb construction is examined and is accounted for as a result of the interaction between surface structural ambiguity and adjectival predicates. Finally, in section 5 I examine how marked case assignment in Korean can be accounted for in a categorial grammar framework.

2. Case assignment in Korean

Before pursuing our analysis of the DSC, a brief statement concerning case marking in Korean is in order. The examples in (1) are relevant to the following discussion:[1]

(1) John-i pab-ul mek-ko-iss-ta
     -NM rice-ACC is eating
'John is eating rice.'

(2) Mary-uy oppa-ka o-ass-ta
     -GEN brother-NM come-PAST
'Mary's brother came.'

(3) [Mary-wa John]-i o-ass-ta
     -and   -NM come-PAST
'Mary and John came.'

(4) nay-ka [Mary-wa John]-ul po-ass-ta
     1-NM   -and   -ACC see-PAST
'I saw Mary and John.'

There are two nominative markers (NM), <u>i</u> and <u>ka</u>, two accusative markers (ACC), <u>ul</u> and <u>lul</u>. The first member of each pair occurs after a noun ending with a consonant and the second member occurs after a noun ending with a vowel. The genitive case marker (GEN) is <u>uy</u>, and the noun phrase conjunction is <u>wa</u>.[2] When conjoined NPs serve as the subject or the object of the sentence, the relevant case markers are realized after the whole coordination, as illustrated in (3) and (4).

Treating case markers as inflectional affixes, the following simplified GPSG-type rules and accompanying morphological operations may be stipulated to account for case assignment in the above examples.[3]

```
(5)  GPSG PS rules:
       S   --> NP[NM], VP
       VP  --> V[1]
       VP  --> NP[ACC], V[2]
       NP  --> NP[GEN], N'
       NP  --> NP[wa], NP

(6)  Morphological Realization Rules (RR) and Operations (OP)
       RR 31: In the context of [+N, -V],
                 [CASE:NM] is realized by operation 31.
       RR 32: In the context of [+N, -V],
                 [CASE:ACC] is realized by operation 32.
       OP 31: Suffixation of /i/ when it is preceded by a consonant, or
                 suffixation of /ka/ when it is preceded by a vowel.
       OP 32: Suffixation of /ul/ when it is preceded by a consonant, or
                 suffixation of /lul/ when it is preceded by a vowel.
```

These rules and operations can correctly account for the case assignment and the close correlation between cases and grammatical functions of the NPs in the above examples: typically, subject NPs are nominative-case marked, while objects of transitive verbs are accusative-case marked. However, they cannot account for case assignment in DSCs, since no commonly assumed rules such as those in (5) and (6) allow two nominative marked NPs in a simple sentence.

According to Park (1973: 63), one of the earliest papers on the DSC, the DSC is a sentence construction 'which contains two or more subjects, but not in the sense of coordination or subordination'. Thus, in the following examples, (7) is a normal compound sentence and (8) is a complex sentence including a relative clause. The PS rules stipulated above can be easily expanded to accommodate sentential conjunction and relative clauses. On the other hand the DSCs of type (9) are unique in that a seemingly simple sentence apparently contains two nominative-case marked NPs. In many studies of this construction, the two nominative NPs have been considered subjects; hence the term 'Double Subject'.

```
(7)  John-i  o-ko     Mary-ka  ka-n-ta
         -NM  come-and      -NM  go
     'John comes and Mary goes'

(8)  John-i  ney-ka  salangha-nun  salam-i-ta
         -NM  I-NM    love-REL      person-is
     'John is the person (whom) I love.'

(9)  a.  ce   salam-i  son-i   khu-ta
         that man-NM   hand-NM big
         'That man is big-handed' or 'It is that man whose hand is big'

     b.  cangmi-ka  kkoch-i    yeppu-ta
         rose-NM     flower-NM  pretty
         'Roses have pretty flowers' or 'It is the rose whose flower is pretty'
```
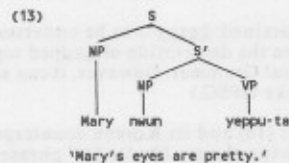
However, Park's (1973) characterization cited above is not clear enough to identify all the DSCs. That is because there are constructions which apparently look like the typical DSCs in (9), with two nominative NPs, but which have quite different internal structures, as will be discussed in the next section. Thus a more precise syntactic characterization of these constructions needs to be made in order to make any plausible claims about them. In the following discussion, whenever the subjecthood of the nominative NPs is not implied, a more neutral term, 'Double Nominative Construction' (hereafter DNC), will be used to refer to any construction with two nominative NPs.

3. Characteristics of the double subject constructions

There are at least three kinds of DNCs in Korean. The first class involves adjectival predicates such as <u>khu</u> 'big' and <u>yeppu</u> 'pretty', and the two nominative NPs most typically exhibit the possessor-possessed relation, as in (9) above and in (10) below. The second class involves a subclass of transitive verbs (i.e. some 'psychological' verbs such as <u>silh</u> 'dislike'), which requires its object NP to be in nominative case, as in (11). The third class involves some copular verbs such as <u>i</u> 'is', <u>an</u> 'isn't', and <u>toy</u> 'become' as in (12).

(10) Mary-ka nwun-i yeppu-ta
     -NM eye-NM pretty
    'Mary's eyes are pretty.'

(11) a. nay-ka paym-i musep/silh/coh-ta
     I-NM snake-NM afraid-of/dislike/like
    'I am afraid of/dislike/like snakes.'

    b. John-i paym-i silh-unkapota
      -NM snake-NM dislike-seem
    'It seems that John dislikes snakes'

(12) a. John-i paksa-ka an-ita[4]
      -NM doctor-NM not-is
    'John is not a doctor.'

    b. Tom-i paksa-ka toy-ass-ta
      -NM doctor-NM become-PAST
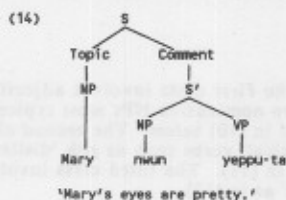   'Tom became a doctor.'

Sentences of these types have all been classified as double subject constructions. For them, Park (1973, 1982) posits the following structure, claiming that the first NP is the subject of the whole sentence and the second NP is the subject of an embedded sentence which functions directly as the predicate of the whole sentence.

(13)

              S
           / \
         NP   S'
             / \
           NP   VP
      Mary nwun yeppu-ta

    'Mary's eyes are pretty.'

Park claims that even equational sentences like (12) have the constituent structure in (13). However, as will be clear in later discussions of the subject honorific agreement, the second NPs in the psychological verb constructions in (11) and the equational sentences in (12) do not bear any of the properties typically associated with syntactic subject NPs, except for the nominative marking. The nominative marking of the second NPs must then be attributed to the idiosyncrasies of the governing verbs, and must not be confused with the grammatical relation of subject. This fact will be further discussed in greater detail in section 3.3.2. My

interest here is primarily in the construction exemplified in (9) and (10) in which adjectival intransitive verbs are used. In the following discussion, then, the label 'DSC' will refer to this construction (and not to those illustrated in (11) and (12)), unless otherwise indicated.

Park's analysis represented in (13) is structurally almost the same as Li and Thompson's (1975) claim that sentences like (9) and (10) should be analyzed in terms of topic-comment relations, as roughly represented below:

(14)

```
                    S
              _____|_____
           Topic        Comment
            NP             S'
            |          ____|____
                      NP        VP
                      |         |
          Mary      nwun     yeppu-ta

          'Mary's eyes are pretty.'
```

However, structures like (13) and (14) are not simply notational variants, as Park assumes, since they make different claims about grammatical relations. The structure in (14) needs to be independently motivated to account for a different set of sentence constructions. Before pursuing another problem with Park's claim, i.e. the subjecthood of the nominative NPs, let us first look at the distinction between the above DSCs and the so-called topic-comment constructions.

3.1. Distinction between DSCs and topic-comment constructions

Any attempt to reduce DSCs to topic-comment constructions is futile. In Korean, which is often claimed to be a topic-prominent language, there are two types of topic constructions; (i) gapped topic constructions, and (ii) gapless topic constructions, which roughly correspond to English sentences like (15) and (16), respectively.

(15) Beans, I like.
(16) As for dinner, I ate beef-steak.

In gapped topic constructions, a topicalized constituent is 'moved' to the front of the sentence, leaving a gap behind, as in (15) and the corresponding Korean sentence (17):

(17) khong-un nay-ka cohahanta.
     bean-TP I-NM like.
     'Beans, I like.'

Accordingly, the syntactic role of the topicalized NP is maintained: <u>beans</u> is to be understood as the object of the transitive verb <u>like</u> in (15) and (17). (Here the description of gapped topic constructions is stated from the viewpoint of Transformational Grammar. However, it can also be easily described in a non-transformational framework like GPSG.)

On the other hand, in gapless topic constructions such as (16) and its Korean counterpart (18), the topic NP does not play a syntactic role in the following clause. The 'as for' phrase in (16) is clearly a separate constituent from the clausal comment that follows it. Its occurrence is licensed not by any syntactic property of the comment clause, but by some discourse pragmatic principles governing sentence initial adverbials in general.

(18) cenyek-un pulkoki-lul mek-essta
     dinner-TP beefsteak-ACC ate
     'As for dinner, I ate beefsteak.'

The only difference between Korean and English is that while English uses periphrastic constructions involving words like 'as for' to mark a constituent as topic, Korean uses a suffixal topic marker, nun/un.

Obviously, the gapped topic construction is distinguished from DSCs by the fact that no gaps are present in DSCs. Therefore, if DSCs are similar at all to topic constructions (in that the embedded sentence is 'about' the first nominative NP, just as the comment is 'about' the topic), it must be similar to the gapless topic construction, and both constructions must be admitted by a PS rule like (19):

(19) S --> NP[NM/TP] S

This PS rule will admit any sentence preceded by an NP which can be either topic marked or nominative marked. If there is any grammatical relation between the first NP and the following sentence, it is to be pragmatically, rather than syntactically, established.

However, there is one striking difference between the gapless topic construction and the DSC, and which is not captured by a simple PS rule like (19). The predicates of DSCs are restricted to a small subset of verbs, i.e. so-called adjectival verbs, whereas the gapless topic constructions impose no such morphosyntactic constraint on the predicates of the comment clause. This fact has not been clearly stated in most previous studies (cf. Park 1973, 1982, Yim 1984, Chun 1986, Yoon 1986), in spite of the fact that virtually all of their DSC examples were built on the adjectival predicates.

Despite the traditional distinction between adjectives and verbs in many Korean reference grammars, adjectives and verbs are not formally distinguished categories in Korean syntax: both can serve as predicates of a sentence, and both can be marked in such inflections as tense and subject honorific agreement. For instance, khu 'big' and yeppu 'pretty', as in (9), serve as predicates of the sentences, without being modulated by copular verbs.

At first glance, then, what distinguishes DSCs from the topic constructions seems to be the stativity of the DSCs' predicates, as suggested by the fact that they cannot be used with the progressive aspect or with the imperative:

(20) a. *John-i kho-ka kil-ko iss-ta
         -NM nose-NM long   PROG
         'John's nose is becoming long.'

     b. *kho-ka kil-ala
         nose-NM long-IMP
         'Be long-nosed.'

However, the non-occurrence of such predicates with the progressive aspect or with the imperative has nothing to do with the DSC, since it is naturally accounted for as a result of semantic incompatibility. Thus, in the following example, the transitive verb talm 'resemble' does not occur in the DSC, despite its stative character.

(21) *John-i kho-ka phinokhio-uy kho-lul talm-ass-ta.
       -NM nose-NM Pinocchio-GEN nose-ACC resemble-PAST
       'John's nose resembled Pinocchio's.'

In fact, no example of DSCs in previous studies involves a typical transitive verb like ttavli 'beat', or cuki 'kill', as in the ungrammatical (22). However, it is not simply transitivity of the predicates that figures in DSCs. Even intransitive verbs like keleka 'walk' as in (23) and ca 'sleep' do not occur in DSCs:

(22) *Mary-ka apeci-ka ku salam-ul <u>cuki</u>-ass-ta
    -NM father-NM the man-ACC kill-PAST
    'It is Mary whose father killed the man.'

(23) *John-i tongsayng-i <u>keleka</u>-ass-ta
    -NM brother-NM walk-PAST
    'John's brother walked.'

It seems then that the adjectival verb requirement is a 'construction-specific' constraint of the DSC. Even though adjectival predicates and genuine verbs share many morphosyntactic properties, there are a few distinctions between them, with respect to their inflectional and derivational paradigms: i) in the present tense, most verbs are marked by a suffix <u>un</u>/<u>nun</u>, while adjectival verbs are zero-marked; ii) adjectival predicates can be directly modified by adverbs like <u>kacang</u> 'most' to form periphrastic superlative expressions, while nonadjectival verbs cannot; iii) as English adverbs can be derived from adjectives by the suffixation of '-ly', Korean adverbs can be derived from adjectival verbs by suffixing one of the morphemes <u>i</u>, <u>hi</u>, <u>li</u>, or <u>ke</u>:

(24) a. mukep 'heavy' ==> **kacang** mukep 'the most heavy'
                   ==> mukep-ke   'heavily'

    b. culkep 'happy' ==> **kacang** culkep 'the most happy'
                   ==> culkep-i   'happily'

In the following discussion, 'adjectival verbs' will thus refer to a subset of intransitive verbs whose morphosyntactic feature specification is defined as [+N, +V].

Despite its formal similarities to DSCs, the gapless topic construction imposes no similar constraint on the verbs appearing in it. Accordingly, the nominative case of the first NPs in DSCs can always be replaced by the topic marker. The same is not true of either of the types of topic construction.

(25) cenyek-un/*i ce salam-i pulkoki-lul sacu-ess-ta
    dinner-TP/*NM that man-NM beefsteak-ACC buy-PAST
    'As for dinner, that man bought (me) beefsteak.'

(26) khong-un/*i nay-ka cohahanta.
    bean-TP/*NM I-NM like.
    'Beans, I like.'

Therefore, the DSC needs to be treated independently of the topic constructions.

3.2. Derivation from genitive constructions?

There have also been persistent attempts to show that DSCs are derived from non-DSC sources. The typical non-DSC source suggested is a possessive construction. This is because the first and second NPs in DSCs are typically in the possessor-possessed relation, and each DSC has a corresponding example in which the first NP is actually in the genitive case:

(27) a. ce salam-i son-i khu-ta   ce salam-<u>uy</u> son-i khu-ta
    that man-NM hand-NM big-DEC <==> that man-GEN hand-NM big-DEC

    'That man is big-handed.'   'That man's hand is big.'

    b. cangmi-ka kkoch-i yeppu-ta   cangmi-<u>uy</u> kkoch-i yeppu-ta
    rose-NM flower-NM pretty <==> rose-GEN flower-NM pretty
    'Roses have pretty flowers.'   'Rose flowers are pretty.'

Linguists who assume a derivational relationship between DSCs and the corresponding genitive constructions include Kang (1988) and Chun (1986), among others. On the other hand, other linguists (Yim 1985, Park 1973, 1982, Yoon 1986) posit no derivational relationship.

Yim (1985) and Yoon (1986) argue against the derivational view from a GB point of view, while Kang (1988) and Chun (1986) argue for a 'possessor ascension' analysis within a Relational Grammar framework. I will not make any detailed review of their analyses, except to point out one significant limitation of their arguments. Regardless of the frameworks in which their arguments are couched, there is one defect common to all the previous analyses: their theory-internal arguments for or against possessor ascension are mainly directed toward the relationship between the first and the second NP, paying no attention to the types of verbs or the internal structures of the predicates in DSCs.

For example, a typical GB-minded argument against movement/possessor-ascension analysis goes like this: 'one has to raise the most deeply embedded Specifier *in severe violation of Subjacency*...the possibility of parameterizing bounding nodes or of positing an escape hatch is not available since the movement is unbounded and the extraction is from NPs where no independent escape hatches exist' (Yoon 1986: 216; italics added).

Any argument about the relation between the NPs involved would be meaningful only if other things are kept constant. However, as we have noted in the previous section, only adjectival verbs are compatible with DSCs. Obviously, this is not a kind of syntactic constraint which can be imposed upon just any sentence. That is because syntactically, a VP must be compatible with any subject, regardless of the internal structure of the subject NP. The unacceptability of the DSCs in (22) and (23) is then attributed to the lack of adjectival verbs. Notice however that the corresponding sentences, (28) and (29), in which the first and the second NP are in the genitive construction, are perfectly grammatical.

(28) Mary-uy /*ka apeci-ka ku salam-ul <u>cuki</u>-ass-ta
        -GEN/*NM father-NM the man-ACC kill-PAST
    'Mary's father killed the man.'

(29) John-uy /*ka tongsayng-i <u>ka</u>-ko iss-ta
        -GEN/*NM brother-NM go PROG
    'John's brother is going.'

Therefore the adjectival predicate requirement seems to be specific to the DSC, and needs to be motivated independently of the corresponding genitive constructions. The possessor-possessed relations between the two nominative NPs in DSCs must, then, be understood as one of the pragmatic constraints associated with DSCs.

3.3. Subjecthood of the nominative NPs

As indicated by the traditional term 'double subject constructions', the two NPs in DSCs have often been assumed to be subjects. This assumption is reflected in Park's (1973, 1982: 656) claim that 'the first NP is predicated by the rest of the sentence, which in turn takes the form of a sentence whose subject is the second NP'. This issue of the subjecthood of the nominative NPs is important not only in understanding the nature of DSCs, but also in distinguishing DSCs from other similar constructions like psychological verb constructions, as briefly noted earlier.

The subjecthood of the second NP with respect to the final verb is less controversial than the subjecthood of the first NP. Kang (1988)'s recent analysis of the DSC makes an explicit claim that the first NP is a subject. In addition, any analysis of DSCs involving possessor ascension (e.g. Chun 1986) can also be viewed as making a similar claim, since in the possessor ascension analysis, the ascended possessor assumes the grammatical relation previously borne by its host (in keeping with the Relational Succession Law). Rejecting this analysis, Yoon

(1986) proposed that the first NP is in the nominative case but does not bear the grammatical relation of subject.

Defining the grammatical relation of subject in languages like Korean is not easy, since neither case marking nor position serves to uniquely identify subjects (as they do in most European languages). To make matters worse, any NPs can be omitted if they are recoverable from the context, and subordination of a clause is not syntactically distinguished from coordination. Therefore it is very difficult to find an unambiguous subjecthood test.

The only available test for subjecthood seems to be subject honorification, whereby the predicate of a sentence is expected to agree with the subject in terms of honorification, as below: (HON is for an honorific marker; and CON for a contempt marker which indicates the speaker's contempt or superiority, instead of deference, to the referent of its host NP.)

(30) a. sensayng-nim-i ka-si-n-ta
         teacher-HON-NM go-HON
         'The teacher is going.'

     b. sensayng-nim-i totuk-nom-ul ttayli-si -ass-ta
         teacher-HON-NM thief-CON-ACC hit-HON-PAST
         'The teacher hit the thief.'

     c. totuk-nom-i sensayng-nim-ul ttayli-ass-ta/*ttayli-si -ass-ta
         thief-CON-NM teacher-HON-ACC hit-PAST   /*hit-HON-PAST
         'The thief hit the teacher.'

As seen in (30a) and (30b), a subject NP which denotes a person to whom the speaker wishes to show deference is elevated by such honorific markers as nim and si. Nim is the honorific personal marker, whereas si is the verbal honorific agreement affix. Nom is a personal noun to whose referent the speaker shows superiority or contempt. In (30c), the subject is 'contempted', while the object is elevated with the honorific marker nim. But such honorification of the object does not trigger honorific agreement on the verb.

3.3.1. Subject honorification and the DSC

Now let's look at DSCs with respect to subject honorification.

(31) a. Kim sensayng-nim-i son-i khu-si-ta
         teacher-HON-NM hand-NM big-HON
         'Prof. Kim is (esteemedly) big-handed.'

     b. [Kim sensayng-nim-uy son]-i khu-(*si)-ta
         teacher-HON-GEN hand-NM big-(*HON)
         'Prof. Kim's hand is (*esteemedly) big.'

Honorification of the first NP seems to trigger the verbal honorific agreement in (31a). As the corresponding genitive construction in (31b) suggests, the non-human second NP, son 'hand', does not act as such a trigger. On the other hand, in the next example, it is the second nominative NP, rather than the contempted first nominative NP, which triggers the honorific agreement:

(32) ce totuk-nom-i enemy-nim-i aphu-si-ta
     that thief-CON-NM mother-HON-NM sick-HON
     'That thief's mother is (esteemedly) sick.'

It seems then that both nominative NPs can trigger the honorific agreement on the verb. Therefore, both NPs are viewed as bearing some subject property according to the subject

honorification test. The following example, however, suggests that the two NPs do not have exactly the same force in honorific agreement:

(33) ce   sensayng-<u>nim</u>-i atul-<u>nom</u>-i aphu-(*<u>si</u>)-ta
     that teacher-HON-NM son-CON-NM sick-(*HON)
     'That teacher's son is (*esteemedly) sick.'

Honorification of the first NP is not enough to trigger the verbal honorific agreement when the second NP is 'contempted', as in (33). This fact might be taken to suggest a closer connection between the second NP and the verb in DSCs. Therefore, as for the DSCs involving adjectival verbs, Park's (1982: 652) claim seems to be on the right track: given a sequence, NP_1-NP_2-V, as a sentence, NP_1 is the subject, and the sequence NP_2-V (which constitutes a sentence whose subject is NP_2) functions as a predicate of NP_1.

Now the question is how it is possible for a sentence to become a predicate. Park (1973, 1982) takes the 'aboutness' relation as the defining character of a predicate such that a predicate expresses a property of the subject of the sentence. Thus, according to Park, any sequence, be it sentential or phrasal, can be a predicate. The 'aboutness' requirement for being a predicate is however pragmatically oriented, and there is no independent syntactic test for 'aboutness'.

Yim (1984) takes virtually the same view as Park. Within a predication theory of Williams (1980, 1983), Yim defines S(entence) to be the subject-predicate relation in which the predicate is INFL' (i.e. INFL single bar).He then goes on to claim that an INFL* (i.e. S) can also function as a predicate. His claim is not, however, based on any strong morphosyntactic evidence. Instead, he proposes a general bar notation principle, as in (34).

(34) X-bar Transparency: A syntactic relation (with an external element) holds through any number of branching nodes of the same category type with immediate dominance between them or with the same head.

He does not, however, discuss how general his X-bar principle is.

I will not take any definite stance on the predicatehood of a sentence in general. I only provide a piece of syntactic evidence that the embedded S in DSCs indeed acts like other VPs with respect to coordination. It is generally assumed that coordination involves syntactic categories of the same type. Then, the following example, in which a VP is coordinated with a sentence with an adjectival predicate, indicates that the VP and the sentence share the same syntactic category of some sort:

(35) a. Mary-ka [$_{VP}$ yeppu]-ko [$_S$ tali-ka kil]-ta
         -NM   pretty-and   leg-NM long-DEC
     'Mary is pretty and long-legged.'

     b. [$_{VP}$ yeppu]-ko [$_S$ tali-ka kil]-n   Mary-ka kyengcu-ese iki-ass-ta
              pretty-and   leg-NM long-REL   -NM race-LOC win-PAST
     'Mary who was pretty and long-legged won the race.'

After all, the sentential predicate in DSCs is similar to the sentential 'comment' in topic-comment constructions. Thus we may assume that the existence of DSCs and the sentential predicates is one of the properties of 'topic prominent' languages like Korean.

3.3.2. Subject honorification and the psychological verb construction

As noted earlier, there is another class of double nominative constructions in Korean. This second class involves a kind of transitive verb (i.e. so-called psychological verbs) such as <u>silh</u> 'dislike', which requires its argument NP to be in the nominative case, as in (36).
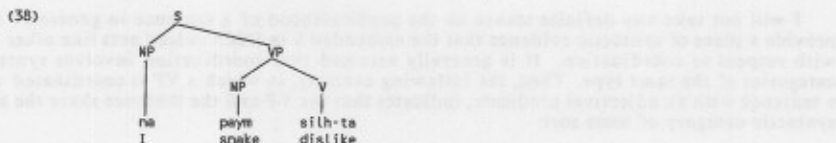
```
(36) a.  nay-ka paym-i   musep/silh/coh-ta
         I-NM   snake-NM afraid-of/dislike/like
         'I am afraid of/dislike/like snakes.'

     b.  John-i  paym-i  silh-unkapota
             -NM snake-NM dislike-seen
         'It seems that John dislikes snakes'
```

These psychological verb constructions (hereafter PVC) apparently look like the typical DSCs involving adjectival verbs in that the verbs are preceded by two nominative NPs. However, unlike typical DSCs, a 'possessor-possessed' relationship between the two NPs is not found in PVCs. Moreover, the second NP in PVCs such as those in (36) does not bear any of the properties typically associated with syntactic subject NPs, except for its nominative case marking.

Subject honorification provides crucial evidence that the second NP is not a subject. In the following examples, it is always the first NP that triggers the verbal honorific agreement; honorification of the second NP has no effect on the verbal agreement:

```
(37) a.  nay-ka ce  sensayng-nim-i silh-(*usi)-ta
         I-NM   that teacher-HON-NM dislike-(*HON)
         'I (*esteemedly) dislike the teacher.'

     b.  ku sensayng-nim-i paym-i  silh-usi-unka-pota
         the teacher-HON-NM snake-NM dislike-HON-seen
         'It seems that the teacher (esteemedly) dislikes the snake.'
```

There is one important constraint on honorification to be noted regarding (37a): the first person pronoun, na/nay 'I', never triggers honorific agreement of any sort. Instead, an alternative form, ce 'I (polite)', is often used to show speaker's respect to the hearer, by humbling himself. Then, sentences like those in (37) suggest that the second NP in PVCs is the object of the psychological verb, and hence that the second NP and the following verb constitute not a 'sentential predicate' but a VP, as in (38):

```
(38)            S
              /   \
            NP     VP
            |     /  \
            |    NP    V
            |    |     |
           na  paym  silh-ta
            I  snake  dislike
```

The nominative case of the second NP must therefore be attributed to an idiosyncratic property of the psychological verb, and must not be confused with the grammatical relation of subject. However it is not simply the semantic type of the psychological verb which is responsible for the nominative case of the object NP. That is because there are some 'complex' verbs which belong, semantically, to the same class of psychological verbs, but assign their objects accusative case, as in (39):

```
(39) a.  nay-ka paym-ul/*i   musep/silh/coh-a ha-n-ta
         I-NM   snake-ACC/*NM afraid-of/dislike/like-PRSNT
         'I am afraid of/dislike/like snakes.'

     b.  John-i  paym-ul/*i  silh-a  ha-nunka pota
             -NM snake-ACC/*NM dislike seen
         'It seems that John dislikes snakes'
```

Truth-conditionally, the sentences in (36) and (39) have the same meaning. The sentences in (39) differ from those in (36) only in the casemarking of the second NPs, and the corresponding forms of the verbs: each verb in (39) is followed by -a ha, which does not seem

to have any internal semantics but only serves to derive nonadjectival forms of the corresponding psychological verbs. This is evidenced by their occurrence in imperative sentences, in progressive aspect, and in present tense, unlike the corresponding adjectival verbs:

(40) a. paym-ul/*i   coh/silh/musep-a ha-ala
       snake-ACC/*NM like/dislike/afraid-IMP
       'Like/Dislike/Be-fond-of snakes !'

     b. John-i paym-ul/*i   coh/silh/musep-a ha ko-iss-ta
        -NM snake-ACC/*NM like/dislike/afraid PROG-DEC
        'John likes/dislikes/is-afraid-of snakes now.'

     c. John-i paym-ul/*i   coh/silh/musep-a ha-un-ta
        -NM snake-ACC/*NM like/dislike/afraid-PRSNT-DEC
        'John likes/dislikes/is-afraid-of snakes.'

In section 3.1, it was noted that stativity is one of the characteristics of adjectival verbs, and that adjectival verbs are distinguished from other verbs in their inflectional and derivational paradigms: i) in the present tense, most verbs are marked by a suffix un/nun, while adjectival verbs are zero-marked; ii) adjectival predicates can be directly modified by adverbs like kacang 'most' to form periphrastic superlative expressions, while other nonadjectival verbs cannot; iii) adjectival verbs can be turned into adverbs by suffixation. Psychological verbs share all of these properties with adjectival verbs. Thus psychological verbs may be defined as transitive adjectival verbs, and their feature specification is [+N, +V, _NP[NM]].

