PROCEEDINGS OF THE FIRST MEDITERRANEAN CONFERENCE OF MORPHOLOGY

(Mytilene, Greece, Sept. 19-21 1997)

Edited by:

GEERT BOOIJ
Free University of Amsterdam

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PREFACE

It is increasingly clear that progress in the theory of grammar greatly depends on progress in morphology. Under this perspective, a number of crucial issues like allomorphy, compounding and inflection fall equally well in more than one grammatical component, namely, morphology, syntax and phonology, and have assumed the status of "hot topics" in the field of grammatical theory.

The aim of the First Mediterranean Conference of Morphology, held in Mytilene (island of Lesbos, Greece) in September 19-21, 1997, was to address these issues and bring together experts working on morphology in a variety of theoretical approaches. The conference was received very enthusiastically by morphologists all over the world and was attended by 84 participants from 20 different countries. 15 papers were selected for presentation in three sessions, referring to "Allomorphy", "Compounding" and "Inflection". 9 more papers were chosen as alternates to these 15, and 3 talks were given by invited speakers.

This volume brings together the majority of contributions at the conference. The papers are organized thematically into four sections. Section I contains the papers of the three invited speakers, M. Arisof, A. Sterner and A. Antonsas-Syromandris; Section II cover allomorphy; Section III consists of papers on compounding and Section IV presents contributions on inflection.

We would like to express our deep gratitude to the following sponsors of the conference: The Municipality of Mytilene, the Prefecture of Lesbos and the Ministry of the Arts.

We are also grateful to the University of Patras, particularly to its Rector Prof. Stamatis Alaborta, whose generous and most valuable support made the publication of this volume possible.

Finally, we would like to thank Anne Thornton and Takis Hadjipanayis for their precious help in the preparation of the volume, as well as all the contributors for their understanding and willingness to collaborate with the editorial requirements of this publication.

The Editors,

Geert Booij, University of Amsterdam
Angela Ralli, University of Patras
Sergio Scalise, University of Bologna

October 1998
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GENDER AGREEMENT AS MORPHOLOGY*

Gender, conceived narrowly as agreement class, is morphosyntactic. While the question of what can agree with what is purely syntactic and universal, the gender category or feature that the actual agreement markers instantiate are not, and the phonological form that agreement takes is purely morphological. Language-particular arbitrary and irregular gender interact with universal agreement through defaults. The final universal default type of agreement morphology is phonological copying, which is a reflection of the underlying universal syntactic mechanism of agreement: complete copying of the controller onto the target. This complete copying is normally disguised by the morphology of the language through its arbitrary system of genders. Actual phonological copying only emerges when it is forced to surface under unusual circumstances, through the rare phenomena of alternative agreement, when no gender is otherwise available. The interaction of language-particular and irregular gender systems with the universal mechanism of agreement thus sheds light on the nature of the agreement mechanism.

1. Introduction

I would like to explore the interaction between gender, conceived narrowly as agreement class, and agreement. I have argued elsewhere in some detail (Arnonoff 1994) that gender is a morphosyntactic bridge between morphology and syntax, while the question of what can agree with what is purely syntactic, the gender category or feature that the actual agreement markers instantiate are not, and the phonological form that agreement takes is purely morphological. As I have shown in this previous work, although genders must be distinguished from inflectional classes, gender systems are always realized through purely morphological inflectional classes. Morphology, being a kind of phonological realization (Zwicky 1992), necessarily involves some form of arbitrariness in the mapping between form and meaning. Indeed, when it is not for morphology, arbitrariness might be confined to individual lexical items. It is the fact that morpheme inventories between syntax and phonology that makes languages arbitrarily systematic. Because gender is always rooted

* In this presentation, I rely heavily on the work of Lisa Debla, with whom I have discussed this and related problems for several years, and Fiona McLaughlin, whose work I have only recently discovered. Thanks to Kenjiro Kanagari for discussion. Thanks also to the organizers of the Mittal conference for getting me to put this down on paper and to all the participants at the conference for a truly splendid few days.
through morphological categories and their realization, it follows that some element of arbitrariness will also figure in the realization of gender. To take a trivial example, there is no reason why the feminine gender in Spanish is normally realized through the -a class and the masculine through the -o class. In fact, masculine is realized through -o and feminine through -a, showing that the realization of a gender through any particular form is arbitrary. But gender itself, not merely its morphological realization, is arbitrary. The representations that gender systems follow vary quite widely across languages, no matter how regular they may be (though they are not often very regular), unlike those for its outer categories of person and number or even case. Some gender systems are sex-based, some shape-based, some rooted in animacy, and some based almost entirely on phonological form, which is by definition arbitrary. I assume the agreement mechanism, by contrast, to be universal, invariable, and obligatory. What is language-particular is the specific way in which agreement is realized through morphology.

This leads to the heart of the matter: how does language-particular arbitrary gender interact systematically with universal agreement? The first part of the answer is that, even though gender may be arbitrary and often irregular, the grammatical and hence obligatory nature of gender forces the individual languages that exhibit gender distinctions to be systematic in the realization of these distinctions, despite any irregularities. In the case of gender, this does not mean that every noun, what Corbett, in his survey of gender systems (Corbett 1991), calls the controllee, must bear a gender marker (indeed there are languages in which gender is always covert and in never actually manifested phonologically on nouns themselves) but it means that agreement morphology on what Corbett calls the target must always be realized (except of course when the morphology provides an actual phonological agreement marker), even when the controller does not provide sufficient information.

The normal way in which systematicity emerges in the face of irregularity or lack of information is through defaults (Labov 1988). Power and Corbett (1997) I will assume that the final default or numerical type of agreement morphology is copying and that this copying is a reflection of the underlying universal syntactic mechanism of agreement. Complete copying of the controller onto the target. This complete copying, though, is normally disguised by the morphology of the language through its arbitrary systems of gender. Furthermore, complete copying violates a basic tenet of the lexicalist or lexical integrity hypothesis that has been elaborated by a number of researchers (Zwicky and Pullum 1982). Anderson 1982; which Zwicky and Pullum call the principle of phonology-free syntax and according to which the words of Anderson (1992, 84) the sentence neither manipulates nor accesses the internal form of words. If agreement morphology were to actually copy the

Pollard and Sag (1994) argue that agreement is not done by copying, but rather by indexing. This view has the advantage of being able to make pronouns/occasional agreement with verb/argument agreement. For no purposes, whether agreement is done by copying or by indexing is not important. What matters is that there be some way for the target to be sensitive to all the information contained in the controller whether through indexing or through copying. Pollard and Sag provide a number of arguments against the directionality of the relationship between controller and target, none of which I find persuasive. See Lapointe (1988) for discussion of directionality in agreement.

on one controller lexeme, then it would contribute this generalization, since the lexeme includes its phonological form(s). In the light, one may see gender as a partial solution to the conflict between the principle of phonology-free syntax, and the copying nature of agreement. Actual agreement morphology is not normally sensitive to the entire controller lexeme; instead it is sensitive to only the grammatical features of the lexeme, including a set of morphosyntactic features. In particular, agreement does not usually need to know the phonological form of the lexeme, so that the principle of phonology-free syntax is preserved in most instances. Actual phonological copying only emerges when it is forced to, through the rare phenomena of allomorph agreement, because for some reason there is no gender available (Debrincat 1997). The alternation of language-particular and irregular gender systems with the universal mechanism of agreement-free copying light on the nature of the agreement mechanism. Indeed, it is through the idiosyncrasy of individual language systems that we come to appreciate what is universal in language in this domain.

2. Ideology

There are no wholly natural languages or wholly natural grammars. The idea of natural languages or natural grammars is the historical residue of earlier stages in our thinking about human language. Natural language, not natural languages, lies at the base of linguistic theory. By natural language I mean Chomsky's (1965a) (grammatically) or more precisely the species-specific cognitive propensity proposed by Lemanberg on which UG rests.

The appearance of language may be thought to be due to an inbuilt mapped in program for behavior the exact realization of the program being dependent upon the peculiarities of the (speech) environment. As long as the child is surrounded at all by a speaking environment, speech will develop in an automatic way, with a rudimentary development, a highly specific mode for generalization behavior, and a relative dependence upon the institutional history of the child. (Lemanberg 1964, 600)

Actual human languages are not wholly natural objects but rather partly cultural objects rooted in the interaction of natural language with individual cultures and happenstance. Grammars (l-languages) are not wholly natural objects, unless we attempt to exclude from l-languages everything that is determined by culture and accident. Lemanberg's program does not include a theory of l-languages (what is acquired), but it is a set of tools, the universal human capacities that contribute to the construction of l-languages, the specific intuitions that make [language acquisition] possible (Chomsky 1965, 27). Actually reified human languages is systematic and at least partly unnatural. Assuming that bivalent languages are not entirely natural, how do we account for the residual but systematic structural aspects of languages? One reductionist approach says that this systematic structural residue is of no interest. My own position is to address the residue directly, on the working assumption that actual languages are the product of the interaction of nature and culture. I will attempt to show in this paper that such direct conjunction of residual but systematic aspects of individual languages can in fact lead to a better understanding of the universal mechanisms of the human language program.
reductionism, languages can be reduced to music principles and mechanisms that are specific to the language program, as opposed to human properties or behaviors. For example, Chomsky's "perfect system" is not realized in any actual language, but which resides in the unanalyzable music faculty. Accordingly to social cognition, consciousness, communication, or social structure, are the underlying explanatory causes of language. Finally, one may assume both together and try to account for languages exclusively in terms of the interaction of natural factors, some of which are specific to language and some of which are traceable to general cognitive and social principles. From any of these viewpoints, there is no interesting residue in individual languages.

Within the structuralist tradition, the arbitrariness of the linguistic sign dictates that every actual language must be in part a conventional system, which Saussure calls "a system of pure values" (1959, p. 111), and therefore no individual language can be understood entirely in terms of internal (mental) or external (social) common human factors. The fact that the sign is arbitrary means that there will be systematic unnatural (purely conventional) structural components or subsystems in every individual language. It is important to realize that acknowledging the arbitrary aspect of individual languages does not commit one to claim, as some structuralists did, that languages are entirely arbitrary or unnatural, or that languages vary among themselves without limit. Instead, one acknowledges that individual languages always traverse the interpretive of universal and arbitrary factors and then allows for some of the systematicity of individual languages to emerge from this interpretive, resulting in unnatural but systematic aspects of languages.

The most likely candidates for partly unnatural subsystems of languages are those that are systematic but not universal and that are close to the arbitrary bond between the signifier and the signified that constitutes the linguistic sign. Inflational morphology is not universal, but in languages where it exists, it is highly systematic and morphology has as close to the arbitrary bond as anything else. Certain aspects of inflection can be traced to natural or general social-cognitive functional factors, but full-blown inflectional systems are usually unnatural in part. Inflectional morphology is therefore a good candidate for the sort of system that I have in mind.

4. Gender

"Gender is a class of nouns reflected in the behavior of associated words." (Blockett 1958, 211) More narrowly, gender are agreement classes:

- An agreement class is a set of nouns such that any two members of that set have the property that whenever (i) they occur in the same morphosyntactic form and (ii) they occur in the same agreement domain, then their targets have the same morphological realization.

(Corbett 1991: 147; following Zalzupik 1964)

Gender is an excellent candidate for an unnatural grammatical category, first because gender distinctions within a language is from universal and hence likely not necessary. Gender boundaries in a few areas (Europe, Africa, China) and a few language families (Indo-European, Afrot-African, Isalo-Soum, Niger-Congo, North Caucasian, Dravidian) Gender are also much more highly varied in their structure and motivation than the other categories usually involved in agreement: person, case, and number. These other categories are, by contrast, fairly restricted across languages. Person systems universally distinguished speaker, addressee, and other, with a few distinguishing further among others. Number is not always distinguished in the grammar, but when it is, it follows a simple implicational system: if the languages distinguishes any particular n-by means of a special class, then it also distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a special class, then it distinguishes n-1-by means of a special class, then it distinguishes n+1-by means of a 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In overt realizations of gender are always morphologically bound.

Gender is obligatory and normally fixed for all noun forms; there is little or no variation among speakers and change in the gender of individual nouns is very rare (e.g., Spitzel 1988). It seems to be a matter of chance if the genitive is feminine or masculine.

Classifiers are variable or optional and often exhibit wide dialectal and age-related variation (Eburne 1986). In any language with classifiers, there is usually a class of nouns that admits none.

There are often large numbers of classifiers (400 in Tchachi) and they are quite fluid.

The number of genders is small (2 - 15) and stable.

Gender is always reflected in system (by definition of gender in agreement clauses).

Classifiers are realized outside of the classified noun's NP-only when used interpose.

A major concern of research on gender has been that there is no morphosemantic coherence, the fact that there are normally many diverse linguistic criteria for membership of a noun in a gender. I have argued elsewhere (Arnold 1981) that what is central and the exhaustive partitioning membership in the gender itself is realized and evidenced through agreement, not any criteria for membership. The semantic coherence of genders has often been exaggerated (Lakoff 1986, 1987). In fact, semantically incoherent gender systems (in which there are exceptions to the semantic categorization that seems to underlie the system) are usually stable over very long periods of time. Witness the gender systems of the languages of the two most widely studied gender-intensive language families, Niger-Congo and Indo-European, all of which remain irregular as far back as we can reconstruct them. We would not expect such stability if genders were in principle rooted in semantic classification. Semantically mixed gender systems are also fairly common. In one type, the individual genders of the language may be motivated differently. Classic examples of this type are found in many parts of Papua New Guinea. Arapesh and Yimas are the best described (Foley 1980, 1991; Fortune 1982). In Arapesh, one gender, male human, is entirely semantic. The eleven remaining genders are entirely phonological, except possibly for one, which contains human females, and another, which is the default. In Yimas, according to Foley, there are four semantic genders (male, human, female human, other animal, and plant), and only phonological genders, and one default. In the other type of mixed gender system, members of a single gender may be motivated by a variety of factors. Latin is a good example: animates are typically female gender by their sex, when sex is differentiated; most names of persons are feminine, most names of rivers and mountains are masculine; stems ending in -s are usually masculine; third-declension nouns with stems ending in certain sequences (e.g., -e- or -e-are feminine, as are indeclinables. Semantically coherent genders emerge in the breakdown of languages, as in young people's Dyerbal (Schmidt 1983), where the last stage is the most coherent. This has been taken as evidence of the true nature of the coherent system, but it may also be understood in the opposite way: robust gender systems do not need to be semantically coherent.

Gender is obligatory in many languages, in one or two of its genders, but because gender systems are not usually coherent, it often happens for some subset of nouns that there will be no regular method for assigning gender to its members. This subset is therefore placed in the default class (there may also be ordered default). One type of default class is partially motivated. While the bulk of its members are assigned by a reasonably well-defined criteria, others are assigned by default. This is fairly common. A more striking type is the 'garbage can,' which has no members assigned other than by default.

Yimas gender y cannot be an example of this type. It is very heterogeneous and seems to be best defined to include all nouns that do not fall under the semantic or phonological criteria set by the other genders.

5. Default Agreement

The combined factors of the obligatoriness of genders and their frequent lack of coherence shall light on another phenomenon: default agreement-target gender. If an agreement target must show some gender, because gender is obligatory, but there is no well-defined agreement controller (for whatever reason), then the target shows a default gender, simply because the target gender is obligatorily 1 I will give examples from default target agreement in Arapesh, which I have discussed at some length in Arnold 1994. This language has 13 genders: Adjectival, possessive, all sorts, and verbs always agree with their controlling noun phrase. When an element must bear an agreement marker and the proper gender of that marker cannot be determined for whatever reason, then the marker always bears the mark of the default gender. Default agreement can arise in several ways: the head noun of the controller may be null; there may be gender clash between coordinated noun phrases within the controller, the head noun may not fit into one of the genders for some reason; or the controller may be outside the gender system (first and second person do not agree in gender with targets). See Corbett 1991, §7.2, for many other examples of this sort of phenomenon.

Most languages have a particular gender or set of genders for default target agreement, but in a few languages, default agreement takes the form of what I will call radical alternative agreement, in which the agreement target simply alliterates or rhymes with its controller, which is outside the gender system. Radical alternative agreement must be distinguished from the apparently alternative agreement found in Niger-Congo languages and many languages of Papua New Guinea. In these languages, a number of the genders have overt allitis that are identical to the corresponding gender agreement markers. Corbett cites the following example from Wellner.

1) ki-kapu ki-ko-bwae ki-upa ki-lo-yaku 1-pl bskt 1-pl-lg bskt 1-pst 1-pl-fall

This form falls into the 7 class in the singular, which has the prefix -ki-. This prefix then applies on all the forms that agree with this controller. The major difference between the Niger-Congo type of apparently alternative agreement and true radical alternative agreement is that what appears to be copied in these Niger-Congo cases is not part of the
nominal, but a segmental prefix. This can be seen from the fact that some nouns in these languages have no prefix, but still get 'allofactive' gender agreement and from the fact that some nouns have the 'wrong' prefixes. Furthermore, in apparently allofactive systems, there is usually a fairly small fixed number of allofactive affixes. In true radical allofactive agreement, there is no limit to the number of possible number of allofactive agreement markers except that imposed by the phonology of the language. Historically, it is likely that apparently allofactive agreement always arises from radical allofactive agreement, at least. In the case that a separate issue: I will sketch some examples of radical allofactive agreement, in order to give the reader a taste of how it works.

1) Onola (Benue-Congo) language, agreement targets definite, demonstrative, and adjective; agree with the final syllable of the controller noun in backness (front, central, or back). We may say that there is agreement, expressed in terms of the final vowel, but that there are no genders, since the actual form of agreement is always completely predictable.

2) mib- the saw NON-FINAL ni saw animal big (data from Dobrin 1996)

3) nyangiri kend- ni saw kend- big (data from Dobrin 1996)

We see in both examples that the quality of the final vowel of the controller is reflected in that of the target definite marker, demonstrative, or adjective.

Definite radical allofactive agreement appears clearly in Ewuu (Savopect 1987), an Atlantic (Niger-Congo) language, which has both pronominal and pronominal affixes. Pronominal agree in allofactive and pronominal pronominal in the pronominal. Pronominal pronominal (a pronominal nasalized vowel) instead of a pronominal pronominal. The pronominal pronominal of individual nouns of the pronominal type take one of two kinds of gender agreement in both pronominal and pronominal. Either a default pronominal in a pronominal copy of the first CV of the pronominal stem (Savopect can find no reason for which method a given noun chooses). Some examples are given in the following Table:

<table>
<thead>
<tr>
<th></th>
<th>pronominal</th>
<th>pronominal</th>
</tr>
</thead>
<tbody>
<tr>
<td>def.</td>
<td>'this case'</td>
<td>'those cases'</td>
</tr>
<tr>
<td>pronominal</td>
<td>'this case'</td>
<td>'those cases'</td>
</tr>
<tr>
<td>pronominal</td>
<td>'long case'</td>
<td>'long case'</td>
</tr>
</tbody>
</table>

Unpronominal with copying of CV:

katima-gó in ka

katima-gó ni in ka-a.

Note that the pronominal nouns trigger the same gender agreement affixes in both singular and plural, which is very unusual in Niger-Congo languages, where pairs of singular and plural agreement affixes are virtually fixed. Note also the co-occurrence of this agreement affixes with the plural agreement affixes, which are very unusual in Niger-Congo. Finally, these pronominal nouns may agree with a prefix in the diminutive or augmentative. For example, the pronominal noun mba 'person' may receive the diminutive prefix ka- or the augmentative prefix di-. In these cases it will 'enter' the normal gender system and show the regular plural prefixes for the diminutive or augmentative and no allofactive agreement. Since pronominal nouns allow only one prefix, the fact that the stem does not lose its initial CV in the diminutive or augmentative shows that it is indeed pronominal.

In Wolof (McLaughlin 1994), an Atlantic (Niger-Congo) language, there are singular pronominal classes and a plural pronominal (one of which has only 1-5 members), although there is no class marked on nouns, only on targets. In some cases, class assignment is allofactive: the class of a noun is determined by its initial consonant: gèleu 'the egg', until 'the broccoli'; waalip 'the nations'. This is true of many earlier loan words, arguing that the default method of class assignment was allofactive at an earlier period. Recently, the 5- class has become the default, but the earlier assignments survive (supporting, incidentally, the "one-word" theory of Arikatiz 1976). As the methods of assigning defaults succeed each other historically, the gender system becomes layered. A final spoken language example comes from Arapahoe (Dobrin 1997). In Fortuna's original grammar (1942), there were thirteen distinct phonologically-based genders, each with its own set of target agreement markers. These were largely but not entirely allofactive. Fortuna shows extensive evidence of a default gender, both for controllers and for targets. In Fortuna time, there were no singular nouns ending in a, which is common in the final sound in plural markers. In recent years, however, singular nouns ending in a have been borrowed from English and Toba Pipe. These no plural form and take a as a singular target agreement affix. The following examples are all from Dobrin 1997:

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background and only surfacing in those instances where there is no gender on the controller and the controller does not fall into the default category either.

In American Sign Language (and most other sign languages), subject and object agreement is deictic. Participants are given locations in the signing space and agreement is encoded in the initial and final locus of agreement verbs. This type of agreement can be interpreted as copying the locus of the subject and object onto the verb as prefix and suffix.

This is the perfect example of agreement as copying, since there is no evidence for distinct readers, and shows that sign languages may be closer to the natural state than spoken languages in this regard.

Doebner (1990, 1997) has pointed out that allomorphic agreement is paradigmatic, although it violates the principle of separation of syntax and phonology, it seems prototypical agreement as copying. But if it is prototypical then why is it true that any form of allomorphic agreement is rare, and where it does occur, it has been regarded as late historically.

M. Richardson: Monsieur le Professeur Gottlieb, vous en parlez souvent concernant... l'évolution apparemment plus récente des morphèmes «allovers» d'accord (cf. 7, 8, 9, 11, 12, 13, 19, 16, 17, 18) postulant comme une nouvelle hypothèse, celle du pragmatisme sur le système initial d'une métaphore allomorphique de classification nominales qui serait plus récente.

M. Gottlieb: Je ne peux pas dire que les classes qui on l'estimé ont le même morphème d'acord une allomorphie complète foussant plus tôt, parce que, comme mieux est avis sur qui est affé à la répétitions, d'un élément identique plus probablement que les types d'accords quelque peu pour surestimer... caractéristiques des classes 1, 2, 3, 4, 5, 6, 9, et 10.

(Montreuil 1967, 353)

The answer is that allomorphic agreement reflects the universal syntactic nature of agreement as copying, but that this universal does not normally surface, because of the principle of lexical integrity. Only in rare cases where the obligation of agreement meets a gap in the gender system does the copying mechanism surface. Allomorphic agreement is therefore a paradigm case of what has been called in optimality theory the emergence of the unmarked (McCarthy and Prince 1995); the unmarked case is a default that emerges just in case nothing else does. Allomorphic agreement is gender agreement in the absence of a gender.

Mr. J. Richardson: Professor Gottlieb, your remarks concerning the apparently more recent evolution of the “allovers” agreement morphemes (cf. 7, 8, 9, 11, 12, 13, 19, 16, 17, 18) could lead to a new hypothesis, that of the grafting onto the original system of an allomorphic method of nominal classification which would be more recent.

M. Gottlieb: It would seem to be at least possible that those classes where complete allomorphy for the agreement morphemes is established were later; since an innovation would have had as its effect the repetition of an identical element more probably than the somewhat irregular types of agreement of types 1, 2, 3, 4, 5, 6, 9, and 10.

16

REFERENCES

RELATIONAL ADJECTIVES AND THE REDUNDANCY OF LEXICAL CATEGORIES

Abstract
In this paper I argue that the familiar lexical category labels, N, V, A, P or equivalent feature systems (e.g. [N, V, A]) are redundant in a theory which admits a level of argument structure. I modify Zwyers’ (1992) conception of a-structure by arguing that major class members always include a ‘referential role’: <R> for nouns, <E> (eventuality) for verbs and <A> (attributive) for adjectives. The <A> role is associated with the <R> role of the noun modified. Reference to categorial information can be read off the a-structural representations without the need for purely syntactic category features. ‘Transposition’, in which just the syntactic category is shifted, are operations over a-structures. I illustrate this system in detail with respect to relational adjectives. I first develop a (constuctional) semantics for compound nouns (N N) in which the modifier receives a new <A> role, with denotation of the original <R> role: noun ‘A’, [R] bound <R>. Relational adjectives have the same a-structure representation with the same semantic interpretation, but lexically specified: atomic: <A> bound <R>.

1. Introduction
In this paper I assume that the representation of a predicate includes a level of argument structure (cf Williams 1981). In the theory of theta-discharge advanced by Higginbotham (1985), it is positions in a-structure which are bound, identified with or marked by thematic elements such as verbs and adjectives. Higginbotham (1985) proposes that the role of a verb includes a position corresponding to the notion of ‘event’ and that this position is accessible to modification by adverbs and the tense operator. Williams’ (1981) original model included a ‘referential’ role for nouns, which is coindexed with the thematic (semantic) role of verbs when the verb

3 I am grateful to the Economic and Social Research Council for supporting the research reported here, Project no. R000236115. Thanks to David Adger for alerting me to Zwyers (1992). This paper was also read to the meeting of the Associação Portuguesa de Linguística, University of Lisbon, 1 October 1997 and will appear in the Proceedings. Thanks to Keith Brown for detailed discussion of earlier versions and also to participants in seminars at the University of Essex, the Workshop on Inflection, 8th Morphology Conference, Vienna, 4th February, 1996, the Research Centre for English and Applied Linguistics, Cambridge, the LAGB Spring 1997 meeting (Edinburgh), the ESRC-funded ‘Challenges for Inflection Description’ (18 April 1997) and particularly Roger Evans and Gerald Gairdner and Lexical Functional Grammar ‘97, University of California, San Diego, particularly Ivan Bresnan, Phil Leacock, Joan Maling, Nigel Vincent.
discharges its semantic role onto a complement or subject. Adjectives are generally assumed to be one- or two-place predicates which have semantic roles akin to those of verbs, but without the event role. These assumptions are summarized in the diagram shown in (3), which I shall term as a "traditional" view on NAs (ignoring prepositions).