These facts then suggest that the case marking (i.e. ACC/NM) of an object NP must be sensitive to the adjectival nature of the governing verb, i.e. the features [+N, +V]: adjectival verbs govern a nominative object, whereas other transitive verbs govern an accusative object. This adjectival feature of verbs plays a more interesting role in the case assignment within a multi-verb construction in which one adjectival verb combines with a nonadjectival transitive verb, as discussed in the following section.

4. The alternative case marking in 'VP + sip' constructions

Now we can extend our analysis of case assignment in the previous sections to a marked case assignment in which an NP is assigned alternative cases in apparently the same configuration. It has been noted in the previous discussion that in a given syntactic configuration, an NP is assigned a unique case, e.g. nominative, accusative, etc. Even though syntactically assigned cases can be replaced by pragmatically controlled topic markers, this interaction between syntax and pragmatics must be understood independently of the unique case assignment in syntax.

Then examples like (41a) pose a problem since they involve an alternation between accusative and nominative case marking of the object NP in apparently the same configuration:

(41) a. nay-ka piano-lul/ka chi-ko sip-ass-ta
        I-NM   -ACC/NM play-INF want-PAST
        'I wanted to play the piano.'

     b. nay-ka piano-lul/*ka chi-ass-ta
        I-NM   -ACC/*NM play-PAST
        'I played the piano.'

Chi 'play' is a typical transitive verb which governs an accusative object, as in (41b). But when it is followed by the verb sip 'want', the object NP shows the case alternation in (41a).
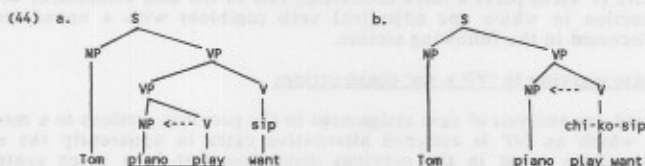
On the other hand, the desiderative verb <u>sip</u> is subcategorized for a VP; it cannot directly take an object NP, regardless of the case marking of the object, as shown in (42):

(42) a. *John-i   cha-lul sip-ta
          -NM car-ACC want
        'John wants a car.'

     b. *John-i   cha-ka sip-ta
          -NM car-NM want
        'John wants a car.'

<u>Sip</u> is another adjectival verb: it is zero-marked in present tense, and cannot occur with progressive aspect or in the imperative, as in the following examples:

(43) a. *piano-lul/ka chi-ko sip-*<u>ala</u>
           -ACC/NM play   want-IMP
        'Want to play the piano!'

     b. *Tom-un piano-lul/ka chi-ko sip-*<u>ko iss-ta</u>
          -TP   -ACC/NM play   want   PROG
        'Tom is wanting to play the piano.'

     c. *Tom-un piano-lul/ka chi-ko sip-ø/*<u>un</u>-ta
          -TP   -ACC/NM play   want-PRSNT-DEC
        'Tom is wanting to play the piano.'

The case alternation in sentences like (41a) seems to be also attributed to the adjectival nature of the verb <u>sip</u>. As noted in the previous discussion of the PVC, transitive adjectival verbs assign their object NPs the nominative case. If <u>sip</u> is assumed to lexically combine with a transitive verb to derive an adjectival compound verb, the case alternation would be accounted for as a result of structural ambiguity as represented in (44):

(44) a.

```
           S
          / \
        NP   VP
         |   / \
         |  VP  V
         | / \  |
        NP<---V sip
         |  |  |
        Tom piano play
             want
```

b.

```
           S
          / \
        NP   VP
         |   / \
         |  NP<--- V
         |   |   chi-ko-sip
        Tom piano play want
```

The object NP is assigned [CASE:ACC] in the structure (44a) by the transitive verb <u>chi</u> 'play'; it will be assigned [CASE:NM] in the structure (44b) by the adjectival compound verb, <u>chi ko sip</u> 'want-to-play'.

If this assumption is correct, the alternative case marking is predicted to occur only when the lexical analysis is not blocked for some syntactic reason. This prediction is borne out by the following examples, in which <u>sip</u> combines with a coordinated VP (each conjunct is underlined):

(45) na-nun i nom-ul/*i <u>ketecha-ass-ta</u>
     I-TP this guy-ACC/*NM kick-PAST
     'I kicked this guy.'

(46) na-nun i nom-ul/i <u>ketecha-ko sip-ta</u>
     I-TP this guy-ACC/NM kick-INF want
     'I want to kick this guy.'

(47) a. na-nun i   nom-ul/*i ketecha-ko ce nom-ul/*i cwiepak-ko sip-ta.
         I-TP this guy-ACC/*NM kick' and that guy-ACC/*NM beat-INF want
         'I want to kick this guy and beat that guy.'

     b. *na-nun i   nom-*i ketecha-ko ce nom-ul cwiepak-ko sipta.
         I-TP this guy-NM kick and that guy-ACC beat-INF want

     c. *na-nun i   nom-ul ketecha-ko ce nom-*i cwiepak-ko sipta.
         I-TP this guy-ACC kick and that guy-NM beat-INF want

<u>Ketecha</u> 'kick', and <u>cwiepak</u> 'beat' are typical transitive verbs governing an accusative object, as in (45). When they are followed by <u>sip</u>, however, the object NP shows alternative case marking, as in (46). On the other hand, when the coordinated VP combines with <u>sip</u>, as in (47), the object NP of each conjunct VP does not show such case alternation; it must be marked accusative.

This fact about case marking is naturally accounted for under the assumption that the alternative case marking is due to the structural ambiguity represented in (44). Sentence (47) cannot be structurally ambiguous: the verbs <u>ketecha</u> 'kick' and <u>cwiepak</u> 'beat' in the VP conjuncts are not syntactically adjacent to the verb <u>sip</u> 'want', as represented below in (48). In configurations like (48), a lexical compounding across the constituent boundaries is ruled out, and hence the object NPs cannot be assigned nominative case:

(48)
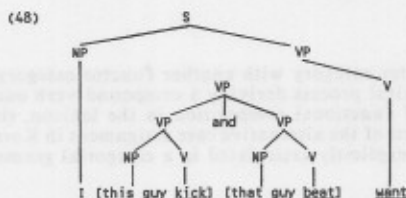
Thus the alternative case marking is accounted for by reference to the adjectival feature [+N, +V] of the verb <u>sip</u> and the lexical compounding process resulting in surface structural ambiguity. However the nature of the lexical compounding process has not been explicitly presented so far. It has been simply assumed that syntactically, <u>sip</u> is subcategorized for a VP, but lexically, it can combine with a nonadjectival verb to derive a adjectival compound verb. It should be noted, however, that the lexical process is not simply a concatenation of the two input categories: the subcategorization of the input category is not preserved in the output. For instance, a transitive verb like <u>chi</u> 'play' governs an accusative object, but when it combines with <u>sip</u>, the resulting compound verb it governs a nominative object.

The above analysis of case assignment cannot be completed unless the nature of the feature changing derivation and its interaction with case marking are specified. In the next section, I will examine how such interactions can be explicitly represented in a categorial grammar framework.

5. A categorial analysis of the alternative case marking constructions

In the following discussion, readers are assumed to be familiar with generalized categorial grammar, and only a fragment of the theory will be sketched (to the extent that it is relevant to the analysis of the case assignment in Korean). For a more detailed introduction to categorial grammar, readers are referred to Bach (1983, 1988), Dowty (1988), and Steedman (1987) among others.

In categorial grammar, linguistic expressions are regarded as functors and arguments, both syntactically and semantically, assuming a uniform correspondence between syntax and semantics. A set of operations combine these categories (i.e. functors and arguments) into larger expressions until a full sentence is derived. The principal operation is 'functional application' (FA), which simply involves applying the functor category to the argument category. Thus functional application, defined as in (49), can be schematically represented as in (50):

(49) Functional Application: (Steedman 1987)
    A function of category X/Y or X\Y with interpretation f can
    combine with an adjacent argument Y with interpretation a to
    yield a result of category X with interpretation $f(a)$.

(50) a. X/Y + Y ==> X
    b. Y + X\Y ==> X

Another operation is 'functional composition' (FC) which is defined as in (51), and schematically represented in (52):

(51) Functional Composition: (Steedman 1987)
    A function of category X/Y or X\Y with interpretation f may combine
    with an adjacent function of category Y/Z or Y\Z with
    interpretation g. The result is their syntactic and semantic
    composition, a function X/Z or X\Z with interpretation $f.g$.

(52) X/Y + Y/Z ==> X/Z
    Y\Z + X\Y ==> X\Z

Thus functional composition combines a functor category with another functor category to derive a composite functor. Therefore, the lexical process deriving a compound verb out of two verbs can be easily analyzed as a case of functional composition in the lexicon, since verbs are of functor categories. And some aspects of the alternative case assignment in Korean sketched in the previous section can be more explicitly articulated in a categorial grammar framework.

First of all, CASE is a morphosyntactic feature defined for an argument category, and its feature value is governed by a particular functor category such as a transitive verb. The usual way that 'government' is handled in categorial grammar is that a functor A/B which governs a particular feature [+F] on its argument B is, in effect, analyzed as being of category A/B[+F] (cf. Bach 1983). Thus, if transitive verbs govern an accusative object, their category is VP\NP[ACC]. As noted in the previous sections, however, some adjectival transitive verbs in Korean (e.g. psychological verbs like silh 'dislike') govern a nominative object. Therefore such verbs are actually analyzed as being of category VP[+N, +V]\NP[NM]. In the following discussion, adjectival verbs will be will be represented as 'AP', for ease of reference. Thus, an adjectival transitive verb is AP\NP[NM].

Given this categorization, the lexical process combining a transitive verb like mek 'eat' and the desiderative verb sip may be analyzed as in (53), using the operation of functional composition. The category of sip will be taken as AP\VP, as was motivated previously.

(53) mek-ko   -sip   ====FC==>   mek-ko-sip   'want-to-eat'
    VP\NP[ACC]   AP\VP   AP\NP[ACC]

However, the result category AP\NP[ACC] will govern an accusative object against our expectation: the compound verb is expected to govern a nominative object, leading to the effect of apparent case alternation in the surface structure. What is missing in the above analysis is the generalization made in the previous sections that all adjectival transitive verbs govern a nominative object. We can accommodate that generalization by stipulating the following lexical redundancy rules:

```
(54)  Lexical Redundancy Rules
      a. AP\NP  ==>  AP\NP[NM]
      b. VP\NP  ==>  VP\NP[ACC]
```

In other words, no transitive verbs are specified in their lexical category for the government feature value of [CASE:NM] or [CASE:ACC]; the government feature values are determined by the general lexical redundancy rules. Given these redundancy rules (LRs), the lexical compounding process in (53) is reanalyzed as follows:
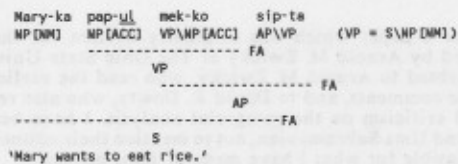
```
(55)  mek-ko    -sip      ====FC==>      mek-ko-sip
      VP\NP     AP\VP                     AP\NP

                                           |
                                          LR
                                           |

                                        mek-ko-sip    'want-to-eat'
                                        AP\NP[NM]
```

In (55), the lexical redundancy rule (54a) applies to the derived compound verb (i.e. the result category of the functional composition), and ensures that it governs [CASE:NM] rather than [CASE:ACC] on its object.
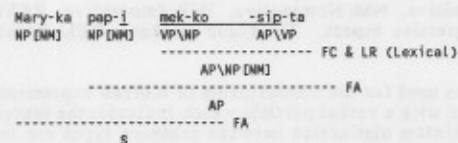
Now the alternative case assignment illustrated in (56) is accounted for by the two distinct derivations in (57):

```
(56)  Mary-ka  pap-ul/i   mek-ko  sip-ta.
        -NM   rice-ACC/NM eat-INF want
      'Mary wants to eat rice.'
```

```
(57)  a.  Accusative Case Assignment by Functional Application

          Mary-ka  pap-ul   mek-ko       sip-ta
          NP[NM]  NP[ACC]   VP\NP[ACC]   AP\VP    (VP = S\NP[NM])
                           --------------------- FA
                                    VP
                           --------------------- FA
                                    AP
          ------------------------------------------ FA
                                    S
          'Mary wants to eat rice.'

      b.  Nominative Case Assignment by Functional Composition

          Mary-ka  pap-i    mek-ko      -sip-ta
          NP[NM]  NP[NM]    VP\NP       AP\VP
                           --------------------- FC & LR (Lexical)
                                  AP\NP[NM]
          -------------------------------- FA
                          AP
          ------------------------- FA
                      S
```

In (57a) the transitive verb mek assigns the accusative case to its object, through the regular syntactic operation, i.e. functional application. In (57b), after the application of functional composition and a lexical redundancy rule in the lexicon, the compound verb mek-ko-sip (AP\NP[NM]) assigns the nominative case to its object .

Thus the alternative case marking can be explicitly accounted for in a categorial grammar by appealing both to the operation of functional composition in the lexicon and to lexical redundancy rules.

7. Closing statement

So far I have presented two interesting problems about Korean morphosyntax: (i) the double occurrences of nominative case in the so-called DSCs/DNCs, and (ii) the alternative case assignment in the 'VP + sip' construction. The adjectival category feature set [+N, +V] was noted to play a crucial role in the analysis of both problems.

DSCs are analyzed as a proper subset of DNCs: both nominative NPs behave as subjects with respect to subject honorification, and they must contain adjectival intransitive verbs. These characteristics distinguish DSCs from topic constructions, on one hand, and from other DNCs, on the other. Topic constructions does not impose any categorial constraint on the verbs involved. The second nominative NP in the other DNCs (e.g. psychological verb construction) is analyzed as the object NP of the verbs, their nominative marking being attributed to the adjectival category of the verbs. The alternative case assignment in the 'VP + sip' construction is also analyzed as a result of the interaction between surface structural ambiguity and the adjectival category of the verb sip.

The role of adjectival verbs in syntax has not been well appreciated in most studies of Korean. In this paper, it was pointed out that there is a significant relation between case assignment and adjectival verbs. However, the analysis of the 'VP + sip' construction requires a much broader investigation of similar constructions. In fact, there are many multi-verb constructions in Korean whose nature is scarcely understood. Most multi-verb constructions involve changes in the subcategory features of one of the element verbs, as in the 'VP + sip' construction. I believe that a careful examination of such multi-verb constructions will provide a more revealing account of case assignment in Korean.

Notes

1. List of Abbreviations:
   ACC: Accusative, GEN: Genitive, NM: Nominative, IMP: Imperative, PAST: Past Tense, PRSNT: Present, PROG: Progressive aspect, TP: Topic marker, REL: Relativizer, INF: Infinitive, DEC: Declarative.

   Yale Romanization system is used for the transcription of Korean expressions throughout the paper. Korean sentences end with a verbal particle which indicates the sentence types (e.g. declarative, imperative, etc). Unless distinction between sentence types are relevant to the corresponding discussion, the gloss for such particles will not be provided.

2. Korean has various conjunctions and disjunctions which are distinguished by the syntactic categories of conjuncts, i.e. NP conjunctions (e.g. wa, hako, lang) and VP-conjunctions (e.g. ko).

3. On the distinction between morphological rules and operations, see Zwicky (1987, 1988).

4. The nominative case marking of the predicate NP is not found in the affirmative counterpart of the following sentence:

```
John-i   paksa   i-ta
    -NM  doctor  is
'John is a doctor.'
```

Park (1973) argues that the predicate NPs of the affirmative equational sentences are also nominative-case marked in the deep structure, but undergo obligatory nominative case marker deletion. However, Park's entire argument here is very weak. We might accommodate this fact simply by stipulating that only derived negative copular verbs require their predicate NPs to be in the nominative case.

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The Morphological Status of Korean Case Markers*

Beom Yoo

1. Introduction

The purpose of this paper is to determine the theoretical status of case markers in Korean in a highly modularized grammar. Their status has remained controversial for a long time in studies of Korean grammar. In most previous analyses, they were treated as either inflectional suffixes (Kang 1987) or as postpositions (Choy 1985). However, neither approach was convincing.

This indeterminacy cannot be tolerated from the standpoint of a highly modularized grammar, especially when we consider the tasks of the syntatic and the morphological components and their interactions in such a grammar. The two components are regarded as independent of each other in their operations. The morphology describes only the distribution of morphemes within words, that is, how morphemes can be combined into words or word forms. On the other hand, syntax describes the distribution of syntactic constituents only. More importantly, syntax is considered to be blind to the internal morphological structure of words in its operations. The idea behind this restriction is that syntax becomes unconstrained once we allow it to have this power, as pointed out in Zwicky (1987).

Now, it becomes clear why determining the status of case markers in Korean is important, as it affects one's description of Korean syntax and morphology. If the markers are treated as inflectional suffixes, their distribution should be described in morphology by way of morphological rules. On the other hand, if the markers are considered postpositions, their distribution should be described in syntax in terms of syntactic rules such as phrase structure rules or subcategorization frames.

This study will investigate case markers as follows: first, in order to help the reader appreciate the problem, section 2 will compare case markers and postpositions using the criteria for distinguishing bound words (or clitics) and inflectional suffixes which were given in Zwicky and Pullum (1983) and Zwicky (1984). Then the differences between nominative/accusative markers and dative/ablative markers will be discussed. It will be argued that three analyses are compatible with the described facts: (a) the treatment of the nominative/accusative markers as postpositions and the dative/ablative markers as suffixes; (b) the treatment of the nominative/accusative markers as suffixes and the dative/ablative markers as postpositions; and (c) the treatment of all case markers as postpositions. Section 3 will begin with an examination of a Korean plural marker, known as the subject plural marker (the SPM), as well as an argument that the SPM is an inflectional suffix. After examining the interaction between the SPM and case markers, it will be argued that nominative/accusative case markers should be treated as inflectional suffixes and dative/ablative markers as postpositions. In section 4, I will examine how the descriptions of the SPM and the case markers can be implemented in a formal grammar. For this purpose, I will employ Generalized Phrase Structure Grammar, as proposed in Gazdar et al. (1985), and the process-based morphological framework proposed in Zwicky (1985, 1987, 1988). Section 5 will summarize this study.

2. Facts and possible analyses

2.1 Case markers and postpositions

First, a brief introduction to case markers and postpositions is in order. More detailed characteristics will be given later in the discussion.

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The case markers under consideration are as follows.[1]

(1) Nominative: -i/-ka
    Accusative: -ul/-lul
    Dative/ablative: -eykey, -hanthey

-I and -ka in the nominative case and -ul and -lul in the accusative case are phonologically conditioned allomorphs: -i and -ul occur after a consonant-final morpheme and -ka and -lul follow a vowel-final morpheme. The dative/ablative case markers -eykey and -hanthey are in free variation. (2) provides examples.[2]

(2) a. haksayng-i (*-ka) chayk-ul (*-lul) ilk-ess-eyo
       student-NOM   book-ACC   read-PAST-IND
       'a student read a book'
    b. kangaci-ka (*-i) kkoli-lul (*-ul) huntul-eyo
       puppy-NOM   tail-ACC   wag-IND
       'a puppy is wagging his tail'
    c. haksayng-i kangaci-eykey/-hanthey meki-lul cu-ess-eyo
       student-NOM puppy-DAT   food-ACC give-PAST-IND
       'a student gave food to a dog'

All of the case markers are bound morphemes which have no semantic content, functioning simply to indicate the case of their host. A host may be an NP, PP, quantifier phrase (including classifier phrase), or nominalized sentence, as shown in (3).[3]

(3) a. NP: [haksayng] -i/-ul/-hanthey (haksayng 'student')
    b. PP: [haksayng-man] -i/-ul (-man 'only')[4]
    c. QuantifierP: [motuw] -ka/-lul/-hanthey (motu 'all')
    d. ClassifierP: [yel mali] -ka/-lul/-hanthey (yel 'ten'; mali Classifier)
    e. Nominalized sentences: [pap-ul mek-ki] -ka/-lul[5] (pap 'rice'; mek- 'eat'; -ki Nominalizer)

The occurrence of case markers in sentences is optional in that a marker may be freely dropped when the case of its host can be understood from context.[6] Thus it is common for no case markers to appear in a sentence. For example, the parenthesized case markers in (4) are optional. (5) lists some Korean postpositions.

(4) a. ayki(-ka) pap(-ul) mek-ess-e?
       baby-NOM rice-ACC eat-PAST-INT
       'did the baby eat rice?'
    b. kangaci(-hanthey) pap(-ul) cuw-eyaci.
       puppy-DAT   food-ACC give-SUG
       'you need to give food to the puppy'

(5) a. -man 'only'
    b. -ppuwn 'only'
    c. -cocha 'even'
    d. -puwthe 'from'
    e. -kkaci 'to'
    f. -khenyeng 'even'
    g. -mankhum 'as much (many) as'
    h. -chelem 'like'

Postpositions in Korean are also bound morphemes, and the syntactic categories to which they attach are the same as those that precede case markers, i.e., NPs, PPs, quantifier phrases (including classifier phrases), and nominalized sentences, as in (6).

(6) a. NP: [haksayng] -man/-ppuwn/-cocha (hakssayng 'student')
    b. PP: [haksayng-mankhum] -man/-khenyeng
    c. QuantifierP: [ilpu] -man/-ppun/-cocha (ilpu 'part')
    d. ClassifierP: [yel mali] -man/-ppun/-kkaci (yel 'ten'; mali Classifier)
    e. Nominalized Ss: [pap-ul mek-ki] -cocha/-man/-kkaci (pap 'rice'; mek 'eat'; -ki Nominalizer)

While they certainly show some similarities to case markers, postpostions differ from case markers in that they have the semantic content shown in (5), and also in that they are not

optional. Thus, (7a) and (7b) cannot be understood to have the same meaning. (7a) is true only when other students did not read, but (7b) is true even when other students read as well as long as <u>ku haksayng</u> 'the student' read.

```
(7) a.  ku haksayng-man(-i) ilk-ess-eyo
        the student-only-NOM read-PAST-IND
        'only the student read'
    b.  ku haksayng(-i) ilk-ess-eyo
        the student        read
```

So much for a brief introduction of postpositions and case markers in Korean. What we need in order to decide on the status of case markers is the criteria for distinguishing affixes from bound words (or clitics). It is for this purpose that I will employ the various criteria given in Zwicky & Pullum (1983) and Zwicky (1984). The criteria are of two kinds. The criteria which are not theory-bound are listed in (8) and a criterion which comes from metatheoretic considerations is in (9).

```
(8) a.  Phonologically bound words can undergo external sandhi rules, while affixes undergo internal
        sandhi rules.
    b.  Bound words can receive accents, but affixes usually do not.
    c.  Bound words can be flexible with regard to the order regarding their hosts, but affixes
        are not.
    d.  Bound words can exhibit a low degree of selection with respect to their hosts, while affixes
        exhibit  a high degree of selection with respect to their stems.
    e.  Bound words can attach to material already containing bound words, but affixes cannot.
    f.  Arbitrary gaps in the set of combinations are more characteristic of affixes than bound words.
    g.  Morphophonological idiosyncrasies are more characteristic of affixes than of bound words.
    h.  Semantic idiosyncrasies are more characteristic of affixes than of bound words.

(9) Syntactic rules and operations can refer to bound words, but not affixes.
```

As Zwicky points out, the criteria in (8) are a collection of the typical characteristics of bound words and affixes and so they are diagnostic criteria, not absolute ones. Indeterminacy may result when an item shows characteristics of both bound words and affixes, or when inflectional affixes and bound words show few differences in a language. In these situations the criterion in (9) may play a crucial role. It derives from metatheoretical considerations about the organization of a highly modularized grammar: syntax and morphology are independent of each other and syntax is blind to the morphological structure of the words on which it operates. If the distribution of an item must be described by reference to its host's morphological structure, then the item should be treated as an affix, not a bound word.

By comparison with the criteria in (8), case markers and postpositions do not seem to be clearly either affixes or bound words. (8a) and (8b) are of no help because it is hard to find appropriate phonological rules to use as tests in Korean, and because Korean does not use accent or stress as a grammatical device. (8c) is not relevant because Korean requires a rigid order between hosts and both affixes and bound words. (8g) and (8h) are also of little help because neither inflectional suffixes nor bound words show any morphological or semantic idiosyncracy. For example, the subject plural marker, which will be proven to be an inflectional suffix in section 3, does not show any morphological or semantic idiosyncracy.

When compared with the criteria in (8d) through (8f), both postpositions and case markers may seem to belong to the same category. They can attach to the same syntactic categories and so show a low degree of selection with regard to their hosts. They can attach to bound words, namely postpositions and classifiers, and they show no arbitrary gaps in their distribution. Thus both appear to be bound words.

However, no argument based on only the three criteria in (8d)-(8f) seems very strong because the characteristics of bound words specified in these criteria can be shown to characterize inflectional affixes also, as pointed out in Zwicky (1987). As mentioned above, it is in this situation that the criterion in (9) can play a crucial role, and the importance of this criterion will be demonstrated in section 3. But first it is necessary for us to take a closer look at the characteristics of case markers because, as we will see, they are not a homogeneous group.

2.2 Nominative/accusative case markers vs. dative case markers

Although previous analyses would treat case markers simply as either suffixes or bound words, the situation is a bit more complicated, as pointed out in Kuh (1985, 1986). Unlike many languages, Korean nominative/accusative markers show several differences from dative/ablative markers.

A. When the host is a PP consisting of an NP and a postposition, nominative/accusative markers can occur only at the end of the postposition, while dative/ablative markers can occur only at the end of the NP--that is, before the postposition. (10) and (11) illustrate these restrictions with a postpostional phrase [[haksayng$_{NP}$ man]$_{PP}$ 'only students'. (haksayng 'student'; -man 'only'; -i nom.; -ul acc.; hanthey dat.)

(10) a. haksayng -man -i/-ul
     b. *haksayng -i/-ul -man -i/-ul
     c. *haksayng -i/-ul -man

(11) a. haksayng -hanthey -man
     b. *haksayng -hanthey -man -hanthey
     c. *haksayng -man -hanthey

This positional variation only occurs when the host is a PP; otherwise, all case markers occur at the end of their host.

B. The nominative marker and the dative/ablative marker can occur in adjacent positions. More specifically, the nominative marker can attach to a host which ends with the dative/ablative marker.[7] This cooccurrence is not possible among other case markers. (mayli 'Mary'; hanthey dat.; -ka nom.; -lul acc.; coh- 'good'; -ayo ind.).

(12) a. mayli-hanthey-ka coh-ayo
        'To Mary is good'
     b. *mayli-ka-hanthey
     c. *mayli-ka-lul
     d. *mayli-lul-hanthey

C. When two nouns are conjoined by bound-word conjunctions such as -hako, -(i)lang, -kwa/-wa, -(i)kena and -(i)tunci (the first three mean 'and' and the last two mean 'or'), nominative/accusative markers can occur at the end of the second conjunct, but they can never occur after the first conjunct.[8]

(13) a. co-hako su-ka   wa-ass-eyo
        Joe-and Sue-NOM come-PAST-IND
        'Joe and Sue came'
     b. *co-ka-hako su-ka wa-ass-eyo

On the other hand, dative/ablative markers can appear on both conjuncts, although the one on the first conjunct is optional and the one on the second conjunct is obligatory.

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(14) a. co-hanthey-hako su-hanthey yenlakhay-ss-eyo
         Joe-DAT-and   Sue-DAT   notify-PAST-IND
     b. co-hako su-hanthey yenlakhay-ss-eyo
         '(I/We) notified Joe and Sue'

D. Korean has a plural marker -tul, an inflectional suffix indicating the plurality of the subject of the clause (I will call it the subject plural marker (the SPM)). Since a detailed discussion of the SPM will be given in the next section, only a difference between the two groups of case markers which involves the SPM will be demonstrated here. What is important is that the position of the SPM varies depending on the case marker it occurs with. It must occur before the case marker if the case marker is nominative or accusative, but if the case marker is dative or ablative, the SPM must occur after it. (15) through (16) illustrate these facts with an NP host.

(15) a. khi-tul-i/-ul
         height-SPM-NOM/ACC
     b. *khi-i/-ul-tul

(16) a. haksayng-hanthey-tul
         student-DAT-SPM
     b. *haksayng-tul-hanthey[9]

When we consider possible analyses of case markers in light of these differences, we are forced to give up at least the analysis treating all case markers as inflectional suffixes. It would be very unlikely that a language distinguishes case-marking suffixes with the conflicting characteristics discussed in A, C, and D. Besides, B provides strong evidence against such an analysis, since it would be very strange for a noun to have two inflectional case markers at the same time. Thus there are three possible analyses left, as given in (17).