(1) "Traditional" NA representations for transitive V,N,A:

- kick: \( \text{E, Ag, To} \)
- tell: \( \text{R, V} \)
- afraid-of: \( \text{Exp, To} \)

There is considerable redundancy between NA representations and lexical syntactic category membership. \( \text{E} \rightarrow \text{Verb} \), \( \text{R} \rightarrow \text{Noun} \), \( \text{R} \rightarrow \text{Pre-rex Theta roles} \) \rightarrow \text{Adj}

But that this is more than a rehash of the 'natural' parts of speech tradition: with an intermediate level of argument structure as in (2) we open up the possibility that syntactic category membership might become redundant even in more complex cases of 'nested' categories such as deverbal nominalizations, or in adnominal adjectives. That is particularly true of theories which make use of mapping principles governing argument realization (the Theta Criterion, Function-Argument Uniqueness etc.), in which insertion into the syntax of a lexical form of the wrong category would cause the derivation to crash simply because of failure of argument selection.

The thesis to be defended here is that, given a level of \( \alpha \)-structure, lexical syntactic category features such as \( \text{[N, V]} \) or their equivalent are entirely superfluous, their place taken by the \( \text{[E, Ag, To]} \). Lexical categories can be defined in terms of their 'functional' roles. At the same time, many of the properties which are often attributed to major category features are better thought of as properties of the functional categories or functional features \( \text{(r-features)} \) which accompany major parts of speech, such as determiners, tense, agreement features of various sorts, and so on. Those are assigned to lexical items on the basis of their \( \alpha \)-structures by universal principles modulated by language-particular codicles.

This perspective throws light on the problem of distinguishing inflection and derivation. One rather serious problem is the existence of intransitive morphology which changes syntactic category such as the verbal participle, which in many languages clearly behaves like part of the verb paradigm (and shows, for instance, tense and/or aspect distinctions as well as retaining the argument structure of the verb), while on the other hand it is treated like an adjective. Likewise, gerunds, infinitives and deverbal nominalizations ('action nouns'), which in many languages are fixed to-adjective transpositions, or relational adjectives. These transpositions are summarized in (3):

\[
\begin{align*}
\text{(2) } & V \rightarrow \text{Adj} \\
& V \rightarrow \text{Adj, N} \\
& V,A \rightarrow N \\
\end{align*}
\]

relationals

Consider for instance, deverbal action nominalizations. As is clear from typological surveys such as Kiparsky's (1993), the action nominal may retain a number of \( \alpha \)-structure properties from the original verb (such as licensing subject-and object-like satellites), may assign the same query case to its object as the original verb (as when nominalizations of Russian transitive verbs with instrumental case marked objects continue to assign the Instrumental to their complement), may retain tense marking (Turkish, Quechua) or aspect (Polish) and so on. For this reason nominalizations are often called 'nested' categories (Lehmann and Ryszard 1988). Where the nominal simply names the event denoted by the verb, to what extent are we justified in saying that the nominal is the result of derivational as opposed to inflectional morphology? In other words, is the shooting of the lions the same as shooting not be a word form of the lexeme shoot? This problem is particularly acute in a language like German in which the component and most productive action nominal is the infinitive form of the verb (NBI) used as a noun, i.e. bearing nominal features of determination and case and being modified by adjectives.

I shall argue here that these problems largely evaporate if we admit that there are no syntactic lexical categories. Category-changing inflection is a species of re-allocation. A deverbal action nominal will be a verb whose event role, 'E', has been 'demoted' and supplanted by a nominal 'R' role, indicating that its denotation is the name of an event, rather than the event itself: Shooting \( \text{<R, E, Ag, To>} \). Language-particular principles then determine whether the \( \text{R} \) role or the \( \text{E} \) role is responsible for licensing arguments, tense/aspect features and so on.

In this paper I shall concentrate primarily on attributive modifiers and explore the relationship between N + N compounding in English and relational adjectives. I begin with a survey of Zwarts' (1992) exploration of the homologies between syntactic structures and semantic structures.

2. Zwart's model

Zwarts (1992) proposes a theory of lexical categories in which there is considerable redundancy between semantic and syntactic representation. He assumes a standard type-theoretic semantics together with a level of \( \alpha \)-structure. \( \alpha \)-structure representations are headed. He proposes that the four major categories of N V A P have a 'referential argument position', or 'r-role' as shown in (3):

\[ A \text{ A treatment of nominalizations is given in Spencer (1998).} \]
For adjectives, Zwart argues for a distinction between those that are gradable, such as tall, red, rich and those that are not. The latter include simple binary adjectives such as dead or married but also determiner relational adjectives such as adjectival, atomic. Zwart, however, draws a finer distinction between measure adjectives such as tall, old, rich and non-measure adjectives such as pretty, healthy, lazy. The measure adjectives can take some kind of measure phrase (two meters tall) while the non-measure adjectives, while gradable (very pretty), don't denote properties which can be expressed as sets of degrees along a scale. The measure adjectives have in their argument structure a \( G \) referential role which is bound by degree expressions. All other adjectives denote simple properties and lack the referential role in their argument structure. In order to express the fact that non-measure gradable adjectives like pretty can still receive degree modification (very pretty) Zwart assumes type shifting. The type of simple properties will be \( \varepsilon_0 \), corresponding to an argument structure with just a Theme role, \( \langle G : THO \rangle \), while the type of measure adjectives such as tall is \( \langle e_0 , T \rangle \), where \( e_0 \) is the type of degrees, with \( s \)-structure \( \langle G : THO \rangle \). Thus, by shifting from pretty \( \langle e_0 \rangle \) to pretty \( \langle e_0 , T \rangle \) we obtain an argument structure \( \langle G : THO \rangle \) for pretty and this maps a property to the set of degrees that realize that property. (Type shifting also accounts for cases in which proper nouns are modified, e.g. the young Einstein.)

What remains unclear is why non-measure adjectives such as pretty fail to take measure phrases when they undergo type shifting. The representation for tall will be something like (5):

(5) \[ \langle tall(s, d) & d \geq 1 \rangle \]

where \( d \) refers to some 'average' or 'standard' degree of tallness (p. 138 ex. (C)). But this means that the difference between tall and pretty is essentially in the \( s \)-representation, not in the \( s \)-structure, since both tall and pretty can be given an \( s \)-structure of the form \( \langle G : THO \rangle \). Again, the facts of disambiguation tell us about semantic incompatibility rather than a morphosyntactic failure of theta discharge. In fact, it is not obvious that pretty is a non-measure adjective, witness (6):

(6) Anna is twice as pretty as Bella.

One of the differences between measure and non-measure adjectives is supposed to be that non-measure adjectives permit the entailment (7):

(7) \[ x \text{ is more adj than } y \implies x \text{ is adj} \]

Thus, if Anna is prettier than Bella, then Anna has to be pretty in some absolute sense.

This is not true, however, of Anna is taller than Bella, since both could be very short. But this is a fact about synchrononomaticity which is independent of measurability. For instance, not all synchrononomatic adjectives like tall are necessarily measurable. Thus, good is the classic example of a synchrononomatic adjective but it is impossible to
measure goodness. Likewise, there are measure adjectives which are not symmorphemic and in which entailment (7) therefore holds, as in (8):

(8) Your account is five pounds overdrawn \( \Rightarrow \) Your account is overdrawn.

Thus, gradability is a matter for lexical representations (or perhaps encyclopaedic knowledge) and not an in-sentence property.

We now turn to the nature of modification. Zwanz offers a fairly uncontroversial interpretation in (9) (p. 83):

(9) "A lexical head \( L \) is modified by a phrase XP iff
a. \( L \) governs XP
b. the prominent argument of XP is coindexed with the referential argument of \( L \)."

The important part of this definition is (9b). The term 'prominent argument' refers to the first thematic argument in the theta array. For an intransitive adjective or preposition this will be the sole Theme argument, and for a transitive adjective or preposition, this will also normally be the Theme argument. An example with an intransitive adjective is (10):

(10) a. tall woman
   b. tall-G Tho woman-R
   c. \( \lambda(A \text{tal}l-'G \text{ Tho} \text{woman'})[O] \)

Note that Zwanz's "G" argument plays no role whatever in theta discharge here.

3. A revised theory of argument structures for adjectives

In this section I shall begin with a consideration of the way in which a noun modifies another noun in a root compound and compare this with the modification of a noun by a relational adjective. This will motivate a new r-role, \( A' \), for adjectives which expresses their canonical function as attributive modifiers, replacing Zwanz's "G" role.

3.1 Compound and relational adjectives

It seems to be widely accepted that compounds such as atom bomb are interpreted pragmatically (Booting 1977). The simplest way to account for such meanings is to assume that the compound construction itself was associated with an unspecified predicate, \( P \), which asserts some pragmatically defined relationship between the denotata of the two nouns (cf. Spencer, 1995), as in (11):

(11) \( \lambda(a \text{bomb}(y)) \land P(a, y), \lambda(a \text{atom}(y)) \)

In other words, an atom bomb is a bomb such that there is some relationship between the property of being an atom and the property of being that bomb. The semantic interpretation provides the modifier with the representation shown in (12):

(12) \( \lambda(P(a, y)) \land \lambda(a \text{atom}(y)) \)

The constructional meaning of a compound noun is given explicitly in (13):

(13) \( N_1 \text{<R> } \text{in the construction } [N_1 \text{<R>} N_2 \text{<R>}] \)

\( \) corresponds to \( \lambda(P_1(a, y)) \land \lambda(a \text{atom}(y)) \)

where \( N_2 \) is the denotation of \( N_1 \).

This means that the representation for atom bomb will be (14), which after \( \lambda \)-conversion collapses to (11):

(14) \( \lambda(P_1(a, y)) \land \lambda(a \text{atom}(y)) \)

If proper nouns also have \( \text{<R>} \) referential role, this works equally for them:

(15) a. London fog
   b. London-R fog-R
   c. \( \lambda(P_2(a, y)) \land \lambda(a \text{London}(y)) \)

The representation yielded by (13) is read off syntactic structure. We do not create a separate 'attributive' clause every time we use a noun as modifier in a compound. Indeed, both the lexical and the role of the noun remains unaltered.

3.2 Attributive adjectives

Zwanz's "G" r-role is to bring out the principal function of adjectives, that of attributive modification. Let us therefore take all adjectives to have an attributive referential role, \( A' \), co-indexed with the prominent argument. When modification occurs within a nominal phrase, the r-role, \( A' \), of the attributive is then identified with the \( \text{<R>} \) of the modified noun, indirectly establishing a coindexation between the prominent argument of the adjective and the noun's referent, as shown in (16):

(16) a. 

\[ \begin{array}{c}
A \\
N \\
\text{<R>}
\end{array} \]

\[ \begin{array}{c}
\text{tall} \\
\text{woman}
\end{array} \]
The default interpretation for (18) is given in (17):

\[ \lambda X. (X(\text{bad}))(\text{woman}(\text{run}))) \]

Applied to woman (translating \( \lambda X. (X(\text{run}))(\text{woman}(\text{run}))) \)) as an adjective such as not will give (18):

\[ \lambda X. (X(\text{run}))(\text{woman}(\text{run}))) \]

The account so far handles ‘ordinary’ qualitative adjectives such as tall, pretty, as well as non-gradable adjectives such as married. It will also handle derived adjectives such as milky, dirty, car-like, available, and so on. The relationship between, say, car-like and cat is a matter of LCS and not GCS. In this sense, the derived adjectives such as atomic. That is, could we say that the relationship between the relational adjective atomic and the noun atom results from an operation over the LCS representation of the noun? This would mean, for instance, that atomic has some predicate, say REL, in its LCS meaning “related to,” giving \( \text{REL}[\text{ATOM}] \), just as milky means “very roughly” \( \text{LIKE}[\text{MILK}] \). However, an element such as REL itself wouldn’t really contribute anything to the LCS of the adjective. To call something an atomic bomb is to claim some relationship between the property of being that bomb and the property of being an atom, rather than attributing “atomicity” to bomb. But this is exactly the grammatically derived relation \( \psi \) used to define the compositional meaning of compounds. Hence, the relational adjective should be derived directly from the noun at the level of \( \psi \), in such a way that the noun acquires an attributive t-role \( \psi \)-role which then coincides with the base noun’s \( \psi \)-role, as shown in (19):

\[ \text{atomic:} \]

\[ \text{atom} \rightarrow \text{A} R \]

This can now be interpreted in the same way as the modifier in a compound noun, as in (20):

\[ \text{atomic:} \]

\[ \text{atomic:} \]

In other words, the interpretation of relational adjectives is the lexical equivalent of the pragmatically defined relation in compounds. The meaning of atomic bomb is now derived in (21), essentially as for atomic bomb:

\[ (21) \]

| a. \( \text{atom} \rightarrow \text{A} R \) \( \rightarrow \) bomb \( \rightarrow \text{R} \) |
| b. \( \lambda X. (X(\text{un}))(\text{woman}(\text{run}))) \rightarrow \text{un} \rightarrow \text{R} |
| c. \( \lambda X. (X(\text{un}))(\text{woman}(\text{run}))) \rightarrow \lambda X. (X(\text{run}))(\text{woman}(\text{run}))) |

The basic interpretation of atomic is identical to that of the noun from which it derives, hence (21b) uses reference to the property \( \lambda X. (X(\text{run}))(\text{woman}(\text{run}))) \) of \( \text{un} \rightarrow \text{R} \). The adjectival morphology is nothing more than a reflection of the changed \( \psi \)-structure of the noun, and not the bearer of a semantic constant, such as the “like of car-like or the ‘y’ of milky.” In this sense, the derivation of a relational adjective creates a distinct form of a nominal lexeme rather than creating a distinct adjectival lexeme.

Finally, how do we account for the fact that modifying nouns in compounds can (sometimes) be modified by adjectives, like ordinary nouns (e.g., red brick house, American history teacher = teacher of American history)? First, we form the phrase red brick. This is headed by a noun, though one which is modified by an adjective: \( \text{red} \rightarrow \text{A} \rightarrow \text{Th}(X)(\text{brick}(\text{brick} \rightarrow \text{R}))) \). Then, the compound N interpretation rule converts the noun into a relational adjective to give (22):

\[ (22) \]

| \( \text{red} \rightarrow \text{A} \rightarrow \text{Th}(X)(\text{brick}(\text{brick} \rightarrow \text{R}))) \rightarrow \text{house} \rightarrow \text{R} |

This process is rare if the phrase is not listed (cf. “expensive brick house in the same house made from expensive bricks”). This account of relational adjectives provides us with an unexpected solution to an interesting problem. An expression such as East Germany economy illustrates a well-discussed kind morphosemantic structural mismatch: East German is clearly an adjectival form (essentially a relational adjective) derived from East Germany. But a part of what East is supposed to modify is lacking: “East German economy.”

\[ (23) \]

\[ \lambda [\text{East Germany}] \rightarrow \lambda [\text{East German}] \rightarrow [\text{Economy}] \rightarrow [\text{R}] \]

This is only a problem, however, if we persist in regarding the relational adjective as a new lexeme formed by derivational process. If we consider German (at least in (23b)) to be simply a form of the lexeme Germany then we can offer the analysis in (24), corresponding to (25):

\[ (24) \]

| \( \text{East} \rightarrow \text{Germany} \rightarrow \text{Economy} \rightarrow [\text{R}] |

\[ (25) \]

| \( \text{East} \rightarrow \text{Germany} \rightarrow \text{Economy} \rightarrow [\text{R}] |

\[ \text{I am grateful to Phil LeSourd for discussion of this point.} \]
The forms in small capitals in (25) are names of lexemes regardless of their s-structures, while the word forms are given in lower case. The morphosyntactic mismatch then disappears as an artifact of a wrong analysis (just as the past tense form sang doesn’t represent a morphosyntactic mismatch simply because it has no past tense suffix).

References


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ON MODERN GREEK NOMINAL ADJECTIVES

ABSTRACT

The Modern Greek adjectival system is described by means of D. Corbin’s model and illustrated with the analysis of four suffixes.

1. Introduction

This contribution aims at presenting the general principles of the Modern Greek (MG) nominal adjectival system according to Dallaselle Corbin’s model (University of Liège, France). This model explicitly formalizes an ordered set of rules and principles that synchronically characterize the constructed part of the lexicon of a language, allowing us to distinguish between accidental and systematic gaps. Thus it is a model whose aim is to describe the speaker’s lexical competence, by means of formal grammar and as a result to interpret not only the constructed words already existing but all the words that it would be to construct (possible words), since their creation will depend on the same rules. In contrast to many other theories and models, the notion of the attested form here acquires only relative importance as far as the lexicon is concerned, since it is only the concept of the possible word that is significant at the level of lexical competence. As a result the description of the lexical system does not correspond to the observable lexicon. In other words the course of abstraction adopted for the remaining levels of linguistic analysis has to be followed by the study and interpretation of the lexicon as well. A form is not considered to be regular or irregular according to the surface structure which is dominated by heterogeneity not as a form considered to be non-existent if it is not directly observable.

In this paper, we will first examine Corbin’s model, i.e. the principles of analysis, namely associativity and stratification, the Word Formation Rules (WFR), the stratification of the meaning of the constructed words, the modules of the lexical component, and secondly the MG nominal adjectival system.

Many thanks are given to Dallaselle Corbin for reading this paper and for her invaluable suggestions. For more details see Corbin (1987 and 1991) and Anastasios-Xyronidou (1992).
2. Corbin’s Model

2.1. Principles of analysis

Derivation morphology constitutes an autonomous grammatical component which is internally stratified into four subcomponents (principle of stratification). The meaning of a constructed word is structured at the same time as its morphological structure (principle of association). The choice of the principle of association is a way of presenting the relationship between the form and meaning of the constructed word involves, on the one hand, an accurate definition of the union of a constructed word and, on the other, the possibility of reciting a distinction between the form and the meaning that may appear in the observable data. The derivational base is not the word, but rather the lexical morpheme. It is still too clear that because MG is a morphological language, the lexical morpheme is accompanied on its right by the inflectional morpheme, whereas it is isolated in discourse.

The constructed word is the concatenation resulting from the application of a WFR of a morphological structure which does not necessarily coincide with the observable form and meaning of the word, nor necessarily identified. A word, in order to be considered constructed has to satisfy three conditions:

a) Each of the constituent elements of the morphological underlying structure belongs to a grammatical category and is related to its meaning in a reproduducible way.

b) The predictable meaning is compositional in relation to the underlying morphological structure.

c) Possible distortions have to be negotiated with specific regular mechanisms.

2.2. The Word Formation Rule

The WFR is the application of one of the means (for example a suffix) of morphological paradigm on to its base (e.g. a lexical morpheme belonging intrinsically to a grammatical category) and four components are included:

a) A structural operation that imposes a categorical relationship between the constructed word and its base, e.g. The derivational WFR constructing adjectives from nouns.

b) A semantic operation that constructs the basic meaning of all the words constructed by the relational WFR, e.g. the meaning of the adjectives resulting from the application of the above mentioned rule is "concerning the noun".

The distinction between the underlying structure and the surface structure, the form and the meaning of constructed words may be settled because the surface structure of a constructed word may derive from the application of rules that correct an underlying structure which cannot be presentable in the way it is. These distortions may be caused by the truncation of a segment or the presence of a class marker.

2.3. The meaning of constructed words

The semantic interpretation of a constructed word includes (i) the predictable meaning and (ii) the conventional meaning.

(i) The predictable meaning is not identical either to the definitions given by traditional lexicography—this is attested meanings—or to its paraphrase given by a native speaker, but rather it is a combination of three parameters: (a) the meaning which is constructed by the WFR and is shared by the CDP of the same WFR.

(b) The meaning that is specified by the morphological means used constructing adjectives from a noun base.

(c) The meaning inherited from the base and given to the constructed word.

(ii) The conventional meaning of the attested constructed words results from the adaptation of the predictable meaning to the extra-linguistic reality.

2.4. The lexical component

The lexical component concerns the "internal syntax" of constructed words, that is, it includes all the necessary operations so that the form, the morphological structures, their semantic interpretation as well as the principles that govern the combination of all these in the possible and attested constructed words of a language are interpreted. The lexical component is stratified into four (sub)components:

a) The base component. It includes (i) the base entry of each of which is accompanied by its properties (phonological representation, grammatical category, distinctive elements, etc. degree of inflex availability, etc.) and (ii) rules.

b) The derivational component. It includes a list of WFRs and it is them that the potentially constructed words of the language are produced each of which is accompanied by all its predictable properties. The WFRs are applied to base entries that belong to the major categories (unaffixable or non-constituents). The WFRs are complex operations that simultaneously construct: (a) the morphological structure and (b) the predictable meaning of constructed words. The products of the derivational component may appear in syntactic structures, except for those in which the rules of post-derivational component apply.

c) The post-derivational component. It includes operations that correct the forms produced according to the WFR and cannot appear in this way in the surface structure. These operations are mechanisms concerning form that can function in a recurrent way.

3 The acquisition of the conventional meaning of constructed words consists in 'disentangling', in this way limiting the possibilities offered by the WFRs.
and allow the transition from the predictable level to the observable level in case of distortion. These mechanisms are: (i) the rules of morphological iteration and (ii) the rules of case marking. With these mechanisms, the number of exceptions in the lexicon is reduced significantly.

(iii) The rules of iteration allow us to explain the absence of segments in the surface structure, the presence of which is predicted by a morphological structure in accordance with their interpretation, e.g. *'vino* 'wine', *'tirnon* 'temple', *'sotontek* 'noninformative'.

(iv) The class marker is a suffix-like ending without having any semantic role. Its task is to give to the word, where it is present, the nominal form as far as its grammatical category or its reference class are concerned and to allow us to explain the presence of suffix-like ending not necessary for semantic interpretation, in the surface structure. Cf. e.g. *'houri* 'heartless' and *'avonoto* 'groundless', products of the same WFR that are differentiated as far as the presence of the class marker -ονο is concerned. The class marker is not accidentally selected, but it is coped according to the copy principle from the suffix that bears the corresponding suffix, but not prefixed, adjective, e.g. *'paronos* 'international' where the class marker -ος is copied on the suffix -ονος of the noun *'national*. The copy principle concerns a surface process where the range of applications restricted to limit the selection of the ending segment. The constructed lexicon includes the products of the derivational component and the post-derivational component.

Finally (v) the conventional component. Its task is to interpret the conventional lexicon, that is the unpredictable sector of the conventional lexicon.

3. The Modern Greek Denominal Adjectival System

Herein, we will attempt to apply the theoretical framework presented above to four suffixes of the MG language. We will be presenting them in the following order: 1) -ονο, which is connected with materials/abstraction, 2) -ονος, which is connected with time. The third and the fourth suffixes, -ανονος and -ονος respectively, are connected with negative connotations.

3.1. The suffix -ονος

In order to determine the range of this suffix, we should emphasize the importance of the position of the stress in the word in MG. In this way, we can distinguish between the suffix -ονος (e.g. *'sotontek' made of stone', *'kastor' ('bricklayer'), and the segment -ονος (e.g. *'tirnon' (temple)).

In adjectives formed using the suffix -ονος, the noun base is, first of all, interpreted extensionally, e.g. *'tirnon' 'bridge made of stone'. But it can be interpreted intentionally, e.g. in *'sotontek' 'heart of stone'.

Let us, therefore, compare *'sotontek* 'bridge of stone' with *'sotontek* 'heart of stone'. The intentional interpretation of the noun base is considered to be derived from its extensional interpretation. If a bridge is made of stone, a human heart can not possibly be, apart from perhaps having one or more properties of stone, in this case the hardness of that material.

The selection of one or other interpretation of the noun base is realized in relation mainly to the modified noun. Consequently, the suffix -ονο allows both an intentional and an extensional interpretation of the noun base.

In an attempt to determine the type of base to which the suffix -ονος can be applied, we can ascertain that the noun base preferably denotes material, e.g. the nouns *'sotontek* 'stone', *'mepo* 'serviceable', *'mepono* 'brass', *'mepono* 'clay', etc. and therefore belongs to inanimate nouns. This particular suffix cannot be applied to a noun base which does not denote material. However, should the primary meaning of a noun be something other than material, the application of the suffix -ονος to that base produces the selection of properties which are connected still with the meaning of 'material', e.g. *'kastor* 'raw' (a zoological phenomenon), but in the combinations *'kastor* 'industrious', the word *'kastor* 'cass' functions as a noun which denotes material. Consequently the semantic relationship imposes restrictions on the selection of the noun base and of the modified noun.

We are certain that in the case of the extensional interpretation of the noun base, the adjectives are not modified in terms of degree *'sotontek* 'very stone'. Conversely, the adjectives are modified when the noun base has an intentional interpretation, e.g. *'sotontek* 'excellent'. Consequently, the semantic characteristics of the denominal adjectives are connected to their predictable meaning.

Finally, MG nouns always has a small number of adjectives which denote colour and which are formed with the suffix -ονος: *'aptenos* 'green', *'vithenos* 'yellow', *'elatos* 'red', etc. We consider that the noun bases of these adjectives (e.g. *'taskos* 'citron', *'sos* 'atritical grain') can take an intentional interpretation, since a feature which can be perceived by sight, i.e. the colour, is selected.

3.2. The suffix -ονος

From a semantic point of view, we can ascertain that approximately 85% of the corpus consists of bases which are temporal nouns. However it is necessary to differentiate between two levels: the referential level where the temporal axis is organized in calendar time, and the semantic level. The temporal noun of the corpus are divided into two groups according to either the characteristic of consecutiveness or that of non-consecutiveness of the occurrence of the referents of a claim. In the first group belong the nouns of axis used for measuring time, e.g. *'panos' 'year', *'mepo' 'month', *'diploidos' 'work', and in the second group their nominalities which include two sub-
groups a) the special denominations of the units e.g. Ἑπετήριον ‘Monday’, Ἑμιμήνιον ‘Tuesday’, Ἑπετήριον ‘January’, by the denominations of the internal structure of units e.g. τετεθείς ‘morning’, ἀρχαιοσκόλο ‘spring’. In the following diagram, we can observe that at the linguistic level, the periodicity of time is not of equal importance. To be more specific, the framework of the 24 hours has a great importance for mankind, because of the social use of time (Taylor 1989).

Apart from these temporal nouns, the base of an adjective with the suffix -στόριον can be chosen from the list of names of the important holidays or spiritual celebrations. For these reasons we consider these words to be temporal nouns, e.g. Παρασκευή ‘Thursday’, Πάσχα ‘Easter’, Χριστουγεννά ‘Christmas’, Χρυσοτίλικα ‘Golden Lilies’, αναρροά ‘summer rain’. Finally, one of the main sources of the terms of adjectives ending in -στόριον, only 6 do not have a clear semantic relationship with the meaning of time. These nouns are αὐθωκαίον ‘day’, ἀργωκάτος ‘calmness’, ὁμοσάλος ‘beauty’, περιστρατός ‘manner’, ἀποκρισίον ‘puzzled’, ἀναρροά ‘blessed’. We must first examine the meaning of the bases, since we can see a difference between the meaning of the two derived adjectives ἀποκριατικός and ἀποκριατικός with the same noun base but a different suffix. If we make use of the distinctions between expert categories and ‘folk’ categories (Taylor 1989: 72), we can assume that temporal nouns, such as ἀποκριατικός ‘winter’, ἀργωκάτος ‘day’, αὐθωκαίον ‘January’ have got the expert’s definitions, meaning definitions from physicists and which are derived as a result of their classifications of the basis of necessity and adequate conditions. However, these nouns have also got folk definitions as a result of folk categories which are created around the prototypical elements which are created by the way in which people comprehend things around them and influence them (Taylor 1989: 72).

In this way we can characterize the weather during the heliocentric days in January as being ‘spring’ weather, although we well know that we should talk about winter if we want to be specific. While, according to the expert definition the winter is the time of the year which begins on the first of December and lasts until the 28th/29th of February, according to the folk definition we can call winter any time of the year which is judged as being extremely cold. Consequently, the concept ‘winter’ is dependent on the knowledge we already have about the winter. This knowledge is the basis of the representation of the winter in our mind and explains why winter, according to the folk definition, may differ from the ‘winter’ of the expert definitions.

3.2.1. The Formation of the Adverb

We can ascertain that the adverbs ending in -στόριον are formed from the base of adjectives ending in -στόριον, whose base is a noun relating to time. Consequently, the derived adverb ‘inherit’ a time related meaning from the derived adjective. Therefore, even though we admit that ἀποκριατικός or ἀποκριατικός are time adjectives in utterances such as ἀποκριατικός ἔργον τῆς γυναικής or τῆς ἀρρενίας ἔργον τῆς γυναικής ‘On Monday he started complaining’, it cannot be accepted that the two utterances are synonyms. This difference in meaning between time adverbs of this type and the corresponding construction with the definite article + temporal noun is reproducible, e.g.

- Η καινούργιον κόσμον ξεκίνησε.
- Η καινούργιον κόσμον ξεκίνησε.
- Η καινούργιον κόσμον ξεκίνησε.
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From the above examples it becomes clear that, in my view, a) in each group the first two examples are at synonymous with each other, b) the third example is unanswerable. I believe that the speaker who selects such an adverb intends to imply along with the temporal determination of the whole utterance, his objection to the representation as to what happens stereotypically during the time period to which the adverb refers. The speaker also wishes to indicate his expectations which are not satisfied as far as the cultural knowledge and the beliefs he has about that particular time period are concerned. Consequently, when the speaker’s expectations are justified in the utterance, these adverbs have no place in the utterance.

3.3. The suffix -τέρμον

Between the noun base and the modified noun there is a relationship of belonging to and, more specifically, we perceive the referential class which is indicated by the modified noun in a stereotypic way within the field of associations which has the referent of the noun base, e.g. αὐτοματή ἀνάπτυξη, ‘an automatic process’, which characterizes boys, διάστημα διαπολίτης, ‘a time suited to girls’, e.g. pink in colour, nicely decorated, etc.

We observe that the features, which have a relationship with the social norm and which are taken on by the noun base, lead to the concept of stereotypy. More specifically, as far as the bases of the adjectives ending in -τέρμον are concerned, preference is shown for nouns which include in their intension the semantic feature [-animate], which orientates their reference towards the indication of persons or animals which are connected with certain types of behaviour, e.g. γενική ζωοτροφία, ‘general feeding’, γενική ζωοτροφία, ‘general feeding’, γενική ζωοτροφία, ‘general feeding’, γενική ζωοτροφία, ‘general feeding’, γενική ζωοτροφία, ‘general feeding’. The suffix -τέρμον selects as its base nouns whose referent symbolizes a type of human behaviour. Following on from all the above, it is easy to see that a proper noun, a noun relating to a person or a place can be selected as a noun base. The referent of a noun related to a human name which plays the role of the base of an adjective ending in -τέρμον does not concern the original referent, assuring the person himself, e.g. Ἰωάννης, although some features of this person are transferred to somebody else, e.g. Ἰωάννης ἰδιομορφευτικά, ‘ideomorphological characteristics of the person Σ is behaviour which has the specific characteristics of Ἰωάννης, such as being charming towards women, and suitable in love, etc. Of course, one presupposition both in the choice of a (human) name as a base and in the understanding of the meaning of the relevant derived adjective in that both speakers have the same knowledge of the world. Finally, certain place names can appear as symbols of certain features, e.g. πόλεις πολιτικούς, which refers to the mythical worth of V.I.P.s, and particularly of actors, who live in Hollywood.

Thanks to the adjective, the referential class which is indicated by the modified noun becomes a stereotype, since it shares certain features of the referent of the noun base, e.g. in contrast with the πόλεις πολιτικούς, ‘legal argument’, which is in accordance with legal science, the πόλεις πολιτικούς, ‘legal argument’, which is an argument which shares certain features with the former one, which are related to the behaviour of the person who uses them, in other words jurispr. in their arrogance and glorifying. These stereotypical features are associated with the social norm, and consequently also have a derogative meaning. The adjectives ending in -τέρμον, since they include a personal evaluation, appear in speech which is characterized by subjectivity and help to underline the ideological-cultural stance of the speaker and his derogative attitude towards the referent of the modified noun, rather than identifying that referent. Contained with the adjectives ending in -τέρμον, with a noun base [-human], a patron of the social norm is clearly projected which Modern Greeks have, regarding the general behaviour of a girl, a boy, a jurist, a philanthropist, a teacher, a priest, a greenhopper, a soldier, etc., meaning discriminations between the sexes and between various professions. The adjectives which end in -τέρμον are traces of the strong presence of the speaker in his speech, and that’s why they are not compatible with passages which demand objectivity, as in, for example, scientific texts. Conversely, they appear in the language of argument, e.g. in opposing political speech and in informal register. It is worth noting that the noun bases of an adjective ending in -τέρμον can be marked as for the register, e.g. μαθήτης ‘student’, but it can also be unmarked e.g. φιλολόγος, ‘philologist’, μαθητής ‘student’, διδάσκαλος ‘teacher’. Whatever meaning it has however, the application of the suffix -τέρμον to these nouns has, as a result, the addition of those characteristics which show the stereotypical views of the speaker in relation to the social norm of behaviour for the referent of the noun base and, therefore, the speaker’s evaluation of the referent of the noun base, and consequently his negative view of the modified noun.

3.4. The suffix -φασις

With the aim of determining which adjectives are constructed using the suffix -φασίσκος, we can apply the principle of associativity to the corpus. Based on this principle, we exclude the words μαθητής (‘student’), φίλος (‘friend’), φίλος (‘friend’), which do not constitute constructed words. Moreover the adjectives πολιτικός, ‘somebody with scruffy hair’, ἰδιομορφευτικός, ‘ideal person’ are not affixed words, since they are adjectives formed with the prefix πολιτεία (‘the noun base μαθήτης’), φίλος (‘a friend’), φίλος (‘friend’). The element -φασίσκος, which is applied on the right, is analyzed as a class marker which has the role of putting these adjectives into the referential class of adjectives which permanently give a negative frame to the modified noun which deviates from the norm in a way which becomes directly perceivable by the senses.

Another aspect of defining the range of this field is concerned with the relationship
between εὑρίσκω and ὕπαρκτω. In MG Grammar the suffix appears in allomorphs: variation, -εύρω and -ὑπάρκτω. This unification is probably based on etymology, since the late -εύρω led to -εύρω, which in turn led to -εύρω and -ὑπάρκτω, as in which the -ε literary vowel of the noun base was transposed in -εύρω, while it was the thematic vowel of the noun base.

Therefore the question is posed whether it is a suffix with two allomorphs or two different suffixes. The answer which will be suggested is supported by semantic criteria. With the first approach, two semantic categories can be distinguished: apart from adjectives ending in -ευρίσκω derived from nouns e.g. δεικτικός, δεικτικών (modern noun), (1) adjectives ending in -εύρω which at the surface structure appear as 'means denoting profession', e.g. ἀρχιερατικός, 'priestly', ἀρχιερατικός, 'archetypal', (2) adjectives ending in -ὑπάρκτω used to describe people e.g. ὑπάρκτως ἀρτον, ὑπάρκτως ἀποθετητής, 'sickly-looking person'. According to this classification, we could support that there are two suffixes in MG -εύρω and -ὑπάρκτω. However, none of the suffixes which describe people, and the suffix -ὑπάρκτω is not longer available for the formation of 'profession' nouns means. Furthermore, the case of the suffixes -ευρίσκω is interesting as it poses the problem of defining the limits of the morphemes, which is connected with the allomorphy but also with the origin of the morphemes, a topic which presents great interest for research.

Another problem relates to the grammatical category of the noun to which the suffix -ευρίσκω is applied. According to the descriptions up until now, the base belongs to the category (a) of the noun e.g. γιαγιά, γιαγιάς, 'grandmother', γιαγιάς, 'grandmother', (b) of the adjective e.g. in σουλτάνης, 'good and wise', σουλτάνης, 'white', (c) of the verb e.g. σεισμός, 'seizure' who cites, σεισμός, 'seizure'. In an attempt to apply the category of the base, we make the following proposal: the base of adjectives ending in -εύρω belong to the category of the noun. In fact the majority of derivatives ending in -ευρίσκω, fit onto the noun base without any problem. The derivatives from the third category can be deverbal nouns. As far as the grammatical category of words ending in -ὑπάρκτω is concerned, which always refer to people, and for that reason only have intransitive or passive forms, we suggest the following: derivative adjectives ending in -ὑπάρκτω, can be converted into nouns using the process of conversion. The suffix -ὑπάρκτω can then be applied to the noun form to produce the adjective, as follows: 

εὐρίσκω γιαγιάς, εὐρίσκω γιαγιάς, εὐρίσκω γιαγιάς, εὐρίσκω γιαγιάς

As far as the semantic analysis of these adjectives is concerned, the suffix -ευρίσκω forms adjectives which establish a permanent relationship between the noun base and the noun which modifies the adjective in -εύρω. The noun base is interpreted extensionally: ἀνέκδοτος ἀνέκδοτος ἀνέκδοτος ἀνέκδοτος 'a person who has never 'scanned'. If we examine, in particular, the noun base from a semantic point of view, we will see that it refers to (a) illnesses or symptoms of illnesses, human infections by their common names e.g. σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis' consumption', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', (b) to external imperfections on the body e.g. σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', (c) to one's character, which is expressed by behaviour which is considered socially unacceptable e.g. σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis', σαρκίτις 'sarcitis'. We believe that the negative connotation, or at least that which is below a socially acceptable norm, which accompanies the meaning of these forms follows the connection between the 'philosophies' ending in -ευρίσκω, and the adjectives ending in -εύρω, which characterize the professions mentioned. These professions lack social prestige and are considered to be at the lowest levels of the social hierarchy of professions, e.g. σουλτάνης, 'someone who has performing activities', σουλτάνης, 'good and wise', σουλτάνης, 'good and wise'. However, can an adjective ending in -ευρίσκω still have negative connotations even though its noun base does not? In this particular case, it is interesting to note the adjective σεισμός, 'a yellow person'. The base of this adjective in the noun σεισμός, 'yellow', which is derived from the adjective σεισμός, 'yellow', the referential meaning of which is not negative, e.g. σεισμός, 'yellow flower'. However, the word σεισμός when used to refer to a member of the white race implies a deviation from the healthy color as it characterizes a sick person, which means we can assume that the suffix -ευρίσκω selects the negative side of the color yellow in relation to the noun. Because of the negative connotations which are associated with words which are formed from the suffix -ευρίσκω, many nicknames and, consequently, surnames are formed from this particular suffix. Furthermore, if we examine the base of the adjectives ending in -ευρίσκω, from a lexicological point of view, we will find that (1) it belongs to [-learned] nouns, cf. γαμή 'consumption', in contrast with other; μεθύ αμαρτίαν 'villain', αμαρτία 'sins' in contrast with the medical terms αμαρτίαν 'disease', or that (2) in the case that there are doubts, the [-learned] type is selected, e.g. ἀκραίω, 'diagnosis' - ἀκραία 'begging'


4. Conclusion

As has been discussed in this contribution, the originality of the model consists of the following points: 1) Associativity, 2) Situativization, 3) Overgeneration, a model property according to which the derivational component generates all the constructed words of a language independently of whether these words are adopted or not. The application of the theoretical principles of the model has allowed us to explain:

A) How it is possible to have derived adjectives which consist of the same noun base but with different suffixes; each suffix takes different characteristics from the noun base.
B) Why some suffixes do not apply to some nouns; in order to apply a suffix to a noun base, there should be compatibility between them. C) Why all the adjectives which could be formed with a suffix are not mentioned (possible words).

A detailed description of the MG derivational system, which would be of special interest not only to theoretical linguistics but also to psycholinguistics, in applied and computational linguistics, is not available. The most important feature of this model is that it contributes to a better understanding of the word formation mechanism.

REFERENCES


From this point of view, there will be no reason to expect that word-formation will employ a unique "base" as in a derivational system. Rather, since there is no limit to the number of constraints that can apply simultaneously in OT, we expect that morphologically complex words could be calculated from multiple bases or "correspondents" by simultaneous application of multiple sets of OO-F constraints. Indeed, I will argue in this article that, in Italian, certain formations that superficially appear to be "de-participial" are in fact based on both the past participle and the infinitive simultaneously, as some of the data in (2) already indicate.

(2) Glass(tile) Infinitive Participles -ov Noun

- a. *adap* adapt-are adapt-at-o adapt-at-are (= partic.)
  b. *compress* compress-are compress-o compress-at-o (= partic.)
  c. *see* see-are see-o see-at-o
  d. *second* second-are second-o second-at-o
  e. *aggere* aggere-are aggere-o aggere-at-o

In (a), the agentive noun in -are, cognate to English -er, is transparently related to the participle as in the one in (b). The one in (c), however, has material from both the participle (the a) and the infinitive (the c). Similarly, the one in (d) has the s from the participle and the a from the infinitive, while the one in (e) is dissimilar from both infinitive and participle, and seems explainable only in terms of its correspondence with other -ov nouns, like the one in (b).

2. Metrically-conditioned syncope. Past participles in Italian exhibit the two types of outcome illustrated for the three different conjugations in (3).

(3) Infinitive Participles: non-synopased Participles: synopased

<table>
<thead>
<tr>
<th></th>
<th>-ere</th>
<th>associ-are, gener-are</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia.</td>
<td><em>cad</em></td>
<td>cad-at-o, cad-are</td>
</tr>
<tr>
<td>Ib.</td>
<td><em>vedere</em></td>
<td>vedere-at-o, vedere-are, <em>vedere-o</em></td>
</tr>
<tr>
<td>III</td>
<td><em>sculpendo</em></td>
<td><em>sculpendo-o</em></td>
</tr>
</tbody>
</table>

With rare exceptions, participles in conjugations I, III are formed by adding to the infinitival stem the sequence -Fs, where F is a stressed thematic vowel. This morpheme is then followed by gender number inflection (= MSCS). The same is true for the variant (v) of that conjugation, in which stress falls on the stem rather than the inflection, participles vary between the usual -Fs and two synopased outcomes -s- and -s-o. As argued in DiPaolo (1990), such synopases can be accounted for by terms of Metric Consonancy, a form of OO-F. By removing the final vowel and hence its associated stress, the main stress can fall on the stem, consistently with the infinitive, as

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1 Material closely related to the present work is presented in Buzio (1998b).

2 OO-F constraints have been argued to derive the effects of the phonological cycle, as well as some of the cases of "Non-derived Environment Blocking". See Buzio (1994a, and ref.).
The oscillation between syncope and no syncope in this case can be attributed to competition between the metrical and segmental OO-F. The non-syncope case, the affix -ab matches other suffixes in the lexicon, hence satisfying OO-F relative to those forms. By the same token, one could take the same to be true of -i or -e, which would then also satisfy OO-F. However, I take -ab to be the 'primary' allomorph, because more general, and hence the ranking in (4) to hold.

Hence the assumption is that it is more important to be faithful to the segmentation of -ab than to that of -i or -e. Now, although Italian allows antepenultimate stress, in hypothetical *made-er-e, stem stress under such circumstances is precluded by the conclusion. However, in (4) of 5, that outer affixes obey a higher-rank {OO-F than stems because they represent the 'head' of the word, determining its paradigm status, as also shown by English vowel shortening, as for instance in saw-i-e, where the stem falls prey to shortening, (compared above), but the affixes do not. I state this as in (5).

This can be contrasted as a case of 'positioned' footfulness, in the sense of Beckman (1996), i.e. a case in which the rank of faithfulness constraints is mapped by the type of 'position' they affect. Returning to (5), each sequence -ab is an affixed head referred to by (5), and hence relatively immune to re-stresssing. Given this, the oscillation of (13b) will now follow from taking metrical and segmental OO-F to be unassailed with respect to one-another, as in (5).

(9)

<table>
<thead>
<tr>
<th>VINC.</th>
<th>SYL.</th>
<th>METRICAL OD</th>
<th>SEGMENTAL OD-F</th>
<th>VINC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (W)</td>
<td>vinc-iti-o</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b.</td>
<td>vinc-il-o</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c.</td>
<td>vinc-i-o</td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>
| d. IV | vinc-i-o | | | *

In (9), 'SYL.' stands for all conditions on syllable structure, including those that exclude a complex code in Italian. Given the ranking indeterminacy expressed by the vertical dotted line, candidates (a) and (d) will be co-opted, while (b) will lose to (a) by the greater resilience of affixes rated in (3), and (c) will lose to (d) due to VINC. The choice between (a) and (d) will thus be made lexically (by INFLECTIVE FATHOMING), in this case in favor of the syncope candidate vinc, but in other cases in favor of the other candidate, as in vesel‰. The choice between syncope affixes -e and -o must also be viewed as lexical, in the event that it is not fully predictable, as shown by minimal pairs like assit-um-e versus assit-um-o ('assitated'), versus appor-um-e versus appor-um-o ('appormented'); pire-p ei-poi versus pire-p ei-po ('hand-aided'); versus smoo-um-sion-um-o ('smeared').

Note that the syncope affixes -a-e do not violate metrical OO-F despite their lack of stress compared with -ab. The reason is that metrical faithfulness is taken here to concern the association of stress with some segmental material, here the vowel u. Simultaneous disappearance of that vowel and its associated stress satisfies, rather than violates, metrical OO-F, while violating segmental OO-F. Note too that stem syncope must be prevented despite the ranking in (5) that would seem to favor it over affixed syncope. Intuitively, this must be to avoid unrecoverable distortions of the stem, as in hypothetical syncope *made-e, in place of either saw-i-o or saw-i-e. I put aside a formal account of this.

3. Syncope in derivatives. A number of formations from non-syncope participle exhibit the variation illustrated in the (b-e) pairs in (7). These formations involve the suffix -e of (2) above and suffixes -i-o, -i-e, -o-in, -o-in-e, all of which have transparent English cognates (-do, a variant of -do-eory).

(7) Derivatives from non-syncope participle:

<table>
<thead>
<tr>
<th>Verb</th>
<th>Infinitive</th>
<th>Participle</th>
<th>Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>dene</td>
<td><em>generate</em></td>
<td><em>generated</em></td>
<td>*generate-A-e</td>
</tr>
<tr>
<td>dene</td>
<td><em>denum</em></td>
<td><em>denum-e</em></td>
<td>*denum-T-e</td>
</tr>
<tr>
<td>dene</td>
<td><em>denum-e</em></td>
<td><em>denum-e-i-o</em></td>
<td>*denum-T-i-o</td>
</tr>
<tr>
<td>dene</td>
<td><em>edum-e</em></td>
<td><em>edum-e-i-o</em></td>
<td>*edum-S-e</td>
</tr>
<tr>
<td>dene</td>
<td><em>edum-e-i-o</em></td>
<td><em>edum-e-i-o-i-o</em></td>
<td>*edum-S-T-e</td>
</tr>
<tr>
<td>dene</td>
<td><em>educ-e</em></td>
<td><em>educ-e-i-o</em></td>
<td>*educ-S-e</td>
</tr>
<tr>
<td>dene</td>
<td><em>educ-e-i-o</em></td>
<td><em>educ-e-i-o-i-o</em></td>
<td>*educ-S-T-e</td>
</tr>
<tr>
<td>dene</td>
<td><em>educ-e-i-o-i-o</em></td>
<td><em>educ-e-i-o-i-o-i-o</em></td>
<td>*educ-S-T-i-o</td>
</tr>
<tr>
<td>dene</td>
<td><em>edu-i-o</em></td>
<td><em>edu-i-o-i-o</em></td>
<td>*edu-S-i-o</td>
</tr>
<tr>
<td>dene</td>
<td><em>edu-i-o-i-o</em></td>
<td><em>edu-i-o-i-o-i-o</em></td>
<td>*edu-S-T-i-o</td>
</tr>
</tbody>
</table>

All cases in the rightmost column in (7) utilize a participial affix, given in upper-case. However, the first member of each pair in (b-e) features a syncope affix despite the fact that the participle itself does not. This second case of syncope, unlike the first, now concerns all conjugations except the one in -e of (7a), which I put aside for the moment. Yet the earlier account will extend to these new cases as well, as can be seen in (8).

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In (8), for each type of faithfulness, metrical and segmental, again unranked with respect to one another, we rank the one for the outer affix, here -ore, above that of the other, here -agreed, in accordance with (5) above: Unlike participial affixes, neither -ore nor the other derivational suffixes in question have syncope replacements; a lexical matter. But the participial suffixes themselves are relevant here as well. With unstemmed -ore of (8b) excluded by the salability of outer affixes sanctioned by (5) above, and stress clashes excluded by unranked metrical constraints, the participial affix will have to be unstemmed, as is in any of (a), (c), (d), but excluding (b). Now the candidates in (a) will satisfy segmental OO-F to the primary participial allomorph -a, but violate metrical OO-F by featuring an unstressed -e. Note that -a is no longer under the scope of (5) here, since it is not the head of the word. In contrast, the syncope candidates in (c, d) will violate segmental OO-F, but satisfy metrical OO-F—the reason d'ore of all syncope replacements. Finally, candidates (c) will lose to (d) due to (iv), which excludes this kind of code in Italian. Hence candidates (a, d) will be co-optimal, and the alternations of (8a, e) will reduce to the use of (8b) above. The alternations in (7b, c, d) are rather similar. The syncope variant satisfies metrical OO-F as before, while the non-syncope variant satisfies segmental OO-F, though only with respect to participial suffix -a of the -ore conjugation: OO-F to -a of the -ore conjugation is in fact violated. Effectively this is the "anti-syncope" of Bresnan (1996), and the "lexical conservatism" of Stowell (1997), describable as the attraction by items within the same general paradigm. So, when forced to deviate from the form -a, the items in (7b, c, d) adopt the form -e, independently existing with the items in (7a), rather than creating a new unattested allomorph -a-e, which is thus avoided altogether in the language. This is in fact quite parallel to the borrowing of syncope affixes -a-e by the items in (7b, c, d). These affixes exist in participles only in the -ore conjugation, as we saw in (3) and are "imported" from that conjugation here. The various patterns of affinal consistency will be summarized in (13) below. The syncope occurring in the derivatives in (7) is thus to avoid re-stemming segmental material in the stem, and thus just like the syncope occurring in the participles in (3). The latter occurred only with -a-e verbs because only these have stressed infinitival stems. The sycope of the derivatives is more general because all conjunctions have stressed participial stems. The only conjunction that is altogether immune to syncope is the first, in -e. Its immunity to segmental allomorphy is more general, however, as shown by the comparisons in (9).