(17) a. an analysis which treats all case markers as postpositions;
     b. an analysis which treats the nominative markers as postpositions and the dative/allative
         markers as suffixes;
     c. an analysis which treats the nominative markers as suffixes and the dative/allative markers
         as postpositions.

Each of these three analyses can deal with the differences discussed above in A, B, C, and D. No problems arise for analyses (17b) or (17c), since these treat nominative/accusative markers and dative/ablative markers as different. In the case of the analysis in (17a), the difference in B can be explained in terms of the cooccurrence restrictions among postpositions, since not all postpositions can cooccur with every other postposition[10]; the difference in C can be attributed to the idiosyncracies of postpositions, since not all postpositions can appear on the first conjunct[11]; and the difference in A can to accounted for as being due to ordering restrictions among postpositions.

Now the question is how to choose the best analysis, and it is in the next section that we attempt to provide an answer to this question.

3. The status of the case markers

In this section, I will first prove that the subject plural marker (the SPM) -tul is an inflectional suffix and then examine case markers in terms of their interaction with the SPM. The idea behind this examination is based on the criterion in (9) -- that is, the syntax cannot refer to the morphological structure of words in its rules or operations.

3.1 The subject plural marker

Korean has two kinds of plural markers: the genuine plural marker (the GPM) and the subject plural marker (the SPM). Both are bound morphemes having the same phonological shape, -tul. In addition, both are optional elements in sentences, as they are freely dropped

when contextually understood. The GPM is a typical plural marker attaching to only a noun and indicating the plurality of that noun. The SPM differs from the GPM in two respects. It can attach to a variety of categories and it indicates only the plurality of the subject of a clause no matter what category it attaches to within the clause. The various syntactic categories which can be host to the SPM are illustrated in (18). That the SPM can indicate the plurality of the subject NP even when it attaches to a non-subject NP is evidenced when (18a) through (18b), in which the subject is plural, are compared to (19a) through (19d), in which the subject is singular.[12] Note that the plurality of the subject is the only difference between the corresponding sentences.

(18) a. ku salam-tul mul-tul mek-ko iss-eyo
          the person-GPM water-SPM drink PROG
          'they are drinking water'   (OBJ NP)
      b. nuney-tul ku salam-hanthey-tul ka po-a
          you-GPM   the person-DAT-SPM   go
          'you go and see the person, please'   (IND OBJ NP)
      c. ku ay-tul-i ku haksayng-chelem-tul-man ha-myen
          the kid-GPM-NOM the student-like-SPM-only do-if
          'if only the kids do as the student does'   (PP)
      d. ku ay-tul-i meli-kam-ki-tul-ul coaha-ciyo
          the kid-GPM-NOM hair-washing-SPM-ACC like
          'that kids like to wash hair'   (INF COMP)

(19) a. *ku salam mul-tul mek-ko iss-eyo
          'he/she is drinking water'
      b. *ne ku salam-hanthey-tul ka po-a (ne 'you' (sg.))
          'you go to him, please'
      c. *ku ay-ka ku haksayng-chelem-tul-man hamyen
          'if only the kid does as the student does'
      d. *ku ay-ka meli kamki-tul-ul coaha-ciyo
          'that kid likes to wash hair'

All the SPMs in (18) denote that the subject is plural in number, regardless of what they attach to.

The SPM may seem to be a bound word according to the criteria in (8d) and (8e), since it can attach to various categories including postpositions. However, as pointed out before, these criteria alone are not sufficient unless other criteria support them. In fact, when we continue our examination, other criteria seem to indicate that the SPM is an inflectional suffix. First, arbitrary gaps are found in its distribution when its host is a verb or postposition. (20) provides examples.

(20) a. Postposition
          i.   sakwa-chelem-tul yeppu-neyyo
               apple-like-SPM pretty-IND
               '(they) are pretty like apples.
          ii. sakwa-kkaci-tul mek-ess-eyo
               apple-even-SPM eat-PAST-IND
               '(They) ate even apples'
          iii. *sakwa-ppuwn-tul (ppuwn 'only')
          iv. *sakwa-khenyeng-tul (cocha 'even')

      b. Verb (ka- 'go'; mek- 'eat')
          i.   ka-sey-tul (-sey sug.) 'Let's go'
          ii. *ka-mnita-tul (-(u)mnita ind.) '(We/They) are going'
          iii. mek-o iss-eyo-tul (eyo ind.) 'Please enjoy eating'
          iv. *mek-ess-umnita-tul '(We/They) will eat'

More crucial evidence for treating the SPM as an inflectional suffix is found when we consider the gaps in its occurrence with verbs. In (20b) -sey, -eyo and -(u)mnita are all inflectional suffixes. Now the point is that if we treat the SPM as a bound word which is

syntactically independent of the verb, we would have to allow the syntax to refer to the internal structure of the verb adjacent to the SPM in order to describe the distribution of the SPM. For example, in (20b), the syntax ought to know which inflectional suffix the verb stem ka- or mek- has in order to block the SPM from occurring after -(u)mnita. As mentioned before, this is not a desirable step. Again, if the SPM is treated as an inflectional suffix, this problem becomes just a matter of the cooccurrence restrictions between inflectional suffixes or features of a verb. Our conclusison then is that the SPM should be considered an inflectional suffix.

3.2 Case markers and the SPM

In section 2.2 we reviewed several differences between nominative/accusative markers and dative/ablative markers, but could not decide among the three possible analyses in (17). In this section it will be shown that the interaction between case markers and the SPM after a postposition enables us to choose the best analysis.

The crucial fact is the following: the SPM may precede a nominative/accusative case marker when the host is an NP, as in (18d). More examples are given in (21).

(21) a. ku cip   ay-tul-i   khi-tul-i   khe-yo
         the family kid-GPM-NOM height-SPM-NOM tall-IND
         'the kids of the family are tall'
     b. salam-tul-i   mul-tul-ul   masi-ko iss-eyo
         person-GPM-NOM water-SPM-ACC are drinking-IND
         'people are drinking water'

When the host is a postposition, however, this is not possible, as shown in (22) and (23).[13] (-man and -puwthe are postpositions.)

(22) a. sensayngnim-tul-i ku ay-man-ul   coahay-yo
         teacher-GPM-NOM   the kid-only-ACC like-IND
     b. sensayngnim-tul-i ku ay-man-tul coahay-yo
                                      SPM
     c. *sensayngnim-tul-i ku ay-man-tul-ul coha hay-yo
                                      SPM-ACC
         'teachers like only the kid'

(23) a. ku salam-tul-un kamuwn-puwthe-ka tall-ayo
         the person-GPM-TOP family-from-NOM different-IND
     b. ku salam-tul-un kamuwn-puwthe-tul tall-ayo
                                      SPM
     c. *ku salam-tul-un kamuwn-puthe-tul-i   tall-ayo
                                      SPM-NOM
         'they have good family background first of all'

(22) and (23) show that postpositions can carry either the nominative/accusative marker or the SPM but not both. The question is then how to describe this coocurrence restriction, and it is here that the the criterion in (9) plays a crucial role. Given that the SPM is an inflectional suffix, if case markers are postpositions, the syntax must be allowed to refer to the internal structure of a postposition in order to determine the distribution of case markers. That is, the syntax must know whether a postposition contains the SPM, an inflectional suffix, in order to decide on whether the nominative/accusative marker may occur with it. This move has already been determined to be undesirable. On the other hand, if nominative/accusative markers are treated as suffixes, the coocurrence restriction can be dealt with simply in terms of the suppression of one inflectional suffix over another (this suppression will be discussed again in section 4), and no unnecessary power needs to be allowed for the syntax. Therefore, the proper analysis is the one treating nominative/accusative markers as suffixes and dative/ablative case markers as postpositions.

4. Plural markers and case markers in the grammar

The status of case markers having been determined in the last section, it is necessary to spell out how the descriptions of various characteristics of case markers can be implemented in the formal grammar. In this section, I will try to achieve this by employing Generalized Phrase Structure Grammar (GPSG) as proposed in Gazdar et al. (1985) and the process-based morphological approach proposed in Zwicky (1985, 1987, 1988).

The fact that nominative/accusative case markers attach to various syntactic categories can be described by instantiating the feature [CASE] whose values are [Nominative] and [Accusative] on the host categories, i.e., NP, PP, QP including CP, and S via ID rules. When we consider that GPSG considers VP to be the head of a sentence and also that Korean is a head-final language, it may seem that treating the feature [CASE] as a head feature can describe the fact that case markers occur at the end of their host, namely on the head of the host. The feature instantiated on the mother node will be inherited by its head daughter according to the Head Feature Convention. However, this analysis encounters problem regarding coordinate structures. As mentioned in section 2, nominative/accusative case markers appear only on the second conjunct when two conjuncts are conjoined by a bound-word conjunction. Now if the feature [CASE] is a head feature in Korean, it should be inherited on both conjuncts because they are both heads, but then the output is ungrammatical.

In order to block the [CASE] feature from being inherited on the first conjunct, I suggest the following: (a) the feature [LAST] is available in the syntax; (b) Korean has a feature coocurrence restriction [+CASE] ⊃ [+LAST] and a feature specification default [-LAST]; and (c) that Korean has a linear precedence rule X < [+LAST]. The feature [LAST] has already been motivated by Zwicky (1987) and so [LAST] does not need to be stipulated only for Korean case markers. By the feature coocurrence restriction and the feature specification default in (b) the appearance of the nominative/accusative case markers on the first conjunct is blocked. The linear precedence rule in (c) assures that the nominative/accusative case markers appear at the end of the second conjunct.

As for the optional occurrence of nominative/accusative markers, two treatments seem to be possible. One is to treat the instantiation of the [CASE] feature in the syntax as optional and the other is to allow the case marker's realization rules to apply optionally. According to the former approach, the realization rules in the morphology are obligatory, while according to the latter, the instantiation of the [CASE] feature in the syntax should be obligatory. Of these two treatments, I argue for the latter since in this analysis the [CASE] feature can be utilized in the syntax to define grammatical relations, even though it may be unrealized. If the instantiation of the [CASE] feature is optional in the syntax, as in the first analysis, then grammatical relations become hard to define.

In passing, it is worth mentioning that instantiating the [CASE] feature on host syntactic categories other than NP is not as strange as it may seem because all syntactic categories which host the case marker can appear as the subject, the object or the indirect object in sentences.

Once the features are distributed in the syntax, their phonological shapes are realized in the morphology. It is here that we need to describe the conflict between the nominative/accusative marker and the SPM after a PP. Recall that this conflict occurred only after PPs, not NPs. What seems relevant here is the number of the slot for inflectional affixes and the suppression of one feature over another in their realization. The need to employ slots to describe inflectional morphology has been discussed in Zwicky (1985), and so I will not repeat those arguments here. What I would argue for is that in Korean, nouns have at least two slots for inflectional suffixes, one for the SPM and the other for the nominative/accusative marker, while postpositions have only one slot. Because there is only one slot, when both the SPM and the nominative/accusative marker need to be realized, one

of them gets suppressed. The suppressor and the suppressee would be determined by the speaker and the context.

The distribution of the dative/ablative markers should be described in the syntax, since they are postpositions. The requirement that they precede other postpositions, as shown in section 2, can be dealt with by ordering restrictions among postpositions. Being postpositions, they also have one slot for an inflectional suffix at the end, and the nominative case marker occurs in this position.

Finally, the optional appearance of dative/ablative case markers on the first conjunct when the conjunction is a bound word does not need any special treatment. This optionality can be explained as in (24). (-hako is a conjunction meaning 'and'.)

(24) a. [NP -hanthey]$_{PP}$ -hako [NP -hanthey]$_{PP}$]$_{PP}$
      b. [[NP -hako NP]$_{NP}$ -hanthey]$_{PP}$

The difference between (24a) and (24b) is the syntactic category of the two conjuncts. Since either PPs or NPs can become conjoined and since Ps take NPs as their complements, both structures are possible. As a result, the dative/ablative marker on the first conjunct is optional.

5. Conclusion

In this study, I examined case markers in Korean to determine their status within a highly modularized grammar. The main point was that the syntax is blind to the internal morphological structure of constituents in its operations and rules. It has been found that nominative/accusative case markers and the SPM -tul, an inflectional suffix, are suppressed after PPs. If nominative/accusative markers are bound words or postpositions, this suppression can only be described by allowing the syntax to refer to the internal structure of the postposition, which is not allowed in a modularized grammar. On the other hand, if nominative/accusative markers are inflectional suffixes, this suppression can easily be described in the morphology as a conflict between the two suffixes. For this reason, I argued that nominative/accusative markers are inflectional suffixes. As for dative/ablative markers, I claimed that they are postpositions partly because they differ from nominative/accusative markers in various respects that do not allow them to be categorized with nominative/accusative markers. In addition, their characteristics can easily be described by treating them as postpositions.

Notes

1. Korean has a genitive marker -uy. I will not be concerned with it in this study because it needs its own discussion.

2. I will use the following abbreviations, especially in the examples.

NOM: nominative	SUG: suggestive
ACC: accusative	PP: postpositional phrase
DAT: dative	NP: noun phrase
IND: indicative	OBJ: object
INT: interrogative	IND OBJ: indirect object

3. Quantifiers in Korean can be separated from the NP they modify by another NP and carry the same case marker as that of their modified NP.

4. Dative/ablative markers do not occur after a P, as will be mentioned in the next section.

5. Dative/ablative markers do not occur after a nominalized sentence.

6. There are some differences in the degree of freedom, however. Dative/ablative markers can be dropped much less freely than nominative/accusative markers.

7. The accusative marker cannot occur with the dative/accusative marker, however.

8. When conjunctions are free words, nominative/accusative case markers may attach to the first conjunct in a very formal speech (e.g. the president's speech on T.V.). But this is very rare.

9. -tul can be interpreted as the genuine plural marker, not the subject plural marker (See 3.1). Thus this sentence is well-formed when we consider -tul to be the GPM.

10. There are coocurrence restrictions among postpositions illustrated in the following (ku 'the'; salam 'person'; -cocha 'even'; -man 'only'; -chelem 'like' (-cocha, -man, and -chelem are postpositions)).

    (i) a. [ku salam]-chelem-man
          'only like the person'
   (ii) a. *[[ku salam]-cocha]-man
       b. *[[ku salam]-man]-cocha
          'even the only person'

11. For example, postpositions such as -khenyeng 'even', -cocha 'even' -ppun 'only', etc. cannot appear on the first conjunct.

    (i) a. sakwa-hako pay
         apple-CONJ pear
         'apples and pears'
      b. [sakwa-hako pay]-khenyeng/-cocha/-ppun
         'even/only apples and peas'
      c. *[sakwa-khenyeng/-cocha/-ppun]-hako [pay-kyenyeng/ -cocha/ppun]
         'even apples and pears'

12. -tul becomes ambiguous between the GPM reading and the SPM reading when the object noun or indirect object noun is countable. The reason is that a suppression occurs between the two plural markers because they should occur in the same slot after a noun (See Zwicky 1985). The suppressor and suppressee are determined by the context and the speaker.

13. Other host categories such as nominalized sentences and quantifier phrases do not allow the SPM and so cannot be tested.

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Turkish Inflection and Copula Cliticization*

Yongkyoon No

1. Introduction

The traditional account of Turkish inflectional systems has several properties that make it unattractive. The quirks, I argue, could be eliminated rather neatly if we put to use the syntactic and the cliticization components of the grammar on top of ordinary morphology. In this paper, the new division of labor, which gives less work to inflection but more to syntax and cliticization, is argued for, and the analyses it yields are investigated.

I examine previous descriptions of a major part of the Turkish inflectional systems and propose a different analysis. I argue for the existence of the defective verb I, on the grounds (i) that whatever words that inflect for the same morphosyntactic features belong to one and the same (major) syntactic category, (ii) that /dI/ and idi stand in near-free variation,[1] (iii) that it is unlikely for there to exist two heavily overlapping paradigms, and (iv) that it does not seem methodologically sound to have a morpheme, the yes/no question marker /mI/, both as an independent word and as an affix. Section 2 sets the stage for the introduction of the copulative verb stems I/sI in section 3, where I put forward evidence for a cliticization treatment and spell out the realization rules for the alternating stems and the different affixal forms. Section 4 describes the distributional properties of the yes-no question marker mI, which will serve as part of the evidence for setting up the copulative verb. The last section, section 5, deals with the predictions this reanalysis of the Turkish inflection makes.

2. Person and number marking in VPs

A predicate in a Turkish sentence inflects for person and number. There are three inflectional systems, the selection among which depends on what grammatical category the predicate is in as well as on what kind of further inflection the predicate takes. (1) summarizes the three systems (Underhill 1976: 115).

(1) Inflectional suffixes

		Predicative	Possessive	
			true possessive	after /dI/
Singular	1	-(y)Im	-Im	-Im
	2	-sIn	-In	-In
	3	(-dIr)	-(s)I	
Plural	1	-(y)Iz	-ImIz	-k
	2	-sInIz	-InIz	-InIz
	3	-(dIr)(lEr)	-(lEr)I	(-lEr)

The predicative suffixes combine with predicate nominals, adjectives, and otherwise inflected forms of verbs. The relevant inflectional features on the verb are PROGRESSIVE, FUTURE, and AORIST, which are realized by /Iyor/, /EcEk/, and /Er/, respectively.

The 'true possessive' affixes occur in the nouns denoting the possessed and in the verb in relative clauses. A similar paradigm is used for a particular inflected form of predicates, namely, the definite past /dI/. Sentences (2) through (4) illustrate the inflectional systems.

(2) a. Ben akıll-ım
       I   intelligent-1SG
       'I am intelligent'
    b. Sen Türk-sün
       you Turk-2SG
       'You (sg.) are a Turk'

```
      c.  Sen gel-iyor-sun
          you come-PROG-2SG
          'You (sg.) are coming'
      d.  O  gel-ecek-tir
          he come-FUTURE
          'He will come'
      e.  Biz oku-ruz
          we read-AORIST.1PL
          'We read'
(3) a.  Ben de  babam     gör-dü-m
        I     also father-my see-PAST-1SG
        'I saw my father, too'
    b.  El-iniz-de   ne   tut-tu-nuz
        hand-your-in what hold-PAST
        'What did you hold in your hand?'
    c.  Ben iste-diğ-imiz kitab-ı  gör-düm
        I   want   -1PL  book-ACC see-PAST.1SG
        'I saw the book that we wanted'
(4) a.  Bu kitab-ı              begen-dim
        I  book-DEFINITE.ACC like-PAST.1SG
        'I liked this book'
    b.  Halil kitap oku-du
              book read-PAST
        'Halil read a book'
    c.  Biz kitap oku-yor-dTk
        we  book read-PROG-PAST
        'We were reading a book'
    d.  Çocuk ağaç-tan  düş-ecek-ti
        child tree-from fall-FUT-PAST
        'The child was about to fall from the tree'
    e.  Size  yemek getir-ir-dim
        you-at food  bring-AORIST-PAST.1SG
        'I would have brought you food'
```

As we see in the data above, the definite past (or the 'first-hand knowledge' past) affix /dI/ does not cooccur with the predicative ending in a simple sentence. The following template of VP-inflection directly encodes this restriction.

```
(5) Inflectional Template (First Approximation)

          ⎧ PROGRESSIVE ⎫  ⎧ Predicative Ending      ⎫
     Stem ⎨ FUTURE      ⎬  ⎨ /dI/  Possessive Ending ⎬
          ⎩ AORIST      ⎭  ⎩                          ⎭
```

One might wonder why FUTURE could go with /dI/, as in (4d) above. I assume this issue to be genuinely terminological. One could have a different name for the affix /EcEk/, such as would suggest it indicates an (imperfective) aspect. Its use, similar to that of a future tense marker, is derivative of the imperfective aspect in that case.

One outstanding quirk in the simple template in (5) is that the predicative ending stands in paradigmatic relation to two affixes: /dI/ and the possessive ending. When the predicative ending is not taken, both /dI/ and the possessive ending are required. The selection of /dI/ in the first subslot requires the possessive ending in the second. The selection of the possessive ending in the second subslot is triggered solely by the presence of /dI/ in the first.[2] This sort of nested dependency is better dispensed with inasmuch as possible, since this would lead either to an otherwise unnecessary assumption, namely that of hierarchical structure of inflectional affixes, or to an unsolvable question as to the slot in which the predicative ending is realized. The following amendment avoids both:

```
(6)  Inflectional Template (amendment to (5))

                    I              II        III
                  PROGRESSIVE
                  FUTURE         (dI)      PERSON/NUMBER
       Stem       AORIST
```

The only obligatory part of the inflection is the PERSON and NUMBER part, which in this amended template takes up the outermost slot. Which particular form a pair of values for the two morphological features should take depends then on whether the immediately preceding slot is filled: the possessive form is chosen if slot II is filled, otherwise, the predicative form is chosen.

Let us turn to the relation between the stem and the affixes. The most unusual feature about Turkish VP-inflection is that the syntactic category of the stem does not matter very much. Aside from its combinability with the affixes in the first slot, the category of the stem does not have any bearing on the inflectional affixes. This is shown by the sentences in (7).

```
(7)  a.  Biz Türk-üz
         we  Turks-1PL
         'We are Turks'
     b.  Biz ev-de-yiz
         we  house-at-1PL
         'We are at home'
     c.  Orhan yorgun-du
         be     tired-PAST
         'Orhan was tired'
     d.  Mehmet gel-di
                come PAST
         'Mehmet came'
```

Nouns, postpositions, and adjectives as well as verbs inflect for PERSON and NUMBER. All of them inflect also for PAST. The very fact that lexical items from all grammatical categories but adverb inflect is astonishing. What is worse, the morphosyntactic features for which words of these categories inflect are the same.

Given these observations, one is obliged to look into the possibility of there being a lexical item after nonverbal categories. If there does exist a lexical item there, the problem of having the same inflection with heterogeneous categories will be solved. The category of the lexical item can best be a verb, since a verb inflects for person and number and a verb has wide range of subcategorizations. Turning to the identification problem, I can think of two possible reasons for the failure to identify such a verb: that the verb stem might be a null-string and that a further factorization on what is assumed to be an inflectional affix has not been done.

In all actuality, I think these possibilities deserve attention so that we eliminate the problems with the traditional accounts of Turkish morphology. Let me add that I cannot come up with more reasons for the misidentification.

Since I know of no examples of lexical stems which are consistently null but which have non-null inflected forms, I reject the first possibility out of hand. This decision is in keeping with restrictive views of grammar that eliminate as many empty items as possible. It is the second possibility that I pursue in the next section. The (predicative) inflectional suffixes are factorized into two parts: a verb stem and a genuine inflectional suffix.

3. The copulative verb: the inflected verb as a clitic

3.1. The copula

One recurrent property of a copulative verb across world languages is that its inflectional paradigm is packed with suppletive items, some of which are simply zeroes. The present form of the copula in Russian, for instance, has no phonological content whatsoever; the copula in Korean systematically lacks substance after a word ending in a vowel. In light of this, one has to look into some 'marked' constructions after the defective verb. One such construction is obviously a copulative sentence in past tense.

```
(8) a.  Yorgun i-dik
         tired  be-PAST
         'We were tired'
    b.  Müdür  i-diniz
         director be-PAST
         'You were the director'
    c.  Ev-de   i-di
         home at be-PAST
         'He was at home'
```

The single-segment morpheme /i/ is obtained from the data right away.

3.2. Phonology is not responsible

The sentences in (8) are synonymous with sentences [yorgunduk], [müdürdünüz], and [evdeydi], respectively. It should be asked then whether it is a phonological process, morphonological or automatic, that relates [idik], etc. to [duk], etc.. If Turkish Vowel Harmony is taken to be automatic, then one would have to say that the underlying representation, say, for the FIRST PERSON PLURAL form of the copula is /idik/ and that a word-initial vowel deletes optionally.[3] This optional-deletion approach is not tenable, granting that the remaining vowel can be made to harmonize with the vowel of the preceding word. The reason is simple: there are thousands of Turkish words beginning in a vowel that does not delete. The putative deletion cannot be automatic, since it has to be sensitive to the value for the putative rule feature [Initial Vowel Deletion]. It has to be morphonological, but then it must not be able to refer to another word.

The deletion ought to be sensitive to the last sound of the preceding word. Where the preceding word ends in a vowel, the deletion of the initial vowel in the following word should not apply. Rather, the high vowel should turn later to a glide: [okuldaydɪk] 'we were at school (dE 'at')' and [okulda idik] are acceptable while [okuldadɪk] is not. Under a hypothesis of strict ordering of the CLITICIZATION-MORPHONOLOGY-AUTPHONOLOGY components such as the one adopted by Zwicky and Pullum (1986) and Zwicky (1987), this would entail the vowel deletion process can neither be morphonological nor autphonological.

The status of Vowel Harmony does not affect the situation. If Turkish Vowel Harmony were viewed as a non-automatic process, /duk/, /dɪk/, and /dük/ could be provided appropriately by a set of morphonological operations associated with the realization rules. The realization rules should refer to something else besides the phonological properties of the stem and the morphological features to be realized: they have to refer to another word. Otherwise, /duk/, etc. cannot be realized as a variant of /idik/. Since not morphonological rules, but only autphonological rules can refer to phonological properties of adjacent words, there is no way to appropriately realize /duk/, /dɪk/, and /dük/ in the REALIZATION component as alternative pronunciations of /idik/.

Since the vowel deletion phenomenon seen in the alternative pronunciations of the past form of the copula cannot be attributed to morphonology or autphonology, the only other

options that remain are SHAPE conditions and cliticization. The former is out early on. The choice between /idik/ and, for instance, /duk/ is not contingent on any phonological properties of the preceding word. Cliticization is now the only plausible approach that has not been considered yet and, in fact, I do not see any reason that it cannot yield the right analysis of the above alternation.

3.3. The word-forms that are enclitic

Notable features of the Turkish copula enclitics include (a) their being inflected word-forms, (b) an asymmetry between the past and nonpast forms with regard to the presence/absence of their related independent word and (c) the nonexistence of nonpast third person forms. The nonpast forms of the copula are /Im/ 'FIRST PERSON SINGULAR', /sIn/ 'SECOND PERSON SINGULAR', /Iz/ 'FIRST PERSON PLURAL', and /sInIz/ 'SECOND PERSON PLURAL'. All of these are clitics: there are no related phonologically independent words.

The past forms of the copula, on the other hand, come in two varieties: the independent word-forms and their clitic counterparts. (9) summarizes this.

(9)		Independent words	Corresponding enclitics
Sing.	1	idim	dIm, ydIm
	2	idin	dIn, ydIn
Pl.	1	idik	dIk, ydIk
	2	idiniz	dInIz, ydInIz
3 Person		idi	dI, ydI

These past forms of the copula are optional 'bound words' much like the English auxiliaries have /-v/, has, is /-z/, had, would /-d/, and are /-r/.[4] The nonpast forms are obligatorily bound words.

There are more enclitics in the language. The nominal conjunction ile and its corresponding enclitic /(y)lE/ exhibit the same phonological pattern as the copula. Sentences in (10) and (11) exemplify this point.

(10) a. Mehmet ile Orhan-i gör-düm
        and   see-PAST
     'I saw Mehmet and Orhan'
    b. Mehmet-le Orhan-i gör-düm
     'I saw Mehmet and Orhan'

(11) a. Bir adam ile bir kadın lokanta-ya   gir-di
        one man and one woman restaurant-at enter-PAST
     'A man and a woman entered the restaurant'
    b. Bir adam-la bir kadın lokanta-ya gir-di
     'A man and a woman entered the restaurant'

A difference is found with regard to the degree of heterogeneity of the host in terms of its category membership: the copula attaches to a word of any category except for an adverb; the conjunction attaches to a noun or a pronoun. While the conjunction has both strong and weak forms, still another enclitic, mI, has only a weak form. We will return to this yes/no question word in section 4.

3.4. Stem and affix alternation

The analysis of I as the stem of the copulative verb urges one to have this verb between the nonverbal phrases and the PERSON/NUMBER affix in (6). Assuming this is the right analysis, we can now turn to a very suspicious feature the inflectional paradigms in (1) exhibit.

The so-called 'predicative' affixes and the particular set of affixes which are selected if the definite past affix is present are highly similar, modulo the occurrence of the as yet unidentifiable /dIr/. There are only two points of difference, however. One is seen in the first person plural forms: /(y)Iz/ versus /k/. The other difference, the one in second person singular and plural forms, is of greater importance in this context. The presence of the initial consonant /s/ distinguishes the predicative forms from the forms required by /dI/. If what has so far been assumed to be a single affix, namely the second person singular or plural predicative inflectional affix, could be analyzed as two morphemes, X followed by the inflectional affix for second person singular or plural, the suspicious feature in the inflectional paradigm would vanish. This is precisely what the preceding paragraph cries out for.

If one takes I to be the primary stem of the copulative verb, and sI to be the secondary stem of that verb, and assumes that this verb is subcategorized for various phrases (NP, AP, and PP, in particular), not many problems remain. The selection between the two stems and the difference in the first person plural affixes are the two major points of concern.

The alternation among stems is not rare. Exactly the same kind of alternation is evidenced by Latin su, es, esse, and fu. Let me write up realization rules along with their concomitant operations, along the lines of Zwicky (1988). The stem realization rules say 'Realize [-N, +V, SUBCAT: 100, PAST: +] by Operation 220,' 'Realize [-N, +V, SUBCAT: 100, PERSON: 1] by Operation 220', and 'Realize [-N, +V, SUBCAT: 100, PAST: -, PERSON: 2] by Operation 221'; the affix realization rules say 'Realize [PERSON: 2, NUMBER: SINGULAR] by Operation 214' and 'Realize [PERSON: 2, NUMBER: PL] by Operation 215'. The realization rules would work out everything, insofar as the operations are correct and there is an additional rule to handle the alternation between the first person plural affixes. (12) and (13) guarantee this.

```
(12)  Rule 37: Realize [PERSON: 1, NUMBER: PLURAL] by operation 212.
           38: Realize [PAST: +, PERSON: 1, NUMBER: PLURAL] by operation 213.

(13)  Operation 212: Suffix /Iz/
                213: Suffix /k/
                214: Suffix /In/
                215: Suffix /InIz/
                220: I
                221: sI
```

It seems appropriate at this point to update the inflectional template presented in section 2. As a matter of fact, there is no need for change in the amended template, granting that there is a change in the understanding of the last slot. I repeat (6) here and rename it.

(14) The Template of Verb Inflection (Revised)

	I	II	III
	PROGRESSIVE		
Stem	FUTURE	(dI)	PERSON/NUMBER
	AORIST		

The analysis of I as a verb stem as opposed to an inflectional ending or part of an ending should have several consequences. First, it must have its own inflected forms. Second, it should have distributional properties distinct from clear cases of bound morphemes. Let us look into the rest of its inflectional paradigm before we go on to the second question in the next section.

The past form of the copula is idi, just as one would expect. Its progressive form is missing, presumably due to semantic conflicts. Its future and aorist forms are borrowings from a semantically related verb ol 'become': olacak is the future form, olur the aorist.

Consider the following:

```
(15) a.  Bu  resim güzel    ol-acak
         this picture beautiful be-FUTURE
         'This picture will be beautiful'
     b.  Yarin  ev-de    ol-acağ-ım
         tomorrow house-at be-FUTURE-1SG
         'Tomorrow I will be at home'
     c.  Antalyan-ın portakal-lar-ı çok büyük ol-ur
                     orange-PL       very large be-AORIST
         'Oranges of Antalya are very large'
```

The negative forms of copula are also suppletive. The unmarked (nontensed) form is <u>değil</u>. This same stem combines with /dI/. The tensed ones are borrowings, again from <u>ol</u>: <u>olmacak</u> 'will not be' and <u>olmaz</u> 'often not'. I will not give examples.

The extraordinary complexity of the facts surrounding Turkish predicate inflection is shown to be exhaustively, and adequately, describable without an appeal to any unrestrictive mechanisms. The description developed above in effect proves the necessity of a strict distinction between the cliticization and morphonological components on the one hand, and between cliticization and syntax on the other. Furthermore, inasmuch as the rules in (12) and the operations in (13) offer the right kind of economical description, they provide evidence that the separation of operations from a realization rule is a route well-taken. Section 4 deals with a major problem in Turkish grammar, which could not be solved unless the syntactic component and cliticization components were put to use.

4. Asymmetry in yes-no questions

Yes-no questions in Turkish are formed by attaching the morpheme <u>mI</u> at the end of a phrase or somewhere in the middle of the inflectional affix slots. Its distribution gives the verbal morphology of the language a very exotic appearance.

```
(16) a.  Biz genç mi-yiz
         we  young YNQ-be
         'Are we young?'
     b.  Biz genç değil mi-yi-dik
         we  young not  YNQ-be-PAST
         'Were we not young?'
     c.  Sen çalış-ıyor mu-sun
         you work-PROG  YNQ-be
         'Are you working?'
     d.  gel-di   mi
         come-PAST YNQ
         'Did he come?'
     e.  meyva aldı-k  mi
         fruit buy-PAST YNQ
         'Did we buy fruit?'
     f.  şimdi mi gel-di-niz
         now   YNQ come-PAST-2PL
         'Is it just now that you came?'
```

This promiscuous behavior of <u>mI</u> is a major stumbling block to a simplistic approach. Hankamer (1986:45) is exceptional among the writers on Turkish morphology in that he explicitly states the problem:

> Somewhat more dubious is the indirect recursion V4-V5-Q1-Q2-Q3-V4, which is there to capture some of the more frightening complexities in the verbal and predicate inflection, and is almost certainly not right. I don't want to talk about it.

What he aims at is a construction of a finite-state parser which proceeds only in one direction, left to right. His V4 is the state recognizing a stem of a verb. He treats derivational suffixes totally on a par with inflectional ones. The next state, V5, of his parser recognizes 'tense' morphemes, which are the slot I and II affixes in combination in our (14). One of the options open to this parser is to make a null transition to Q1, which in effect has made sure that there is the right sort of string to which mI attaches. After checking the presence of this morpheme and then of another morpheme y, the parser makes another null transition to V4, leading to a recursion. I give his diagram in Figure 1 on the next page.

Having mI₁ as an independent word and mI₂ as an inflectional affix hardly seems right when these putative homonyms have the same grammatical functions. This difficulty does not remain once we take the stance motivated in the previous section: if I is separated as a verb stem, the generalization is that mI never intervenes between the verb stem and its inflectional affixes. The only place in which mI can occur is an absolute phrase-final position. The syntactic structure of (16a) for instance is seen to be like (17).

(17)
```
                  S[YNQ]
                 /      \
               NP        VP[YNQ]
               |         /     \
              Biz    AP[YNQ]     V
                     /    \      |
                   AP    ADV[YNQ] I
                   |       |
                   A       mI
                   |
                 genç
```
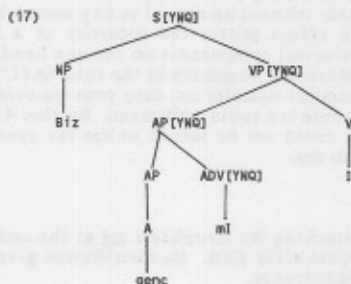
Ordinary agreement mechanisms work out the inflection on the verb I, via the realization rules given in section 2. What is noteworthy in this structure is the fact that the feature [YNQ] is a foot feature. It can be instantiated freely at any node under S, for instance under the subject NP or under an adverbial daughter of S or VP (as in (16f)), as long as no semantic conflict arises.

If the generalization about the distribution of mI is correct and if /dInIz/, etc. are really inflectional endings in contradistinction to their mates /sInIz/, etc., then there should be an acceptability contrast between the two groups when they combine with a preceding mI. That, in fact, is the case.

```
(18)  a.  Gel-iyor  mu-sun
          come-PROG YNQ-be.NONPAST
          'Are you coming?'
      b. *Gel-iyor  mu-dun
          come-PROG YNQ-be.PAST
          'Were you coming?'
      c.  Gel-iyor  mu-ydun
          come-PROG YNQ-be.PAST
          'Were you coming?'
      d.  Gel-iyor-dun
          come-PROG-be.PAST
          'You were coming'
```

What is relevant is the unacceptability of (18b) as opposed to (18a). Not only the bond between the stem and the inflectional affixes, but also the one between any pair of adjacent affixes is strong enough to reject a non-affix. The first affix /Iyor/ and the second affix /dI/ in
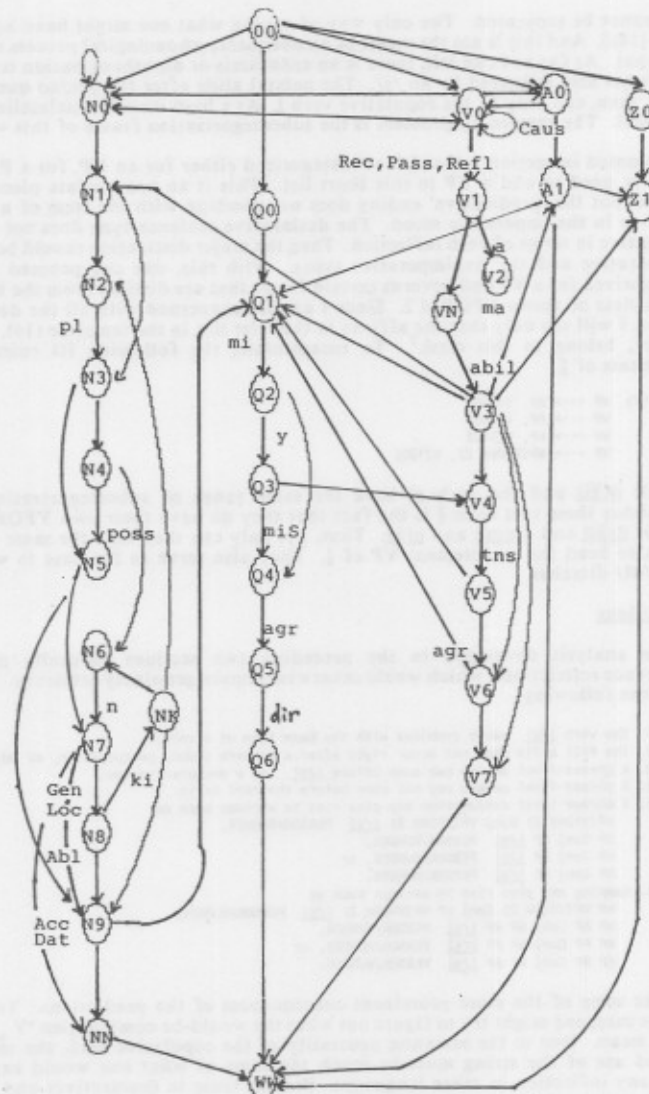
Rec,Pass,Refl

Caus

mi

abil

a

ma

pl

poss

y

miS

tns

agr

agr

dir

n

ki

Gen
Loc

Abl

Acc
Dat

Figure 1. Hankamer's (1986) Parser

(18b) cannot be separated. The only way of saying what one might have hoped to say with (18b) is (18c). And this is not the result of an obligatory phonological process applying to (18b) as its input. As far as I can tell, there is no epenthesis or diphthongization triggered by a /d/ which is not also triggered by an /s/. The palatal glide after the yes/no question morpheme in (18c), then, can only be the copulative verb I. As a high vowel, it palatalizes after another high vowel. The remaining problem is the subcategorization frame of this verb.

We noted in section 3 that I is subcategorized either for an NP, for a PP, or for an AP. We clearly need to add a VP to this short list. This is an appropriate place to recall from section 2 that the 'predicative' ending does not combine with the stem of a verb unless the sentence is in the imperative mood. The declarative sentence type does not differ from the interrogative in terms of verb inflection. Then the major distinction should be drawn between the imperative and the nonimperative types. With this, one can proceed to say that I is subcategorized for a VP and governs certain forms that are distinct from the base form. I will call this class of forms VFORM 2. Since I am not concerned with all the details of Turkish grammar, I will say only that the affixes in the first slot in the template (14), /Iyor/, /EcEk/, and /Er/, belong to this class.[5] To recapitulate, the following ID rules introduce the complements of I.

```
(19)    VP ---> NP, V[100]
        VP ---> PP, V[100]
        VP ---> AP, V[100]
        VP ---> VP[VFORM 2], V[100]
```

The verb değil and the verb ol have the same range of subcategorizations as I. What distinguishes these two from I is the fact that they do have their own VFORM 2 forms: the invariant değil and olacak and olür. Thus, not only can they take the same complements as I, they also head the complement VP of I. They also serve as the base to which the PAST ending /dI/ attaches.

5. Predictions

The analysis developed in the preceding two sections naturally predicts several cooccurrence restrictions, which would otherwise remain genuinely arbitrary. The predictions include the following:

```
P1. The verb I/sI never combines with the base form of a verb.
P2. The PAST affix does not occur right after a nonverb (noun, postposition, or adjective).
P3. A phrase-final adverb may come before I/sI, as a daughter-in-law.
P4. A phrase-final adverb may not come before the PAST affix.
P5. A phrase-level conjunction may give rise to strings such as
    VP[VFORM 2] Conj VP[VFORM 2] I/sI  PERSON/NUMBER,
    AP Conj AP I/sI  PERSON/NUMBER,
    PP Conj PP I/sI  PERSON/NUMBER, or
    NP Conj NP I/sI  PERSON/NUMBER.
P6. Gapping may give rise to strings such as
    NP VP[VFORM 2] Conj NP VP[VFORM 2] I/sI  PERSON/NUMBER,
    NP AP Conj NP AP I/sI  PERSON/NUMBER,
    NP PP Conj NP PP I/sI  PERSON/NUMBER, or
    NP NP Conj NP NP I/sI  PERSON/NUMBER.
```

Let us see some of the more prominent consequences of the predictions. To see that P1 is really the case, one might try to figure out what the would-be combination 'V $_{stem}$ + I/sI' could possibly mean. Due to the semantic neutrality of the copulative verb, the meaning and the associated use of the string must be much the same as what one would expect on a verb without any inflection in other languages. Present tense in declaratives and the imperative mood suggest themselves as candidate features of such a putative string. Since the former is indicated by the aorist affix /Er/, a VFORM 2 affix, the only remaining question is whether the imperative forms really lack I/sI. Here comes an absolute yes, again.

It will be seen that the imperative of the second singular is identical with the stem; cf. the English imperative without 'to.' Of the second-person plural forms, the longer is the more polite. Care should be taken not to confuse the third-person suffix of this mood with the second-person singular of the Type I [same as our 'predicative', YN] endings; if -sin is added to a stem, it makes the third-singular imperative: gel-sin 'let him come'; if added to a base, it makes the second-singular present: gel-ecek-sin 'you-are about-to-come'; gel-miş-sin 'you-are having-come.'

(Lewis 1967: 137)

P2 accounts for the exceptionless existence of the independent-word variant /IdI/ corresponding to every occurrence of /dI/ cliticized to a noun, a postposition, or an adjective. P3 and P4 provided major evidence for the whole analysis: mI is no longer an affix, but an adverb. Other phrase-final adverbs, the generic-assertion marker dIr and dE 'also', for instance, would not occur before the past affix dI, but would occur phrase-finally before the copula I/sI. However, two facts about Turkish detract somewhat from the value of this prediction. First, there is a systematic alternation between the independent IdI and the enclitic /dI/. Due to this alternation, /dIrdI/ may arise if the /dI/ is the enclitic counterpart of IdI. Second, dIr occurs mainly with a third person subject. Since, as the realization rules in section 3.4 insure, the third person present form of the copulative verb is a null string, this leads to a case where we cannot tell whether the adverb dIr precedes or follows the null string.

The last two predictions turn out to be very compelling as evidence for the lexical status of I/sI, due to their more syntactic nature. The following grammatical sentences serve to bear the predictions out.

(20) a. Biz git-meli (ve) gid-eriz.
      'We have to go and will go'
   b. Siz ya ev-de ya okul-da i-di-niz.
      'You were either at home or at school'
   c. Sen genç ve malum-sun.
      'You are young and well-known'
   d. Biz ya turk ya arab-îz.
      'We are either a Turk or an Arab'

(21) a. Biz git-meli siz gel-meli-siniz.
      'We have to go; you have to come'
   b. Siz ev-de biz okul-da-ydîk.
      'You were at home; we were at school'
   c. Sen genç Orhan ihtiyar-dîr.
      'You are young; Orhan is old'
   d. ?Biz turk Mahmet arap.
      'We are Turks; Mahmet is an Arab'

Note the absence of facts related to VP-Ellipsis in the above list of predictions, which, if included, would certainly serve to corroborate my claims. The syntactic process found in the English sentences in (22) does not seem to have such an analog in Turkish as would prove the word-hood of I/sI.

(22) a. Although Sue wanted to, the rest of them decided among themselves that they shouldn't attend the game.
   b. My goose is cooked, but yours isn't.
   c. Every girl who could, saw the film.
   d. Kim's father urged her to play every game her boyfriend did.

The strings in (24) cannot be used to convey the meanings expressed by sentences in (23), even when the context of conversation helps determine the meaning.

(23) a. Ben-de yorgun-um.
     I-also tired-be
     'I also am tired'
   b. Ben-de Türk-üm.
     I-also Turk-be
     'I also am a Turk'
   c. Ben-de git-meli-yim.
     I-also go-OBLIG-be
     'I also have to go'

(24) a. *Ben-de yim.
   b. *Ben-de-m.

Unlike the complement of I, that of the negative copula degil can be suppressed. B's response in the following piece of conversation is linguistically perfect.

(25) A: Yorgun-mu-sunuz?   'Are you tired?'
    B: Degil-im.   'I am not.'

The suppression of its complement could be due to XP Ellipsis or to its status as a proform of a VP. Since there is no syntactic process in Turkish that is as prevalent as VP Ellipsis in a language like English, we take degil to be a proform of a VP.

The absence of VP Ellipsis, if anything, is presumably to be attributed to the closer connection between the Turkish morphemes corresponding to English auxiliary verbs and their 'complements' than in English[6]. Auxiliary verbs in English are independent words; the Turkish means of expressing the same meanings are either derivation, inflection, or cliticization. Auxiliary verbs being responsible for VP Ellipsis, the absence of independent-word auxiliaries in Turkish is the very reason for there being no VP Ellipsis in the language.

6. Conclusion

What are known as 'predicative inflectional suffixes' have been analyzed as the copula followed by an inflectional suffix. Their affixal characteristics are shown to be due to the enclitic status of the copula. Adopting Zwicky's framework of syntax-phonology interface, the two heavily overlapping paradigms of predicate inflection are shown to be reducible to a single paradigm of verb inflection. Hankamer's (1986) problem of 'dubious recursion' arising from the traditional analysis is successfully overcome, since the yes/no question morpheme, mI, is taken to be an adverb, rather than an inflectional suffix. The analysis is supported by facts about phrasal conjunction and gapping.

Notes

* The main body of this paper was written for Seminar in Inflectional Morphology, led by Arnold Zwicky in Spring 1988. I would like to thank Gönül for acceptability judgments on Turkish sentences, Hee-rahk Chae for his role as a liaison between me and Gönül, and Uma Subramanian and Joyce Powers for their suggestions about exposition and style. It would not be fair to keep unexpressed my gratitude at the couple of cycles of comments by Arnold Zwicky on previous versions of this paper, which constitutes one of my General Exams Papers.

1. Lexical items and word-forms are underlined, while affixes are given between slashes. No such distinction is made when they appear in example sentences.

2. This is so at least in the highest sentences. In an embedded clause, however, the predicative ending cannot occur. Neither can dI. The only ending that can, and actually should, occur in the outermost slot of an embedded VP is a possessive ending, namely one of those in the second column of (1).

3. There cannot be any conditioning factors, phonological or categorial. For the classification of clitics into 'bound words' and 'phrasal affixes', see Nevis (1985), cited and commented on by Zwicky (1986).

4. mEli 'OBLIGATORY' is another sure candidate for VFORM 2, as is suggested by Lees (1972:69). Lees views a VP in VFORM 2 as a noun-phrase: 'The participialized verb-phrase is itself a noun phrase, a predicate of the copula.' However, since the 'participialized' VP does not behave as an ordinary NP, his analysis would have to face serious overgeneration problems. As of writing, I am not sure of the status of other affixes like EmE, Ebil, and mEmEli. I am inclined to take mE 'NEGATION' to be a derivational suffix, hence not a VFORM 2 affix.

5. I am assuming that VP-Ellipsis is confined to a proper subset of complement-taking verbs in every language. However, while English conforms to this assumption, I do not know of VP Ellipsis phenomena of other languages. Nothing in this analysis hinges on this particular assumption.

6. I am assuming that VP-Ellipsis is confined to a proper subset of complement-taking verbs in every language. However, while English conforms to this assumption, I do not know of VP-Ellipsis phenomena of other languages. Nothing in this analysis hinges on this particular assumption.

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The Benefits of Morphological Classification: On Some Apparently

Problematic Clitics in Modern Greek

Brian D. Joseph

1. Introduction and theoretical background

Any theory of grammar, and more particularly any theory of the component of a grammar, the morphological component, that is concerned with words and word-like units and the pieces that make them up, must provide some means of classifying 'elements', i.e. morphemes and morpheme combinations, as to their morphological status. Of particular concern is the classification of elements into different types along the scale in (1):

(1) word - clitic - affix

with *affix* on one end of the scale as the typical bound morpheme, *word* on the other end as the typical free or complex morpheme, and *clitic* somewhere in between as a quasi-word/quasi-affix.

A concern for classification with regard to these three constructs is not meant to deny the importance of other taxonomic parameters for morphemes, such as, for words, content versus function, or for affixes, inflectional versus derivational. However, there is a special significance to the division of elements suggested in (1).

First, knowing where a given element falls on the classificatory scale in (1) permits one to make predictions about expected behavior of particular items in specific languages. Thus, once it is determined that the plural marker (// s //) in English is an affix, then certain properties automatically follow. For example, under the frequently held assumption of the integrity of stem-plus-affix combinations (see Kanerva 1987, for instance), the affixal status of // s // would guarantee, accurately, that other, nonaffixal, material could not interrupt its attachment to a particular noun.

Second, precise classification is necessary if cross-linguistic generalizations and putative universals concerning the elements in (1) are to have any empirical content. As Zwicky (1985) has emphasized, it is only by making a decision on such a classification that testable generalizations about the behavior of such units within individual languages and across different languages, i.e. universally, can emerge.

Particularly troublesome here are claims concerning clitics and clitic behavior, for their ambiguous status, lying somewhere between words and affixes, represents an implicit challenge to linguistic theory. Nonetheless, several generalizations about clitics have been proposed in recent years, and these claims need the benefit of precise classification in order to be tested adequately.

Two examples deserve mention here, for the facts to be considered below bear on their viability as linguistic universals. First, Kaisse (1982) has proposed, as a modified version of the generalization widely known as Wackernagel's Law, that S' (= 'S-bar') clitics must occur in second position within their clause. Second, Zwicky (1987), following Klavans (1983) and others, has claimed that there are no endoclitics, i.e. clitics that are positioned within the morphological unit defined by a word (as if *Bo-'ll-b come were an acceptable variant of Bob'll come, with the clitic variant 'll of the future auxiliary will).[1]

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In order to carry out the classification necessary for the testing of such hypotheses, though, it is essential to have a set of criteria which will allow for a decision as to the categorial status of a given element. Although many linguists have proposed criteria for distinguishing among words, clitics, and affixes (see, for example, Carstairs 1981 or Muysken 1981), those put forth recently by Zwicky, in Zwicky (1985), Zwicky (1987), and Zwicky & Pullum (1983), are adopted here. These 'Zwicky criteria' present the strongest basis for deciding categorial status, for they are both internally consistent and derivative from the architecture of overall theory of grammar he assumes. In particular, Zwicky's conception of grammar has a highly modular system (whose modules generally correspond to different 'components' of grammar recognized in traditional frameworks) that has only limited interaction among the different modules; moreover, it has a monostratal phrase structure syntax that is maximally general, in that it refers to classes of items rather than to individual lexemes per se in its statements, and is further characterized by a rule-to-rule mapping between syntax and semantics.

Among the criteria that Zwicky proposes for distinguishing words, clitics, and affixes from one another are those given in (2); (2a) through (2d) distinguish affixes from nonaffixes (i.e., clitics and words), while (2e) and (2f) distinguish words from nonwords (i.e., clitics and affixes):

(2) a. selectivity in combinatory possibilities (affix: high selectivity; nonaffix: low selectivity)
b. morpho(phono)logical idiosyncrasies (affix: shows idiosyncrasies; nonaffix: few or no idiosyncrasies)
c. semantic idiosyncrasies (affix: shows idiosyncrasies; nonaffix: few or no idiosyncrasies)
d. paralleled by a morphophonological process (affix: can show such parallels; nonaffix: shows no such parallels)
e. ordering with respect to other elements (nonword: strictly ordered; word: some degree of free ordering (within other grammatical/semantic limitations)
f. phonological dependence (nonword: dependent; word: independent)

Other criteria are proposed in Zwicky's discussions, but those in (2) are the most relevant for the discussion below.

The overall thrust of these criteria is that affixes are characterized by a high degree of idiosyncrasy in their realization and behavior, while nonaffixes, i.e. clitics and words, show a high degree of regularity and predictability in realization and behavior. This general characteristic of affixes derives from the theory assumed in Zwicky's model of grammar because only the occurrence of clitics and words--but not of affixes--in particular phrasal positions is licensed by the (maximally general) syntax, and further, all such syntactically licensed elements must correspond to overt and fully regularly derived phonological material and must have a direct and transparent, hence nonidiosyncratic, semantic translation; with affixes so characterized, the basis for distinguishing between clitics and words is provided by other behavioral characteristics, such as extent of independence of one sort or another, most typically of a phonological nature.

With these criteria in place, the two hypotheses about clitic behavior mentioned above--second position for S-bar clitics and the ban on endoclitics--can be explicitly tested. More particularly, apparent counterexamples to each of these claims provided by some facts from Modern Greek can be subjected to rigorous testing via Zwicky's criteria.

2. The Greek facts

The problems posed by the Greek facts both center on the finite verbal complex, a unit composed of the inflected verb plus various elements traditionally called 'clitics', in the case of the weak object pronouns (1SG ACC me, 1SG GEN mu, 3SG ACC NTR to, etc.), and 'particles', in the case of the modal markers na and as, the future marker θa, and the negation

markers _δen_ and _mi_. These elements modify the inflected verb for tense, mood, negation, and argument structure (see Joseph 1985 for some discussion). The general schema for the verbal complex is sketched in (3), and some examples of the expansions of the verbal complex are given in (4):

```
(3) ( na ) - ( min ) - ( θa )   -   (WEAK PRONOUNS)       -   VERB
        as        δen                [1SG.ACC me, GEN mu, etc.]
        MOOD      NEGATION   TENSE   ARGUMENT.MARKER           HEAD

(4) a.  δen θa ta              fáo
        NEG FUT 3PL.ACC.NTR    eat/1SG
        'I won't eat them'
    b.  δen tus       to       δósame
        NEG 3PL.GEN   3SG.ACC.NTR   give/1PL
        'We didn't give it to them'
```

The classification of these elements is crucial for the claims concerning clitics noted above, for if any of the interior ones are true clitics (note especially the traditional label of 'clitic' for the weak pronouns) while the exterior ones are affixes, the clitics would present a clear case of endoclisis, being positioned within the bounds of a word unit consisting of a stem plus affixes. Similarly, the negation markers, whose distribution correlates with verbal mood-- _δen_ occurring with indicative mood and _min_ with subjunctive mood--pose a problem for the modified Wackernagel's Law second-position generalization. To focus just on the indicative negator, relevant evidence concerning which is discussed below,[2] it need not occur in second position (note (5a) with sentence-initial _δen_) even though its scope is demonstrably sentential.[3] In particular, the occurrence of a negative marker with the verb determines the selection of the negative polarity indefinite pronoun _kanénas_ as subject, as opposed to the nonnegative _kápjos_; this situation is illustrated in (5):

```
(5) a.  δen frθe       kanénas    / *kanénas frθe
        NEG came/3SG   no-one/NOM
        'No one came'
    b.  kápjos       frθe     / *δen frθe kápjos
        someone/NOM  came/3SG
        'Someone came'
```

It turns out, however, that there is a solution to these problems posed by the Greek facts for the hypotheses noted above. In particular, a close examination of the properties of the morphemes in question--the weak pronominals and the indicative negator--with regard to the Zwicky criteria allows for an analysis of these elements as affixes and not as clitics in the strict sense that these criteria now permit. Crucial to this solution is the ability to classify the problematic elements on a principled basis as being outside the domain of these generalizations. In that way, both the negator _δen_ and the weak pronominals become irrelevant for these hypotheses, and so do not constitute counterexamples to them.