<table>
<thead>
<tr>
<th>(8)</th>
<th>agreed-it</th>
<th>-ore</th>
<th>YRL</th>
<th>-ere</th>
<th>agreed-it</th>
<th>-ore</th>
<th>agreed-it</th>
<th>-ore</th>
<th>agreed-it</th>
<th>-ore</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. (s)</td>
<td>agreed-it</td>
<td>-ore</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td>agreed-it</td>
<td>-ore</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td>agreed-it</td>
<td>-ore</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. (s)</td>
<td>agreed-it</td>
<td>-ore</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in (9), conjunctions II, III, and IV each exhibit segmental alternations of various sorts beside syncope, specifically palatalizations and diphthongizations, while conjunction I does not, each stem maintaining an invariant form. To account for this (and similar resistance to allomorphy by this conjunction in other Romance languages), it seems necessary to single out this conjunction in terms of a higher-ranked (segmental) OO-F, a fact attributed in Bresnan (1997) to the much larger size of this conjunction compared with the others.

4. Sycope revealed. Participial derivatives can deviate from their participial bases not only in being syncope but still maintain their, as shown in (7) above, but also in the opposite way, as shown in (10).

<table>
<thead>
<tr>
<th>(10) Glass incompatible</th>
<th>Infinitive</th>
<th>Participles</th>
<th>Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. través</td>
<td>través-er</td>
<td>través-T-o</td>
<td>través-Z-ate</td>
</tr>
<tr>
<td>b. add</td>
<td>aggrin-ar</td>
<td>aggrin-T-o</td>
<td>aggrin-Z-ate</td>
</tr>
<tr>
<td>c. dispere</td>
<td>dispere-er</td>
<td>dispere-S-o</td>
<td>dispere-S-ate</td>
</tr>
<tr>
<td>d. le</td>
<td>pled-er</td>
<td>pled-S-o</td>
<td>pled-IZ-ate</td>
</tr>
</tbody>
</table>

In (10), the first member of each pair of derivatives maintains the segment of its participle, which is syncope. This is putting aside the assimilation that affects i before i in some, yielding d' (orth. d). The second member, however, does maintain that segment, retaining instead a non-syncope participial affix -a-e ("d'-a-"). Therefore, in participle-derivative pairs, syncope gives rise to four patterns, by being present in either participle or derivative, neither one, or both. The variation in (10) can again be reduced to the familiar tension between metrical and segmental faithfulness, as shown.
Let us now turn to the segmental material inserted in cases like (11c), given in uppercase. The sequence -er is clearly the participial suffix of other cases, indigenous to the third conjugation, but adopted in its uninflected variant by other conjugations as well, thus limiting metrical allomorphy to -er, -er, and avoiding uninflected -as as needed. (Recall that uninflected -as becomes possible when further derivational affixes follow, thus denoting it from brahAth.). The overall distributive pattern of participial affixes is as reconstructed in (13).

<table>
<thead>
<tr>
<th>(11)</th>
<th>Metrical OOF</th>
<th>Segmental OOF</th>
</tr>
</thead>
<tbody>
<tr>
<td>vin-</td>
<td>-er</td>
<td>*</td>
</tr>
<tr>
<td>vint-</td>
<td>-er</td>
<td>*</td>
</tr>
<tr>
<td>vint-</td>
<td>-ore</td>
<td>*</td>
</tr>
</tbody>
</table>

Candidate (b) in (11) is excluded for the same reasons as the one in (8) above: outermost affixes do not re-appear, as mandated by (5) above. Candidate (c) violates metrical OOF to the particle by dis-stressing the stem (no stress-clashes), while candidate (d) satisfies metrical OOF thanks to the inserted syllable, which, however, causes a violation of segmental OOF. Hence candidates (a, c) are co-opted as in previous cases and the choice is made again lexically, whereas the variation in (10). I turn to the nature of the inserted material thereby. The diagram in (12) recapitulates the inflexional particle and participial-derivative relations we have so far seen.

(12) Infinitives

| spodiose | possideo |
| aggredere | posside |
| possideo | aggredere |

Participants

| baterro | vimineo |
| baterro | vire |
| vimineo | vimine |

Derivatives

| spodiose | possideo |
| aggredere | posside |
| possideo | aggredere |

In (12), the infinitives in the lower box are in -ere, and their participles bifurcate at point A into syn-copated and not. The infinitives in the upper box are from other conjugations, and their participles do not syn-copate, as we saw. In going from non-syn-copated participles (upper box) to their derivatives, there is a bifurcation at point B, into -erano - syn-copated and not. Similarly, in going from syn-copated participles to their derivatives, there is also a bifurcation into syn-copated and not, at point C. I have argued that the three bifurcations in (12) are all of the same nature: the upper branch maintains the segment of the stem, while the lower one avoids re-stressing the stem.

In (13), the -ere conjugation has syn-copated participles like into and opprere, which give syn-copated derivatives like inere and opprere by segmental futurity. The other two conjugations only have non-syn-copated participles but these can still give syn-copated derivatives by metrical futurity. When the segment of these cases breaks away from that of their participle, it falls in with the affinal segment -er, -er, -er, -er, that independently exists, as indicated by the downward arrows. At the same time, other derivatives from -ere participles are segmentally consistent with those participles rather than being syn-copated, yielding affinal segment -er-er, -er-er, -er-er, etc. As indicated by the upward arrows in (13), these segments are utilized by derivatives of participles in -er from the -ere and -ere conjugations, as an alternative to the syn-copates, thus altogether avoiding uninflected -as. Derivatives of syn-copated participles like into, whose segment breaks away from the participle the metrical reason, also find this independently available segment more realistic, whereas vocare, etc. Hence affinal correspondence/futurity is pervasive; whenever affinal material is driven into allomorphy, reassertion is had to independently existing patterns, even if this crosses boundaries between the conjugations, otherwise segmented systems by definition.

This leaves us with the e. of vocare, -ore, present in the derivative in (13a) despite its absence in the participle. The source for it is obviously the infinitive vocare, revealing that both participle and infinitive simultaneously serve as bases for the derivatives.
Similar considerations hold for (18b) recce-an-4eरे (pl. -13), and (18c) per-D-tö-
none. Although the participle is the primary base, when the derivative stems from
participial segmentation under compulsion from metrical OO-F, the infinitival
segmentation comes in as next best, revealing the multiple correspondence.

Links with the infinitive are revealed as well by cases like (14).

<table>
<thead>
<tr>
<th>(14)</th>
<th>Gloss (Inf)</th>
<th>Infinitive</th>
<th>Participle</th>
<th>Derivatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>arend</td>
<td>arend-erэ</td>
<td>arend-s-o</td>
<td>arend-s-o</td>
</tr>
<tr>
<td>b.</td>
<td>iprote</td>
<td>iprote-erэ</td>
<td>iprote-s-i</td>
<td>iprote-s-i</td>
</tr>
<tr>
<td>c.</td>
<td>apperweed</td>
<td>apperweed-erэ</td>
<td>apperweed-s-o</td>
<td>apperweed-s-o</td>
</tr>
<tr>
<td>d.</td>
<td>defmted</td>
<td>defmted-erэ</td>
<td>defmted-s-o</td>
<td>defmted-s-o</td>
</tr>
</tbody>
</table>

In (14), the s of the infinitive is lost in the participle, but is present again in the
derivatives. This effect can be interpreted as follows. The stress of the participle is lost in
the derivatives due to the loss of strong clashes. However, the heavy syllables of the
derivatives (in upper-case) make it possible to maintain some prosodic prominence
despite the lack of stress, and thus better satisfy some kind of prosodic OO-F to the
participle. This of course is in the expense of segmental OO-F. The question now is why
is the s lost in the participle in the first place. The answer is that (as argued in Berioz,
1994a) morphological operations in general give rise to ‘emergence of the unmarked’
effects, as has been shown for subphrasing in McCarty and Prince (1994). Wherever
OO-F is lower-ranked than IO-F, as would seem to be the case here, derived words
(calculated by OOF) will feature relatively less marked structures than unmarked ones
(calculated by IO-F), another case in point being English vowel length, which falls prey
to marklessness only in inflected environments, e.g. vorean’s domesii (see Berioz,
1994a). Hence, in the formation of the participles in (14), the closed syllable turns into a
less marked open one, a change that does not affect the preservation of stress, since-
Italian allows stress on open syllables. However, in the formation of the derivative,
participial stress is lost, and prosodic prominence can only be maintained by making the
syllable heavy again. The point is that, when extra material is needed, it is the
infinitive, rather than some general suppletion process that supplies it, both in (11) and
in (14), revealing the double correspondence of the derivatives, with both the participle
and the infinitive.

In sum, derivatives whose participle base is synocopated vary between maximizing
the synocopated form of the participle and invoking the syncope by inserting extra
material. Such variation reduces to the usual tensions between metrical and segmental
OO-F, resolved lexically. The nature of the material inserted reveals a cross-
derivational relationship to other derivatives, and a trans-derivational relationship to the
infinitive.

5. Conclusion. Participial morphology in Italian varies between a non-synocopated
stressed form -IO and two synocopated forms -s, -i. The pattern of variation reveals a
complex network of rules among lexical items which defines both traditional work
based on segmental derivations, as well as work that utilizes OO-F within OT more
conservatively than in the present work, by attributing to morphologically complex
words unique bases. What the above evidence suggests is that words can in principle
influence each other’s sound structures whenever they are independently similar in
content and regardless of whether the similarity concerns stem or affixes. The question
that this raises, important but beyond the scope of this article, is of course how to
determine from principle the weight that each relation holds (i.e. the rank of OO-F that
it imposes) in the calculation of sound structure.

Beside the relations discussed above, other similar ones appear to exist as well. One
is a relation between participles and preverbs. Like the participles, preverbs of the verbs
vary between synocopated and not, though they only syncope in-s, as in recce-an-erэ-
re-cce-‘be-wait 1-nm’, versus non-syncope-
ning-erzę-vend-4eo-vend-4eo-‘the-still 1-fap’. As
with the participle, syncope in the preverb maintains the stem stress of the infinitive, and
is thus amenable to the familiar analysis. Interestingly, while the variation in the preverb
is in itself unpredictable, like that of the participle, the correlation within participle
preverb pairs is near-perfect, as shown in (15), revealing OO-F at work within such
pairs.

<table>
<thead>
<tr>
<th>(15)</th>
<th>Gloss (inf)</th>
<th>Infinitive</th>
<th>Participle</th>
<th>Preverb</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>hide</td>
<td>nascend-erэ</td>
<td>nascend-T-o</td>
<td>nascend-S-i</td>
</tr>
<tr>
<td>b.</td>
<td>selle</td>
<td>vend-erэ</td>
<td>vend-di-o</td>
<td>vend-di-t</td>
</tr>
<tr>
<td>c.</td>
<td>write</td>
<td>scrie-erэ</td>
<td>scrie-T-s</td>
<td>scrie-S-i</td>
</tr>
<tr>
<td>d.</td>
<td>recerwe</td>
<td>ricer-erэ</td>
<td>ricer-s-o</td>
<td>ricer-O-I</td>
</tr>
<tr>
<td>e.</td>
<td>length</td>
<td>nel-erэ</td>
<td>nel-s-o</td>
<td>nel-S-I</td>
</tr>
<tr>
<td>f.</td>
<td>joke</td>
<td>oll-erэ</td>
<td>oll-s-0</td>
<td>oll-0-I</td>
</tr>
<tr>
<td>g.</td>
<td>put</td>
<td>mett-erэ</td>
<td>mett-S-o</td>
<td>mett-S-I</td>
</tr>
<tr>
<td>h.</td>
<td>heat</td>
<td>bat-t-erэ</td>
<td>bat-t-o</td>
<td>bat-t-I</td>
</tr>
<tr>
<td>i.</td>
<td>undance</td>
<td>dusci-erэ</td>
<td>dusci-S-o</td>
<td>dusci-S-I</td>
</tr>
<tr>
<td>j.</td>
<td>repeat</td>
<td>ripet-erэ</td>
<td>ripet-di-o</td>
<td>ripet-di-I</td>
</tr>
</tbody>
</table>

In (1), similarly with other verbs based on food-erэ ‘fear’, the derivative is
segmentally, rather than prosodically, faithful to the participle.
f. oppestr oppestr-er oppestr-s-oppestr-s-iv
f. pens pens-er pens-s-o pens-o-s-i

Another relation appears to exist among derivatives of the same participle. We have seen that derivatives from non-syncope particles may or may not syncope. However, if one does, all do, as shown by the contrast in (16).

(16) Glassify

a. send send-er send-s-end send-er-s-ire
b. aggress aggress-s-ere aggress-s-ire aggress-s-s-ire

Furthermore, we have seen that syncope varies between -s- and -o-, rather unpredictably. However, the choice is completely consistent across derivatives of the same participle, as shown by (17) and (16).

(17) Glassify

a. adhere adhere-s-ere adhere-s-ere-s-ire
b. assert assert-s-ere assert-s-ere-s-ire assert-s-s-ire

These facts reveal the presence of OOF across derivatives. The overall network of lexical links thus identified is summarized in (18).

(18) Network of correspondences:

a. Derivatives of the same participle are cross-linked: (16), (17)
b. They are linked to both participle and infinitive: (10), (11), (14)
c. Participle and pronoun of the same verb are cross-linked: (15)
d. Derivatives of different verbs are cross-linked: (12).

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ALLOMORPHY IN PolyLex

Abstract
The PolyLex project aims to produce a hierarchical multilingual lexicon for Dutch, English and German, in which information common to more than one language is inherited from a shared component. The PolyLex work done to date has concentrated on the morphology and morphophotology of these three languages. In this paper we present the morphological framework used in PolyLex, with examples of the ways in which allomorphic varieties are handled.

1. Introduction
Our general approach to inflectional morphology is within the tradition that treats pseudomes (inflectional classes, declensions, conjugations, etc.) as analytically central rather than episemantically or of secondary status.1 The central notion is the lemma, not the word or the morpheme. Words exist, but only as realizations of (morphological) representations of lemmas - hence Stump's use of the term "realization" to characterize this tradition. Morphemes also exist, but only as second-class citizens. The appearance of a morpheme is just one among several ways that morphological information gets expressed in the realization of a lemma as a word (cf. Wourd 1990: 60-69). And we share Zwyk's view that "all realization rules are treated as expressing defaults; which are automatically overridden by more specific rules (and these in turn by still more specific rules, and so on)." (1985: 372).

As regards current work, our approach is closely related to Corbett & Prince's Network Morphology2 and the most recent version of Stump's Paradigm Function Morphology (forthcoming). In our approach, unlike those of Stump and Corbett et al., abstract inflectional rules are typically sketched in terms of phonological units most commonly the syllable and the segment (as in Callih 1996a, 1996b, 1992) Gibson and his collaborators in the ILEX (Integrated Lexicon with EXEpiphon).

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2 For more information see: [URL].
3 For a comprehensive overview of Word 1990, 2000, see [URL].
4 For details see [URL].
5 For more information see [URL].

The PolyLex project at Bielefeld4 have pioneered the use of default inheritance hierarchies for the representation of lexical phonology and morphophotology. Our work is thus also indebted to theirs.

2. The DATR language
The PolyLex lexicons are implemented in the lexical knowledge representation language DATR (Evans & Gonder 1996).5 DATR is a rather spartan first-order language for defining inheritance networks with path-value equations. The development of DATR was guided by a number of concerns which we summarize here. The objective was to design a language which (i) has an explicit theory of inflection, (ii) has an explicit declarative semantics, (iii) can be readily and efficiently implemented, (iv) has the necessary expressive power to encode the lexical information presupposed by work in the unification grammar tradition, and (v) can express all the evident generalizations and subgeneralizations about such centers.

In keeping with its intendedly minimalist character, it lacks many of the constructs embedded either in general purpose AI knowledge representation languages or in contemporary grammar formalisms. The language is nonetheless sufficiently expressive to represent completely the structure of lexical information at a variety of domains of language description.

It should be stressed that DATR itself is no more a very general language for lexical description and therefore does not commit or restrict itself using to any particular linguistic framework, theory or formalism, nor is it restricted to the class of natural languages that it can be used to describe. Clearly, it is well suited to lexical frameworks that embrace or are consistent with inheritance and non-monotonicity through networks of nodes, but these are not requirements. DATR can be (and has been) used to implement differing theoretical approaches (including ILEX, HP5, Word Grammar, ITAG, Finite State Morphology, Network Morphology, Paradigm Function Morphology), and it perhaps best thought of as a programming language which can be used to implement and test linguistic theories. Indeed, it would not be entirely misleading to think of DATR as a kind of assembly language for constructing (or reconstituting) higher level theories of lexical representation. Unlike most other formal languages proposed for lexical knowledge representation, DATR is also not restricted to the domain of linguistic description in which it can sensibly be applied. It is designed to be equally applicable in phonological, orthographic, morphological, syntactic and semantic domains of description. But it is not intended to replace existing approaches to those domains. DATR cannot be (usefully) made without a prior decision as to the theoretical frameworks in which the description is to be conducted; there is thus no "default framework" for describing, say, morphological facts in DATR.

In DATR, information is organized as a network of nodes, where a node is essentially just a collection of related information. In the context of lexical descriptions, a node might correspond to a phoneme, a syllable, a morpheme, a word, a lemma, etc., or a class of such items. For example, for German, we might have

4 See also [URL].
5 See also [URL].
a node describing an abstract word, a node for the class of nouns, a node for the subclass of nouns that mark plural with a, a node for the particular noun lemma Khale (Cibeh) and still more for the individual words that are instances of the lemma Khale, Kalla. Each node has associated with it a set of equations that define partial functions from paths to values where paths and values are both sequences of atoms (which are primitive objects). Atoms in paths are sometimes referred to as attributes. The syntax and terminology of DATR, like its name and its minimalist philosophy, owes more than a little to that of the unification grammar language PATR (Shieber 1986).

3. Phonology

Our interest in phonology in the Polynesian project is restricted to those aspects of phonological structure that are relevant to the description of inflection in the languages considered. Those aspects include syllable structure, but do not include any structure above the level of the syllable, such as metrical structure.

We also restrict ourselves to a segmental representation of the phonology. Our phonological segment inventory is taken from CUEK (Raymer et al., 1995) and is used in the LAMPA machine-readable phonetic alphabet (Wells, 1987). As one of us has shown in earlier work (Cahill, 1993), the step from representing structures with segmtes to representing the same structures with full-fledged sets at each point in the tree is relatively simple. We have not taken that step here because it would not add anything to most of the present analysis but it would make our DATR code much harder to read. However, a formal encoding would permit a more elegant treatment of phonological alternations such as final consonant devoicing and morphophonological alternations such as vowel lengthening and umlaut.

As in Cahill (1993b) and Bleicher (1992), we define syllabic structures by means of simple context-free phrase structure rules:

```
syllabic => onul rhyme

rhyme => peak code

code => body tail

syllabic => syllabic syllable
```

A syllable consists of an onset and a rhyme; a rhyme consists of a peak and a code; and a code consists of a body and a tail. A syllable consists of two syllables, and a syllabic of three. We can express these in DATR as follows:

```
Syllables:

<phon $yll rhyme> => "<phon $yll onset>" "<phon $yll rhyme>
```

The tail of a code is its final segment and the body consists of any remaining segments in the code. This simplifies reference to final consonants of roots.

We have simplified and restructured the DATR code from the actual Polynesian languages whatever this has looked likely to obscure the readability of the sets at issue. We have also added some proofs for the monosyllabic roots which would be required to document every case of such word entries.

```
<phon $yll rhyme> => "<phon $yll peak>" "<phon $yll code>
<phon $yll code> => "<phon $yll body>" "<phon $yll tail>
<phon root> => "<phon xy>
<phon root> <= Null.

处置able:

< => Syllable

<phon root> <= "<phon xy>" "<phon xy>

<phon root> <= "<phon xy>" "<phon xy>" "<phon xy>
```

This rule schema makes crucial use of a variable $yll that ranges over attributes (xy1, xy2, ...) that denote syllable positions. Note also that the maximally unspecified path (<>) at the Syllable node is defined by reference to Null which always returns the empty sequence as its value. An <onset>, <peak> or <code> which is left undefined at lower levels of the hierarchy will, as a consequence, end up as null.

The definitions of di and triyllables number the syllables from the right. This is a language-specific aspect of our analysis and reflects the fact that Dutch, English and German morphology all primarily involve suffixation. Reference to final syllables is thus more frequent than reference to the initial syllables and it is technically convenient to have a constant identifier (xy1 here) for final syllables.

Given this set of axioms for syllabic structure, we can now use them to help define particular concrete (pol) syllables. Here, for example, it is a possible definition for the monosyllabic -> suffix, realized phonologically as /xy/:

```
Sufflexes:

< => Syllable

<phon xy> => "<phon xy>" "<phon xy>
```

Likewise, a disyllabic word root such as the German Toter can be specified in terms of the individual components of its two syllables:

```
Toter:

< => Root_1

<phon root form> => "Disyllable

<phon $yll onset> => x

<phon $yll peak> => y

<phon $yll onset> => x

<phon $yll peak> => y
```

Default information for a lexeme such like this comes from the declensional class node, in this case, Root_1.
From these side definitions, taken together with the axioms for syllable structure given above, we can now infer that:

\[ \text{Suffix:} \]
\[ \text{\textit{phn root form}} = \phi s. \]

\[ \text{Vowel:} \]
\[ \text{\textit{phn root form}} = t u: + 5 r. \]

4. The representation of allomorphy

Within this framework, there are two principal methods for representing allomorphy: (i) the use of path extensions on the left hand side of equations and (ii) the use of conditional statements on the right hand side of equations. These two methods can also be combined. In discovering the applicability of these two approaches, we make a distinction between the variant and inherent properties of a class of lexeme nouns, for example, have gender as an inherent morphosyntactic property while case and number are variant morphosyntactic properties. The variants or inferences of a property are relative to the class of lexemes involved, thus adjectives, for example, have gender as a variant property, not an inherent one.

4.1. Path extensions

When querying the form of a word, a query path is invoked that is partly composed of attributes representing the particular values of the variant morphosyntactic properties of the lexeme involved. So, to find the form of the genitive singular of a noun, for instance, the query path would be \texttt{word sing gen}. The morphological word is defined, by default, as a root followed by a (possibly null) suffix. The word node, from which all word class nodes and ultimately all words inherit by default, thus appears as follows:

\[ \text{Word:} \]
\[ \text{\texttt{word} = \text{\textit{phn root form}} \text{\text{\texttt{-}}\text{\textit{sufffix}}}.} \]

Given this definition, the query path \texttt{\texttt{word} sing gen} leads to the phonological form query \texttt{\textit{phn root form}} having the variant morphosyntactic attributes appended, as the query path for the root is \texttt{\textit{phn root form} sing gen}. This allows us to define realizations which are contingent on variant morphosyntactic properties by specifying the relevant attributes in appropriate path equations as follows:

\[ \text{Noun:} \]
\[ \text{\texttt{\texttt{phn syll peak prefix}} = \text{\texttt{Lengthen(\texttt{\textit{phn syll peak}})}}.} \]

\[ \text{Note that we are making the distinction with respect to classes of lexeme, not individual lexemes. There is a case in which the noun \textit{buren} means \textit{inviolable} plural, but that sense is not in the point here.} \]

which says that if the feature \texttt{plur} is present in the query path then the peak is realized by application of the \texttt{Lengthen} function.

Several examples of this kind of allomorphy can be found in the three Polish languages. In one class of Dutch nouns the stem vowel in the plural form is always /e/, regardless of what vowel the singular form has, e.g. \textit{stol/stoelen, lid/lidén}. This is captured in Polish in the following manner:

\[ \text{Noun:} \]
\[ \text{\texttt{\text{\texttt{phn syll peak prefix}} = e}.} \]

English nouns which have a final vowel alternation, such as \textit{wife/wives, roses/roses}, can be accounted for in a similar way, the realization of their final coda being dependent on whether the form is singular:

\[ \text{Noun:} \]
\[ \text{\texttt{\texttt{phn syll coda sing} = \text{\texttt{Device(\texttt{\texttt{phn syll coda}})}}}.} \]

This is just a restricted application of final consonant devoicing, something which applies more generally in German and Dutch.