3. Evidence for the affixal analysis from Standard Modern Greek

The affixal analysis that provides the key to preserving the above-mentioned generalizations is well-supported by facts from Standard Modern Greek. In particular, evidence is available that is relevant to the various criteria noted above.

With regard to the indicative negator _δen_, it is clear first of all that must be a nonword. In particular, it is a phonologically dependent element: it cannot stand alone, for instance as a negative response word. By itself, *_δen_ does not constitute a well-formed utterance, and cannot, for example, mean 'no; don't; not' independently. Second, it shows the strict ordering with respect to other elements it combines with that is characteristic of nonwords; as (6) shows, it must be leftmost in the verbal complex:

```
(6) a.  δen  θa   vlépo  /  *θa δen vlépo  /  *θa vlépo δen
        NEG  FUT  see/1SG
        'I will not be seeing'
    b.  δen  ton    vlépo  /  *ton δen vlépo  /  *ton vlépo δen
        NEG  him/ACC see/1SG
        'I don't see him'
```

Other evidence suggests that of the nonword possibilities, δen shows some of the idiosyncratic behavior characteristic of affixes, and thus can be classified as a nonword, nonclitic, i.e. an affix. For instance, δen is highly selective in its combinatory possibilities, occurring only with indicative finite verbs, as in (7a), but not with subjunctive finite verbs, as in (7b), nor with nonfinite verbs, as in (7c):[4]

```
(7) a.  δen vlépo    'I don't see (PRES)'
        δen évlepa   'I wasn't seeing (IMPRF)'
        δen íδa      'I didn't see (AOR)'
        δen θa vlépo 'I won't see (FUT)'
    b.  *δen na vlépo / na δen vlépo  'that I not see (SUBJUNC)'
    c.  *δen vlépondas 'not seeing/ACT.PPL'
        *δen δés   'Don't see/IMPV.SG'
        *δen δéste 'Don't see/IMPV.PL'
```

Also, δen shows a semantic idiosyncrasy in its use in the expression δen mu lés 'tell me ...', which introduces an inquiry without a trace of negative meaning, even though its literal meaning is 'you don't tell me'. While admittedly, the nonnegative meaning of δen mu lés may lie partly in the pragmatics, it is nonetheless true that in this expression, δen idiosyncratically does not have its usual negative value, and so prevents a fully compositional meaning for this phrase. The other criteria--morpho(phono)logical idiosyncrasies and parallelism with a morphophonological process--do not yield any further support for the affixal analysis, but neither do they point towards a clitic analysis of δen, for there simply is no relevant evidence from them at all bearing on the classification of δen. Thus, all the available evidence from Standard Modern Greek supports the claim that indicative negation is realized by means of an affix.

With regard to the weak pronominal elements, a similar case can be made for analyzing them as affixal elements. The facts are discussed more fully in Joseph (1988a, 1988b) but a sketch of the relevant data can be made here.

As with δen, it is clear that the weak pronominal forms cannot be independent words. In particular, they are phonologically dependent, not being able to occur, for instance, as one-word answers --the corresponding strong form must occur instead:

```
(8) pjón     íδe      o jánis?       eména         /  *me
    whom/ACC saw/3SG  the-John/NOM   me/ACC.STRONG    me/ACC.WEAK
    'Whom did John see?  Me.'
```

In addition, they are strictly ordered with respect to the other elements they combine with, as (9) indicates:[5]

```
(9) δen ton         vlépo  /  *ton δen vlépo  /  *ton vlépo δen  /  *δen vlépo ton
    NEG him/ACC.WEAK see/1SG
    'I don't see him'
```

On other criteria, moreover, the weak pronouns test out as affixal, and not as clitics.[6] They show selectivity of combination, in general occurring only with verbs, although accusatives also occur with the adverb kalós 'well' in a collocation meaning 'welcome' (e.g. kalós ton 'welcome to him!') and genitives occur with some prepositions (e.g. brostá mu 'near me') and with a few adjectives (e.g. mónos mu 'on my own'). Though the existence of these

occasional nonverb hosts for the weak pronouns suggests a lesser degree of selectivity, at the same time, it is possible to point to extreme selectivity with respect to combinations with adverbs, for only <u>kalós</u> among the adverbs can support the weak pronouns. Also, the weak pronouns show various gaps in combinations, such as the absence of first person genitives with second person accusatives, e.g.:

```
(10) *mu            se         δósane
     me/GEN.WEAK   you/ACC.WEAK  gave/3PL
     'They gave you to me'
```

and such gaps constitute a type of selectivity recognized by Zwicky & Pullum (1983) as typical of affixes.

In addition, the weak pronouns show several idiosyncrasies. With regard to morphophonology, the second person singular genitive weak form /su/ in combination with any third person weak accusative form, all of which begin with /t-/, e.g. the neuter singular /to/, anomalously undergoes a contraction to [s], e.g. /su + to/ ---> [sto] 'to you it', even though there is no regular elision process affecting /u/ in that context in the standard language. Also, for at least some speakers, in some speech styles, the initial /t-/ of the weak third person pronouns may undergo voicing to [d-] in combination with the future morpheme Θa and the modal marker <u>na</u>, e.g. /Θa to káno/ --> [Θa do káno] 'I will do it', even though intervocalic voicing of stops is not a regular feature of Greek phonology. With regard to morphosyntactic and semantic idiosyncrasies, it is significant that the weak pronouns can occur in idiomatic phrases with verbs which are ordinarily intransitive, e.g.:

```
(11) pú      Θa   tin            pésume
     where   FUT  her/ACC.WEAK   fall/1PL
     'Where will we go?' (literally '*Where will we fall her')
```

In such phrases, the idiosyncratic behavior is twofold--not only is the weak pronoun empty, without any interpretation as an argument, but its cooccurrence with the intransitive verb is entirely irregular.

Given this behavior, from the perspective provided by the Zwicky criteria, one has to conclude that the weak pronominal elements of Standard Modern Greek, despite their traditional label, are best treated as affixes.

4. <u>Dialect evidence</u>

Beyond the evidence from the standard language presented in section 3, various facts from Greek dialects can be adduced to strengthen the case for the affixal analysis of the indicative negator and the weak pronouns pan-Hellenically. The modifier 'pan-Hellenically' is needed, for the dialect evidence cannot of course bear on the analysis in Standard Modern Greek per se, but they lend a typological credence to the analysis proposed here since the dialects, as varieties of Greek, are closer to Standard Greek in all respects--lexically, structurally, grammatically--than any other human language.

First, evidence bearing on the status of the indicative negator comes from the Tsakonian dialect of the southwest Peloponnesos, based on the description in Pernot (1934). In this dialect, the indicative negator is <u>ó</u>, but it is parallel to Standard Greek <u>δen</u>, coming historically from the first part (<u>ou</u>) of the Ancient Greek form <u>oudén</u> 'in no wise; not at all' (composed of <u>ou</u> 'not' + <u>dé</u> 'but' + <u>hén</u> 'one/NTR') which yielded <u>δen</u>. Moreover, some bidialectal Tsakonian speakers produced a hybrid negator <u>δon</u>, with the vocalism of the native Tsakonian form and the consonantism of the standard form, suggesting a closeness between the two forms that would permit inferences about the categorial status of the standard form from an examination of the dialectal form.

Two pieces of data are relevant here. As (12) shows, Tsakonian has innovated a virtual negative auxiliary through the fusion of ó with the verb 'to be', which is used in the formation of all present and imperfect tenses periphrastically in this dialect:

```
(12)  1SG  óñi  'I'm not'    (< ó + éñi )    1PL  óme  'we're not'   (< ó + éme)
      2    ósi  'you're not' (< ó + ési)  2    óthe 'you're not'  (< ó + éthe)
      3    óni  'he's not'   (< ó + éni)  3    úñi  'they're not' (< ó + íñi)
```

Not only does the fusion give the appearance of an inflected negative verb, but the details of the contraction process that gave rise to it, especially in the 3PL form úñi, would require its synchronic derivation from ó plus 'be' to involve some morphophonological irregularities. In particular, /ó + í/ does not regularly yield [ú] synchronically (rather, [o]), so that úñi would require a synchronically idiosyncratic treatment. Thus, if not inflectionally affixal because of the fusion, Tsakonian ó would nonetheless present a synchronic idiosyncrasy, i.e. a characteristic of affixes.

Also, for certain forms of the paradigm in (12) irregular truncated variants are possible, specifically: 1SG ói, 3SG ó, and 3PL úi, and at some point in the history of Tsakonian, the old 3SG form, óñi, separated off from the paradigm and was lexicalized as the emphatic 'surely not!' (the current 3SG being a reformation). Such specialization of individual forms is characteristically found with affixal formations, according to Zwicky & Pullum (1983), and not with those involving clitics, which are syntactically and semantically transparent. Thus, from this evidence, Tsakonian, and by extension, Greek in general, has affixal indicative negation.

Second, several dialect facts point to an affixal analysis of the weak pronouns. In particular, in many Northern dialects (e.g. of Thessalia, Macedonia, etc., cf. Thavoris 1977), the first person singular weak pronoun m(é) has come to occur inside of an indisputable affix, the plural imperative ending -ti; examples of such forms are given in (13):

```
(13) a. pé-m-ti [= 'tell/IMPV' + 'me' + PL]    '(You/PL) tell me!'
     b. dó-m-ti [= 'give/IMPV' + 'me' + PL]    '(You/PL) give (to) me!'
     c. féri-mé-ti [= 'bring/IMPV' + 'me' + PL] '(You/PL) bring (to) me!'
```

Such placement is unusual and unexpected for clitics, for it amounts to endoclisis, an otherwise unattested positioning for clitics.[8] On the other hand, such interior placement is not unusual if m(é) is an affix.

Also, in Tsakonian, a singular weak pronoun regularly occurs in a semantically empty usage as an optional but preferred accompaniment to a plural weak pronoun, as in (14):

```
(14) tsi     m              epétsere  námu
     what    me/ACC.WEAK    said/2SG  us/ACC.WEAK
     'What did you say to us?' (literally: 'What did you tell me to us?')
```

Thus, in such a construction, there is anomalous nonagreeing 'doubling' of the plural weak pronoun. Not only does (14) reveal a semantic idiosyncrasy, in the form of a null interpretation, of the weak pronouns in Tsakonian, but it also reveals a syntactic idiosyncrasy, in the form of an irregular sort of agreement pattern, for person only and not for person and number, as is found, for instance, with doubling of a strong pronoun by a weak pronoun.

Finally, the dialect of Tírnavo in Thessalia, as described by Tzartzanos (1909), presents a clear case of processual realization of an entire weak pronoun (criterion (2d) above). In this dialect, the feminine accusative singular weak pronoun, which has the form [tn] before vowels, is realized with verbs having an initial dental stop or affricate simply as voicing on the verb's initial consonant. For example, contrasts such as those in (15) occur:

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(15) a. [táraksi] 'he disturbed' vs. [dáraksi] 'he disturbed her'
     b. [tˢókusi] 'he caught'   vs. [dᶻókusi] 'he caught her'
     c. [tˢímsi]   'he pinched'   vs. [dᶻímsi]   'he pinched her'

Processual realization--here by the process of voicing--is expected in Zwicky's system only for affixes, not for clitics, so Tírnavo offers clear-cut evidence in this framework for the affixal analysis under consideration.[9]

Both the indicative negator and the weak pronouns, therefore, show themselves clearly in these dialects to be affixal in nature.

5. <u>Conclusion</u>

What emerges from this brief discussion is that these elements from Modern Greek, which at first glance seem so problematic for claims regarding clitics universally, turn out to present no problem, once a stringent set of classificatory criteria is applied to the data. Rather than being clitics, they are instead well-behaved affixal elements and as such are irrelevant to the hypotheses discussed at the outset. A ban on endoclisis and second-position for S-bar clitics can therefore be maintained as viable universals, given present knowledge. To be sure, more examination of the Modern Greek verbal complex is needed, though the preliminary indications[10] are that it is a word-level unit, built up of a verbal stem plus clitic modal markers, tense prefixes, negation prefixes, affixal argument markers (realized prefixally for finite verbs, and suffixally for nonfinite forms), plus regular aspectual suffixes and suffixes for the person and number of the subject.

Thus the principles of morphological classification inherent in Zwicky's framework have enormous benefits for research in this area. To the extent, then, that the Zwicky criteria lead to satisfying results in dealing with these seemingly difficult facts, the analyses presented here can be said to lend considerable credence to the overall framework and approach to morphological classification embodied in Zwicky's theory.

Notes

1. Some apparent cases of endoclitics have been reported for various languages, but upon closer inspection each putative case has turned out to have a better analysis in some other way (see e.g. Nevis 1984, Klavans 1985, Macauley 1986). Thus, at present the claim of nonoccurrence for endoclitics constitutes a relatively secure working hypothesis. Moreover, it is theoretically desirable to maintain such a ban on endoclitics (data permitting), under an assumption that words, as the output of the morphological component, have an internal integrity (see Kanerva 1987) that is not subject to alteration by the syntax, the component responsible for the distribution of syntactic classes, including clitic elements, and for the internal structure of phrases, but not for the distribution of word-formatives (affixes) and the internal structure of words.

2. I am deliberately ignoring the potential counterexample posed by the modal negator min, largely for reasons of space; although it is a safe assumption that the considerations to be discussed regarding the classification of δen carry over into the classification of min, min presents other analytic problems that go beyond the scope of this paper so that all the relevant evidence regarding min can not really be explored here (see Joseph & Janda 1987 for some discussion of min).

3. Similar problems for the modified Wackernagel's Law would arise, of course, if any of the MOOD and TENSE markers in (3) are sentential in scope and are clitics (so also with the modal negator min (see footnote 2)).

4. On finiteness in the Greek verbal system, see Joseph (1983: Ch. 2) and Joseph (1985).

5. There is one predictable difference in the ordering of the weak pronominals, namely that besides the leftward placement evident with finite verbs, as in (6b) and (8), they regularly occur to the right of nonfinite verbs, e.g. with the active participle as in vlépondás ton 'seeing him'. Since this ordering difference is predictable based on finiteness (see also footnote 4), it does not contravene the import of the strict ordering criterion for affixhood. Similarly, the fact that weak pronominals, in some dialects of Greek, regularly follow even finite verbs is irrelevant to the question of strict ordering, for in such dialects, the ordering of these elements with respect to those they combine with is still strict.

6. Note also that based on evidence too detailed to present here from vowel contraction, stress assignment, and voicing assimilation, Malikouti-Drachmann & Drachmann (1988) conclude that the weak pronouns of Greek pattern more clearly with verbal prefixes than with free words, suggesting that phonologically, the weak pronouns need not be referred to with a separate class label such as 'clitic'.

7. See Warburton (1977) for some discussion of the relevant facts from Greek concerning weak pronominal combinations.

8. Admittedly, one could say that these are prima facie cases of endoclitics, the very construct the weak pronouns are being argued not to constitute in the verbal complex (e.g. in (4)). In the cases in (4), endoclisis depended on a demonstration that some controversial elements, e.g. the negator en, are in fact affixes and not clitics, whereas in the forms in (13), an obvious affix (-ti) is involved, so that alternatives to an endoclitic analysis should at least be considered.

9. There is of course a possible synchronic derivation for this processual realization, one which mirrors the diachronic source: /tn + táraksi/ ---> tn dáraksi ---> tdáraksi ---> [dáraksi]; however, what is relevant in Zwicky's system is the surface realization of particular morphemes, so that the contrasting pairs in (15) are significant.

10. This work is part of a larger research project into the morphosyntax of the Modern Greek verbal complex, the full results of which have been made public in various lectures in the United States and Europe in 1987 and 1988 and should appear in print in the near future.

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Mutation by Default on Welsh Finite Verbs[*]

Joyce Powers

1. About mutations

A characteristic feature of the Welsh language is the mutation of word-initial consonants in particular syntactic environments. The situation is a complex one: there are several different kinds of mutations, each with its own phonological effects; words of different syntactic categories and grammatical functions may undergo mutations; and a mutation may be triggered by an immediately preceding word, may be triggered by a word found elsewhere in the sentence, or may have no apparent trigger at all.

I will be considering only a small subset of the entire range of facts about Welsh consonant mutations. Specifically, I will be concerned with the soft and mixed mutations as they affect finite verbs. (Nonfinite verbs (or 'verb-nouns') behave like nouns with regards to mutation, rather than like finite verbs.[1]) Although the default form of words in Welsh is unmutated, I claim that there is a more specific generalization to be made about finite verbs, namely that they are by default mutated. This in turn is overridden by the requirement that under certain specific conditions, finite verbs are regularly unmutated.

1.1. Phonological effects

Although there are several mutation patterns, I will be considering examples only of soft mutation (also known as lenition) and mixed mutation. These mutations change radical (that is, underlying) consonants to the forms illustrated in (1), expressed here in conventional orthography:[2]

```
(1) Radicals:       p   t    c    b   d    g   m   ll  rh
    Soft Mutation:  b   d    g    f   dd   -   f   l   r
    Mixed Mutation: ch  ph   th   f   dd   -   f   l   r
```

These changes occur in the first consonant of a word or constituent. Note that the mixed mutation can be treated as a variant of the soft, since it shares many of the same phonological effects with soft mutation.

1.2. Defaults

One way to express generalizations in describing language is to identify the unmarked, 'elsewhere' case for a particular feature, and to specify only the circumstances under which a more marked value for that feature occurs. Zwicky (1986, 1989) discusses default and override relations between the general and the specific case, and the role of such relations in the grammar. Generalized phrase structure grammar makes use of feature specification defaults (FSDs) to capture the idea that a certain feature value is typically associated with a category. For example (Gazdar et al. 1985: 30-31) the default value in a grammar of English for the feature [INV] is 'minus'; this expresses the fact that in the general case, sentences are not inverted. Whenever the category S appears, then, the grammar is not required to specify any value for the feature [INV]. An S will automatically have the property [-INV] as a result of the relevant FSD. Only when a rule stipulates a value for this feature is the default overridden. Default statements express generalizations about language by identifying the unmarked situation and allowing exceptions to be treated exceptionally.

These defaults may be universal or parochial. Welsh apparently has a parochial set of default principles which cause finite verbs to be realized as [+MUT], barring evidence to the contrary. The most general case is that words are [-MUT]; overriding that is the default value

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of [+MUT] for finite verbs; overriding that is the fact that finite verbs in particular situations are marked [-MUT]. A similar layering of defaults obtains the appropriate kind of mutation. The default realization of [+MUT] is soft; this is overridden in certain situations by stipulations that require the mixed or another mutation pattern to appear.

2. The environments of mutation on finite verbs

An examination of the sentence-types of Welsh reveals that in the spoken language, finite verbs most often appear in their soft mutation form. In this section I will list and provide examples of the syntactic environments in which soft-mutated verbs appear, as well as one class of examples involving verbs which have undergone the mixed mutation.

In spoken Welsh, affirmative sentences may be preceded by the affirmative marker fe (or in Northern Welsh, mi).[3] Welsh is a VSO language and so these particles are followed by a verb, which appears in its soft mutation form.

```
(2)  Fe  alla    i   siarad Cymraeg.  (radical = galla)
     PRT can/1SG 1SG speak  Welsh.
     'I can speak Welsh.'
```

```
(3)  Fe  brynes    i   ddau lyfr.  (radical = prynes)
     PRT bought/1SG 1SG two  books.
     'I bought two books.'
```

The interrogative marker in spoken Welsh may consist solely of the presence of soft mutation on the verb.

```
(4)  Ddarllenwch chi hwn i   fi?  (radical = darllenwch)
     read/FUT/2PL 2PL this for 1SG
     'Will you read this for me?'
```

```
(5)  Welest ti fe?  (radical = gwelest)
     saw/2SG 2sg 3sg
     'Did you see him?'
```

The bookish versions of interrogative sentences have the preverbal particle a. It, too, is followed by a soft-mutated verb.

```
(6)  A   welaist ti ef?  (radical = gwelaist)
     PRT saw/2SG 2SG 3SG
     'Did you see him?'
```

The facts concerning negative sentences are similar, but involve the mixed mutation. Increasingly in speech, however, soft mutation of all mutable consonants is taking over in this environment. Ni is the negative preverbal particle used in statements. It is followed by soft mutation; in speech ni is omitted but the verb's mutation is not.

```
(7)  Ni  thalodd ef.  (radical = talodd)
     NEG paid/3SG 3SG
     'He did not pay.'
```

```
(8)  Thaliff    e'r un geiniog.  (radical = taliff)
     pay/FUT/3SG 3SG one penny
     'He won't pay a penny.'
```

Oni, reduced in speech to ni, is the preverbal negative interrogative particle. Na is the corresponding answer particle. Both are followed by soft-mutated verbs.

```
(9)  Oni  thaliff     ef?
     NEG  pay/FUT/3SG 3SG
     'Won't he pay?'

(10) Na   thaliff.
     NEG  pay/FUT/3SG
     'No.'
```

Verbs are also mutated following relative clause markers, both affirmative and negative. The affirmative clause particle may be omitted, but the following mutation remains.

```
(11) Dyna'r    dyn (a)   weles   i'n    dod allan o'r  banc.  (radical = gweles)
     that-is-the man (whom) saw/1SG 1SG/PRT come out  of-the bank.
     'That's the man (whom) I saw coming out of the bank.'

(12) Y   dyn na    ddaeth  (radical = daeth)
     the man who/NEG came/3SG
     'the man who did not come'
```

Soft mutation also appears on verbs following the optional complementizer a 'whether'.

```
(13) Gofynnodd (a)    alle    fe ddod.  (radical = galle)
     asked/3SG whether could/3SG 3SG come
     'He asked whether he could come.'
```

After a preposed NP (an emphasized or topicalized NP, or an interrogative word), a verb carries soft mutation.

```
(14) Damwain welon  ni.  (radical = gwelon)
     accident saw/2PL 2PL
     'We saw an accident.'

(15) Dr Rhys brynodd   y  bwthyn.  (radical = prynodd)
            bought/3SG the cottage
     'Dr. Rhys bought the cottage.'

(16) Pwy ddaeth   i mewn?  (radical = daeth)
     who came/3SG into
     'Who came in?'

(17) Fe es      i pan ddaeth  e.
     PRT went/1SG 1SG when came/3SG 3SG
     'I went when he came.'
```

Similarly, soft-mutated inflected verbs follow question words like beth 'what' and faint 'how much/many'.

Verbs also appear in their soft-mutated form after the infixed pronouns 'i, 'w (both 3SG MASC) and 'th (2SG). However, on closer inspection this turns out not to be a very relevant set of facts for our purposes. These pronouns trigger soft mutation, but other members of their paradigms have different effects. Some trigger the spirant mutation, and others preserve the radical. Thus it is an idiosyncratic fact about these particular lexical items that they are always immediately followed by a particular form of the mutable consonants, no matter what the category of that following mutated constituent. These morphophonemic requirements can be coded into the pronouns' lexical entries, and need not concern us further - though it is important to note that these lexical specifications override the default value of the mutation feature when the two are in conflict. (See Powers 1988 for a discussion of these pronouns and the mutations they trigger.)

3. The environments of radical-initial finite verbs

Though (as I claim) finite verbs are mutated by default, there are numerous syntactic environments in which verbs appear in their radical form. This fact might seem to contradict the idea that mutation is the unmarked condition for verbs, but if these various constructions all fall into a defineable pattern, they too can be easily explained. Here I present the range of occurrences of radical-inital verbs, and show that a generalization can in fact be found.

As observed in section 2, declarative non-negative Welsh sentences may contain the preverbal particle fe or mi. The particle may also be omitted; as pointed out by Jones and Thomas (1977: 362) and by James Fife (p. c.), there is a great deal of variability among speakers and dialects as to the form of the sentence-initial verb. However, I will consider the written variety of Welsh used in Awbery (1976), Harlow (1986), and Sadler (1988). In it, declarative sentences without an initial affirmative particle have an initial radical verb.

(18) Cafodd y   lleidr ei ddal gan yr heddlu.
     got/3SG the theif 3SG catch by the police.
     'The thief was caught by the police.'

(19) Rhoddodd y dyn y ffon i'r   ci.
     gave/3SG the man the stick to-the dog.
     'The man gave the stick to the dog.'

Similarly, sentence-initial finite impersonal verbs do not show mutation. (These verbs belong more to a formal style than to conversational Welsh.)

(20) Gwelir   y môr.
     sees/IMPRS the sea
     'One sees the sea / One can see the sea.'

(21) Telid   arian iddynt
     pay/IMPRS money to/3PL
     'Money would be paid to them.'

Welsh has no direct equivalent of English 'yes' and 'no.' Questions are usually answered with the appropriate inflected form of the verb in the question. These verbs used as replies to questions are unmutated.

(22) (Oni chlywent hwy'r sŵn?)   Clywent.
     neg hear/3PL 3PL-the noise   hear/3PL
     '(Could they not hear the noise?) They could (hear).'

(23) (A ddaw   ef?)   Daw, daw.
     PRT come/3SG 3SG   come/3PL
     '(Is he coming?)   Yes, yes.'

Imperative verbs are also consistently unmutated.

(24) Gwna   hyn!
     Do/IMPV/2SG these
     'Do these!'

(25) Gofynnwch   iddo fe.
     ask/IMPV/2PL to/3SG 3SG
     'Ask him.'

(26) Peidiwch   â cholli eich tymer.
     stop/IMPV/2PL PRT lose 2PL/GEN temper
     'Don't lose your temper.'

Verbs appear in their radical form following the complementizer y (whether it is realized as y or is null) and the complementizers os and pe, both meaning 'if'.

```
(27) y   dyn y   dywedodd Siôn y   gwelodd Mair
     the man that said/3SG John that saw/3SG Mary
     'The man that John said saw Mary'
```

```
(28) Fe  ddwedodd e  (y)   galle   fe ddod.
     PRT said/3SG 3SG (that) could/3SG 3SG come
     'He said that he could come.'
```

```
(29) Os dewch   chi, fe ddown    ni hefyd.
     if come/2PL 2PL  PRT come/FUT/1PL 1PL too
     'If you come, we'll come too.'
```

```
(30) Fe fasen   ni'n hapus pe basech chi'n gallu dod.
     PRT would/1PL 1PL-in glad if would/2PL 2PL-in be able come
     'We would be glad if you were able to come.'
```

Following neu 'or', verbs are unmutated.

```
(31) Gwrandewch  ar y radio neu byddwch    yn dawel
     listen/IMPV/2PL to the radio or be/IMPV/2PL PRT quiet
     'Listen to the radio or be quiet.'
```

In conversational Welsh the finite verb meddwn i 'I said,' etc. is used to report speech. This verb has no infinitive, negative or interrogative forms, is never preceded by fe or mi, and occurs mainly in the past tense. It appears without mutation.

```
(32) 'Rwy'n mynd,' medde   fe wrtho i  un bore.
     am-in go     said/3SG 3SG to  1SG one morning
     '"I'm going," said he to me one morning.'
```

```
(33) 'Paid â mynd heb   dy    fag,' meddwn i wrtho fe.
     stop PRT go  without 2SG/GEN bag  said/1SG 1SG to 3SG
     '"Don't go without your bag," said I to him.'
```

The interrogative words ble 'where', pryd 'what time', pam 'why', and sut 'how' are followed by the radical form of verbs (and other categories). In written usage these words are followed by y; in the spoken language this complementizer is null. Furthermore, it appears that sentence adverbials are not followed by mutated verbs, but rather radical ones, as in examples (34) and (35).

```
(34) Gobeithio byddwch   chi'n gallu dod.
     hopefully be/FUT/2PL 2PL-in be able come
     'I hope that you will be able to come.'
```

```
(35) Rhyw brynhawn gwelais ddieithryn yn yr ardd.
     some afternoon saw/1SG stranger   in the garden
     'One afternoon I saw a stranger in the garden.'
```

Finally, the third person present form of 'be', mae, appears to be immune to mutation[4]. It never occurs in any form other than the radical, even in environments in which other finite verbs are mutated. Consider the clefted sentences in (36) and (37); preposed NPs normally are followed by a mutated verb, as discussed above.

```
(36) Ei    dad  mae Ifan yn weld.
     3SG/GEN father is    in see
     'It is his father that Ifan is seeing.'
```

```
(37) Dreifio car mae'r  dyn
     drive   car is-the man
     'It is driving a car that the man is.'
```

We have also observed that verbs mutate following a relative particle. However, Williams (1980: 52) observes that 'initial b in forms of bod sometimes remains unmutated' when preceded by an affirmative or negative relative particle.

```
(38) rhai na       buont
     those who/NEG were/3PL
     'those who were not'
```

4. Generalizations and exceptions

Upon comparing the conditions under which finite verbs appear in mutated and radical forms, we can extract the following generalizations:[5]

(39) By default, finite verbs are [+MUT].

(40) Finite verbs which occur initially in non-negative, non-interrogative, non-WH clauses are [-MUT].

To see that (40) is a valid generalization, consider the data presented in section 3 as compared to that in section 2. In (18-21) we saw that when the verb was the very first element in its clause, it was unmutated if the clause was non-negative and non-interrogative. Similarly, the verbs in (24) and (25) functioning as affirmative answers to questions were in the radical, as were the sentence-initial imperative verbs in (24-26). The form in (26) is a bit deceptive; it appears that forms of peidio (â) should be negative, since the verb is is translated as 'don't'. In fact, however, this verb means 'cease' or 'stop'. This use of the verb is semantically negative, but there is no reason to assume it is syntactically negative.

Other examples in section 3 require examination. Although it may appear that some of these verbs are not sentence-initial, in fact they are the first element in their S (as opposed to S'). In (27) and (28), y (or a trace) is in COMP, and so is not a part of S. Of course, the relative clause markers in (11) and (12) and the complementizer in (13) are also in COMP, leaving the verb S-initial, but those clauses bear the feature [+WH] and, in the case of (12), [+NEG]. Os 'if' and pe 'if' are also [-WH] complementizers. In (31), neu 'or' is external to the S (as Harlow 1986: 20 points out) and so the following verb meets the conditions in (40). The verbs of reported speech in (32) and (33), though they follow a string which could be of any length, are clearly S-initial. The occurrence of the radical on verbs following the adverbs ble 'where', pryd 'what time', as mentioned earlier, is due to the fact that they are followed by an overt or null form of y; since y is a complementizer, neither it nor the adverbial preceding it is S-internal. Therefore the verb is initial in its clause; the adverb is outside it. Furthermore, these adverbs are WH-words. The examples in (34) and (35) are somewhat harder to explain, however. The lack of mutation on verbs following fronted adverbial phrases is historically due to the fact that such phrases would also be followed by y (James Fife, p. c.) but it is not clear that there is any synchronic evidence for assuming a null y still exists in such constructions. It appears that adverbials such as gobeithio 'hopefully' and rhyw brynhawn 'one afternoon' of (34) and (35) are sisters to the clause containing the verb, but are not daughters of that S.

The apparently exceptional forms of the copula bod exemplified in (36 -38) are, I'd suggest, just that. Apparently mae simply has no mutated counterpart in Welsh, and neither do certain b-initial forms of bod. Bod is a highly irregular verb, and so it hardly seems surprising that it is exceptional in being selectively immune to mutation as well as being exceptional in its morphology. The unmutable form mae appears with great frequency, however, because of the very common use (especially in the spoken language) of periphrastic constructions.[6]

Note that there is independent evidence in the grammar of Welsh for the morphological importance of the features [NEG] and [INTERROG], which (along with [WH]) are crucially referred to by the generalization in (40). The copula exhibits separate inflectional paradigms for [+INTERROG], [+NEG], and [-INTERROG, -NEG] forms. In (41) I provide only the present tense forms.

(41)		[-INTERROG, -NEG]	[+INTERROG]	[+NEG]
	1SG	rydw	ydw	dydw
	2SG	rwyt	wyt	dwyt
	3SG	mae	ydy	dydy
	1PL	rydyn	ydyn	dydyn
	2PL	rydych	ydych	dydych
	3PL	maen	ydyn	dydyn

Therefore, the claim in (40) is made more plausible by the differentiation of verbal forms according to these features. Furthermore, there is some independent evidence that the grammar of Welsh is sensitive to whether or not a verb is S-initial. Rhys Jones (1977: 87) points out that there are words used to mean 'yes' and 'no' which are used to answer a question that 'begins with any part of speech other than the personal form of a verb':

(42) Bachgen yw   Tom?   Ie/Nage.
     boy   is
     'Is Tom a boy?'   Yes/no.'

Given that all the examples of radical finite verbs from section 2 can either be explained as conforming to the generalization in (40) or, in a very limited set of cases, being due to a special lexical exceptionality, the generalization in (39) is valid. Except in a well-defined set of circumstances, finite verbs are realized in mutated form.

5. Layers of defaults

Zwicky (1986, 1989) points out that defaults and overrides may come in more or less deeply layered sets. That is, a very general condition may hold, with a more specific principle overriding it (following Panini's Principle); that principle may in turn be overridden by a still more specific one, and so on. The principles determining the facts about Welsh consonant mutations on verbs are layered in just such a way; in fact, there are two different sets of defaults and overrides at work in these phenomena. One deals with the presence or absence of mutation on constituents, and the second deals with the sort of mutations that appear.

As stated earlier, the broadest generalization about Welsh's mutation system is that words are unmutated. A more specific statement about finite verbs, (39), overrides this, so that these verbs are mutated. (39) itself is overridden by the even more specific statement in (40), resulting in verbs in certain environments being in the radical. Finally, the most specific layer of all involves particular lexical items. No matter what other verbs are doing, if mae 'he is' is lexically marked as being [-MUT] (or as having no mutated form made available in the lexicon), it will fail to conform to any general requirement of mutation. In a somewhat different vein, the infixed pronouns discussed at the end of section 2 have special, specific requirements about the form that a following word will take; these requirements override any non-lexical, less specific ones.

Another layering of defaults is involved in the determination of which mutation pattern will appear once it is established by the grammar that a constituent is [+MUT]. The facts relevant to the data in this paper are quite simple: the default mutation is soft, but in the presence of the negation feature, the mixed mutation is used.

5. Conclusion

Other studies of Welsh consonant mutations have proposed that soft mutation be the unmarked case. Willis suggests that lenition is unmarked across morpheme boundaries within the 'phonological word'. Zwicky (1984, 1986) goes further in proposing that NPs be soft-mutated by default. This approach fits well with observable facts about the language--that speakers' use of soft mutation is on the rise, though perhaps only at the expense of the other mutation patterns, and not of the radical. I have found that it also fits well with facts about finite verbs in Welsh. I have proposed that finite verbs receive soft mutation by default, and that this default may be overridden by more specific principles.

Notes

*The earliest version of this paper was written for a seminar on the structure of Welsh given by Arnold Zwicky in the summer of 1985. Under the title 'Soft Mutation on Verbs in Welsh', that version was presented at the Kentucky Foreign Language Conference in April 1986. I am grateful to Arnold Zwicky, Steve Harlow, James Fife, and Uma Subramanian for their help along the way; none of these people is responsible for what I have done or failed to do with their advice.

1. See for example the discussions in Willis (1982: 64-66) and Zwicky (1984: 387, 391, 393) concerning the differences between non-finite and finite verbs, and the similarities between non-finite verbs and nouns with regard to mutation.

2. <p, b, t, d, g, m, l> all have their usual values. <c> = /k/, <f> = /v/, <dd> = /ð/, <ch> = /x/, <ph> = /f/, and <th> = /θ/. <ll> is a voiceless unilateral fricative; <r> is a trilled or flapped alveolar /r/ and <rh> is its voiceless aspirated counterpart. '-' in the chart in (1) indicates that the radical consonant is deleted by mutation.

3. According to Jones and Thomas (1977: 7), i is sometimes used instead of fe in southern Welsh.

4. And presumably the third plural, as well. This form, maen, is used only with the third person plural pronoun nhw, expressed or understood. Then the subject of the copula consists of one or more nouns, mae is always used.

5. Cf. Harlow (1986) for another analysis; he argues that NPs trigger soft mutation on any following constituent.

6. These have the form [finite vb - subj - prt - verbal noun - object]; the finite verb is always a form of bod.

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A CASE-study in Modern Icelandic*

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1. Introduction

The study of the paradigm, which was originally viewed as a mere list of inflectionally related forms, and which figured so prominently in traditional grammars, was more or less abandoned with the advent of structural linguistics in America. Theoretical work on paradigms continued to languish until very recently, but several linguists have now reopened the issue of the theoretical significance of paradigms and have laid the foundations for a new understanding of paradigms as something more than mere lists. Whether by accident or design, much of the recent work on paradigms has had a primarily Teutonic data-base, with a great deal of the work focussing on modern German and Icelandic.

In this paper I will be drawing particularly heavily on work by Wurzel and Zwicky. In particular, I want to take another look at cases in Icelandic, as discussed by Wurzel (1987), hereafter W, and Carstairs (1988), hereafter C. The observations made by these two authors are particularly interesting when seen in the light of a Zwicky-style analysis of the same data. Of crucial importance here is the question of which generalizations about paradigms ought to be represented in the grammar, and also how these generalizations are to be understood.

2. The facts

A brief recounting of the facts and the analysis given them by W (as well as amendments made by C) is in order here. Following W and C, I will consider only the very restricted sub-class of strong, feminine, monosyllabic nouns. Kress (1963), hereafter K, lists the following paradigm types for strong feminine, monosyllabic nouns (the numbers in the following table refer to the relevant sections in K):

Table 1: Strong, feminine, monosyllabic noun paradigms

		(1) i-class nouns$_1$ (cf. 157)	(2) i-class nouns$_2$ (cf. 158)
SG	NOM	mynd	öxl
	ACC	mynd	öxl
	DAT	mynd	öxl
	GEN	mynd-ar	axl-ar
PL	NOM	mynd-ir	axl-ir
	ACC	mynd-ir	axl-ir
	DAT	mynd-um	öxl-um
	GEN	mynd-a	axl-a

		(3) 'pure' a-class nouns (cf. 140)	(4) 'pure' a-class nouns with á (cf. 142)
SG	NOM	vél	á
	ACC	vél	á
	DAT	vél	á
	GEN	vél-ar	á-r
PL	NOM	vél-ar	á-r
	ACC	vél-ar	á-r
	DAT	vél-um	á-m
	GEN	vél-a	á-a

(5) va-class nouns (cf. 143)

SG	NOM	stödh
	ACC	stödh
	DAT	stödh
	GEN	stödhv-ar
PL	NOM	stödhv-ar
	ACC	stödhv-ar
	DAT	stödhv-um
	GEN	stödhv-a

(6) ja-class nouns (cf. 144)

SG	NOM	skel
	ACC	skel
	DAT	skel
	GEN	skelj-ar
PL	NOM	skelj-ar
	ACC	skelj-ar
	DAT	skelj-um
	GEN	skelj-a

(7) C-stem nouns$_5$ (cf. 168)

SG	NOM	nögl
	ACC	nögl
	DAT	nögl
	GEN	nagl-ar
PL	NOM	negl-ur
	ACC	negl-ur
	DAT	nögl-um
	GEN	nagl-a

(8) C-stem nouns$_6$ (cf.170)

SG	NOM	brú
	ACC	brú
	DAT	brú
	GEN	brú-ar
PL	NOM	brý-r
	ACC	brý-r
	DAT	brú-m
	GEN	brú-a

(9) C-stem nouns$_7$ (172)

SG	NOM	geit
	ACC	geit
	DAT	geit
	GEN	geit-ar
PL	NOM	geit-ur
	ACC	geit-ur
	DAT	geit-um
	GEN	geit-a

(10) C-stem nouns$_8$ (173)

SG	NOM	mús
	ACC	mús
	DAT	mús
	GEN	mús-ar
PL	NOM	mýs
	ACC	mýs
	DAT	mús-um
	GEN	mús-a

(11) C-stem nouns$_2$ (cf. 168)

SG	NOM	nótt
	ACC	nótt
	DAT	nótt
	GEN	nat-ur
PL	NOM	nat-ur
	ACC	nat-ur
	DAT	nótt-um
	GEN	nótt-a

(12) C-stem nouns$_3$ (cf. 168)

SG	NOM	mörk
	ACC	mörk
	DAT	mörk
	GEN	merk-ur
PL	NOM	merk-ur
	ACC	merk-ur
	DAT	mörk-um
	GEN	mork-a

(13) C-stem nouns$_4$ (cf. 169)

SG	NOM	vík
	ACC	vík
	DAT	vík
	GEN	vík-ur
PL	NOM	vík-ur
	ACC	vík-ur
	DAT	vík-um
	GEN	vík-a

(14) C-stem nouns$_1$ (cf. 167)

SG	NOM	ký-r
	ACC	kú
	DAT	kú
	GEN	ký-r
PL	NOM	ký-r
	ACC	ký-r
	DAT	kú-m
	GEN	kú-a

The <dh> in type (3) is an [ð]. The <æ> in type (11) represents a long diphthong [a^i:]. Accented vowels are long. Otherwise the orthography corresponds fairly closely to standard transcription symbols.

3. W's analysis

W analyzes four declension classes covering these various paradigms according to the following schema (from C):

Table 2: Monosyllabic feminine nouns

	Type A:	Type B:	Type C:	Type D:
SG NOM	∮	∮	∮	∮
GEN	-ar	-ar	-ar	-(u)r
DAT, ACC	∮	∮	∮	∮
PL NOM, ACC	-ir	-ar	-(u)r	-(u)r
GEN	-a	-a	-a	-a
DAT	-um	-um	-um	-um

Obviously, a considerable amount of analysis has been done to yield this tidy package. W simply gives this analysis without defending it; but I will reconstruct the apparent arguments behind this analysis, because much of the point I will be making later depends on an understanding of the full range of paradigm types present in these data. It will also become apparent in so doing that this implicit analysis cannot be completely correct. The phonological framework I will be using is Natural Phonology (NP).

The first thing that should be noticed about W's analysis is that it breaks down the declension classes strictly on the basis of the relevant affixes, and not on the basis of the various non-affixal marks of inflection (most notably, vowel shifts). This has the effect of collapsing seemingly distinct paradigm types into the same declension class in Wurzel's analysis. For example, types (1) and (2), which are identical with respect to their endings, but apparently different in regard to internal change, are counted as members of a single declensional class, namely type A in Table 2.

A number of the paradigms which appear superficially different from each other are actually phonological and morphological variants of one another. Types (5) and (6), which show stem variants, are readily amenable to an automatic phonological analysis whereby word-final clusters whose second members are glides are reduced by the deletion of the glide:

$$(1) \quad C[+glide] \longrightarrow \phi/C \_\_\_ (C, \#)$$

Type (4) resembles type (3) considerably; the only difference is that in paradigm (4) all of the endings of shape VC have lost their vowels. This deletion is best analyzed as arising from a morphonological rule since there are parallel instances in certain other lexically-marked morphemes in the language where such a deletion does not occur, e.g. strá-um (see sec. 134 of K). These facts are instead described by a morphonological rule, something like:

$$(2) \quad V \longrightarrow \phi/ \, \acute{V} + \_\_\_$$

I suspect this rule is weakening via a diffusionary path through the lexicon at the present time; certainly there are exceptions to it in some forms. The vowel /a/, in particular, seems to be immune to this rule -- a fact which we would want to capture in a careful formulation of this rule. Paradigm (10) is like paradigms (7) through (9) with the exception of the NOM and ACC PL, where there is no overt ending present. At this stage of the analysis it seems plausible to argue that the NOM and ACC PL ending in paradigm (10) is simply /-r/ (cf. paradigm 8) and that this /r/ is deleted by an independently needed automatic phonological rule which deletes /r/ between /s/ and a word boundary:

K gives only three members of this class, and we might find W justified in this assumption if it were not for an interesting complementarity in the data. There are no nouns acting like (11), (12) and (13) which end in a long vowel, whereas all the nouns which act like (14) have a stem-final long vowel. This strongly suggests that a phonologically based solution is needed.

The question is, what might that solution be? If we posit an underlying /-ur/ in the NOM SG of this declension class, there is no way to account for the lack of ending in types (11), (12) and (13). If, however, we posit an underlying ending /-r/ in the NOM SG of declension type D, a ready solution exists. Icelandic makes considerable use of the distinction 'light' vs. 'heavy' syllable. 'Heavy' syllables are those which have either a long vowel nucleus with a single consonant offset, or a short vowel nucleus with a consonant cluster offset. All other syllables are 'light'. A careful check of the data reveals that all nouns behaving like (11), (12) and (13) have roots with 'heavy' syllables. On the other hand, all nouns behaving like (14) have long vowels which have no offset (as mentioned earlier) and therefore count as 'light' syllables in Icelandic phonology.

The correct solution in this case seems to be that the ending for the NOM SG of the type D declension is /-r/ in all instances. This /-r/ appears, however, only in instances where it follows 'light' roots; otherwise it is not present. I will state this as a restriction on a realization rule as follows:

> (5) /-r/ is not morphonologically realized when it would occur between 'heavy' syllables and word boundaries.

This conclusion is considerably different from the implicit analysis presupposed by W. It requires a different analysis for NOM SG <kŷr>, which derives in my analysis from an underlying /kŷ-r/; and e.g. NOM PL <kŷr>, which derives in my analysis from an underlying /kŷ-ur/ via deletion of the /u/ by rule (2). There seems to be no other plausible explanation for these facts, however, than that given in the preceding paragraphs. This means that W's treatment of the type D declension, with no ending in the NOM SG, is wrong. This fact does not immediately affect W's paradigm structure conditions (to be discussed later) since they nowhere make mention of the feature bundle [CASE:nom, NUM:sg], or its realization (which is a fault in itself, as I will later show). Despite the fact that W doesn't refer to this particular feature bundle, however, it is fundamentally important to have the correct (mor)phonological analysis before making claims about the morphological analysis of a language.

There is one last bit of variation that we have not yet accounted for in paradigm (11). Here we find two (obviously phonologically related) roots within the paradigm. The vowel shift will be ignored for the moment (following W), while we consider the /tt/~/t/ alternation. There is nothing in the phonology of Icelandic which leads us to expect the simplification of a /tt/ cluster when it occurs in this environment. In fact, we may compare the form næt-ur with the form hátt-ur (K p. 87), where nearly identical conditions are present but there is no degemination. This most certainly calls for a morpholexical analysis, whereby the particular lexical item has two allomorphs listed in the lexicon with the conditions under which they occur. This variation is simply a non-rule-governed 'glitch' in the linguistic system.

By way of summary thus far, we now have collapsed paradigms (1) and (2) to form a single declension class with respect to their endings; this class corresponds to W's type A. Types (3), (4), (5) and (6) form a single declension class via our first two rules; this class corresponds to W's type B. Taking our second, third and fourth rules into consideration, types (7), (8), (9) and (10) form a single class with respect to their endings, corresponding to W's type C. Types (11), (12), (13) and (14) are identical with respect to their endings if we take our second and fourth rules and the lexeme-specific allomorphy found in (11) into account; this class corresponds to W's type D, but with /-r/ in the NOM SG. A revised version of the table of endings given by C is repeated here with the appropriate amendments:

Table 3: Monosyllabic feminine nouns (revision 1)

	Type A:	Type B:	Type C:	Type D:
SG NOM	∮	∮	∮	-r
GEN	-ar	-ar	-ar	-ur
DAT, ACC	∮	∮	∮	∮
PL NOM, ACC	-ir	-ar	-ur	-ur
GEN	-a	-a	-a	-a
DAT	-un	-un	-un	-un

4. W's Paradigm Structure Conditions (PSCs)

W cooks these data down (implicitly) in much the same way we have here. His reason for doing so is to allow him to make sense of the paradigms in terms of what he calls PSCs. Again following C's presentation of the facts, I give the PSCs which W offers for these paradigms.

Table 4: Wurzel's paradigm structure conditions for Table 2

1. [+Subst] --> [un/DAT PL]

2. [+Subst, {-C, -V̇}] --> [a/GEN PL]

3. [+Subst, +Fem, monosyllabic] --> [∮/DAT\ACC SG]

4. [+Subst, +Fem, -C, monosyllabic] --> ([ir/NOM\ACC PL]-->) [ar/GEN SG]

5. [ur/GEN SG] --> [ur/NOM\ACC PL]

NOTE: '(a) --> indicates a "default-implication", that is an implication which holds unless overridden
        by a lexical feature or a more specific default-implication.' (from C)

W sets up these PSCs as a set of default statements which indicate the inflectional endings associated with the grammatical features they represent on the right sides of the arrows, depending on various lexical properties of the stems on the left sides of the arrows. Among the lexical properties which W takes advantage of are: [+Subst], which embraces nouns, adjectives, pronouns, and determiners; [+Fem] which is simply lexically-marked gender; various features of sound shape, such as the features monosyllabic, -C and -V̇, the last two of which refer to the final segment in the stem; and particular inflectional marks, such as [ur/GEN SG].

5. C's constraint on PSCs

While it is not crucial to the main issue presented later in this paper, it is worth noting that C has proposed a constraint on PSCs. C's essential insight is that in any paradigm one or more feature bundles will be realized with more different inflections than the other feature bundles. The Paradigm Economy Principle (PEP) as put forth by C says that the total number of paradigms will not exceed the number of distinct realizations of the most variously realized feature bundle(s). For this reason, any particular paradigm ought to be able to be classified on the basis of its realization of the feature bundle which has the most different realizations. The term given to this particular inflected form is the Kennform, German for 'recognition-form'.

C's proposal depends crucially upon this notion. C proposes that 'No forms other than Kennformen may form the basis for PSCs.' Since the NOM PL or ACC PL is the most diversely realized of the inflections in these paradigms, one or the other or both must serve as Kennforms. This permits a PSC such as (4) in Table 4, where the [ir/NOM\ACC PL]

predicts [ar/GEN SG], since NOM\ACC PL is the Kennform. But it does not allow PSC (5), [ur/GEN SG] --> [ur/NOM\ACC PL], which predicts the Kennform on the basis of a non-Kennform. The PEP is an obvious weakening of the capabilities of PSCs, and it appears to make some correct predictions about language change as discussed in C.

6. Paradigms and realization rules

In this section an alternative approach to the facts in question is considered. Following Zwicky 1985, hereafter Z, I make use of two types of realization rules: rules of exponence and rules of referral. Rules of exponence 'realize some bundle [of grammatical features], in the context of some other bundle [of features], as a morphophonological operation or operations.' (Z p. 373) Rules of referral tell us 'that certain combinations of features have the same realization as certain others.' (Z p. 372) The ultimate goal of this paper is to consider the relationship between Z's realization rules and W's PSCs.

First let us consider what the realization rules might look like which are needed to realize all of the feature bundles represented in the Icelandic noun paradigm. Much of the inflectional marking in Icelandic noun paradigms is done via affixation, specifically with endings. And it is this aspect of inflectional marking which W and C focus on. But this is not the sole mark of inflection in these paradigms. Both so-called u-umlaut and i-umlaut, which historically were automatic phonological processes, have been morphologized in Icelandic and serve as marks of various feature bundles. Perhaps the most dramatic example of the loss of phonetic motivation for umlaut can be seen in instances, such as the NOM SG in paradigms (2), (7) and (12), where the only mark of inflection is u-umlaut (which causes an a --> ö shift). U-umlaut was originally due to a suffix *-u which has since been lost, while leaving its mark on the stem.

In the theory of morphological description espoused by Z, both affixation and the vowel shifts are given in the grammar as morphophonological operations which are put to use by realization rules. Hence the realization of the feature bundle [CASE:nom, NUM:sg] in the context of [CAT:noun, CLASS:strong, GEND:fem, (TYPE:a)] is accomplished by shifting the vowel of the stem from /a/ to /ö/. In the same context, but for the feature bundle [CASE:dat, NUM:pl], the realization rule will need to make reference to the u-umlaut operation, *and* the operation of /-um/ suffixation.

In Icelandic, the operation of u-umlaut is defined only on /a/. It is also true that we find a complementarity between stems which show alternation and stems which do not among the DAT and ACC SG forms of the strong feminine nouns. The nouns which do show stem alternation always show the same alternation, /a/~/ö/. Hence, we may make a very general statement that *all* strong feminine nouns have u-umlaut as the operation realizing [CASE:(nom, acc), NUM: sg]. The fact that the effects of this operation are apparent only in stems which have a basic /a/ follows from the nature of the operation of u-umlaut. This strategy of referring to operations in rules allows maximum generality in the application of rules, with the apparent differences in realization usually being due to restrictions on the morphophonological operations referred to by the rules (as shown in the example above). It is even the case that no type A noun ever has an underlying /a/ in its root, and therefore never shows this alternation. This allows us to say that u-umlaut applies to all DAT and ACC SG forms among the strong feminine nouns, but that it always does so vacuously to nouns of type A; we thereby maximize the generality of our realization rule. Many similar instances are readily available. For example, all realizations of [CASE:dat, NUM:pl] on Icelandic nouns include suffixation of /um/. Only some of these nouns, however, show concomitant vowel shifts. Why? A careful look at the data reveals that only those stems which have a basic /a/ show a vowel shift in the DAT PL. Again this follows from the statement of the operation of u-umlaut in the grammar of Icelandic.

Similarly, there is an operation of so-called i-umlaut, which originally had the phonological effect of causing vowels to more closely approximate /i/. But again, this operation is undefined for some vowels and diphthongs, such as /í/ and /ei/, as can be seen in paradigms (9) and (13) in the PL NOM and ACC. The other paradigms of these types show vowel shifts for the specified feature bundles precisely because their stem vowels are in the domain of i-umlaut.

These data also provide nice examples of the other type of realization rule which was mentioned, namely rules of referral. With the exception of type D, the DAT and ACC SG forms in these paradigms are always identical to the NOM SG. Clearly, we do not want to be put in the position of needing to state this fact by the use of three independent and accidentally identical realization rules for the relevant feature bundles in types A, B and C. Instead, of course, we may use rules of referral. These would look something like the following:

(6) Realization Rule x: in the context of [CAT:noun, GEND: fem, CLASS: strong], the bundle [CASE:(acc, dat), NUM:sg] has the same realization as [CASE: nom, NUM:sg].

At this point, we give a yet further amended table of the paradigm types, including not only the endings involved in inflection, but the vowel shift operations as well. In this table 'i-u' refers to the operation 'i-umlaut' and 'u-u' refers to the operation 'u-umlaut'.

Table 5: Monosyllabic feminine nouns (revision 2)

		Type A:	Type B:	Type C:	Type D:
SG	NOM	ø, u-u	ø, u-u	ø, u-u	-r, u-u
	GEN	-ar	-ar	-ur, i-u	-ur, i-u
	DAT, ACC	ø, u-u	ø, u-u	ø, u-u	ø, u-u
PL	NOM, ACC	-ir	-ar	-ur, i-u	-ur, i-u
	GEN	-a	-a	-a	-a
	DAT	-um, u-u	-um, u-u	-um, u-u	-um, u-u

For these data a complete list of the morphonological operations used to realize the various inflectional features is given in Table 6, and in Table 7 are the realization rules which use these operations. Each operation and rule is given an arbitrary index in these tables.

Table 6: Morphological Operations

OP 12:	suffix /-r/
OP 13:	suffix /-ar/
OP 14:	suffix /-ur/
OP 15:	suffix /-ir/
OP 16:	suffix /-a/
OP 17:	suffix /-um/
OP 18:	shift /a/ to /ö/ [traditional u-umlaut]
OP 19:	shift /ú, ó, a/ to /ý, æ, e/ respectively [traditional i-umlaut]

Table 7: Realization Rules

RR 40: In the context [CAT:noun], the bundle [CASE:dat, NUM:pl] is realized by OP 17 and OP 18.

RR 41: In the context [CAT:noun], the bundle [CASE:gen, NUM:pl] is realized by OP 16.

RR 42: In the context [CAT:noun, GEN:fem, CLASS:str, TYPE:a], the bundle [CASE:nom, NUM:pl] is realized by OP 15.

RR 43: In the context [CAT:noun, GEN:fem, CLASS:str, TYPE:b], the bundle [CASE:nom, NUM:pl] is realized by OP 13.

RR 44: In the context [CAT:noun, GEN:fem, CLASS:str], the bundle [CASE:nom, NUM:pl] is realized by OP 14 and OP 19.

RR 45: In the context [CAT:noun, GEN:fem, CLASS:str], the bundle [CASE:acc, NUM:pl] has the same realization as [CASE:nom, NUM:pl].

RR 46: In the context [CAT:noun, GEN:fem, CLASS:str, TYPE:d], the bundle [CASE:nom, NUM:sg] is realized by OP 12 and OP 18.

RR 47: In the context [CAT:noun, GEN:fem, CLASS:str], the bundle [CASE:acc, NUM:sg] is realized by OP 18.

RR 48: In the context [CAT:noun, GEN:fem, CLASS:str], the bundle [CASE:{nom, dat}, NUM:sg] has the same realization as [CASE:acc, NUM:sg].

RR 49: In the context [CAT:noun, GEN:fem, CLASS:str, TYPE:d], the bundle [CASE:gen, NUM:sg] is realized by OP 14 and OP 19.