German unumlaut is the classic example of this type of alternation, and is interesting in the present context because of the fact that the relevant morphosyntactic property differs in nouns and verbs. In German nouns which belong to one of the declension classes which undergoes unumlaut, the unumlaut function applies only in the plural forms:

\[ \text{Noun:} \]
\[ \text{\texttt{\texttt{phn syll peak prefix}} = \text{\texttt{Umlaut(\texttt{\texttt{phn syll peak}})}}}. \]

However, in one class of verbs, the (relevant) vowel undergoes umlaut in past tense forms:

\[ \text{Verb:} \]
\[ \text{\texttt{\texttt{phn syll peak past}} = \text{\texttt{Umlaut(\texttt{\texttt{phn syll peak}})}}}. \]

All three languages exhibit this type of allomorphic variation in their numeral forms, with variation between, for example, \textit{two/twoes}, \textit{ten/tenes}. In our account of the numerals expressions (Cahill & Gardiner, 1996) we capture this alternation by the use of morphosyntactic features to indicate the \texttt{zero} and \texttt{ty} forms of the numerals. Thus, the form of a numeral combined with either \texttt{zero} or \texttt{ty} is marked with an attribute bound that encodes a variant morphosyntactic property of morphemes (free/bound). Given this attribute, the variation in forms can be stated as follows:
4.2 Conditional statements
The use of path extensions is the natural way to deal with allomorphic variation that is conditioned by syntactically determined properties of the unit involved. But it cannot be used for inherent properties of the unit since such properties will not be represented in the attributes that specify the inflected form. In such cases a different approach is required.

The approach adopted in PolyLex employs one of the most common idioms of modern programming languages, the if . . . then . . . else . . . construct. In DATR, this construct takes the following form:

```
IF <condition> THEN <value1> ELSE <value2>
```

where the condition is asserted as some boolean combination of atomic truth-valued statements and value1 and value2 are phonological units (segments, for example). The atomic statements may involve predicates, such as /n/ /n/ /n/, /n/ /n/ and /n/ /n/ applied to arguments denoting phonological, morphological, or lexical units.

The condition can thus refer to any lexical information available, not just phonological. So, for instance, the realization of a phonological constituent may be determined by phonological aspects of the root or suffix, syntactic gender of the root or even semantic properties of the root (e.g., animacy in Raising noun inflection).

One of the major noun classes in Dutch suffixes is /n/ in the plural. The phonological realization of this is dependent on whether the root ends in a syllable or not, taking the form /n/ if it ends in a syllable and /n/ otherwise. This suffix node is defined in PolyLex as follows:

```
Suffix 3:
<- = Affix
```

```
<phn syll tail> = a
<phn syll peak> = IF:<GILIAM:<Root:<phn syll tail>>
THEN #
ELSE Null>
```

German has an identical suffix, with identical variants. English also has an -e suffix, but because of the absence of final consonant devoicing in English, it also has a voicing contrast. This therefore requires two conditional statements: one for the peak which is identical to that for Dutch and one for the tail, stating that if the root final consonant is either voiced or a syllable then the tail of the suffix is /e/ and otherwise it is /a/.

```
Suffix 2:
<-> = Affix
<phn syll peak> = IF:<GILIAM:<Root:<phn syll tail>>
THEN #
ELSE Null>
<phn syll tail> = IF:<GILIAM:<Root:<phn syll tail>>
THEN #
ELSE #>
```

German has two noun classes which suffix -e, one with umlaut and the other without. We include in these classes nouns which do not inflect in their plural (or which only umlaut the peak), where this is phonologically determined. The phonological requirement in these cases is that the final syllable must have a schwa peak. So the root Affix has the singular and plural form /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:/ /a:...
There are not many examples of this kind in the PolyLex lexicon, but one notable one is the German singular negative suffix which only appears on masculine and neuter nouns. We can encode this fact as follows:

```
<phn_syl_peak> ~ a.
```

The rhyme of this suffix is a, if the syntactic gender of the noun is feminine and otherwise it is inherited from the Suffix S node, which as we have seen above, incorporates an additional phonological condition.

Conclusions

We have described the principal ways of representing allomorphic variation within the PolyLex lexicon. Alternations which are dependent solely on variant properties of the unit in question are captured with path extensions. Alternations which are dependent solely on inherent properties of the unit in question are captured with conditionals. These conditional statements may refer to any lexically available inherent information. In the case of the PolyLex languages, this information includes morphosyntactic information (noun gender) but mostly involves phonological information about the root. When this alternation involves both variant and inherent properties of the units involved, then it is necessary to combine the use of path extensions with the use of conditionals. We have illustrated these methods with examples drawn from the PolyLex lexicon(s) for Dutch, English and German.

References

COVERT GENERALIZATION

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In a context where allophones [A] and [B] merge to [A], what is the underlying representation of non-alternating [A]?1

[1] Underyling: \( /\mathrm{A}/ \) /\( /\mathrm{B}/ \)

Output: [A]

Analytical change shows that it is analyzed as [A]. The evidence is that when a neutralization process [B] = [A] is lost, non-alternating outputs of the form [A] remain unchanged (Kiparsky 1968, 1973). This preference for "face value" analyses is predicted by several theories, including Natural Phonology (Stump 1972/1980), Natural Generative Grammar (Neeemann 1973; Hooper 1976), Lexical Phonology and Morphology (Kiparsky 1982), and Optimality Theory (Prince & Smolensky 1993).

But analytical change also provides evidence that this is not the whole story. The face-value analysis can be overridden by positive evidence for a deeper underlying form. I shall argue that the correct generalization is as follows:

   b. Of several equally optimal lexical representations, the one closest to the output is preferred.

By [2a], non-alternating [A] is analyzed as underlying [B] rather than as [A] when [B] conforms better to constraints on lexical representations, such as those relating to the phonological inventory, phonetics, or the structure of particular classes of morphemes. Case [2b] is then only the tie-breaker.

This view is actually a consequence of Lexical Phonology and Morphology (LPM), and is in fact more compatible with Natural Phonology. On the other hand, it seems inseparable from Vendramin's and Hooper's NUG. And if Prince and Smolensky are right that the form of lexical representations is derivative of constraints on the output (Richards of the NUG, Lexicon Optimization), then lexical constraints could never choose [B] as the preferred underlying form of an output that is always overtly realized as [A]. In that version of OT, case [2a] cannot be distinct from case [2b].

I will present evidence which indicates that case [2a] is not reducible to case [2b], and supports a version of OT phonology where lexical and postlexical phonology constitute

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1 Thanks particularly to an anonymous reviewer, Wayne Riedweg, who long ago suggested, as a corollary of the analysis of Latin morphology in Riedweg 1974, that non-alternating forms could be a case of irreversible alternation. Thanks are also due to Edward Haiman, Andrew Garrett, Bruce Hayes, and clinical readings for critical discussion.
separate, serially related constraints systems. Such a theory allows properties of lexical representations to be determined by phonological and morphological constraints at the lexical level, not just derivatively by constraints on output forms.

(2a) implies that lexical constraints can (indeed, covert analyses of surface [IA] as [IB], which may be overtly manifested in morphological change. Latin morphology provides a

Conclusive evidence of the synchronic productivity of rhythm is the fact that it applies to words newly introduced into Latin after the historical change had already taken place. These include lexicons (6a-6b), and new ε-stems resulting from reinterpretation (6b-6b).

[3] a. noster "father"
b. noster "nother"
c. dino "loose"
d. dino "loose

b. post "oath, utterance"
c. post "utterance"

In Latin, intervocalic -s becomes r, a process known as RHOMATISMS (for the sound change, see e.g. Lassman 1965:140). Synchronically, rhythm applies only in derived forms. Morpheme internal truncation occurs both in native words such as [5] and in lexicons such as [6].

[4] a. hānasvah "harm (broad)"
b. hānasvah "harm (broad)", Akkadian shānu "harm", Hebrew sānu "harm".

Synchronically, rhythm is productive. It functions as a rule of Latin morphophonology accounting for r-vowel alternations at morpheme edges in both derivational and inflectional morphology.

[5] a. festus, -œtes "joyful", festus, -œtes "lustral"
b. sātus, -œtus "sattus"
c. mātus, -œtus "matte, matted"
d. ēmātus, -œtus "matte, matted"

In classical Latin, this productive change affects primarily masculine and feminine dyssyllabic and polysyllabic nouns, including undervowed nouns, such as [6] and derived nouns such as [6b], including about 60 nouns in -s and forms in -st.

[6] a. adiēs > adīes "day" b. pātīes > pātīes "pawter"

d. eōs > ēōs "oos"

e. oree > ooren "oore"
Most neuter neuter remain s.


Adjectives fall into two classes. Adjectives derived from nouns (compound the halon Респубий type) have the alternation in all three genders (see 10a), while other adjectives remain s.

[10a] a. ‘corpore’ > *corporis’ > *corporis’ (m., f., and n.)
   b. *corpore > *corpere > ‘corpere’ (m., f., and n.)
   c. *corpore > *corpere > *corpere (m., f., and n.)
   d. *corpore > *corpere > *corpere (m., f., and n.)
   e. *corpore > *corpere > *corpere (m., f., and n.)

Moneyables remain a.

[11] fles (m.) ‘fles’, mites (m.) ‘venoms’, mistis (m.) ‘venoms’, sitis (m.) ‘thirst’, sitis (t.) ‘power’, mites (m.) ‘mules’

Since monosyllable continuation takes place in Latin also (see [5]), the pative nominalities of neuter > nominative would not be a simplification of the grammar. Moreover, some words that have the nominative singular keep the s-alternation in derivative stems.

[12] a. urbis > urbem ‘wooded’, urbem ‘the city’
   b. honor > honor > *honorable
   c. urbem > urbem > urbem

b. ‘corpore’ > *corpere > ‘corpere’ (m., f., and n.)

These data somewhat undermine the credibility of an analysis according to which s-stems are alternated as 1-stems, e.g. Honore > Honore. Such a restructuring would entail complementing monosyllable rotation the halon Republic type) by a further constraint on or constraint on the alternation (12). Signification adds a further constraint to the ease of the grammar because it must be prevented from applying when the base ends in a ‘fle’ (e.g. ‘fleas’). Thus a further requirement is the inalienability of the alternation. Other data for the inalienability of the alternation would be required, possibly having to do with the status of the nominative-singular in the case paradigms (see Hooper 1979).

An adequate historical account of the Latin change should not only address this point, but also the following questions:

[13] a. Why does the analogy not apply in some neuter nouns?
   b. Why does the analogy apply in some neuter adjectives but not in others?
   c. Why does the analogy not apply in monosyllabic nouns (Kuryłowicz 1977:14)?
   d. Why does the analogy not apply in verbs and prepositions? For example, why not *sensae for sensa?* (for that matter *sogn for sogn*? Why not *dis-sed the for dis-sed the* ‘sane’, on the analogy of *dis-sed the* ‘sane’, or *dis-sed the* by the converse analogy?
   e. Honore > honor eliminates the s-alternation but in turn introduces an s-alternation into the paradigm (Kuryłowicz 1977, Hale, Kluéck, and Reiss 1999). Then in what sense can it be characterized as a leveling?
   f. Why not instead *Honore* > *Honore* = *X* = *Honore* (Kuryłowicz 1977:14), or indeed *X* = *Honore* = *X* = *Honore*?

For an answer, let us take a closer look at the third declension, to which the s-stems belong:

[14] *circle* ‘city’, *city* ‘city’, *manner* ‘manner’, *spare* ‘spare’

The third declension includes several classes of stems which were morphologically distinct in Indo-European, including α-stems and γ-stems, which contrast in genitive plurals, cf. [15a] and [15b].

   b. *pares* ‘paris’
   c. *parentem* ‘parents’
   d. *simplex* ‘simple’, *simplicius* ‘simplest’
   e. *iudex* ‘iudex’

The Nom. Sg. ending -s is reduced to -s in polysyllables, and with some exceptions, as in the case of *simplex*. This Nominative-s-deletion process applies to -l-s and -l-s but not to -l-s. The stems that undergo it will be referred to as LONG STems.

[16] a. *Autos-potential corpus in control* vs. *petrificus ‘able’
   b. *Amateus* ‘little’ vs. *matreus ‘nate’
   c. *Atleticus* ‘little’ vs. *Atleticus ‘nate’

The analysis proposed here considerably simplifies the distribution of these endings.
c.  *mera* & *meru* ‘mound’ (gen. pl. *meru*)
   *meru* & *meru* ‘mount’ (gen. pl. *meru*)

   *teksu* & *teksu* ‘root’ (gen. pl. *teksu*)

   *tambar* & *tambar* ‘inner’ (gen. pl. *tambar*)

   *trikiru* & *trikiru* ‘shower’ (gen. pl. *trikiru*)

   Short-C stems, where deletion does not apply, show that there are two nominative
   singular allomorphs *ta=vi* and *ta=vi*; contrast (17a) and (17b).

   [17]

      <Nom.Sg. Gen.Pl.>
      
      b.  *kewal* & *kewal* ‘help’, pl. ‘means’

   Long-C stems also provide evidence for the distinction between the allomorphs *la=vi*
   and *la=vi*; contrast (18a) and (18b).

   [18]

      <Nom.Sg. Gen.Pl.>
      

   Similarly the icros* *kuru* ‘ant’ (k) vs. *kuru *=kuran* ‘antique’. Generally, *kuru* is
   more frequent in feminine as it is the accusative ending *’oru*, which I take as underlying
   *kuru*; e.g., *kutam* ‘flower’ *(kuru*) in feminine or adjectives, *kuru* is regular.

   [19] 

   3.  The *la=vi* & *la=vi* variation is part of a larger pattern of allomorhism. Other
   functional categories that begin with consonants have developed an allomorph in *la=vi*;
   which is favored after -C stems, where it eventually replaces the consonantal allomorph
   completely. In UII stems, vocalic inflection replaces consonantal inflection, and in Romance
   stems, parythesia replace imperatives. Thus *Dor.Ash. dubu* = *du* (see 21a)
   and 2.3.Sg. *la=vi* & *la=vi* is parallel to Nom.Sg. *la=vi* & *la=vi* (see 21b).

   [21] 


   b.  *teksu* & *tikiru* ‘shower’ (Nom.Sg. Gen.Pl.)

   I will assume a lexical phonology with the constraints in (24) and (25). \(^7\)

   7.  These in long -a suffix patterns with -C stems, e.g., *maru* vs. *maru* = *maru*
   ‘give’, optimal prosody.

   Please note that these constraints represent a very preliminary analysis, and are
   greatly simplified by LPM.
[24] Cyclic phonology:
  a. *V·V (the constraint that drives chiasm)
  b. *CODA: A syllable must lack a codas.
  c. OVERLAP: A syllable must not overlap.

[25] Word-level phonology:
  a. STEM-FORM: A stem must contain at least a two-mora foot (not counting a stem-final C, which is not metric).
  b. *VVR(L): A word cannot end in a long vowel followed by -il- (Dominates by STEM-FORM, hence no shortening in *stem*(itself).)
  c. *N-OVERLAP: A syllable cannot be a constituent of a rhyme.
  d. *END-IND: * is deleted in the final syllable of nominative singular forms. (Probably not a single constraint but a complex of constraints. Synchronically, it has to be restricted to nominative because of endings like gen.sg.-is, historically -es.)

As mentioned, the variation constraint *V·V* is virtually unimportant. *CODA* and *OVERLAP*, of course, are less often seen in action in Latin because they are dominated by Full-stress constraints. Their role in allomorphy selection is thus a case of the emergence of the marked in the sense of McCarthy and Prince.

Tables [26] and [27] show the analysis of Nom. Sing. -a /-a/ in long stems. Syllable-driven allomorphy selection in the cyclic lexical system yields *stem* /-a/ (see [26]), and the word-level constraints reduce *stem* /-a/ to *stem* (see [27]).

<table>
<thead>
<tr>
<th>Cyclic</th>
<th>Candidates</th>
<th><em>CODA</em></th>
<th>OVERLAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>*VVR(L)</td>
<td><em>V·V</em></td>
<td>*</td>
<td>*</td>
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<tr>
<td>forms /-a/</td>
<td>forms /-a/</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>stems /-a/</td>
<td>stems /-a/</td>
<td>*</td>
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</tbody>
</table>

In some words. In particular, for the phonological constraint to be decisive in the cyclic or word-level phonology, it must be that it is determined by the presence of an appropriate Full-stress constraint. In the initial analysis systems the cyclic and word-level systems are not compatible, including essentially the same candidates, and the non-cyclic systems the cyclic and word-level systems are not compatible, including essentially the same candidates, and the non-cyclic systems the cyclic and word-level systems are not compatible, including essentially the same candidates.

[26] Words Candidates | STEM-FORM | *VVR(L) | *N-OVERLAP |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>bon[a]-is /-a/</td>
<td>stem /-a/</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>stem /-a/</td>
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<tr>
<td>stem /-a/</td>
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<td>*</td>
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</tbody>
</table>

[27] Words Candidates | STEM-FORM | *VVR(L) | *N-OVERLAP |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>hon[a]-is /-a/</td>
<td>stem /-a/</td>
<td>*</td>
<td>*</td>
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<tr>
<td>stem /-a/</td>
<td>*</td>
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<tr>
<td>stem /-a/</td>
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</table>

We have seen that the Nom. Sing. -a /-a/ spreads through the third declension over a long period. On the surface, this spread results in diverse changes, or no change, according to what the regular phonology of Latin dictates.

[28] Cyclic | Candidates | *VVR(L) | *N-OVERLAP |
<table>
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<tr>
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<tbody>
<tr>
<td>bon[a]-is /-a/</td>
<td>stem /-a/</td>
<td>*</td>
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<tr>
<td>stem /-a/</td>
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[29] Word-level constraints take *N-OVERLAP* to *stem* (see [29]).

<table>
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<tbody>
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<td>bon[a]-is /-a/</td>
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<tr>
<td>stem /-a/</td>
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</table>

We have seen that the Nom. Sing. -a /-a/ spreads through the third declension over a long period. On the surface, this spread results in diverse changes, or no change, according to what the regular phonology of Latin dictates.

[31] Words Candidates | STEM-FORM | *VVR(L) | *N-OVERLAP |
<table>
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<tbody>
<tr>
<td>bon[a]-is /-a/</td>
<td>stem /-a/</td>
<td>*</td>
<td>*</td>
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<tr>
<td>stem /-a/</td>
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<tr>
<td>stem /-a/</td>
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</table>

The questions posed in [13] are now also answered.

Re [13]: the reason the analogy does not apply is non-noun nominae is that nominae do not
have a Nom/Acc. Sg. ending, as shown by the absence of a's even in those stems where an underlying /d/ would have to surface.

(I) many 'add' ('near'), lac 'milk' ('claric, zigal'), cipar 'head' ('copez). Because nouns have no Nom/Sg. or, there is no occasion to regularize /k/>/l/ or /d/, and hence no diminution.

Re (13b): noun s-stems address get analogical Nom.Sg. or in those morphological classes which are infected with an overt Nom.Sg. ending, and nouns stem-final -s (as noun stems do) in those morphological classes which are infected without an overt Nom.Sg. ending. In particular, noun adjustives of the form X-Nom compounds of the hukawa/l type get Nom/Acc.Sg. -s which is synchronically /k/ by our hypothesis (see 32a). Otherwise, noun adjustives have no Nom/Acc.Sg. ending, like noun nouns (see 32b).


b. *koci (m.f.), koci (m.) 'short' (cf. mor 'six').

Therefore, those adjectives in /k/ which are hukawa/l compounds, lead out through to all those genders, whereas those adjectives in /k/ which do not belong to this class adopt the majority pattern. Adjectives formed with the comparative suffix -or, -ur and plus belong to this type.

21. a. *koci? koci 'koci' 'three-toothed' (m., f., and n.)

b. *koci? koci 'koci' 'three-toothed' (m., f., and n.).

c. *koci? koci 'koci' 'three-toothed' (m., f., and n.).

Re (13b): monotonic verbs enable Nom.Sg. -s because a covert generalization of the vocalic ending /d/ is ruled out. For a reflexion doesn't apply in short stems. Consequently, *gills does not use "gills" the way long-Sg. becomes "bears," in the analogical informed "gills" a short-stem, thus its "s" is not subject to deletion, and the expected analogical output, instead, is "gills".

In fact, *gills /gills/ is actually attested in late Latin (Adj. P. Diez). Thus, the real counterpart to the analogical spread of rhymes in the nominative singular long stems (bears > bears) in the analogical spread of the root ending is the analogical singular of short stems (gills > gills), analogically to cases like mind > minds etc. see [21a] and [21b]. But the root generalization of /d/ has a more drastic effect on the output forms than its covert counterpart, for it not only replaces the stem-final consonant but also adds a syllable. Because the short stems provide the lexical with clear overt evidence than the long stems, they change most slowly, with the potential characteristic for the silent cases of an innovation (Nero 1971).

In post-Colonial Latin, the declensional classes tended to merge, many stems that remained the -s, s-alteration in the classical language leveled out.

20. "The adjectives that agree most happily with verbs, like (en) 'add' 'near', 'koci' 'three-toothed', 'five-toothed', 'seven-toothed', 'eight-toothed', 'nine-toothed', 'ten-toothed'.

21. "The word(s) "gills" was introduced, because the verb 'gill' contains the term, although in Latin there is no evidence of its existence in Genesis 6:5.

22. "In "gills" the /gills/ was introduced, because the adjective "gills" contains the term, although in Latin there is no evidence of its existence in Genesis 6:5.

23. "In "gills" the /gills/ was introduced, because the adjective "gills" contains the term, although in Latin there is no evidence of its existence in Genesis 6:5.

24. "In "gills" the /gills/ was introduced, because the adjective "gills" contains the term, although in Latin there is no evidence of its existence in Genesis 6:5.

25. "In "gills" the /gills/ was introduced, because the adjective "gills" contains the term, although in Latin there is no evidence of its existence in Genesis 6:5.

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PARADIGMATIC FACTORS IN THE IRRADATION OF ALLOMORPHY: THE REANALYSIS OF THE LATIN TYPE MANUALS IN ITALIAN

Abstract

Latin derivatives in -sist-, -stiv-, -stitus, -stitius show a -s- between root and suffix of the root in a fourth declension noun: see thus have manually from the fourth declension noun manus, but floridly from the second declension noun florus. Italian inherited a list of these Latin bases and derivatives, but not the various declension classes. Since the distribution of -s- thus became opaque, Tekačić 1980 hypothesizes that this allomorph variation also became unproductive, a conjecture incompatible with the existence of quite a number of analogues with -s- in Italian. A closer examination of the data shows that most neologisms are due either to local analogies based on existing derivatives with the same suffix or to the influence of co-derivatives, i.e. existing derivatives with the same root but a different suffix. In these cases, however, it is only the allomorphy that is determined by the co-derivative, while from a morpho-semantic perspective the derivatives follow the series of woulds with the same suffix.

1. Introduction

It is quite frequent, at least in the more familiar European languages, that an affix seems to be joined to a base not directly but through some intervening „intermezzi“. In English, e.g., though the adjectival suffix -al is generally attached directly to the base noun, as in organizational, in other derivatives one may observe an intervening element such as -cr- (e.g. criminal) or -st- (e.g. fastidious). Such elements have received quite a number of different treatments in the literature, the main points of discordance being their morphemic vs. phonemic status, their proper segmentation and brachiating, their function, and, tightly linked to these different concepts, terminology. There seems to be more agreement about how such elements arise: at Mikkeli 1958 has shown, they may be relics of earlier or foreign morphological systems or the result of mandarin or contamination.

Once such elements occur in at least one word of a language, one may often observe that they spread to other words of that language, and it is this process of

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1 The most important contributions to these topics are the following: Mikkeli 1958, Tekačić 1968, Aronoff 1976: 98-114, Szmytke 1983, and Desaulier / Merlini 1994: 529-557.
imitation that will be at the center of the present investigation. In the few occasions when Mackie touches the problem of the imitation of such elements, he invariably resorts to analogy as the underlying mechanism, a view that is also explicitly endorsed by Latané Carr et al. 1972 and Bickel 1993: 206 (with respect to the linking elements of German compound). Arnett 1926: 112, on the other hand, describes English words such as the one cited above in terms of "rules of allomorphy", i.e. rules that introduce an empty morpheme in the context of two other morphemes. More recently, Boas 1985 has drawn our attention to the fact that the choice of such elements may also be determined paradigmatically: that the -fast- of the Dutch ethnic adjective Amerikaner Amerikaner 'American' is taken from the intransitive form Amerikaner, inhabitant of America', following a general rule of Dutch according to which ethnic adjectives are formed by joining -ant to the corresponding intransitive name. In the following analysis of the fate of the Latin type manually in Italian we will see that both analogical models, i.e. existing words or groups of words with the same suffix, and co-derivatives, i.e. words with the same suffix but a different suffix, may play a role in the imitations of our elements.

2. The Latin type manually:

The conditions underlying the appearance of -us- in Latin derivatives are well-known and quite straightforward. It was applied, roughly, after bases of the fourth declension and before the suffixes -ally, -ary (indefinite ending), -aris, and -anism. There are only about twenty base nouns that do not contain the fourth declension, as well as some sporadic examples of suffixes different from the ones just mentioned, but on the whole the pattern was quite regular and productive.

The nouns of the Latin fourth declension may be grouped into three groups: action nouns, "status nouns" of the type consulatus, consulerant, and a heterogeneous residual group. As table 1, based on Graintzen 1984 and George 1914, shows, action nouns were by far the largest group and produced the greatest number of derivatives with -us-. The 20 status nouns interestingly did not give rise to any derivative with -us-, while more than half of the residual group did so.