RR 50: In the context [CAT:noun, GEN:fem, CLASS:str], the bundle [CASE:gen, NUM:sg] is realized by OP 13.

A few notes about the interactions and effects of these rules are in order here. There are some examples of more specific rules overriding more general rules in this set of rules. RR 46 realizes the NOM SG of type D nouns by suffixing /-r/ and u-umlauting the root vowel. RR 48 says that the realization of all DAT and NOM SG forms is the same as the realization of their corresponding ACC SG forms. This would predict that type D nouns are realized merely by u-umlaut, not u-umlaut plus suffixing of /-r/. Since RR 46 specifically realizes this form, RR 48, which is more general, is overridden by it. That is to say, RR 48, which yields a realization for any NOM SG form, is overridden by RR 46, which yields a realization for the NOM SG of type D nouns only. Similarly, RR 49, which realizes the feature bundle GEN SG on type D nouns, overrides RR 50, which realizes the feature bundle GEN SG on nouns of all types. Also, RR 44 is overridden by RR 42 and RR 43, both of which specify particular endings for the NOM PL forms of types which do not follow the general rule. These rule interactions follow from the nature of the realization rules themselves as default statements.

There is one further point of interest in these data, again having to do with the NOM SG of type D. Paradigm (14) has as its representative in the NOM SG the form <ký-r>, from an underlying /kù-r/. Our realization rules call for the operations of /-r/ suffixation and u-umlaut in this form, yet seemingly we find /-r/ suffixation and i-umlaut. This is only an apparent problem, however. It is still the case that this form is realized by /-r/ suffixation and u-umlaut, but the operation of u-umlaut is undefined on /ù/, so that no vowel shift takes place. The effect of i-umlaut is not achieved by the realization rule, but rather by a morphonological rule which is well-motivated by other evidence in the language. I will state this rule only for the segment in question to keep the presentation simple, but it actually is considerably more general than this:

(7) /ù/ --> [ý] / ___ + r

Thus, although the /ú/ remains unchanged by the realization rule, it is changed by the morphonological rule. This affords us an opportunity to point out that the morphonological operations called up by rules may have effects identical to morphonological or perhaps even automatic phonological rules.

7. A comparison of approaches

We are now in a position to compare W's PSCs and Z's realization rules. There are really two issues which I wish to discuss in this section of the paper: (1) the difference in theoretical perspective of the two approaches and (2) the empirical differences between the approaches.

7.1 Theoretical differences

Let us begin by looking at the theoretical differences between these approaches. Z's realization rules are fit into a well-articulated and highly modular theory of grammar. Realization rules in this theory give realization to inflectional marks, and are therefore fed by a syntactic component which supplies the syntactic features that the inflectional marks are expressions of. The realization rules depend on the lexicon as well, since they make reference to lexically-marked features such as gender and declension type -- characteristics which are not determined by rule.

Furthermore, these rules, which make use of morphonological operations, actually feed the morphonological and automatic phonolgical components of the grammar. This can be seen in the example given above. The form kȳr derives from basic /kǔ/, which undergoes /-r/ suffixation and u-umlaut via its realization rule, yielding /kú-r/. This form, in turn, is operated upon by the morphonological rule (6), yielding /kỳ-r/, which in turn is fed to the automatic phonological component. By ordering these components in our theory of grammar, we seek to avoid making language-particular stipulations about rule ordering. It is also very clearly the case in this theory that inflectional morphology is the mediator between syntax and phonology because it provides phonological substance for the realization of syntactic features.

In contrast to Z's realization rules, it is not entirely clear what the theoretical underpinnings of W's PSCs are. W's PSCs are in some ways similar to realization rules, but they are stated in somewhat different terms. PSCs are not so much conditions on the structures of paradigms as they are conditions on the well-formedness of particular inflectionally-marked forms. This is, of course, how Z understands realization rules as well. Realization rules are essentially passive conditions of association between basic and inflectionally-marked forms -- the 'active' sounding vocabulary, e.g. 'suffix /-ur/', is simply a metaphor for understanding the relationship between two sets of forms, one set with /-ur/ and the other without. In the same way PSCs tell us, e.g., that any substantive must end in /-um/ in its DAT PL form if it is to be considered well-formed. This is logically equivalent to our RR 40, the difference in the statement of the rules being merely a difference in formalization. There are some differences in implementation between these approaches, however. C gives an illustrative presentation of the implicit assumption of lexical 'features' present in W's PSCs, which I replicate in Table 8.

Table 8: PSCs & Lexical 'Features'

	Lexical 'feature'	PSC(s) applicable (besides (A-C))
Type A	None	(4) complete
Type B	[ar/N.A.Pl.]	(4) except parenthesized portion
Type C	[ur/N.A.Pl.]	(4) except parenthesized portion
Type D	[ur/G.Sg.]	(5)

I have put the word 'feature' in quotation marks above to show that it is not really a grammatical feature in the normal sense, but rather a simple lexically-specified inflectional form. The lexical entries for roots of types B, C and D in W's account have not only their basic forms, but a particular inflectional form as well. While the analysis I gave made reference to declension types which were then referenced in the realization rules, this is not a necessity of my analysis in this instance and the facts could just as well be handled by lexically-specified inflectional forms.

The question of the 'cost' of theoretical descriptions which arises here is an important one. We are a bit in the situation of comparing apples and oranges here, in trying to determine which analysis is cheaper. At a very simplistic level, W's account requires lexical marking of a special inflectionally-marked form for three of the declension types. It also lists five PSCs which are of greater or lesser complexity. My analysis using realization rules requires either ten realization rules, or seven realization rules plus lexically determined inflectional forms for the ACC PL in three of the paradigms. This may seem like a more expensive account since more rule-like entities are required and they generally seem to require reference to a greater number of pieces of information.

Part of my answer to this charge is to point out that W's PSCs do not provide an account for any NOM SG forms, presumably because he believed them to be the basic forms. This is most certainly wrong. On W's analysis, which takes only inflectional endings into account and which claims that no NOM SG form takes any ending, it is less obvious that it is wrong; but when we take into consideration that the type D declension actually has an /-r/ suffix in the NOM SG, and that all of the declension types under scrutiny show u-umlaut in the NOM SG, it is strikingly wrong. This means that at the very least W will have to add another PSC to his list, which specifies the well-formedness conditions for type D, NOM SG forms. He will also have to generalize his PSC (3) in Table 4 which specifies that DAT and ACC SG forms must have zero endings, to include NOM SG endings as well.

This discussion also raises two other issues. First, and this applies to realization rules as well, is the question of how many rules or PSCs there really are. The modified PSC (3) of Table 4, which limits the endings of three distinct feature bundles, is really three distinct rules whose conflation is simply a consequence of the formalization chosen, and in no way implies any functional unity -- as is obvious when we note that elsewhere in the language these three feature bundles often have three distinct realizations. Of course what's good for the goose is good for the gander, and we must admit that RR 48, which makes use of curly brackets, is really a conflation of two distinct rules as well. Counting PSCs and rules under the described definition of what counts as a distinct generalization, I find nine logically distinct PSCs plus three lexical 'features' (one per every root of paradigm types B, C and D) in W's account, and either eleven realization rules or nine realization rules, two lexically-specified inflectional forms (one per every root of paradigm types A and B), and one lexically specified declension class type (viz. type D -- type C is the ultimate default type under my analysis since it requires no special lexical information, either by way of particular forms or declension type indices). In other words, the accounts are very similar in terms of their theoretical 'cost'.

7.2 Empirical differences between the two approaches

There are two significant issues surrounding the empirical validity of the two approaches to inflectional description presented in this paper. A very striking difference in the two accounts is that one deals only with the endings which are marks of inflection in these paradigms, but the other account includes all of the relevant marks of inflection, both endings and vowel shifts. There is no question that the analysis which accounts for all the facts is better than the one which accounts for only some of the facts, despite W's statement that 'Allerdings nehmen diese PSB (=PSC in English) nur auf die Flexionsendungen und nicht auf

die Vokalwechselerscheinungen Bezug, die wir hier der Übersichtlichkeit halber außerhalb der Betrachtung lassen.' (W p. 631)[2]

Another point of contention between the theories has to do with their predictions about external evidence, specifically loanwords and language change. C (p. 2) states the evidence: 'Since the Old Icelandic period, there has been a continued drift of items from Type D to Type C, and from all the other types to Type A. In addition, Type A is regularly the home for loanwords which are adopted into Icelandic as monosyllabic Feminines, such as kók 'Coke' and dós 'dose'. This seems to pose a problem for the account offered in this paper, which takes Type C to be the least marked type of monosyllabic feminine noun. W's account, on the other hand, takes Type A nouns to be the least marked type of monosyllabic feminine.

The preponderance of strong, feminine nouns in Modern Icelandic are of Type A. Because Types C and D both show /-ur/ in the NOM PL as opposed to Type A with /-ir/ and Type B with /-ar/, the most general statement about the realization of the NOM PL must be that it is accomplished by suffixation of /-ur/ and i-umlaut unless otherwise specified. To state that the most general realization of NOM PL is accomplished by suffixation of /-ir/, which would seem to make the correct predictions about external evidence, requires us to introduce another realization rule. In other words statistics and logic lead us to different conclusions about the grammar of Modern Icelandic. It is certainly the case that the most common paradigm type in Modern Icelandic is Type A, economy of grammatical description notwithstanding, because it is a very large class, while B and especially C and D are much smaller. It is not the case, however, that the theoretically unmarked type must be statistically prominent.[3]

It is also somewhat comforting to notice that W's PSCs are not logically required to have Type A as the most basic noun type. Rather, he has simply 'rigged' his PSCs to get this result. This approach smacks of looking up the answer and working backwards through the solution, which is very second-rate methodology.

8. Conclusion

This paper reexamines strong, feminine, monosyllabic nouns in Modern Icelandic, beginning with a careful review of the data and amendment of previous analyses. The most striking finding in regard to the data in this paper is that previous analysts have overlooked some crucial details of inflectional realization: especially that there is a class of consonant-stem feminine nouns in Icelandic which are realized by suffixation of /-r/ and u-umlaut, not zero-suffixation as has been previously put forth; and second, that not only inflectional endings, but also vowel shifts, play an important role in inflectional realization, contrary to assertions otherwise in a recent analysis of these data.

This paper also compares two frameworks for understanding paradigm structures, namely W's PSCs and Z's realization rules. W's theory is found wanting in that it is inadequately incorporated into a larger theory of grammar. Furthermore, W's demonstration of his theory in describing Modern Icelandic gives a rather cavalier treatment of the facts, a methodologically, and therefore theoretically significant flaw. Z's realization rules, on the other hand, are fitted into a modular theory of grammar, which makes universal predictions about the organization of natural language grammars and rule interactions within those grammars. Furthermore, Z's framework makes place for the full range of phenomena found in inflectional morphology, namely nonconcatenative processes such as umlaut, as well as more agglutinative morphological processes.

Notes

*This paper was written in a seminar on inflectional morphology given by Arnold Zwicky, spring quarter 1988. Thanks go to Arnold Zwicky and the other participants in the seminar for their discussion and suggestions.

1. I render this quotation in English here for the reader: 'A vowel must either follow or precede an *r*. Where this was not the case in Old Icelandic, a *u* was later inserted before the *r* (young u).'

2. Again a translation for the reader: 'To be sure, these PSCs refer only to inflectional endings and not to the appearance of vowel alternations, which we have here left out of consideration for the sake of clarity.'

3. W's analysis dosn't really 'explain' the borrowing facts anyway. Why does kók enter Mordern Icelandic as a feminine noun in the first place? W's PSCs are silent about this issue. It seems like a plausible explanation to me to say that loanwords, which are borrowed as feminine nouns, are treated analogously with the most statistically prominent paradigm type because it offers the most cognitively salient model for analogy.

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Arnold M. Zwicky

1. The problem

Even small details in the morphological analysis of one language can have substantial consequences for morphological theory and for assumptions about the place of morphology in grammar. Consider the fact that to English ADVs derived from ADJs by suffixation of *-ly*, like QUICKLY,[1] there correspond no inflectional forms (*quickly*, *quicklier*, *quickliest*); instead there are inflectional forms lacking the *-ly* (*I left quicker than Kim, Robin left quickest of all*), plus alternative 'periphrastic' (syntactic) constructions (*more quickly, most quickly*).[2]

Two very different accounts of *quicklier* are found in the literature on morphology in generative grammar. For Aronoff (1976: 92-4, hereafter A), a comparative rule inserts *-er* under phonological and lexical conditions, and there is a rule truncating the morpheme *-ly* in ADVs, as in (1).[3] For Kiparsky (1982: 23-4, hereafter K), the comparative rule inserts *-er* only after ADJ stems, as in (2).

(1) A: Delete $+ly$ / $[C_0 VC_0 \_\_ +er]_{ADV}$

(2) K: Insert $+er$ / ADJ $\_\_]_{ADJ/ADV[+COMP]}$

There are at least three separable sets of issues here: those having to do with the putative phonological conditioning on inflectional degree forms; those arising from the (quite robust) fact of mutual incompatibility between adverbial *-ly* and the degree suffixes *-er* and *-est*; and those concerned with the grammaticality of the periphrastic degree expressions with MORE and MOST. Speaking crudely, these are phonological, morphological, and syntactic issues, respectively. My initial focus is on the morphological issues, after which I will turn to the syntax and phonology of the matter.

I will argue that neither A's treatment nor K's is satisfactory on theoretical grounds; each entails a step that the prudent theoretician should be reluctant to make.

2. Theoretically offensive features of (1)

A maintains (92), as in (3), that inflectional degree forms are obligatory for some stems and that both degree forms are available for disyllables ending in *-ly*, periphrastic degree forms being obligatory otherwise. This leads him to expect both *more quickly* and *quicklier* (parallel to ADJs like *sprightlier*), but instead of *quicklier* we have *quicker*. Hence a truncation rule.

(3) Aronoff's generalizations for $+er$:
   a. Monosyllabic ADJs (BIG: bigger - *more big) and ADVs (FAST: faster - *more fast) and most disyllabic ADJs in -y (HAPPY: happier - *more happy) have only the inflectional comparative, with lexical exceptions (STUPID: stupider - *more stupid; APT: *apter - more apt)
   b. Some disyllabic ADJS and ADVs in -y, in particular those in -ly (LOVELY: lovelier - more lovely; SILLY: sillier - more silly; DEEPLY: deeper, by truncation from *deeplier - more deeply), allow both expressions
   c. Otherwise, ADJs and ADVs have only the periphrastic comparative (FLAGRANT: *flagranter - more flagrant)

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But truncation - 'morphologically controlled deletion of affixes', as K (23) describes it, or 'stipulated zeroes in morphology', as I would put it so as to eliminate the gratuitous derivational view that attends the word *deletion* - is the sticking point. K himself observes, 'It would obviously be desirable to eliminate this powerful device from the theory' (23), and offers reanalyses for a range of putative instances of truncation. Janda & Manandise (1984) take the stronger position paraphrased in (4), and in my own work (summarized in Zwicky 1989: secs. 3.4, 5) I have attempted to show how 'zero inflection' and 'zero derivation' can be described without such stipulation.

(4) Position I: There are no stipulated zeroes in morphological rules.

Note that (4) expresses a profound difference between morphology and syntax. In syntax there are stipulated zeroes of several types: empty constituents that require interpretation from context, as in *The horses moved to the edge of the stream and drank* NP[NULL]; empty constituents that must be anaphorically connected to antecedent constituents, as in *I can play racquetball, but Chris can't* VP[NULL]; and gaps, empty constituents that must be associable with filler constituents, as in *How big did you say it was* AP[NULL]*?* But the case for stipulated zeroes in morphology is slim indeed. And given the view - the 'process' view expounded in Anderson (1988) and Zwicky (1988) - that morphological rules involve phonological operations on stems, rather than a genuine lexeme-internal 'syntax' of stems and affixes, this difference is to be expected, since then affixes do not serve as lexeme-internal constituents bearing meaning on their own (as opposed to expressing the meanings associated with the rules introducing them).

3. Theoretically offensive features of (2)

At this point I must flesh out some of the details of the analysis K offers. K's treatment avoids stipulating a zero alternant of +*ly* when it is in combination with comparative +*er* by blocking the insertion of +*er* after ADV stems, including those ADV stems with the derivational suffix -*ly*. It also, according to K, correctly predicts the ungrammaticality of forms like *quickerly, since these would involve the application of both rule (2), inserting the comparative inflectional suffix +*er*, and rule (5), inserting the ADV-forming derivational suffix +*ly*; the crucial claim for K here is that (2), applying after an ADJ stem in an ADJ or ADV with the feature [+COMP], is a more specific rule than (5), applying after an ADJ stem in an ADV, so that the preclusion of the general by the specific (Panini's Principle, also known as Proper Inclusion Precedence and the Elsewhere Condition).

(5) Insert +ly / ADJ ___]$_{ADV}$

The appeal to Panini's Principle is, however, unjustified. Let me first note that the reference to 'ADJ/ADV' in (2) is not to just any old disjunction of categories. The ADJ and ADV categories constitute a class, both in the syntax and morphology of English and in a general theory of linguistic categories. Using 'A'* to denote the superclass comprising ADJs and ADVs (so that ADJs are picked out as the [A, -ADV] items and ADVs as the [A, +ADV] items), (2) should be reformulated as in (2').

(2') Insert +er / ADJ ___]$_{[A, +COMP]}$

But now it is clear that (2') is not more specific than (5); rather, the conditions on their applicability overlap, with (2') applying to a more general class than (5) in one respect (A being a superclass of ADV) and (5) applying to a more general class than (2') in another respect (ADV being a superclass of [ADV, +COMP]). What, then, bars *quickerly? One answer to this question, consistent with K's framework of 'lexical' (I would prefer 'level-ordered') morphology and phonology, would build on the claim that +*ly* derives not

just an ADV, but an inflectional form - namely, the positive degree - of an ADV. In such an analysis, (5) would be restated so as stipulate that the result is an ADV[+POS], rather than merely an ADV, as in (5'). Rules (2') and (5') would then be incompatible by virtue of the incompatibility of the degree features [+POS] and [+COMP].

(5') Insert +_ly_ / ADJ ___]_{ADV[+POS]}

A rule like (5') presents no problem in level-ordered morphology, but it runs counter to a fundamental principle separating derivational morphology (DM) and inflectional morphology (IM) in more traditional approaches to morphology. Following the discussion in Zwicky (1989: sec. 5), I state this principle as in (6). The problem with (5') is that it conflates the functions of a DM rule (predicting the phonological shape of ADV lexemes on the basis of the phonological shape of ADJ lexemes) and an IM rule (predicting the phonological shape of a degree form for ADV lexemes).

(6) Position II: DM and IM constitute separate subcomponents of grammar, with DM relating the stems of different lexemes and IM relating a stem of a lexeme to its forms; DM and IM rules are otherwise independent of one another, except for the option that a DM rule can build on a stipulated form of a lexeme rather than on a stem.

Notice that the ungrammaticality of *quickerly_ follows directly from the position in (6). A DM rule having the effect of (5) operates phonologically on the stem of an affected ADJ lexeme, not on the [+COMP] form. (It would be possible for a DM rule to stipulate that it always builds on the [+COMP] form of an ADJ lexeme, but this of course is not what happens in English.) Nonoccurring forms like *quickerly_ are a problem only in a framework that allows free mixing of IM and DM, as level-ordered morphology does.

K abandons (6) and its analogues in order to express an intimate association between the phonological interactivity of affixes with their stems, on the one hand, and the linear ordering of affixes, on the other: The more interior an affix is, the greater its phonological interactivity tends to be, and the greater the phonological interactivity of an affix, the more interior it tends to be. I have suggested (Zwicky 1986) that this association, though intimate, is not a necessary one, and that elevating it to theoretical status, via the levels (or strata) of level-ordered morphology and phonology, brings in its train more problems than it solves. I see no good reason to relinquish (6) and the constraints it imposes on the interactions between DM and IM.

So much for (5'). But (2') also presents difficulties. There are two rather different ways to interpret such an 'insertion' rule in IM: a 'syntax of words' interpretation, in which the inserted affix (-er) fills an Af slot provided by a morphotactic rule ([A, +COMP] ---> [A, -ADV] Af); or a 'process' (morphology ex nihilo) interpretation, in which the affix is appended to a stem (with the features [A, -ADV]) to yield a form (realizing the features [A, +COMP]). On either interpretation, the relevant rule licenses morphological structures in which a construct with the features [A, +ADV, +COMP] has a daughter with the features [A, -ADV]. But then we have an inflectional form of a lexeme of one category specified by reference to a lexeme of another (derivationally related) category, contra the restrictions of Position II in (6).

There is also a 'referral' (Zwicky 1985a, b) version of K's approach, in which a rule refers the realization of [+COMP] on a category [A, +ADV] to its realization on the corresponding [-ADV] category.[5] But this, too, mixes derivation and inflection, by referring an inflectional form to a derivative lexeme. The reverse - building a derivative lexeme (a kind of referral, in a way) on an inflectional form of a base - is attested, and permitted by (6), but this sort of interaction is not.

4. Single purposes and double duties

Further data point in both directions, some favoring A's type of analysis (which is consistent with Position I but violates Position II), others favoring K's (which is consistent with Position II but violates Position I).

First, there is at least one clear example of a single-purpose, ADV-only, lexeme, namely SOON. The fact that this lexeme has the comparative *sooner* and superlative *soonest*, even though there is no ADJ stem for the suffixes to attach to (as (2) or (2') would require), speaks for A and against K. For some speakers, OFTEN has inflectional degree forms (*oftener*, *oftenest*) and tells the same story as SOON.

Second, there are a number of 'double-duty' items, homophonous ADV-ADJ pairs (with no meaning difference beyond that following from the category distinction) that are identically inflected,[6] as in (7).

(7) FAST: <u>a fast(er) car, go fast(er)</u>
    EARLY: <u>an early/earlier dinner, was over early/earlier</u>
    LATE: <u>a late(r) breakfast, end late(r)</u>
    HARD: <u>a hard(er) rain, rain hard(er)</u>
    LONG: <u>a long(er) meeting, last long(er)</u>
    DEEP: <u>a deep(er) dive, dive deep(er)</u>
    QUICK: <u>a quick(er) fox, run quick(er)</u>
    SLOW: <u>a slow(er) race, go slow(er)</u>
    LOUD: <u>a loud(er) band, play loud(er)</u>

This array of facts is consistent with both K's and A's analyses, given some device for blocking the suffixation of -*ly* for the ADV members of the pairs, either obligatorily (as for *FASTLY 'quickly', *LONGLY 'for a long time', *HARDLY 'intensely', and *LATELY 'at a late time') or optionally (as for QUICK(LY), SLOW(LY), and LOUD(LY)). What is not predicted by A's analysis, as K points out (24), is the possibility of a double-duty suppletive inflectional form, like *better, worse, best,* or *worst* (*a better/worse idea, do better/worse; the best/worst singing, sing best/worst*), in particular. These cannot be the product of A's truncation rule (1), since there is no positive -*ly* form to supply the stem phonology.

But the double-duty suppletives are a mixed blessing for K. He must treat the ADV WELL explicitly as a derivative lexeme based on the ADJ GOOD - presumably as a replacement for *GOODLY 'in a good manner' - so that GOOD can provide the ADJ stem for his comparative and superlative rules. And the ADV forms *better* and *best* must be treated explicitly as [+COMP] and [+SUP] forms built on the ADJ GOOD, presumably as replacements for *gooder* and *goodest*, these being the forms that K's rules predict. That is, K's treatment here appears to commit him to a particular view of suppletion, that suppletive forms are listed in the lexicon as substitutions for specified strings of morphemes.

This is a necessarily sequential view of the matter, in which GOOD with the feature [+COMP] is assigned the representation *good+er*, which is in turn replaced by *better*. So long as K wants the fact that *better* and *best* do double duty to follow from the rest of his analysis, he cannot have recourse to the more straightforward (and nonsequential) analysis, in which GOOD with the feature [+COMP] is assigned the shape *better* directly, the existence of this shape in the lexicon then blocking the application of rules for the realization of [+COMP]. The (closely linked) theoretical points at issue are (8) and (9).

(8) Position III: Morphological rules place static conditions on the properties of constructs (lexemes or forms); in particular, they make no reference to phonological representations other than those of stems and forms for lexemes.

(9) Position IV: Interactions between rules are governed not by sequential application but by a logic of defaults and invocations; bleeding-style interactions occur when one rule overrides another, feeding-style interactions when one rule invokes another, implicitly or explicitly.

The part of (9) that is germane to the analysis of suppletive degree forms is the clause about bleeding-style, or overriding, interactions between rules. Overrides are predicted, inter alia, by Panini's Principle and by a principle of Lexical Blocking, according to which the lexical listing of properties for a construct precludes the application of rules that predict incompatible properties for it.

According to (9), we ought always to be able to appeal to Lexical Blocking (rather than replacement) in the analysis of suppletive lexemes like the ADV WELL and suppletive forms like *better* and *best* - and in fact Kiparsky now (1989) argues, on the basis of extensive parallels between suppletion and gaps in paradigms, for blocking rather than replacement as the operative mechanism in suppletion - but this appeal seems to be unavailable for K's 1982 analysis. A's analysis is in no better shape in this regard, since it too depends on sequential application of rules, with a form like *quicklier* serving as a crucial intermediate stages in the derivation of the ADV form *quicker*.

5. A morphological rapprochement

What we want is an analysis with both sets of virtues, and without the theoretical defects of either approach.

I propose (with A) inflectional rules realizing [+COMP] and [+SUP] on both ADJS and ADVS (as in (10)), rather than (with K) basing the ADV forms on an ADJ source. However, I posit <u>two</u> relevant rules licensing an ADV derived from an ADJ (as in (11)) - DR1, calling for a *-ly* suffix; and DR2, involving no change - and (with K) propose to account for the configuration of occurring forms via interactions between rules, rather than (with A) by appeal to an additional 'fix-up' rule.

(10) In the context of [A],
    a. IR1: [+COMP] is realized by a form with suffix <u>-er</u>
    b. IR2: [+SUP] is realized by a form with suffix <u>-est</u>

(11) a. DR1: To a [A, -ADV] lexeme there corresponds a [A, +ADV] lexeme with suffix <u>-ly</u>
    b. DR2: To a [A, -ADV] lexeme there corresponds an identical [A, +ADV] lexeme

The effect of these rules is to predict two ADV[+COMP] forms corresponding to the typical ADJ, each form involving one of the DM rules in (11) plus the IM rule in (10a) - ADJ+*li*+er (*quicklier*) involving DR1, ADJ+er (*quicker*) involving DR2. For standard English at any rate, DR1 (predicting the ADV lexeme QUICKLY, given that there is an ADJ lexeme QUICK) is the default ADV-forming rule, so that DR2 (predicting the ADV lexeme QUICK, given that there is an ADJ lexeme QUICK) manifests itself only when DR1 is inapplicable, which is what happens for the (systematically unacceptable) [+COMP] and [+SUP] forms of a garden-variety ADV like QUICKLY.

There is plenty of evidence for DR2. It describes the ADJ-ADV pairs (like FAST 'quick' paired with FAST 'quickly') listed in (7), as well as double-duty items - like RIGHT 'correct' and WRONG 'incorrect' (*the right/wrong answer, answer the question right/wrong*) - that happen to have no inflectional degree forms. Note Partridge (1963: 18) on the *-ly* suffix: 'Some adverbs...may occur with or without the suffix...; e.g., *slow(ly)*, *quick(ly)*, *cheap(ly)*. The *-ly* forms are more polite, the root forms are more vigorous. Sometimes [as

for HIGH and HIGHLY] there is a difference in meaning...' And Follett/Barzun (1966: 50):
'The truth is that many adverbs, including *right* and *wrong*, are formed without *-ly*. They
do not differ in appearance from adjectives, but they are adverbs. We go *straight* to the
point, not *straightly*; a transgressor of speed limits is driving *too fast*, not *too fastly*'; also
cited are *drive slow* and *wide awake*, *doubtless* and *regardless*, and (52), '...words of
adjectival form (without *-ly*) but adverbial function - such words as *relative, preparatory,
preliminary, irrespective, independent*', as in *This subcommittee is now conducting field studies
preparatory to drafting much-needed legislation.*

DR2 also provides an account of a curious set of facts about frequency ADJs
derived by suffixing *-ly* to Ns denoting units of time (HOURLY, DAILY, WEEKLY,
MONTHLY, YEARLY), as in *an hourly rate, their weekly visits*. These ADJs are ineligible as
inputs for DR1: *HOURLILY, *DAILILY, and the like are absolutely unacceptable, and
are not attested.[7] But they are eligible as inputs for DR2, which then provides the
appropriate frequency ADVs: *We checked hourly on the temperature, They travel to Cleveland
almost weekly.*

In addition, DR2 is well attested in nonstandard varieties in all parts of the
English-speaking world. In fact it would not be unreasonable to argue that in some
nonstandard varieties it is DR2, rather than DR1, that is the default ADV-deriving DM
rule. The significance of DR2 is suggested by the fact that prescriptive grammars
routinely caution against the forms it predicts - usually confusing form and function and
accusing nonstandard speakers of using an ADJ where an ADV is called for, as when
Foerster & Steadman (1931: 166) advise, 'Where there is a distinction in form between
adjective and adverb, observe this distinction carefully', correcting RAPID in *I think he
talks too rapid* to RAPIDLY, and REAL in *He is a real clever man* to REALLY; or when
Irmscher (1972: 475) addresses 'CONFUSION OF ADVERBS AND ADJECTIVES' by
warning, 'Ordinarily a word ending in *-ly* can be identified as an adjective instead of an
adverb if it can be compared by inflection... Confusion, however, occurs in actual usage',
and contrasting the 'colloquial use of adjective' in *I was driving along pretty steady* and *She
seemed terrible upset* with the 'standard use of adverb' in *I was driving along pretty steadily*
and *She seemed terribly upset*; or when Partridge (1963: 18) asserts boldly, 'ADJECTIVE
FOR ADVERB. This is an illiteracy...'

6. Characteristics of the two-DR analysis

This analysis avoids the theoretically unpalatable features of A's and K's.
Consistent with (4), there are no stipulated zeroes. Consistent with (6), DM and IM are
separated, with the lexeme stems predicted by DM rules (in particular, DR1 and DR2)
serving as the inputs to IM rules (in particular, IR1 and IR2). Consistent with (8), all four
of these morphological rules are framed as static conditions, with no reference to stipulated
intermediate stages in a derivation.

6.1. Zero derivation

The two-DR analysis does posit (in DR2) zero derivation, or conversion, as in (12) -
a type of lexeme-to-lexeme prediction that is amply attested in the world's languages, and
certainly in English (with its conversions, for instance, of Vs to Ns, as in the motion Ns
RUN, WALK, STROLL, CRAWL, etc.; of Ns to Vs, as in the Vs of removal BONE, SHELL,
SKIN, WEED, etc.; and of nationality ADJs to nationality Ns, as in ALSATIAN, SWISS,
QUEBECOIS, TOGOLESE, etc.).

(12) Position V: DRs can stipulate that stem of the output lexeme is identical to the stem of the
       input lexeme.

This observation would not be worth making except for the fact that other assumptions about morphology entail the denial of Position V, and possibly of Position I (having to do with stipulated zeros) as well. Suppose we assume (with K and with Lieber (1981), Williams (1981), and Selkirk (1982), among others) that all DM is endocentric, with affixes serving as the heads of their morphological constructions. Consider the N STROLL, the V SKIN, and the N TOGOLESE. There must be rules predicting the category of such examples (as well as their phonology). Either these are DRs or they are not. They cannot be zero derivations (contra Position V), since then there would be no affixes to serve as heads of the morphological constructions. So either there are (three different) affixes, all stipulated to be zeros (contra Position I), or else the theoretical framework must be enriched by positing some new sort of rule (other than DRs) relating lexemes, as Lieber (1981: ch. 3) in fact does.

Now of course I am not assuming that all DM is endocentric - I am not even adopting the general 'syntax of words' view of morphology that makes this assumption plausible - so that a zero-derivation rule like DR2 presents no difficulty.

6.2. Stipulated overrides

The two-DR analysis also assumes, as in (13), that DRs serving the same function can stand in stipulated override-default relationships, as DR2 does to DR1.

> (13) Position VI: In addition to override/default relations predicted by universal principles,
> there can be parochial stipulations of such relations, involving two particular rules of the
> same type (two DRs or two IRs) and serving the same function.

Parochial stipulations of overides are familiar from IM, where a 'less regular' realization rule (for instance, suffixation of -en realizing the PSP (past participle) category in English, as in shaken) overrides a 'more regular' one realizing the same gramatical categories (for instance, referral of the PSP form to the PST (past) form, as in baked); the labeling of such rule pairs as less versus more regular is equivalent to stipulating the former as the override and the latter as the default. The same sort of rule relationship is common in DM as well, as when the ('more productive') rule deriving abstract N from ADJ by suffixing -ness (PLAINNESS, FIRMNESS, CONCRETENESS, RAPACIOUSNESS) serves as the default as against other ('less productive') rules having the same function but involving other suffixes, among them -ity (SANITY, OPACITY, LOCALITY, SALINITY), -(c)y (OBSTINACY, EFFEMINACY, CONSISTENCY, INDECENCY), -(c)e (PERSISTENCE, RELUCTANCE, TURBULENCE, ELEGANCE), and -th (DEPTH, WARMTH, WIDTH).

Note that stipulated overrides in morphology are never absolute, since lexemes and forms can always be listed: hence the possibility of alternative lexemes like OPACITY and OPAQUENESS, and of alternative forms like the pasts dreamt and dreamed.

6.3. One last bash at *quicklier

The two-DR analysis is all very well, but we have still not given any account of *quicklier. For this, some additional statement is needed; I claim that the appropriate stipulation is that ADVS derived by DR1 have no [+EXT] ([+COMP] and [+SUP]) forms, that any output of DR1 belongs to a paradigm class with a defective paradigm.

This might look like the crassest sort of ad hoc stipulation, but in fact it can be seen as nothing more than the coincidence of two phenomena, each of which is quite ordinary: defectivity as a property of paradigm classes, as in (14); and DRs that predict the paradigm class of their outputs, as in (15).

(14) Position VII: A paradigm class can be characterized in part by lacking particular forms - that is, by a pattern of defectiveness.

(15) Position VIII: Among the properties DRs can require their output lexemes to have is membership in a paradigm class.

Paradigm classes characterized by defectivity are not uncommon. The English modal verbs, for instance, have a strikingly defective paradigm, which lacks all [-FIN] (nonfinite) forms: BSE (base), as in *We saw them must sing versus We saw them have to sing; PRP (present participle), as in *We saw them musting sing versus We saw them having to sing; and PSP, as in *They have musted sing versus They have had to sing. I am claiming that there is a paradigm class of As, call it CLASS:NO, characterized by lacking all [+EXT] forms. (For As of CLASS:NO, there is only a [-EXT] form. Since English has no IRs realizing [-EXT], even for As of CLASS:YES, this form is phonologically identical to the A stem.)

Now membership in a paradigm class (in the -en-PSP class for Vs in English, in DECL[ension]:3 versus DECL:1/2 for Ns in Latin, and so on) is one of the properties of a lexeme - a 'purely morphological' property, there being also 'morphosyntactic' properties (playing a role in both morphological and syntactic generalizations) like membership in a category, for instance N, or possession of a grammatical category, for instance GEND[er]:MASC; 'purely syntactic' properties like membership in a syntactic subcategory, for instance the subcategory of Vs licensed to occur with two NP objects; phonological properties, in particular the information encoded in the stem of the lexeme; and semantic properties. A given DR relates the semantics, phonology, and purely syntactic properties of an input and output lexeme, and (among other things) it can also place conditions on the morphosyntactic and purely morphological properties of the output, as when the German DRs describing diminutives in -chen (Mädchen) and -lein (Fräulein) impose GEND:NEUT on their output lexemes.

The imposition of (default) values for the feature CLASS by particular DRs pervades degree inflection in English. Prefixal derivation in English, in particular the rules deriving negative ADJs by prefixing un- and in-, preserves the CLASS value of the input on the output: HAPPY is CLASS:YES (happier) and so is UNHAPPY (unhappier); ACTIVE is CLASS:NO (*activer) and so is INACTIVE (*inactiver). ADJS derived from Ns with -ic (CUBIC, CELTIC, ATOMIC), from Ns with -ish (CHILDISH, ROGUISH, CLOWNISH), and from ADJs with -ish (GREENISH, BLUISH, YOUNGISH) are generally CLASS:NO, even when they are otherwise phonologically suitable for inflection (*cubicker, *childisher, *bluisher), while those derived from Ns with -y (BONY, CHILLY, CURLY) and -ly (WORLDLY, GHOSTLY, SAINTLY) are generally CLASS:YES when they are phonologically suitable (bonier, worldlier).

Now note the striking contrast between these ADJs derived from Ns by suffixing -ly (DR3, the WORLDLY type) and ADVs derived from ADJs by suffixing -ly (DR1). The outputs of DR3 are CLASS:YES if they satisfy phonological requirements for inflectibility, but the outputs of DR1 are as robustly CLASS:NO - this is the *quicklier with which we began - as are ADJs derived with -ic, like CUBIC.

6.4. Single purposes and double duties again

A garden-variety ADJ, like CUTE or BRIGHT, has a corresponding ADV[-EXT] supplied by DR1 (cutely for CUTELY, brightly for BRIGHTLY) and a corresponding ADV[+EXT] supplied by DR2 (cuter/cutest for the ADV CUTE and brighter/brightest for the ADV BRIGHT). The ordinary pattern, then, is for ADVs in standard English to have a paradigm that is pasted together from the paradigms associated with the outputs of two different DRs.

Against this background, I return briefly to three sets of data from section 3: ADV-only inflectible lexemes like SOON; ADJ-ADV twins like FAST; and the double-duty suppletives *better/best* and *worse/worst*, which serve for both ADJ and ADV.

ADV-only lexemes are straightforward, since nothing I have said would require that there be an ADJ stem for every inflectible ADV.

ADJ-ADV twins (as in (7) above) come in two types, illustrated by FAST and QUICK. FAST-type ADJs, which have no DR2 counterpart ADVs, are just exceptionally ineligible for DR1; DR2 provides an ADV FAST corresponding to the ADJ FAST whether or not there is an ADV derived by DR1. QUICK-type ADJs, which have both counterpart ADVs (QUICK and QUICKLY), are exceptionally eligible for DR2 as well as for the default DR1.

The ADJ BAD follows the ordinary pattern of CUTE or BRIGHT, with the complication that it has suppletive [+EXT] forms, *worse* and *worst*. Its ADV[-EXT] correspondent *badly* is provided by DR1 and its ADV[+EXT] correspondents *worse* and *worst* are carried over from the ADJ, thanks to DR2 (which has the effect of making its output identical to its input except as stipulated otherwise). The ADJ GOOD is parallel to BAD, with the further complication that its ADV[-EXT] correspondent is not the *goodly* provided by DR1, but rather the idiosyncratic *well*.

7. The syntactic issues

The interaction between DR1 and DR2 provides *quicker* in the absence of **quicklier*. But what makes *more quickly*, the periphrastic alternative, available? And how do we prohibit double degree expressions like **more quicker* (which are ungrammatical in standard English)?

7.1. The syntax-morphology interface

We might attempt to account for these syntax-morphology interactions by treating the two domains as one, in the fashion of early transformational grammar. But despite A's remark that comparative inflection might be 'syntactic' (94), I propose to preserve the ('lexicalist') view that syntax and morphology are autonomous components of grammar, interacting with one another in very restricted fashion, as in (16) and (17). The metatheoretical benefits of such autonomy assumptions seem to me to justify upholding them so long as is reasonable, and in this regard my positions are congruent with most current theoretical frameworks for morphology.

(16) Position IX: Syntactic rules have no access to the morphological composition, or the purely morphological properties, of the lexemes instantiated by the words whose distribution these rules describe.

(17) Position X: Morphological rules have no access to the syntactic properties of the expressions within which the lexemes and forms they describe are instantiated.

Somewhat more concretely, syntactic rules express generalizations about the association of semantics to phrasal and clausal expressions; in so doing, they distribute properties (both purely syntactic and morphosyntactic) within these expressions, ultimately to individual words.[8] Morphological rules express generalizations about the properties of lexemes, including their lists of forms. An expression is wellformed if its words have the properties required by the syntactic rules (or stipulated in an idiom template) and if each word instantiates a form with the properties required by the morphological rules (or

stipulated idiosyncratically in the lexicon). That is, an expression must be simultaneously wellformed from the morphological and the syntactic point of view.

Even more concretely, let us return to the facts about comparatives and superlatives.[9] I will assume that degree ADVs - those modifying A, like VERY, MUCH, A LITTLE, NO, HOW, THAT, TOO, ENOUGH, SO, AS, and of course MORE and MOST - have the feature [+DEG], while V, VP, and S modifiers are [-DEG]. Syntactic rules will have to be responsible for licensing [A, -DEG, +EXT] words like the capitalized ones in *much FASTER than a speeding bullet* and *by far the BIGGEST of the problems*; for licensing [A, +DEG, +EXT] words as in *much MORE astounding than a speeding bullet* and *by far the MOST impressive of the problems*; for licensing [A, -DEG, -EXT] words as in *much more IMPRESSIVE than a speeding bullet* and *by far the most IMPRESSIVE of the problems*; and for prohibiting redundant [+EXT] words (*much MORE QUICKER*).[10]

The syntax then provides for structures of several types, and the lexicon supplies lexeme forms to fit in the word slots within those structures. An expression is illformed if it fails to satisfy syntactic requirements (as *more quicker than a speeding bullet* does) or if it fails to satisfy morphological requirements (as *quicklier than a speeding bullet* and *impressiver than Superdog* do). Expressions like *quicker than a speeding bullet* and *more quickly than a speeding bullet* satisfy all the relevant requirements of both types, and so are wellformed.

7.2. A sketch of a syntactic analysis

Though a full analysis would have to have many details filled in, I can sketch here the sort of syntactic analysis that will achieve the right results.

First, I posit two AP constructions associated with the semantics of comparison and with the occurrence of a [+EXT] word within the AP, and similarly for superlation. The constructions INFCOMP and INFSUP (inflectional comparison and superlation, respectively) require that the head A of the AP have the morphosyntactic property [+COMP] and [+SUP], respectively. The constructions PERCOMP and PERSUP (periphrastic comparison and superlation, respectively) require that a [+DEG] word modifying the AP's head have the morphosyntactic property [+COMP] and [+SUP], respectively. [ADV, +DEG, +COMP] and [ADV, +DEG, +SUP] are the 'particle lexemes' (Zwicky 1989: sec. 6.1) MORE and MOST, respectively.

Second, I assume that [-EXT] is the default for A expressions in syntax, so that [+COMP] and [+SUP] appear only when they are licensed by some rule. We then have an account of the ungrammaticality of expressions like *more happiest, *most happier, *too happier/happiest to talk, *too bigger/biggest by six feet, *so happier/happiest that I couldn't talk, *as happier/happiest as anyone* (involving restrictions that are unlikely to be entirely semantic in nature).

And third, I assume that INFCOMP and PERCOMP (similarly, INFSUP and PERSUP) stand in a stipulated override/default relationship. If INFCOMP is used, PERCOMP is inapplicable; they cannot be used to reinforce one another. Of course PERCOMP is, in a sense, 'always available', as when some A lexeme lacks a [+COMP] form, or when conditions on coordination demand a [-EXT] form for parallelism, even for a lexeme that has [+EXT] forms (as for SMART in *It is a more attractive, smart, and ingenious idea than any other I've heard*).

The first of these steps depends on our allowing, as in (18), inflectional features to be distributed to a modifier, and not always to the head. A similar move will allow us to

describe the appearance of negation in (the modifying ADV) NOT in VP[-FIN]s like *not been to Vienna*, versus its appearance as an inflection on a (head) auxiliary V in VP[+FIN]s like *haven't been to Vienna* (Zwicky & Pullum 1983); and perhaps to describe the expression of the grammatical category of 'possession' within an NP, either in a (modifying) PP with head P OF (as in *recent destruction of the city*), or as an inflection on the (head) determiner of the NP (as in *the city's recent destruction*), though most details of this analysis are controversial. The third of these steps depends on extending Position VI, in (13), to syntax as well as morphology, as in (19).

(18) Position XI: Syntactic rules can require that a property of a construct be distributed to its head or to a modifier of that head.[11]

(19) Position XII: In addition to override/default relations predicted by universal principles, there can be parochial stipulations of such relations, involving two syntactic rules that serve the same function.

Treating INFCOMP and PERCOMP (and INFSUP and PERSUP) as distinct syntactic constructions predicts that there could be contexts in which only one of them is permitted, and this prediction is fulfilled in English. There are at least three such contexts. First, [+DEG] comparatives and superlatives, those serving as modifiers of A rather than as predicates or as [-DEG] modifiers, must be periphrastic: *more deeply philosophical(ly)*, **deeper philosophical(ly)*, but *Terry is more deep, Terry is deeper, Sandy dug more deeply, Sandy dug deeper.*[12]

Second, there is a 'metalinguistic comparative' construction METACOMP (the 'metacomparative' of Pinkham (1982: sec. B3.1)) that uses PERCOMP only, as in *Jan is more bad than mischievous* 'It would be more appropriate to say that Jan is bad than to say that Jan is mischievous'; *Jan is worse than mischievous* is grammatical, but it does not have the right meaning to be an instance of METACOMP. Third, there is an 'absolute superlative' construction ABSSUP that uses PERSUP only, as in *You are most polite* 'You are extremely polite'; *You are politest* is grammatical in context (for instance, following *Chris and Tracy are very polite, but...*), but it does not have the right meaning to be an instance of ABSSUP. This treatment of METACOMP and ABSSUP depends on a stipulated relationship of invocation ('using', or 'calling up') between syntactic rules, as in (20).

(20) Position XIII: One syntactic rule can invoke another specific rule. When this happens, all the syntactic conditions of the invoked rule are in force, in addition to any other conditions of the invoking rule; the invoked rule contributes its semantics insofar as this does not conflict with the semantics of the invoking rule.

8. The phonological issue

I now return to the involvement of phonological shape in the availability of [+EXT] forms for particular lexemes.

Few topics in English morphology have excited so many, and so many different, proposals. A's version, referring to number of syllables and segmental phonology (in particular, ending in -y), was summarized in (3); Evans & Evans (1957), quoted in (21), suggest more detailed rules of thumb; Zwicky (1969), building on the discussions in Kruisinga (1932: 3.62-7) and Jespersen (1949: 347-63), gives the principles in (22); and Pullum & Zwicky (1984: 113-4) cite generalizations from Sweet (1891) that refer to number of syllables and segmental phonology (ending in -er, as in TENDER and BITTER, and ending in a syllable with a tense vowel, as in OBSCURE and POLITE).

(21) Evans & Evans's (1957: 105) generalizations:[13]
  a. 'As a rule, the inflected form is preferred for short words, especially those ending in -d, -t, -r, or -y, such as loud, soft, clear, happy.'
  b. 'The form using more or most is preferred for longer words, especially those ending in (1) more than one unstressed syllable, such as tyrannical; (2) -ive or -ile, such as active and hostile; (3) -s, -ish, or -est, such as curious, foolish, honest; or (4) -ed or -ing, such as crooked and cunning.'
  c. 'The qualified form...is required with (1) adverbs ending in -ly; (2) any word that can only be used predicatively, such as afraid, aware, content; (3) the word eager; (4) words that have an unusual or foreign form, such as antique, burlesque, bizarre.'

(22) Zwicky's (1969: 414) generalizations:
  a. Disyllabic words ending in -le (NOBLE), -er (TENDER), -ow (YELLOW), and -y (HAPPY), or with tense vowels in their final syllables (POLITE, PROFOUND, SINCERE, OBSCURE) generally have inflectional forms.
  b. Otherwise, words of two or more syllables (ACTIVE, AWFUL, INTELLIGENT, ABRUPT, EXACT) generally have periphrastic forms.

What is at issue here is the distribution of the paradigm feature CLASS for As in the English lexicon. I have already argued (in section 6.3) that some DRs predict default values of CLASS on their output lexemes; but such generalizations by no means cover the data hinted at in (3), (21), and (22), which suggest that the default value of CLASS for an A lexeme can sometimes be predicted in part from the phonology of its stem, as in (23).

(23) Position XIV: There can be principles making default predictions about certain properties of a lexeme on the basis of other of its properties; among these are principles making default predictions about purely morphological properties, like paradigm class, on the basis of phonological properties of stems.

I am not prepared to make a full inventory of the 'lexical redundancy rules' (LRRs)[14] that relate A stem phonology to values of CLASS in (any variety of) English. It is enough to observe that there are some very good default predictions - in particular, that ADJs with monosyllabic stems are mostly CLASS:YES, a prediction that is overridden by a stronger principle that ADJs zero-derived from V[PSP] are CLASS:NO (*scareder, *pisseder 'more angry') and is frustrated for lexemes belonging to formal style or technical registers (like APT) and for a handful of others (like WRONG); and that ADJs with stems of more two syllables (even those, like FATHERLY, MASTERLY, and LAWYERLY, that would be slated for inflectibility as a consequence of the DR describing them) are uniformly CLASS:NO, a prediction that is overridden only (for ADJs like UNHAPPY and UNLIKELY) by the even stronger principle that CLASS value is preserved through prefixal derivation.

The point would not be of much consequence if it had not been for Pullum & Zwicky's (1984) claim that such LRRs allow for a breach of a fundamental autonomy principle (in (24)) that goes hand in hand with (16); this is the Principle of Phonology-Free Syntax of Zwicky (1969) and Zwicky & Pullum (1986). Pullum & Zwicky (1984) consequently maintain that phonology is in fact irrelevant to the values of CLASS, which they do by observing that the putative LRRs are riddled with exceptions.

(24) Position XV: Syntactic rules have no access to the phonological properties of the lexemes instantiated by the words whose distribution these rules describe.

But the properties these LRRs predict from stem phonology are purely morphological (predicting whether a lexeme is in a paradigm class), not syntactic. So long as our framework distinguishes different types of properties - phonological, purely morphological, morphosyntactic, purely syntactic, semantic - and different components of grammar, we can constrain the way rules in particular components can make reference to these properties, and so can enforce the component-autonomy positions in (16), (17), and (24).

The crucial point is that the LRRs at issue predict a property like CLASS:YES, which is relevant only for morphological rules, not a property like INFCOMP, which is relevant only for syntactic rules. If we could predict INFCOMP versus PERCOMP from phonological properties of stems, then indeed the autonomy principle in (24) would be subverted. But so long as morphology and syntax are distinguished - so that CLASS is governed by one sort of regularity and INFCOMP by another, with their joint effect following from the requirement that wellformed expressions must exhibit all relevant regularities of both types - LRRs predicting paradigm class from stem phonology (and many other types of LRRs as well) are theoretically innocuous.

Notes

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1. References to lexemes (meaning-phonology pairings) are in all caps, references to all sorts of linguistic expressions (including the inflectional forms of lexemes) in italics.

2. Since the facts about the superlative and the comparative expressions are almost entirely the same, I will use just one of them, namely the comparatives, as the basis for my discussion.

3. A notes that the rule applies before -est as well, so that it 'would take place before a class of morphemes rather than before a single morpheme' (93). This degree of generality presumably adds to its plausibility.

4. A = [+V, +N] in the now-standard feature decomposition of the major categories.

5. We cannot posit an implicational rule requiring that any category with the features [A, +COMP] has the feature [-ADV] as well, because this would say that ADVs had no comparatives at all.

6. Not all of the items listed in (7) are acceptable as ADVs for all speakers of English in all styles. FAST is (so far as I know), but QUICK is not. The point at issue is not which items happen to be on the list for a particular speaker, but the fact that there is such a list at all.

7. Other ADJs ending in -ly - including both those like FRIENDLY and KINDLY for which the -ly is predicted by a DR, and those like SILLY and SPRIGHTLY for which it is not - are awkward as inputs to DR1. As Thurber (1931: 151) puts it, 'You can say "he plays lovelily," but even though the word is perfectly proper, it won't get you anywhere. You might just get by with it at a concert; but try shouting it at a ball game.' Though awkward, FRIENDLILY, SILLILY, and many other 'lily words' are attested; *DAILILY is simply impossible.

8. I am using word to refer to syntagmatic entities in syntax, lexeme to refer to paradigmatic entities in morphology.

9. There are only a few works that attempt both to cover a wide variety of English data and to achieve a reasonable degree of formalization: for comparatives, Bresnan (1973),

Gazdar (1981), Pinkham (1982); for superlatives, Ross (1964). A full account of these phenomena must also cover the subordinate degree expressions with TOO (*too big for me to lift*), ENOUGH (*big enough for me to see*), SO (*so big that I couldn't lift it*), and AS (*as big as anyone I've ever seen*), all involving the [-EXT] form of an A.

10. Some speakers accept nested (nonredundant) comparison, as in *This sauce is much more tastier than the last sauce than we could have expected* 'The degree to which this sauce is tastier than the last sauce is much greater than we could have expected'. I will suppose that such examples are grammatical, though since they are very difficult to process and since they express very convoluted thoughts, they are awkward at best. It is hard to imagine how they could be prohibited in any but an ad hoc fashion, given the occurrence of sequences like the following: *How much tastier than the last sauce is this sauce? Much more than we could have expected.*

11. Or to a specified argument of that head or to an edge, though these possibilities are not at issue here.

12. A attributes to Alan Prince the observation 'that [what is in A's terms] the truncation is restricted syntactically' (93), with only the periphrastic forms occuring before ADJ.

13. They add the hedge, 'But this is a description of what usually happens, not of what must happen. Mark Twain wrote: *the confoundedest, brazenest, ingeniousest piece of fraud*.'

14. As they are usually referred to. Zwicky & Pullum (1986: 81) suggest 'lexical implication principles' as a more appropriate designation.

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What's Become of Derivations? Defaults and Invocations*

Arnold M. Zwicky

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.

These interactions are of three types, the unproblematic one of mutual applicability and two others that are the focus of this paper: preclusion, 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 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 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 as meaning. It is impossible to suffix both -ness and -ity directly to a stem, for instance.

In inflectional morphology 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 - inflectional rules - 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 first-person subject] and g- [marking second-person object] are mutually exclusive by virtue of their "competition" for the same formal position'; the v- prefix is the winner here.

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.

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 derivational 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 derivational 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. <u>Word formation calling on inflection</u>. There can be word formation 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. <u>Rules of referral</u>. There can be inflectional 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. <u>Calls on stems</u>. Both inflectional and word formation rules can refer to specific stems, as in McCarthy's (1981) treatment of the 'patterns' or 'binyanim' in the derivational morphology of Arabic, each pattern involving a combination of a CV melody with a vocalism and a root consonantism. When a derivational 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. <u>Some observations</u>. Before extending this discussion from morphology into syntax, I pause to make four metatheoretical observations.

2.1. <u>Theorizing</u>. 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. <u>Directionality</u>. 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 dispensible, 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. <u>Descriptive power</u>. 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 morphological 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-à-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 cases[5] 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 where a rule permitting verbs to be FEM SG with PL SUs from a particular declension class 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.[6]

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: *How many people ate cookies?* and *Not a single person ate a cookie*, but **Did who eat the cookies?* and **Did not a single person eat a cookie*.

As in the morphological example from Georgian, there might be some general principle predicting the interaction of rules - here, predicting that FOCINIT overrides SAI when they are in conflict - but I have at the moment no idea of what that principle might be. 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 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 (but not prepositional object (PO)) - *That pigs can't fly distresses me* and *I know that pigs can't fly*, but **I'm aware of 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. It also does not make sense to say that English has a rule describing non-SU finite complement clauses as composed of S[+FIN] <u>optionally</u> 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 *My shoulder hurts*, another sort of genitive in *A friend of mine arrived*).

3.5. <u>Layers of defaults</u>. 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. <u>Default associations within and beyond the grammar</u>. At this point I must comment briefly about how syntax fits with morphology, with semantics, and with pragmatics.

4.1. <u>Syntax with morphology</u>. 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. <u>Syntax with semantics</u>. 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. <u>(Sub)categories</u>. 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. <u>Gramcats</u>. 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 word formation rules in morphology 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 ellipsis: *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. ADV 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 ADV (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. <u>Calls on specific constructions</u>. 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. <u>Secondary stipulation</u>. 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. <u>Secondary stipulation of grels</u>. 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 interpretation of the various 'semantic theories of control', as in Dowty (1985). But it seems to me that the invoked conditions must nevertheless be stated in the syntax, since what is required is syntactic as well as semantic congruence, as is evidenced by the differential behaviors of dummy IT and THERE just illustrated.

5.3.3.2. <u>Secondary stipulation of categories</u>. 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 complement VP (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 to 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.[5] 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 stage 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 stage.

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.

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 <u>agreement</u>, 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. 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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