<table>
<thead>
<tr>
<th>morph. category</th>
<th>action nouns</th>
<th>status nouns</th>
<th>other nouns</th>
</tr>
</thead>
<tbody>
<tr>
<td>example</td>
<td>80</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>total number</td>
<td>285</td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>derivatives with -us-</td>
<td>72</td>
<td>0</td>
<td>35</td>
</tr>
</tbody>
</table>

Table 1

3 A more extensive version of the present analysis will appear in Italian in the proceedings of the annual meeting of the Società di Linguistica Italiana held in Padua in September 1977.

4 Latané also speaks of "-u-stems", since the nouns of this declension have a -u- after the root in all cases: nom. sg. manus 'hand', gen. sg. manus, nom. pl. manus, etc. (-us) always stands for a long vowel). The -us- thus appears before the case endings and the four suffixes -ally, -ary, -anism, and -anism, but not normally before other derivational suffixes.

Though, as we have seen, the presence of -us- in Latan is conditioned by the declension classes of the base noun and the presence of one of the four suffixes mentioned above, it is interesting to note that there was also a strong co-variation between the appearance of -us- and the presence of a root final -n or -n', due to the fact that the root of all action nouns of the fourth declension ended in -n or -n' and that the residual group was largely due to etymological extension from the action noun group based on semantic, but also formal similarity (as in the classic example of montanum, montanurus, from montes: > "mountain", which is held to have been formed on the model of almost synonymous substrates, from asperi, -aspori).

3. Stratigraphic analysis of 152 Italian derivatives with -us-:

As shown in table 2, many Latin derivatives with -us- were borrowed into Italian over the centuries. This stock of intrinsics was then extended during the modern times by a number of gallicisms and anglicisms, many of which were not borrowed from Latin but formed by speakers or writers of French or English. And last but not least, there is a considerable number of derivatives, from the very beginning of the Italian language up to the present moment, which must be classified as "neologisms", i.e. formations on an independent Italian basis.

<table>
<thead>
<tr>
<th>century</th>
<th>latimns</th>
<th>gallicisms</th>
<th>anglicisms</th>
<th>neologisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>XIII</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>XIV</td>
<td>32</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>XV</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>XVI</td>
<td>16</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>XVII</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>XVIII</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>XIX</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>XX</td>
<td>5</td>
<td>4</td>
<td>30</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2

It is this last group that is of particular interest to us concerns. How can there be Italian neologisms with -us-, one may wonder, when one of the essential conditioning factors in Latin, the fourth declension, has disappeared in that language? And, in fact, Tavani 1980: §§ 1015.3 and 1040.4, the only diachronic model that addresses the problem, holds that the choice of -us- has become opaque and hence unproductive in...
Italian due to the disappearance of the fourth declension. But this view is clearly at odds with the results displayed in table 2. We will thus have to investigate which factors determined the appearance of -io in Italian neologisms.

4. Iracliation from analogical models

We have already seen that in Latin there has been, to a large extent, a co-variance between the third declension and the presence of i as root final i or, less frequently, -io. A first reasonable guess might then be that Italians simply validated this phonological one, continuing with the morphological one. A first crude statistic indeed, seems to corroborate this suspicion. 60% of the Italian bases have a 3rd and 25% of them have the final vowel, while only 7% have a consonant different from i or io in the same position. One might then be tempted to formulate an Italianian "rule of allomorphy" of the type: insert io before the suffixes -ale, -are, -aro, and -ato if the base ends in io or i0.

<table>
<thead>
<tr>
<th>Suffix</th>
<th>3 loan words</th>
<th>2 neologisms</th>
<th>2 loan words</th>
<th>4 neologisms</th>
<th>5 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td>Italian XVI</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XX</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian III</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian IV</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian V</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian VI</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian VII</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian VIII</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian IX</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian X</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XI</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XII</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XIII</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XIV</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XV</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XVI</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
<tr>
<td>Italian XVII</td>
<td>3 loan words</td>
<td>2 neologisms</td>
<td>2 loan words</td>
<td>4 neologisms</td>
<td>5 or more</td>
</tr>
</tbody>
</table>

A closer inspection of the data however reveals that such a solution would be too simplistic. Let us look, e.g., at the behaviour of Italian bases ending in -ato before the suffixes -ale and -are, as displayed in table 3. Our rule of allomorphy would predict that they should all uniformly have a -io, at least all the neologisms. But this is manifestly not the case. We may observe, on the contrary, that the presence of -io is dependent on the suffix, while most neologisms in -ate have a -o; these in -are overwhelmingly do not show this insert. One would thus at least have to modify the rule of allomorphy in the following way: insert i0 before the suffix -ale if the base ends in -ato or -ato.

But even this restricted version turns out to be too powerful, as the data in table 4 show. In fact, all the roots of table 4 end in -ato and should thus show -io according to our revised version of the rule of allomorphy. Though this is the case for the large majority of the neologisms, closer scrutiny reveals that the presence of -io seems to be determined not just by the root-final consonant but by the phonetic form of the root starting from the stressed vowel. Thus, while the bases in -ato consistently take the -io after the model of xenoxia, those where -ato is preceded by a vowel different from i seem to avoid the insert. We must thus conclude that the presence of -io in Italian neologisms is not determined by some general rule of allomorphy, but obeys a host of very particular generalizations taking in consideration the suffix and the phonetic material of the root from the stressed vowel onwards. The irradiation of -io, in other words, is mainly to be accounted for by local analogy.

<table>
<thead>
<tr>
<th>Xate</th>
<th>Xatato</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 loan words</td>
<td>2 neologisms</td>
</tr>
<tr>
<td>ato</td>
<td>xenoxia</td>
</tr>
<tr>
<td>ato</td>
<td>xenoxia</td>
</tr>
<tr>
<td>ato</td>
<td>xenoxia</td>
</tr>
<tr>
<td>ato</td>
<td>xenoxia</td>
</tr>
<tr>
<td>ato</td>
<td>xenoxia</td>
</tr>
</tbody>
</table>

Table 3

Table 4

* The counter-examples to this generalization have a special explanation, which however need not concern us here.

* The first column of table 4 shows the vowel immediately preceding root final -ato.
5. Irremoval from co-derivatives

Some neologisms try to involve -as to the fact that some co-derivatives, i.e. a derivative with the same stem but a different suffix, also has one. The arguments for the need of this additional mechanism are subtle and not always conclusively, but on the whole it would seem to me that the need for such an additional device is indispensable.

A first kind of argument is based on lexicographic practice. Italian lexicographers sometimes felt the need to justify the presence of -as in certain derivatives, and in these commentaries they also resort to derivations from co-derivatives. By explaining the non-formation into improve (i.e. intellectual) as a derogatory variant of intellettuale, Migliorati 1983, for example, seeks to establish a direct relationship between these co-derivatives. Other lexicographers are more explicit. GDLZ, e.g., notes with respect to CE: Gadda’s intellettuale puansini ‘to gain in precision’ derived from puansino ‘intellettuale’ as ‘to improve’ (as in: improve). And in the Notizie Italiane (Roma: Città) seminario ‘seminario’ is said to be derived from arace ‘arazzio’. An explanation of this historical perspective, since etymology is a loose-translation of other French or English lexicons, where the -as is already present, but it is nonetheless interesting as an imitation of a native speaker.

The Italian lexicographers quoted in the last paragraph seem to have had in mind a kind of double derivation for words like puansino or seminario, while from a morpho-

semantical point of view they are said to derive from their bases puansino and -as, respectively, according to the general model of verbs in -are and adjectives in -are, their allomorphy is attributed to the influence of the co-derivatives puansino and seminario. In other words, we would have here cases of paradigmatically determined allomorphy in the sense of Boas (1947).

This is not, however, the only possible interpretation. Scholars often in this idea of double derivation might want to argue that these Italian words are directly derived from their co-derivatives, both semantically and formally. And, indeed, one can also find some common points in their direction in Italian dictionaries. For example, puansino, e.g., is an absolute synonym of puansino, GDLZ writes: ‘Deriva da puansino, con cambio di suff.’ (Derives from puansino, with suffix change). This could also point to the fact that affix-substitution is a relatively common process both in inflection and in word formation. It has been argued, e.g., that analogical leveling of the type Old French je clame ‘I cry out’, nous clamons, we cry out’, jamonice ‘I love’ becomes: we love’ in Modern French je clame / nous clamons, / ‘jamon / nous aimons should be analyzed as based on affix-substitutions of the type X:je / ‘sje and xe: X:je / xe: X:ne.

And Polimeni-Wisser 1981: 214-5 has pointed to an interesting case in the derivational system of Mexican Spanish, where the inflection of allomorphic -c, which is inserted between bases of a certain poetic shape and the suffix, from diminutives in -to to augmentatives in -are can be shown to be due to the fact that -on and -arc are in a productive anacronymic relationship in that variety of Spanish, which allows speakers to form a corresponding derivative in -on to almost any derivative in -are. In the same fashion, one might be tempted to derive puansino from puansino by substituting -are to -as, and similarly in the other cases.

Though I agree that affix-substitution is much more widespread than is generally believed, I do not think that it is the right solution for our Italian cases, at least not for the major-
derivative /latest, /virtual/, even though one cannot totally exclude the possibility that its shape might be the result of a formal analogy to the couple site-place, /smear,, to locate/. The case where the irradiation of the -ae- in a co_derivative is most obvious, however, is in the long series of morphological derivatives from area, area, contrary to what we observe in English morphology and similar terms in other European languages. Italian *areolasia* shows a -ae- which must have irradiated from the co-derivative *areolae* (since there is no other Italian derivative in -ae- that might have served as an analogical model. The same behavior, by the way, may be observed in most other neologisms on the basis of *area, *areolasia, *areolalmia, *areolomorphia, *areolomorphism, etc. What distinguishes the -ae-case from the others is that the irradiation of -ae- goes even beyond the limits of the four suffixes -are, -area, -area, and -ae. It seems that Italian speakers have extracted a new allomorph *area- from *areolae which is more applicable before all suffixes beginning with a back vowel.9

The different behavior of Italian and other European languages with respect to the irradiation of the -ae- inside the suffix-families suggests that it is not possible to formulate sufficient conditions under which such paradigmatic irradiation of allomorph takes place. The same conclusion is also prompted by opposing *area, *areolasia, *areolalmia, *areolomorphia, *areolomorphism* to *areolae, *areolae, *areolae, *areolae, *areolae, *areolae, *areolae, *areolae*, where no irradiation of -ae- may be observed under comparable circumstances. In the case of one can do, it seems, it is formulate necessary conditions for this kind of paradigmatic irradiation, but as in analogical leveling, some kind of higher-order paradigmatic organization of morphological categories seems to be a precondition for paradigmatic irradiation to take place. In the case of one ae, there is an implicit paradigmatic network in the sense that the 125 Italian derivatives with -ae- are not distributed randomly, but overall about ninety Italian nouns and four suffixes.

6. Conclusion

This study of the irradiation of -ae- in Italian has shown that it cannot be totally accounted for by analogy alone. As we have seen, allomorphy may also spread from co-derivatives. Since we have argued against an afix-substitution account of the Italian facts, we have to conclude that the creation of a new morph is, if the word is integrated into a certain type of paradigmatic network, follow two models at the same time, one for the morphosyntactic role and one for the allomorphy.9

---

9 The limitation to back vowels is necessary in the light of the existence of *area*, and similar derivatives.

10 Things are even more complicated, since other Italian neologisms with -ae- can only be explained as "virtual instances": Italian writers and speakers in several cases seem to have inserted -ae- only because they have been aware of the fact that the base noun originated from a Latin root, so that derivations from such nouns are supposed to have a -ae-. Still another, marginal, source for -ae- not treated here is contamination.

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Stem Allomorphs or Suffix Allomorphs?

This paper examines Italian derivatives with the suffix -ale, -ero, -ero, and -are which display /e/ or /a/ between the stem and the suffix. These derivatives are not generated by categorical rules. Rather, they conform to schemata of the sort of those discovered by Bybee & Slobin (1982). The bases of derivatives with /e/ conform to a source-oriented, phonologically and partially morphologically defined schema, which establishes a prototypical for the insertion of /e/ bases ending in CVC. Bases which insert /a/ can be accounted for with similar schemata, but a subset of the derivatives which display /e/ between stem and suffix, those in -ale, can be described also as the result of a morphophonological or realignment rule inserting /e/ between certain zero-final suffixes and stem.

6. Introduction

This paper addresses the question of allomorphy in Italian. There is a set of Italian lexically distinct suffixes, -ale, -ero, and -are, which sometimes appear preceded by orthographic distinctives el or on, which can be realized phonologically as high vowels ([e] or glide [e]) (cf. (1a)). Following my own usage, I will consider these segments glide. Examples of words showing the alternation under discussion are given in (1b). At first sight it seems that the glides appear unpredictably in contexts (1b)-(d) which are virtually identical from the segmental point of view to the ones in which no glide appears (1b). Our task is then to discover conditions that govern the appearance vs. absence of the glides in derivatives of this kind.

(1) Prehistorical overview of the data

(a) Suffixes

-ale el/ale

-ero er/ero

-are ar/ar

(b) Examples of derivatives

<table>
<thead>
<tr>
<th>stem</th>
<th>suffix</th>
</tr>
</thead>
<tbody>
<tr>
<td>etro</td>
<td>-ero</td>
</tr>
<tr>
<td>atro</td>
<td>-ero</td>
</tr>
<tr>
<td>ete</td>
<td>-ale</td>
</tr>
<tr>
<td>ete</td>
<td>-a</td>
</tr>
</tbody>
</table>

1 A more precise division for the suffixes would be as follows: (a) [-el/ale] suffixes, which are those suffixes which begin with a vowel and are in themselves morphemes, and (b) [-er/ero] suffixes, which are attached to the stem and not morpologically independent units. For the purposes of this paper, the suffixes will be referred to as [e] and [a], indicating the dominant vowel in the stem-final position. The alternative with the [e] stem-final position of the suffix is by far the more systematic and grammatical, though that is not to say that the alternative with the [e] stem-final position of the suffix is not grammatical. The [a] stem-final position of the suffix is by far the more systematic and grammatical, though that is not to say that the alternative with the [e] stem-final position of the suffix is not grammatical.

2 Preposition in the morphological allomorphs of Italian. Glides are not permitted for lack of space. The boundaries symbol ‘|’ is used parenthetically in (2) to show the start of a third subsequence procedure.

3 Based on the mapping of Zalpini (1989) and Gazzaniga (1997) two dictionaries of usage including "gu" 10,000 words each. Categorization of Table De Diano.


5 The data show the number of derivatives in -ale, -ero, -are are derived from an unbalanced dataset consisting of 1,730,222 items. The results of this 1,730,222 items is the same that is defined. From the percentage, I have obtained the number of uninflected zero-final -are verbs in a 1,730,222 item dictionary of about 100.

6 Based on the mapping of Zalpini (1989) and Gazzaniga (1997) two dictionaries of usage including "gu" 10,000 words each. Categorization of Table De Diano.


8 The data show the number of derivatives in -ale, -ero, -are are derived from an unbalanced dataset consisting of 1,730,222 items. The results of this 1,730,222 items is the same that is defined. From the percentage, I have obtained the number of uninflected zero-final -are verbs in a 1,730,222 item dictionary of about 100.

9 Based on the mapping of Zalpini (1989) and Gazzaniga (1997) two dictionaries of usage including "gu" 10,000 words each. Categorization of Table De Diano.


11 The data show the number of derivatives in -ale, -ero, -are are derived from an unbalanced dataset consisting of 1,730,222 items. The results of this 1,730,222 items is the same that is defined. From the percentage, I have obtained the number of uninflected zero-final -are verbs in a 1,730,222 item dictionary of about 100.
b. Descendants of Latin nouns alternating between fourth and second declension (total = 8)

Examples:
- turritu ‘root’ — turritus ‘rootful’
- portus ‘port’ — portus ‘portful’

c. Descendants of Latin nouns of the second declension (= stems) (total = 18)

Examples:
- suntur ‘sweat’ — suatum ‘sweaty’
- consens ‘consent’ — consentus ‘conscientious’
- temer ‘temerity’ — temeratus ‘temerous’
- delitio ‘crime’ — delitum ‘criminal’

d. Descendants of Latin nouns of the third declension (= stems) (total = 4)

Examples:
- pantum ‘mouth’ — pantum ‘promiscuous’
- portus ‘port’ — portum ‘portable’
- potentia ‘power’ — potentia ‘potent’

New bases not attested in Latin according to Larsen & Short:
- inventio ‘invention’
- remissio ‘remission’
- personae per centum — percentum
- raptus ‘abduction’ — raptum

These bases do not share any morphological property, except being almost all masculine gender. We will comment later on the relevance of this feature.

From the segmental point of view, though, it is striking that the overwhelming majority of the bases (95.1%) has a root ending in a coronal anterior segment. However, a root ending in such a segment does not automatically yield the insertion of a /-i/ glide before one or more suffixes, as there are over 300 derivatives in -ity and about 100 derivatives in -ity and -aur, from bases whose root ends in a coronal anterior segment which do not display a /-i/ glide between root and suffix (examples include: late / lati > late late > lati late, dieter / dieter > dieter late, naum / naum > naum late). However, this is not the case for those bases with a /-i/ glide between root and suffix. Therefore, it cannot be incorporated in a phonological rule of a reanalysis rule.

I would like to propose that this condition emerges rather as a schema, in the sense of Bybee and Slobin (1982) and Bybee and Medin (1983).

Bybee and Slobin (1982:279) exemplify their notion of schema with a class of English verbs whose past tense has the shape in (4):

(4) | /[verb] past

They comment that “the schema defines a prototype of the category (in the sense of Badz & Merovski 1978), in that it is or distal are the best exemplars — but again and analogs may also belong to the category because they end in /-isual/, although not /-isual/” (Bybee & Slobin 1982:279).

The theory of Bybee and colleagues, then, is that a schema defines the prototype of a category that functions as a natural class, i.e., a schema describes a class by referring to its prototype, which is defined on the basis of its phonological shape. The phonological shapes of the members of the class form a series of family resemblances rather than sharing a discrete set of features. The “most common and best exemplars” of the class conform to the schema, i.e., to the prototype.

Using this notion of schema, and the idea that morphological classes, like natural categories, can be defined not by a necessary and sufficient set of features but by their clustering around a prototype, we could say that there is a phonological prototype of the root of bases displaying the /-i/ glide: those whose root differs from the prototype only often still behave like the prototype; i.e., belong to the class of bases which insert a /-i/, while progressively more distant bases display progressively less often the /-i/ between root and suffix.

The prototype of bases displaying /-i/ is shown in (5):

(5) Root ends in /CSi

i.e., root ends in a C’-Continuant followed by a [-Continuant, - Sonorant, - Voice, Consonantal] C

Bases differing from the prototype by one or more features are schematized in (6):

(6) a. Root ends in /CSi [C’ Continuant]

b. Root ends in /Visi no Coda Consonant

c. Root ends in /Visi no Coda Consonant, [-Continuant]

d. Root ends in /Csi [C’ Sonorant]

e. Root ends in /Visi no Coda Consonant, [-Sonorant]

f. Root ends in /Csi not Consonantal

The number and percentage of bases of each type in the corpus are shown in (7):

(7) Final shape | Number of bases | Percentage | Cumulative percentage
---|---|---|---
/Cs/ | 41 | 41.1% | 41.1%
/Csi | 10 | 10.0% | 51.1%
/Visi | 3 | 3.0% | 54.1%
/Visi | 4 | 4.6% | 58.7%
/Other Consonantal | 4 | 4.6% | 63.3%


It is clear that the majority of bases that have a root allomorph ending in /u/ either correspond to the prototype or differ from it by only one feature.

A chi-square test was run to determine whether the distribution of the bases in the first three rows differed significantly from what could be expected given the number of bases with the relevant shape in the language. It turned out that the difference between the prototype and the /u/ shape was not significant ($\chi^2 (1) = 0.06, p = 0.8$), while the difference between the prototype and the /i/ shape was highly significant ($\chi^2 (1) = 22.8, p = 0.001$).

This leads to the hypothesis (already put forward by Bybee & Reanalysis) that there is a hierarchy among the features characterizing the prototype, a closed syllable being the last segment that is more important than having exactly /u/ as last segment. This means that patterns with more important than segmental conditions in defining the shape of the prototype, even if more striking are the data, which result from taking into account only the bases of the 'new' derivatives with /u/, i.e., the bases of these derivatives that did not exist in Latin (according to Lewis & Stone). These data are shown in (9).

(1) Number and percentage of new derivatives from bases with different final shapes:

<table>
<thead>
<tr>
<th>Final shape of the base</th>
<th>Number of derivatives</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS</td>
<td>47</td>
<td>68.6%</td>
<td>68.6%</td>
</tr>
<tr>
<td>CSu</td>
<td>7</td>
<td>16.0%</td>
<td>84.6%</td>
</tr>
<tr>
<td>VS</td>
<td>6</td>
<td>8.1%</td>
<td>92.8%</td>
</tr>
<tr>
<td>Ch</td>
<td>2</td>
<td>2.9%</td>
<td>95.7%</td>
</tr>
<tr>
<td>Chs</td>
<td>3</td>
<td>4.3%</td>
<td>99.0%</td>
</tr>
<tr>
<td>L</td>
<td>1</td>
<td>1.4%</td>
<td>100%</td>
</tr>
</tbody>
</table>

It seems that in the history of Italian the likelihood of a new derivative displaying a root allomorph with a final /u/ to come up was directly proportional to the closeness of the base to the prototype defined by the schema in (5), and decreased steeply for bases whose root differs from the prototype by more than one feature.

The characteristics proposed by Bybee & Reanalysis are the schema for English irregular past tenses, and considered by these authors as general characteristics of all morphological schemas, are the ones in (9).

(9) Characteristics of the schema for English irregular past tenses:

(a) Their defining properties are phonological and can range over more than one segment [...].

(b) Classes of items covered by schemas are defined in sets of family resemblances, not by sets of strictly shared properties [...].

(c) Through schemas do not in themselves change forms, they are used in lexical selection, and they may serve as the basis of new formations, occasionally, in speech errors [...].

(But see & Stone 1982:385)

The schemas we have established to describe the class of bases that may insert a /u/ before one of the suffixes in (4) are the characteristics (9b) and (9c); as far as characteristics (9a) is concerned, although the definition of our schema is generally phonological, some morphological conditions seem to play a role: the bases should be maximally, and should not contain the suffixes -mental, although it has the relevant phonological shape. The generalization in (9b) holds both in the attested lexicon and in morphological derivations.

(10) ... -mentu > mentalu, *mentumale
    +gen. -mentale, +dat. -mentale
    *gen. -mentemato, *dat. -mentemato
    *gen. -mentumato, *dat. -mentumato

There is one characteristic, however, which distinguishes the schema we have established to describe the set of bases that may undergo a /u/ insertion from Bybee & Reanalysis's schemas. They claim that schemas are product-oriented generalizations: one of their schemes 'does not relate a base form to a derived one; as a rule does, but describes only one class of forms (the product class, in terms used by Zager 1980)' [Bybee & Reanalysis 1982:285]. Our schema (5), instead, is not product-oriented but base-oriented (or 'source-oriented', in Zager's terms): the relevant conditions are defined over the base and not over the derivative (or at least, there is no gain in defining them over the derivative).

So it seems that the study of the Italian bases which insert a /u/ before certain suffixes has led us to widen the concept of morphological schema, to include also source-oriented generalizations that define classes of bases rather than classes of outputs.

2. Derivatives with /i/

I have been able to collect 118 bases which have at least one derivative in which one of the suffixes in (1a) is preceded by /i/. There is no strong historical relation among these bases, comparable to belonging to the Latin IV declension for the bases of /e/ derivatives.

At first sight, it is striking that many of the bases of the derivatives inserting /i/ and certain suffixes, as shown in (11).

(11) Number of bases in -serra, -uncia, -uncia which have one or more /i/ derivatives
    -serra (derivative suffix forming agent nouns) 15
    -serra (adjective suffix forming superlative adjectives) 5

We could hypothesize that at least in these cases it is the suffix in the base which is responsible for the glide insertion, and we could try to write a readjustment rule (12) after these suffixes.

2.1. Derivatives with /e/.

I have been able to collect 118 bases which have at least one derivative in which one of the suffixes in (1a) is preceded by /e/. There is no strong historical relation among these bases, comparable to belonging to the Latin IV declension for the bases of /e/ derivatives.

At first sight, it is striking that many of the bases of the derivatives inserting /e/ and certain suffixes, as shown in (12).

(12) minnere 'pinz' > minnusale, minniric 'mirted', minnirello 'milde', mond'in 'mundo, mond%H' mondino 'grand', smite 'smile' > minnire 'minnare' humilitis, zero 'small' > terzat 'terzo'
More crucially, there are counterexamples to the generalization that bases with these suffixed yield alternates with /j/. These counterexamples are shown in (13):

(13) Derivatives from bases in -ense, -enter, -sore without /j/

| sans | sante | -ente | -enter | -sore | sans 
|------|-------|-------|--------|-------|------
| with /j/ | 1 | 1 | 1 | 1 | 1 
| without /j/ | 2 | 1 | 1 | 1 | 2 

Therefore, it is not possible to predict the occurrence of /j/ before one of our suffixes or morphological pronouns, at least if we want to predict the distribution of /j/ in the unadorned lemmas.

Nevertheless, before abandoning the hypothesis of a morphological condition on the appearance of /j/, let us review the quantitative distribution of this glide with bases in -ente, -enter and -sore in the unadorned lemmas (excluding neologisms). The number of derivations with and without the glide for each base and suffix combination is shown in (14).

(14) Number of derivations with and without /j/ for each base and suffix combination

| sans | sante | -ente | -enter | -sore | sans 
|------|-------|-------|--------|-------|------
| with /j/ | 1 | 1 | 1 | 1 | 1 
| without /j/ | 2 | 1 | 1 | 1 | 2 

We will come back to these data in section 4.

As far as the data observed in the attested lemmas are concerned, the best way of accounting for derivatives with /j/ between stem and suffix seems to be the hypothesis of the existence of phonologically defined schemata. These are two schemata among which the majority of the derivatives with /j/ cluster. They are shown in (15):

(15) Schemata of the bases which yield /j/ derivatives

a) “s” schema

Prototype: Root ends in -ens, i.e. Root ends in -(C)S, -enter, -sore

b) “e” schema

Prototype: Root ends in -ene, i.e. Root ends in -(C)S, -enter, -sore

Shapes differing from the prototype by one feature:

- Root ends in -ens lacks [-Sonant]
- Root ends in -sore lacks [-Continuant]
- Root ends in -enter lacks [-Sonant]
- Root ends in -ente lacks [-Continuant]
- Root ends in -enter lacks [-Sonant]
- Root ends in -ente lacks [-Continuant]

Shapes differing from the prototype by two features:

- Root ends in -ene
- Root ends in -ente

(16) Number of bases and percentage of bases with each final shape

<table>
<thead>
<tr>
<th>Final shape</th>
<th>Number of bases</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cies</td>
<td>35</td>
<td>46.6%</td>
<td>46.6%</td>
</tr>
<tr>
<td>Cis</td>
<td>1</td>
<td>5.1%</td>
<td>51.7%</td>
</tr>
<tr>
<td>Cis</td>
<td>2</td>
<td>2.5%</td>
<td>54.2%</td>
</tr>
<tr>
<td>b. Vies</td>
<td>29</td>
<td>36.4%</td>
<td>36.4%</td>
</tr>
<tr>
<td>Vies</td>
<td>8</td>
<td>6.4%</td>
<td>22.8%</td>
</tr>
<tr>
<td>Ces</td>
<td>2</td>
<td>2.5%</td>
<td>25.3%</td>
</tr>
</tbody>
</table>

A chi-square test showed that the difference between the number of bases in the prototype and in the second and third row in (16) respectively is highly significant (CIES vs. CIs: $\chi^2(1) = 129.73$, p < .001, CIs vs. CIs: $\chi^2(1) = 20.67$, p < .001).

The table in (17) shows the number and percentage of new derivatives with /j/ from bases of different final shapes:

(17) Number of derivatives and percentage of new derivatives with /j/ from bases of different final shapes

<table>
<thead>
<tr>
<th>Final shape</th>
<th>Number of derivatives</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Cies</td>
<td>37</td>
<td>62.6%</td>
<td>62.6%</td>
</tr>
<tr>
<td>Cis</td>
<td>1</td>
<td>0.8%</td>
<td>63.4%</td>
</tr>
<tr>
<td>Cis</td>
<td>1</td>
<td>0.8%</td>
<td>64.2%</td>
</tr>
<tr>
<td>b. Vies</td>
<td>2</td>
<td>0.8%</td>
<td>65.0%</td>
</tr>
<tr>
<td>Vies</td>
<td>6</td>
<td>4.9%</td>
<td>24.9%</td>
</tr>
<tr>
<td>Ces</td>
<td>2</td>
<td>1.1%</td>
<td>25.0%</td>
</tr>
</tbody>
</table>

93
Here again, bases conforming to the prototype are the vast majority, and periodic conditions prove more important than segmental ones in defining the prototype.

Now that we have seen the schemata at work with derivatives which display a /j/, we can compare them with the schema at work with /w/-derivatives.

The interesting thing is that there are certain phonological configurations that could be marginal members of classes defined by two different schemas, yielding different glides. For example, nouns ending in /j/ differ from nouns ending in /w/ (prototype of the class defined by the schema in (1)) only in the feature [+continuant], and from nouns ending in /w/ (prototype of the class defined by the schema in (15)) by the lack of the [+continuant] slot. The prediction, in such a case, would be that we should find, at least occasionally, derivatives from bases of these shapes with both glides. This prediction is borne out by data such as the ones in (18).

(18) Chs root derivative with /j/ derivative with /w/
  *aare* *aare*
  *oone* *oone*
  *fint* *fint*
  *koone*

3. Productivity

Let us consider now the neologisms formed with our suffixes, to see whether the glides appear with new derivatives. Besides, appearing in part of the attested lexicon.

The formation of declension sets with a /-oone/ suffix seems to be slightly, if at all, productive in contemporary Italian (cf. Jacobson & Thompson 1992). Therefore we will concentrate on the three adjectival suffixes.

All three are productive in a Schachterian sense, i.e., new words are formed with them in contemporary Italian. For /-oone/ and /-oare/, the number of neologisms from bases that match the prototype of one of the schemata we have defined are so few as to render almost meaningless the evidence. With /-aare/ there are no neologisms with any of the glides, and a couple of glissides neologisms from bases that correspond to a schema: *eccendontar, cecetar*. With /-aare/, there is one neologism with /-aare/, *allalistarotus*, and no glissides neologism from bases that match the Chs schema, the schemata for /j/, on the contrary, seem inductive: there are glissides neologisms from bases that match them both, *zecantare, zecantare, zecantare, zecantare, zecantare, zecantare, zecantare, zecantare, zecantare, zecantare, zecantare*. The former, crucially, are those we saw, from feminine bases. It is /-oone/ that derivatives with a glide from bases that match one of the schemata are encountered more frequently: there are 6 /-oone/ neologisms from Chs bases (e.g., *gama, gamale, oomonate, oomonate, oomonate, oomonate*). 4 /-oone/ neologisms from Chs bases (e.g., *opera, opera, opera, opera, opera, opera*). There is also an occasional extension of the /-oone/ to a new prototypical base (e.g., /-hardenone/). Counterexamples (i.e., neologisms without a glide from bases which match one of the schemata) are rare, but we find some derivatives from feminine bases (e.g., *gama, gama, gama, gama, gama, gama, gama, gama, gama, gama*, from the blend communicative *vima*). It is possible that masculine gender is a morphological condition to be added also to the definition of the prototype of the Chs schema, as derivatives from feminine bases that match the phonological definition of this schema fail to display the glide also with /-oone/, as we have seen. Neologisms in /-aare/ from bases of the Vre shape are all from nouns ending in the Agentiv/Instrumental suffix -oare or from English bases with the comparable suffixes: *oare, ononeare, ooononeare, ononeare*. Neologisms in /-oone/ from bases of the Chs schema are all from bases in -oone...

4. Concluding remarks

To conclude, let me summarize my findings and the analysis which I propose for the two sets of data we have seen.

In the case of /w/ insertion, I think the best analysis is that certain bases, those which correspond to a prototype described by the phonologically and morphologically definable, base-oriented schema in (7), may have or develop a root allomorph ending in /w/, a base which is employed in the derivation of adjectives in -oare and occasionally in -aare, and which is observable in the attested lexicon also in derivatives in -aare and -oare. Productivity is scanty (only 7 neologisms), as expected with morphological processes regulated by a schema rather than by a rule.

Bybee & Medler, following Roos, call our attention to the factor of "base validity" as predictor of the productivity that a morphological class defined by means of a schema can enjoy.

According to Roos, "base validity is a probabilistic concept: the validity of a given base X as a predictor of a given category Y [...] increases as the frequency with which one X is associated with category Y increases, and decreases as the frequency with which one X is associated with categories other than Y increases" (Roos 1978:30).

In the case of the category of bases which display a root allomorph ending in /w/, the cut validity of the schema we have established is very low, as most of the bases that match the prototype in the language do not in fact display a glide-final root allomorph. There are almost 2000 masculine bases whose root ends in Chs, and only 51 have a root allomorph with final /w/.

So the schema for root allomorphs with final /w/ is not very productive, but, as some of the schemata discovered by Bybee and colleagues, it can "serve as the basis of new formations occasionally" (Bybee & Shibves 1982:235, cf. (9) above). There are in fact a few neologisms in -aare and -oone from bases that conform to the prototype, and in a pilot test I have been able to elicit oral production of -aare derivatives from bases which do not have an established adjectival derivative in the language and whose phonological shape conforms to the schema in (15).

As far as cases in which a /j/ differs, different analyses are possible. If we want to take into account all the attested lexicon, the analysis will be parallel to the one offered for /w/-derivatives: certain bases, conforming to one of the two phonologically defined schemata in (15), may have a root allomorph ending in /j/, which is employed in derivatives with one of the suffixes in (14).

But another analysis is possible for the derivatives in -aare. If we go back to the data in (14), we can see that the presence of one of the three suffixes -oone, -oare and -oare has high cut validity in predicting that a derivative in -aare will display a /j/ before this suffix as there are very few counterexamples to this generalization. So if we hypothesize the existence of a morphologically defined schemata such as the ones in (19), which define a base containing one of these suffixes as prototypic for derivatives in -aare, such schemata would have a high cut validity, contrary to the low cut validity of the purely phonologically defined schemata in (15).
Morphologically defined schemata for derivatives in -ule

a. Base ends in -o
   i. Base ends in -o
   ii. Base ends in -o
b. Base ends in -o

The morphologically defined schemata in (19) are not mutually exclusive with the phonologically defined ones in (15). Of course there is overlapping between the sets of bases captured by the morphologically defined schemata in (19a-b) and the phonologically defined schema in (14a) and by the schema (19d) and the schema (19b), but the interesting point is that the two sets of schemata have different cut points: this is quite low for the morphologically defined schemata in (19), but quite high for the phonologically defined ones in (15).

According to Bybee’s (1985) approach, in which the difference between rules and schemata is not qualitative, but purely quantitative, in that “rules are highly situated representational patterns of schemata” (Bybee, 1985: 135), we would predict that a highly reinforced schema, i.e. a schema with high cut value, such as the one in (19d), is almost non-distinguishable from a rule. And in fact, this is the case: remember that of but one of the metaphor with -ule from bases conforming to the morphologically defined schema in (19d) display the -ule and conversely, only one metaphor displaying the -ule (46b) is not derived from a base defined by one of the schemata in (19).

This categorial behaviour is typical of productive word formation rules.

So, if we do not aim at generating all the attested lemmas, but limit our aim to the characterization of productive processes only, the establishment of a morphological condition is possible. As we have seen, -ule appears in metaphor only in derivations with -ule from bases ending in the suffices -ure, -ure, or -ure. In this case, we might analyze the data as both cases of morphologically governed base allomorphy as in (20a) or of morphologically governed suffix allomorphy as in (20b).

20a. Morphologically governed suffix allomorphy

a. ...-ule(N) → -ule(N) → -ule(N) → -ule(N) → -ule(N)

b. -ule(N) → -ule(N) → -ule(N) → -ule(N)

The decision between analyses (20a) and (20b) is up to a point arbitrary, as both correctly describe the facts.

(20b) would be preferred on historical grounds, as the source for the observed allomorphy is in the fact that the Latin suffix was a part of derivatives in -onale and the Latin suffix was in -onale, which then formed the model for analogical citations in -onale, derived from Italian base in -onale.

Analysis (20a) would be preferred on extrinsic grounds, in so much the number of allomorphs extracted in the language only the suffix -ule would have an allomorph, vs. the four suffixes -ure, -ure, -ure, and -ure. But in the age of morphology by itself is not clear whether the reduction of allomorphy must be pursued as the most desirable outcome.

I believe the decision will have to be taken on more general grounds, considering also the tendency in allomorphy phenomena in other parts of the Italian language and in other languages.

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Section III

Compounding
MORPHOLOGY AND SYNTAX:
DELIMITING STUMP COMPOUNDS IN RUSSIAN

Determining the degree to which syntax is involved in morphological compounds—
the central issue of the Mytlenie conference's session on compounding—is elucidated
by so-called stump compounds in Russian. This paper uses two particularly interesting
case studies to illustrate stump compounds' hybrid properties.1

This paper consists of four parts: First I discuss the properties distinguishing stump
compounds. Then I present two case studies which show that some stump compounds
involve internal case-assignment: In the first case study the stump assigns empty case
to the following part of the compound. The second study shows that a stump compound
and its anti-stump counterpart correspond to differing syntactic case-assignment. In
the final section I suggest, using colloquial data, that syntactic relations within stump
compounds are unstable and this situation is rectified in one of two ways: Either the
stump starts to act as a full-fledged word or the syntactic relation disappears.

1. Background, definitions, diagnostics

I begin by distinguishing between two types of transitive morphology in Russian.2
Following Word (1965:156-83), I refer to the examples in (O) as STUMP-COMPOUNDS,
in which the first of two stems is shortened (usually) in its final syllable.3

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1 Most of this paper originally appeared in Billings (1995) and was presented in lectures at
Leipzig and Pragmatics, and as a talk at the First Mediterranean Conference of Morphology. I
declare no affiliation to the audience at all of these venues, especially to U. Alkemundy.

2 As Andrew Sprouse has pointed out to me, stump compounds (and perhaps even clitics)
might better be referred to as word insertion, not as word deletion. This is because such forms
are generally coined post-operatively, but by hooks, adverbial complements, adjectives and the like.
I insist that while their usage might be extended in this way, stump compounds' properties
are quite rigid perceptually. That is to say, there is a real grammar constraining their production.

3 The following special notations are used in this paper. Abbreviations: ACC(TIV),
ACC(TIV), ASC(TIV), DAT(Iv), HAB(DIV), IN(NIV), INSTR(IN), LOC(TIV),
LOC(TIV), NEC(Iv), MASC(PAT), INT: name, NUM(MOD), GC: adjective, HYP(OPOSED), NCn):
Stump insertion. Main word types are shown in ALL-CAPS; secondary stems, in small CAPS; other
ejectives, in plain text. Transcribed (order stepped on elided) words are underlined. Unless
otherwise stated, the form in all the NOME and NS. Finally, a bracket [v] indicates the boundary
within complex word-formation.
(1) Stem components:

<table>
<thead>
<tr>
<th>Part of Speech</th>
<th>Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>genitive</td>
</tr>
<tr>
<td>b.</td>
<td>information</td>
</tr>
<tr>
<td>c.</td>
<td>command</td>
</tr>
<tr>
<td>d.</td>
<td>komeasIR</td>
</tr>
<tr>
<td>e.</td>
<td>kiMANDIRj</td>
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<tr>
<td>f.</td>
<td>poliNym</td>
</tr>
<tr>
<td>g.</td>
<td>procedurE</td>
</tr>
<tr>
<td>h.</td>
<td>TRADE-NAKIR</td>
</tr>
<tr>
<td>i.</td>
<td>hunkhonN_am</td>
</tr>
<tr>
<td>j.</td>
<td>vishN_nish</td>
</tr>
<tr>
<td>k.</td>
<td>iMandgir</td>
</tr>
<tr>
<td>l.</td>
<td>eXkonN</td>
</tr>
</tbody>
</table>

(2) Claws

<table>
<thead>
<tr>
<th>Component</th>
</tr>
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(3) Properties of stems:

- The final stem is not truncated; any non-fnal stem is truncated to a "stem".
- Stems are inflexional forms; if this is an inflexional form, then it is a stem.
- Stems are monosyllabic; if not inflexional, then syllabic if vowel-initial.
- Stems bear secondary stress (shown in SMALL CAP in this paper).

As the following discussion shows, these properties all point to a minimal-PWd template for stems, whereas no such template applies consistently to clips.

First, note that the wording in (3a) allows for stem compounds with more than one non-final stem, so long as the last stem appears in full. The example in (4a) consists of three stems: two stems (nand and imur) followed by the full word (space). Neither nand nor imur can be free-standing words in Russian (with these meanings).

(4) soVETskoe informacionNoe bjuro soVETskoe informacionNoe bjuro

I mean shortly by the thirdity of imur in (4a) and (4b). The observation in the first clause of (3a) that stems are consistent-final, distinguishes stem compounds from other kinds of compounds, which make a linking vowel between the stems. An example of such a non-stem compound is informacionNoe "informative". The inflexion in (3b) also distinguishes between stem compounds and clips; cf. (3c) prahv, in which the initial stem is truncated to vowel-final prah. As the second part of (3b) states, any stem-final obstruent must be [voice].

The observation has PrWd-final devocing; other languages, such as German, have syllable-final devocing. This is additional evidence that stems are PrWds.

The syllabic criterion in (3c), which is inevitably true of stems, does not always hold for clips. One example, devah (2), has the stem truncating to non-syllabic f-. Furthermore, stems not only must be syllabic, they conform to a specific number of syllables—monosyllabic if consonant-initial and disyllabic if vowel-initial.4 As (3d) informacionNoe and (3e) prahv in (3) show, there can occasionally be disyllabic clips. This is because of an apparent crossover between syllabicity and initial onsetlessness. Similar template phenomena, where certain morphological operations

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4 I am grateful to Anna Thorne for pointing out this correspondence to me. An earlier version of this paper incorrectly characterized the following truncated form as a stem compound: prahv. I am now convinced that this form is a true stem compound (as prahv), since I am now convinced that this correct morphological analysis of this form is correct. A similar word in Russian is prahv (1988), which is not a stem compound.

5 In many cases, this is true of clips as well as stems. All clips that I am aware of truncating to the final stem. However, this is not true of clips in this paper, which truncates to the final stem without truncating to a stem.
such as PVM-reduplication require an onset, are discussed in Downing (1998). While there is disagreement in the prosodie-morphology literature about why an onsetless

initial syllable is deficient, there is a consensus (based on numerous language families) that certain special morphological phenomena require an onset in the resulting form.

Finally, according to (6b), each stamp has a secondarily-stressed syllable; the final

unstressed stem bears the compound’s main stress. This is a property shared with

other compounds, cf. serease ˚sverðstaelur [list ˚svera-riSTºru]. With regard to the

clips listed above, only (5c, d) have secondary stresses on the non-final member.

Generally speaking, secondary stresses are limited to compounds in Russian, but there are

exceptions. One such example is the non-compound borrowing in (5c):

(5) Non-compound words and secondary stress

a. kogov(ani)j [kogov-anA-j] ‘congilial’

b. komfotTARjaj [komfot-ATAR-jaj] ‘conformation’

Perhaps the most reliable test for whether a syllable bears stress—is secondary or

primary—is its readiness of underlying hl. As (5a) and several of the examples in (1) show, secondary stresses on hl maintain ipf-rounding. The example in (5b) also is a

borrowing beginning in the same home place—does not have secondary stress.3

The exact reduction of unstressed hl takes two forms after a non-prestressed

consonant; in the syllable immediately preceding the main stress hl reduces to h and

diversely hl reduces to n. See the first two syllables of (5b). What is important for

these purposes is that unstressed hl loses ipf-rounding. Thus, while secondary

stress is required on compounds, with clips and other non-compound secondary stress is possible.

I should add that some older stamp compounds have become re-analyzed as simplex

stems. Examples of this are shown in (6a-b):

(6) Stamp compounds which have lost the internal morphological boundary

a. professonALaj [profes-sonA-j] ‘make union’

b. portVORdiuraj [port-VOR-diurA-j] ‘submarine’

Note the reduction of the unstressed hl of stems in (6a-b) to n [n] and [N], and the

non-presence of the stamp-final obstruent [n] in (6b). The lexical representations of

(6a-b) should not therefore include a morphetic boundary. Note as well that the

adjective footprint (from this non-final stamp compound in (6a)), footpriehner, can be

further reduced into a stamp, as in (7) profenheitaj [prof-EN-etA-j], which doesn’t reflect

‘professional meeting’, but rather ‘trade union meeting’. The stamp prof can mean

‘professional’, as in (5e), or ‘professional’, as in (11) below. Data like (6a-b) are

both ‘trade union’, as in (5e), or ‘professional’, as in (11) below. Data like (6a-b) are

Note that the contrast between (5a) might have to do with the number of syllables between hl and the compound.

Preliminary primary stress is given on the

stem syllable, though the internal structure of the compound varies. As an example, it

is not unusual for the duration of secondary stress within non-compound compounds

(1985) for stress placement to be decided post-hoc by the position of the ultimate stress on the compound.

5

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Note that the distinction between (5a) might have to do with the number of syllables between hl and the compound.

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stem syllable, though the internal structure of the compound varies. As an example, it

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(1985) for stress placement to be decided post-hoc by the position of the ultimate stress on the compound.

6

Observations show that the final consonant of a stamp-final stem is syllabified as the onset of a following word-initial stem (cf.-wording [prof-ed DF-word] ‘department directory’ (editions ‘Departmental’)). See also the examples second, stamps in (7) [prof as PROF in BIO]. Cf. the forms in (3a-c) where word-initial ony- does trigger onil-capture: [prof-TORK] and [prof-PORK].
Note that the context not only breaks up the stress compound, it also interrupts a periphrastic phrase. I show in Fillings (1996:70) that a semantic role can even appear between a proposition and pronominal in a word environment, as shown in (10):

(10) [JA no ZNAju. ( anfjalEto hle genO nngwARAT. ) ]
regarding YN filling they speak

I don't know if it's regarding him that they're talking (usual stress on nego)

Is (10) the orthographic representation a trigger for a special, neutralized form of the personal pronoun nego? Nonetheless, a semantic role can intervene. My answer to whether the semantics is productive or not, the semantic role appears after the first periphrastic-word stress. Stamps are periodic words. If a NWt ends within a morphologically (and productively) compound word, periodic inversion places an article inside that compound.

Address (1981:199) adds that non-clitic pronouns can likewise interrupt stamp compounds, as shown in (11):

(11) meNIA [... VYgilai m ZEgE ERa naaVAma1, requiDOnO
mace Ac.]
expedition for professional so-called professional/academic

'I was expected for so-called professional academics'

Pretentially, in my view, constitutes a valid argument for the syntactic-phrasehood of stamp compounds. I return to this theme below.

One piece of evidence in support of my morphological analysis is that stress compounds are found in the following full stress. That is, the following stress can be elided or moved syntactically. I show examples of support of this argument below.

2. First case study: De-participle stamps assigning quirky case

Having shown that stamp compounds are indeed morphological structures, I turn to the first of the two case studies which show that there is a syntactic relation within a morphological compound. Note the case-marking in the form repeated in (12a-b):

(12) Stamp assigning quirky (instrumental) case to the following stem

a. vaZgEmhE [laberhoZgE] ZEgE [hloZgE] [ZgE hoZgE. TO A1] (1)
directive

labourer/policemen

b. upoZgEmhE [laberhoZgE] ZEgE [hloZgE] [ZgE hoZgE. TO A1] (1)
manager

affair

The stamps in (12a-b) are truncated from stems that were present active participants which were in turn derived from verbs. In this type of 'direct' and 'instrumental' manager, which assigns quirky instrumental case to their objects. Throughout these morphological derivations, the assignment of instrumental case has been maintained, even by the stamps. All available periphrastic tests confirm that these stamps have secondary stress. Because the stamp's voiced is in lla in both, the la-lemma test is not available. Because the stamp provides the main stress by at least a syllable, however, a less-peripheral but nonetheless just as conclusive a test is available.7

Stressed /b/ (after a non-palatalized consonant) reduces to [a] in the syllable immediately preceding the stress and to [a] elsewhere. In (12a-b) the stamps' secondary-stressed vowel surfaces as [a], not as [A] or [a]. These stamps likewise undergo devoicing of the lla to [l].8

This section has shown that stamp compounds can involve very specific kinds of syncratic relations (quirky case assigned by the stamp to the following stem). Unfortunately, there is little evidence that /na/ and /nngw-/ are simple syncratic words. The one proof of their stress-bounding is that they are bound to the following stems.

3. Second case study: Path "half"

The next case study shows this boundness more clearly: The element /pa/ "half", introduced in (13) and exemplified again in (16), is unique among numerals in that it must immediately precede the element which it quantifies. That is, the noun quantified by /pa/ must be phonetically overt and not be moved. In this section I begin by showing that /pa/ is syntactically a numeral. Many of these tests come from Robby (1987) and Mefluk (1983, 1985). Thus I use my own tests to show that /pa/ is a bound numeral, which supports my conclusion that /pa/ is a stamp.

Russian has, in the last several hundred years, developed a syntactically distinct category of numerals, of which /pa/ is a member. The most conclusive test for numeralhood in the case assigned by so-called numeral numerals (those less than 5 in cardinality) is the following numeral numerals /pa/ "half" and /nngw/ "quarter", shown in (13a-c):

(13) Assignment of distinctive "adpositional" GEN case by a numeral

a. TRI taZa
b. [BEV] taZa

c. TRI [BEV] taZa

"three hours"

"half hour"

"a quarter hour"

Like the other numeral numerals in (13), /pa/ assigns the special adpositional GEN form to the quantified noun. Only numerals assign this special form. Usually this form is referred to as the GEN SO, because most nouns don't show a distinction between the adpositional and GEN SO forms. The noun in (13) and a handful more have the same form, however, shows a distinction. The ONG SO form has its initial stress, as in Ciaa to (14a-c) shows, compared to the end-stressed dafa in (13a-c).

7. Some characteristics of the reduction of unstressed /la/ and /lu/ do differ from my description here. In first-person possessive (after a non-palatalized consonant) /la/ and /lu/ neutralized to [a] in the final form of a word, whereas, for example, one Ruthven (1990) and others claim there. With such a simplification, you would expect reduction arguments to longer hold in case 2. Either characterization would function, however, for any arguments about the reduction of /la/ shown in the next section.

8. These two adpositional stems and final devoicing are illustrated opportunity of comparing the stamp compound generation [ZgE hoZgE. TO A1] (1) with "path" with the like in (12a-b) showed. In former ONG SO "managing a bag of fish". While it remains a stylistic preference, the one adaptation of the morphological structures, the provided effects follow quite straightforwardly from the distinction between stamp compound and clip.
(14) Assignment of normal GEN.SG case in situations GEN environments

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<td>CAS</td>
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<tr>
<td>b.</td>
<td>poloVlms</td>
<td>CAS</td>
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<td>c.</td>
<td>CETvet</td>
<td>CAS</td>
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Replacing the end-stressed form CASA with non-stressed CASA in (13a-b), or replacing CASA with CASA in (14a-b) results in intransitivity. Other arguments of GEN case, such as a verb and preposition, invariably trigger the end-stressed GEN.SG form.

Note that (13c) and (14a-c) have identical first words: CETvet. I argue in Billings (1995) that CETvet 'quarter' is both a numeral and a nominal morphophonemes. This is supported by the test in (13) and (15), where the ADPAIC-triggering numeral takes pl. agreement, in (15), while the noun that triggers GEN.SG morphology on the following noun triggers SG agreement on the determiner, in (15).

(15) Plural agreement (on demonstratives) if there is a numeral.

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<td>a.</td>
<td>TR</td>
<td>TR</td>
<td>three hours</td>
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<td>b.</td>
<td>TR</td>
<td>CETvet</td>
<td>half hour</td>
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<tr>
<td>c.</td>
<td>CETvet</td>
<td>CETvet</td>
<td>quarter hour</td>
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(16) Singular agreement (on demonstratives) if there is a noun.

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<td>b.</td>
<td>TA</td>
<td>poloVlms</td>
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<td>c.</td>
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The agreement combinations in (15) and (16) are the only ones possible. If the nominal expressions in (15) and (16) are the remotest, the subject, then they trigger Pl. or SG agreement on the verb, respectively. Thus, while homophonemes noun and numeral versions of CETvet 'quarter' co-exist in the lexicon (each with its own syntactic-properities), the forms meaning "half", poloVlms and poloVlms, are not homophonemes. Nor do they share the same morphophonemes properties: poloVlms is a stumper: polovime, a word.

One final syntactic test for numeral-hood is shown in (17) and (18). In time expressions in the form "at 1 o'clock" the property of a 'triggers the ACC case in the

9 Above, I argue for the inscriptions of normal (non-numeral form) CETvet 'quarter'. I have no explanation for why CETvet 'quarter' cannot take the ACC case as in CETvet. Only the ACC assigning construction is evidenced. I find these facts (quantiative: polovime, etc.) at quarter construction is evidence. I find these facts (quantiative: polovime, etc.) at quarter construction is evidence. I find these facts (quantiative: polovime, etc.) at quarter construction is evidence.

(17) The preposition v with numerically quantified time expressions

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(18) The preposition v with non-quantified time expressions

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<td>poloVlms</td>
<td>CETvet</td>
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<tr>
<td>b.</td>
<td>poloVlms</td>
<td>CETvet</td>
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Once more, (17b) and (18b) show that poloVlms is a numeral and polovime is a noun. Before concluding my analysis of the two words that mean 'half', I should show two tests which prove that poloVlms is not a bound morpheme. The contrast in (19) shows that all non-bound numerals can take an elided noun after them.

(19) Ellipses of the quantified noun

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Although it is not always follows to elide the noun after the numeral, it is possible in (19a) or (19b). With poloVlms in (19b) the following noun is obligatory.

The other indicator that poloVlms is morphologically bound is the argumentation-inversion construction, discussed in Billings (1995) and exemplified in (20). Whereas nouns and numerals and the following quantified noun can be juxtaposed to express approximate continuity, this is not possible with poloVlms.

(20) Argumentation with most (non-bound) numerals

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The constraints between (19c-e) and (20a-c) are especially convincing because the numerals are both fractions. Syntactically poloVlms and CETvet are numerals, yet these two possess quite divergent morphological properties. Having proven that poloVlms is a quantifier, it remains to be proven that poloVlms is not some prefix or preposition. The vowel-inclusion test discussed above in section 1 applies this issue: poloVlms always contains lip-inclusion in its vowel form (e.g., poloVlms, etc.). This eliminates any analysis of it as prefix or preposition.

Returning to poloVlms and polovime, I propose that these two forms are, morphologically, a stumper and full form, despite the fact that poloVlms is a numeral and polovime is a noun. This analysis is not, however, accurate etymologically: polovime is the form historically derived from the Common Slavic root *pol (cf. Czech pol or polo 'half'), of which
Russian пoв (also known as пов-SEN) is a reflex. Stamp compounds other than пов- (and клип) are discussed extensively in the sociolinguistic literature, because their emergence largely coincided with the 1917 revolution (and many of the compounds have to do with political systems). According to Makarov (1973), the elec- tronic introduction of пов- is widespread during this century. The re-analysis of пов- as the stump corresponding to повелительное is something akin to back-formation. Still, the proper synchronic analysis for these two forms is morphologically that of a noun and its corresponding full-form.

How then is it possible that a noun and full form differ as their syntactic counterparts? (I am grateful to Dick Cartee for posing this seeming inconsistency to the text category.) This is not really a problem for two reasons: if morpheme and syntax are clearly, then this is not really a problem for two reasons: if morpheme and syntax are clearly

(Rus. 1.17) shows that in certain cases the non-stand alone nouns have developed meaning unattested from their extraneous parts. "He gives (10), where the two full words неволговский самолёт mean something like a 'household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like 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means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household accounting', while the stump component неволгов means 'self, like household a

To conclude this paper, I have shown how stamp compounds in Russian pose a challenge to the autonomy hypothesis. Two types of stamps assign very specific cases to the word-form to which they are bound morphologically. Still, the range of such forms, and possible indications that this interference of syntax into the internal affairs of words is being avoided, suggest that the autonomy of syntax from morphology is still not as well known as studies of syntax show. 


10. Forms like (31a) show a striking similarity with colloquial stamp compounds. Mel'čuk (1983) reports that constructions involving пов- "half", when externally assigned oblique cases (e.g., пoв-кa, пов-нyм, and пов-лyст) display such case marking instead of the explicit marking triggered by пов- in (31a). However, I have determined that one assigning proposition will cause the noun quantified by пов- to take the non-oblique case form, not пов-пoлшкa, with half an argument (e.g., пов-пoлшкa). Leonard Bakley informs me that such case marking is observed with the adnominal stamp compounds like заводской "factory dwelling" in colloquial speech when the entire compound is assigned a non-OBL oblique case, as in заводской "factory dwelling".
In fact, one of the common threads underlying his discussion is that most of these forms are nonanal in the language in some sense and should be replaced by more Spanish-like formations. He is probably correct in assuming that many ne locutions from English, but the fact remains that modern Spanish has been able to incorporate these strings to such an extent that the literature is productive.

Noun-noun sequences take the gender marking of the left noun. Plural formation of these sequences varies, not only with the string but also with the speaker. As Rainer and Varrot note for Spanish (1992: 126), plural marking is usually only found on the left noun, but can occasionally also appear on the right noun. This is also the case for Catalan; e.g., conservative speakers will say "problemes clau" in Catalan. In our experience the speakers of all three of our varieties have had problems class.

2. Rainer and Varrot's discussion of the data

"Rainer and Varrot point out that "left-headed n-n compounds and restrictive phrases" are the hardest sequencettes in Spanish to classify as other compounds or phrases. They provide examples of nine types of noun-noun sequences, and suggest that "the hard core of these compounds is that constituted by the coordinate type, a noun "sister," an adjective (preposition), and the subordinative type vis a vis the "band."" (1992: 126). They go on to claim that contrary to what occurs in Germanic, Spanish compounds of this sort in productive use only follow a restricted set of semantic types" (1992: 126), although they do not identify exactly what exactly defines these semantic types.

Let us consider their idea in more detail, particularly with reference to other word-formation processes in Spanish and Catalan. Obviously, semantics plays an important role in determining whether a given formation can actually combine with a given stem in derivation. There are surely semantic restrictions on compounds involving a noun. For example, the combination like Sp. coidado containe / Cau. caidat containi is not likely to be a coordination like Sp. cuidado contenido / Cau. caidat conteniti, while the combination like Sp. cuidado contenido / Cau. caidat conteniti is not likely to be an adjective like Sp. cuidado contenido / Cau. caidat conteniti.

3. The semantics of subordinative compounds

Although we are not convinced that there is a single semantic feature or set of features shared by nouns appearing in non-head position, it does seem to be the case that these nouns are typically not interpreted literally but rather figuratively. Let us consider the following examples:

(1)

a. La plan / planograma / proyector / projet
   "pilot plan / program / project"

b. El paper moneda
   "bill" (Sp. paper coin)

The only possible way to interpret paper is figuratively, as neither plan nor programs nor projects can be bills because bills must be animals. Likewise, paper is not like coins in a literal sense but rather serves the same purpose as coins do.

The behavior of the noun bomba "bomb" is particularly interesting. In both languages, bomba combines with other nouns to refer to the bomb's packaging:

(2)

coco bomba (Catalian) / boque bomba (Spanish) "car bomb"

paquete bomba / paquete bomba "bombe bomb"

Although Rainer and Varrot analyze coces bomba as a subordinative compound, we suggest that the literal interpretation given to both nouns would put it on a par with other names, i.e., in our view it is a coordinative compound. Bomba, however, can also be understood figuratively:

(3)

Ellos aprovechaba (Catalan)
Una noticia bomba (Spanish) "shocking low prices"

shocking news item"

If semantics is the basis for comparison of coordinative vs. subordinative compounds, then a true bomba must be different in structure from coces bomba because the latter is not understood in the same fashion. Another interesting set of examples are those listed in (6), taken from a document on pharmaceutical procedures written in Spanish.

(6)

a. La solution peros
   "standard reference solution"

b. La solution problema
   "water solution"

c. La solution reactivo
   "reactive solution"

The sequences in (6a) and (6b) can be analyzed as subordinative compounds in that the solution serves as the standard reference or as the test case being run through the equipment. Neither (6a) nor (6b) appears to have arisen as a result of prepositions.
deletion, as the corresponding phrases "sallenin" or "pasen"/"probemos" do not occur.

The phrase in (6), however, may be related to the solution del rencorc, with
deletion of the preposition de "of" and of the definite article.

Proposition deletion has not received much attention in Spanish or Catalan.

Rainer and Vatole mention that forms which seem to have lost a proposition, such as
una cocina Bosch or una sala de ballet, (their examples) probably do not qualify as
lexical structures but rather as syntactic strings, and we would agree. Examples of noun-
noun sequences that appear to be missing a proposition are commonplace in advertising,
where they often consist with the full forms.

(7) Examples taken from hardware store catalogue in Catalan, summer 1996
   a. Both forms: alcalde sobre "capitol",
gabinete de "office desk",
   b. No proposition: jardín jardín "garden furniture",
casa jardín "garden can",
décor jardín "outdoor shower",
loja jardín "home canopies",
clara ordenador "computer desk"

In an advertising context, in which a speaker's knowledge of real world
references is all important, the semantic information contributed by the proposition
is easily obtained without the proposition itself. It is what we know about the world, and
not some characteristic of noun-noun sequences, that allows us to interpret such nouns as
a table made out of a certain substance yet made of wood as a table designed
to hold a computer while in use. That explains why the specific proposition that can be
defined is not always de "of", which is rarely used to indicate nouns, but can also be
Canarian per "for". and, with, Spanish por "with". The semantic of these noun-noun sequences is thus critically dependent on external
information, whereas the semantics of true subordinate noun-noun sequences is more
dependent upon a non-lexical interpretation of the non-head noun.

4. Noun-noun sequences with proper names

A subset of subordinate noun-noun sequences are those strings in which the
right-hand noun is a proper name.

(8) una cocina Bosch "Bosch kitchen"
   una ventana Velux "Velux-branded window"
   la plaza Niemeyer "the Niemeyer plaza"

Zwanzig, in his discussion of the parallel forms in French, suggests that this
structure is used for name-giving and then becomes more or less fixed in meaning.

"La solución del problema" would be interpreted as the answer to the problem.

(1992: 225). It is certainly true that this kind of structure can become lexicalized, as in
the Spanish phrase cuerpo Dannone "body of Dannone Yogurt", which is not used to
describe the bodies of yogurt-eating individuals but rather to describe a young,
physically fit person, but the great majority of these strings do not exhibit this behavior.
The prototypical interpretation for these strings is "ready, manufactured, produced by...
but again, the role of what a speaker knows about the real world is important in being
able to interpret the phrase. We may compare two phrases:

(a) a madre Nuribeb "a Nuribeb mother, a mother who uses Nuribeb"
   b. pecho Nuribeb "a Nuribeb jar of baby food"

The possible relationship between the nouns in (a) cannot be the same as that
in (b) because as people we know that mothers are not made by the manufacturers
of commercially prepared baby food. Unlike the subordinate sequences discussed above,
however, the non-head noun Nuribeb is not understood figuratively. Rather, this seems
to be a syntactic structure in which a commercial company is related to a food
product. This structure probably originates from one with the proposition de "of", but can no
longer only be explained by proposition deletion precisely because of examples like
(a), as la madre de Nuribeb is ungrammatical. Nor does the structure seem to
display the semantic unity that it typically claimed for lexical compounds. We therefore
suggest that these strings are the result of a syntactic structure combining two nouns.

5. Lexical vs. syntactic origins of compounds

As we stated at the start, one of the major debates in morphology addresses
whether compounds are lexical or syntactic in nature. Both views have eloquent
defenders: Liher (1992) claims compounds are syntactic because all morphological
processes are syntactic; some years earlier Di Scialito and Williams (1987) argued that
what had previously been claimed to be compounds in French were lexicalized
syntactic phrases issued in the lexicon and not the output of word-formation in the
lexicon, which is basically the view espoused in Zwanzig (1992). Alternatively, a
reactivating them in the work of linguists like Carné and McCarthy and Spencer in the
word-formation is just that -word-formation- and not sentence formation. Choosing
one approach or the other depends on one's overall view of what the organization of a
grammatical what generalizations one wants to make in that grammar, and what
tells one wants to use or that available to make those generalizations. Even for a single
structure, those decisions can only be made when a substantial variety of word-
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a small number of examples of a few structures, it would be rather presumptuous to make
any far-reaching claims based on such little data. We can suggest, however, whether the
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formation structures have been clearly examined. Since this paper has only dealt with
a small number of examples of a few structures, it would be rather presumptuous to make
any far-reaching claims based on such little data. We can suggest, however, whether the
type of noun-noun sequences discussed should be generated by the word-formation
component or by the syntax. To date, many of the arguments for a syntactic origin
are lexicalization of a set phrase, or at least a phrase naming a specific reference. We
believe these two issues need to be separated from one another. The productive use of

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nouns in the non-head position would seem to simplify that lexicalization of a set phrase is not necessary for a noun to be used as a noun modifier. Strings like pain mask - (literally 'mask apart, agreement sample') or press button are not lexicalized in our view, yet we think they should be generated in the syntax as opposed to in the word-formation component. This, in turn, means that nouns can act as modifiers of other nouns in Catalan and Spanish, which in effect expands the possible type of non-head phrases in these languages. The acceptability of these structures in the modern languages is probably shaded by external factors such as increased influence from English, especially in journalistic prose, and an advertising style in which recoverable information is deleted to save space, as well as by the presence of other non-head sequences resulting from apposition. These syntactic phrases may lexicalize, as in fecha límite / due date deadline, but it is equally possible for the non-head noun to become increasingly more adjectival, as in the case with close/clos key.

6. Concluding remarks

The analysis outlined in this paper expands the role nouns play in Catalan and Spanish. If this approach is correct, then we should expect to find nouns in other non-prenominal contexts, and we do.

(6)

Spanish nouns in adverbial contexts:
Me lo pasé muy bien / 'I had a blast.'
No hagan nada extraño / 'Don’t do anything stupid.'
Les gustó ese horribil / 'They like it a lot.'

Catalan nouns in adverbial contexts:
No m’agrada gos / 'dog'.
Li va impresionar aquell / 'amount'. They impressed him a lot.

The alternative, considering subordinative noun-noun sequences compounds in our view would open the flood gates as to what constitutes a compound in their languages. That in itself is not argument against it, but lexical origin seems ill-equipped to account for proper nouns as non-head nouns, and if these noun-noun sequences are to be regarded like other subordinative sequences—and we think they should—then a syntactic approach is preferable.

Noun-noun sequences in Catalan and Spanish are interesting proving grounds for morphological analysis. We hope to continue gathering data on potential compound structures, and specifically on the sequences involved in subordinative noun-noun sequences, not only to achieve a better understanding of how these two languages work, but also to shed light on compounding and word formation in Romance. For now, we hope to have shown that the range of semantic relationships between the two nouns is wider than previously thought.

References

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Abstract

The formal and semantic differences between compounds and phrases are proposed to follow from general economy considerations, treating X and XP expressions to be defined as soon as possible in the derivation. Some consequences of this hypothesis for the differences in conceptual interpretation between the two sorts of expressions are discussed. It is shown that the formal differences involved, basically that the spec-head and the head-complement relations and the features they bear are not visible for interpretation at the interface between word-structure and Conceptual-Intentional system, correctly predict that the semantic features associated with the subject or external argument, b) with deaccenting and nonmaking modification, and c) with referential specific categories, are not available for interpretation in compound structure, whereas they are in phrasal structure.

1. ECONOMY OF X/XP DERIVATIONS

1.1. Purpose

The purpose of this paper is to account for the differences and the similarities between words (X) and phrases (XP) in terms of economy considerations. We focus on compounds, as they exhibit both X and XP properties.

On the one hand, compounds are Xs by phonological criteria, they have a unique stress on the root-head (Chevrel and Halle, 1967; Clague, 1972); by conceptual criteria, they exhibit conceptual and referential opacity (Di Scialo and Ginzberg, 1992), and by syntactic criteria, they are not separable (Di Scialo and Williams, 1987). On the other hand, compounds are XPs by other criteria, e.g. they have more than one category form, they may include a physical component, and they may associate pseudo-modification and pseudo-complementation (Di Scialo, 1994, 1997). The question we address in this paper is the following: why are compounds both different and similar to phrases?

1.2. Proposal

We propose that the differences and the similarities between compounds and phrases are an effect of the economy of the grammar. Compounds and phrases share properties, and their differences arise because they are distinguished in the derivation, which proceeds in the same computational space. However, they differ in their derivations, which proceed in the same computational space. The conceptual system must distinguish Xs from XP in conceptualized contexts in order to translate each expression into a different sort of interpretation.

1.3. Assumptions

We assume that the derivation of the linguistic expressions, Xs and XPs, takes place in the same computational space as an effect of the operation of the different modules of the grammar, including the morphology and the syntax (Chomsky, 1995). The modules are autonomous to the extent that they mandate specific treatments of the grammatical, pronomial, and referential categories, as in Di Scialo (1996).

We assume further, as in Di Scialo (1996), that the computational space includes unitizing types of derivations leading to optimal target configurations. The derivations lead to canonical target configurations (CTCs), the features of which can be visible, i.e. interpreted at the interface with the cognitive system. Canonical target configurations are fixed to specifier-head, head-complement and subject-head configurations. They are the conceptual structures upon which the conceptual-intentional systems and the features they bear are highly visible at the interface. We assume that a feature is visible/interpreted only in a target configuration. Xs/CTC is an adjunct-head configuration, XPs/CTC is a specifier-head-complement configuration at the conceptual interface.

1.4. Hypothesis

We propose that the syntactic differences between Xs and XPs may not survive in the phrase and especially not at the conceptual interface, given the Optimality of X/XP derivations, that we define as follows:

- Optimality of X/XP derivations
  X/XP derivations must be distinct as early as possible in the derivation.

That compounds and phrases may share configurations in the derivation and at the grammatical interface (PI), but they must differ at the conceptual interface. This condition is part of the economy condition inherent to the grammar. It imposes the possible derivations of Xs and XPs, and analogous derivations are not covered by the economy condition of the Minimalist Program (Chomsky, 1995).

1.6. Consequences

If the derivation of the Xs and XPs lead to distinct target configurations at the conceptual interface, we predict that XPs and Xs have different conceptual properties at the interface. We show that they differ with respect to the visibility of the features of Xs:

- the subject or external argument
- deaccenting and nonmaking modification
- referential specific terminals

We take the specifier-head configuration to be the target configuration for feature agreement, i.e. the head-complement configuration to be the target configuration for feature matching under partial identity, and the subject-head configuration to be the target configuration for feature matching under full identity, as in Di Scialo (1995).

Pronouns are c-linked with the link active at every step in the derivation and allow to choose between two grammatical derivations, i.e. interpreting at the interface, optimal ones. Full pronouns are in a condition of representation meaning that no superficial element is part of the interface. The Optimality distinguishes Xs and XPs, not distinguishing their similarity.
These forms, visible in spec-head and head-complement configurations in XP structure, are not visible in compounds, which are, in our theory, simplex-head structures at the conceptual interface.

This paper is organized as follows. In section 2, we discuss the features supported by the predication relation and show that the features associated with the subject are not visible in compounds. In section 3, we consider the differences between words and phrases with respect to aspectual modification, bringing evidence to the effect that at least one sort of aspectual modification cannot be obtained within compounds. In section 4, we show that, as in the case for nouns and adjectives, theta structure specific reference cannot be obtained with compounds because the configuration-specific reference is not available at the morpho-conceptual interface. These facts are predicted by our theory and follow in a unified way. In the last section, we consider some theoretical advantages of our proposal over alternative treatments.

2. Predicates and Predication

In this section, we focus on the differences between compounds and phrases with respect to predication. Compounds are XPs, they are predicates, i.e., open functions, and they include predicates. On the other hand, phrases are XPs, they are closed functions, and they include predicates. Functional closure may be achieved via predication (Williams, 1988, 1994). Theta-bonding (Higginbotham, 1988) and feature checking (Chomsky, 1985).

2.1. Primary predication

In the Minimalist framework, (Chomsky, 1995; Ura, 1997) predication is a manifestation of the spec-head relation, where features of the external argument or the subject are in the spec position.

[Spee X],

subject

While predicates are legitimate in XPs and X’s, the predication relation may only be legitimate in XPs. In descriptive analyses, the noun nominal category does not qualify as a legitimate argument or a subject. In this case for compounds, where the nominal nominal category is not a legitimate argument or a subject, the nominal nominal category is interpreted as the theme, but not as an object or an experiencer; compare (4) and (5).

a. John reads.

b. John reading.


2.1.1. Relatives

Furthermore, assuming that the predication relation also holds between the head of a relative clause and the clause, as suggested in Williams (1994), our theory correctly predicts that relative clauses may not be visible/interpreted as a compound at the morpho-conceptual interface.

In effect, in the case of the relativization of the subject, the head of the relative clause is in a position with the verb via the movement in spec-CP. Subject-verb agreement does not hold within compounds.

(6) a. the [one who writes] the book is out of town.
b. the [one who writes] the book are out of town.

(7) a. The [writer] of SPE

b. The [writer] of SPE

This again follows from our hypothesis that at the conceptual interface, the spec-head configuration and the features it bears are not visible/interpretable in X’s, whereas they are in XPs.

Thus, our theory correctly predicts that compounds and phrases are different with respect to primary predication, and derives the fact that the features supported by a subject are not visible/interpreted within compounds.

2.1.2. Secondary predication

We also predict that secondary predication, deverbative or relational, may not be obtained within compounds, as it also is a manifestation of the spec-head configuration, which is not part of XPs.

(8) a. He goes [the book on the shelf].
b. *Book-shelf-putting is boring.

(9) a. They consider [smoking crazy].
b. *Smoking-crazy-considering is quite common.

(10) a. They eat [the meat].
b. *Fish-raw-eating is particular in Japan.

(11) a. They iron [shirts flat].
b. *Shirt-flat-ironing is what you want to do.

This again follows from our hypothesis that the spec-head configuration is not visible in X’s or the conceptual interface, while it is in XPs.

3. Aspectual modification

There is a difference in the range of aspectual modification that can be licensed in XPs and in X’s. For compounds, we take event structure to be a representation that covers the mental event conceptualization of the situation or as ever denoted by a verbal expression (Koster, 1987; Comrie, 1979; Bach, 1986; Kips, 1990; Perussi, 1990; Smith, 1991; van Kemenade, 1993). Various features and properties of this event structure can be inferred or modified by affect or phrase elements across languages. We examine the following three types of aspectual modification: sequencing, branching, and removing.

The following paragraphs provide evidence to the effect that while sequencing, branching, and removing modifications may be licensed in compounds, this is not the case for deverbative
sequencing modification, which can occur only in XPs. This difference, not noticed before in the literature, brings further support to the differences between words and phrases of the conceptual interface and provides a rationale to the XXP difference with respect to aspectual modification.

3.1. Sequencing modification

Sequencing modification, as a manifestation of the adjunction configuration, may be licensed in XPs and in XPs. It takes the form of intensive and inverse prefixes in XPs and of adverbial phrases in XPs.

The crucial difference between XP and X sequencing modification gives rise to the difference in aspectual interpretation (cf. Wechsler, 1990; Di Sciusco, 1997; Rooper and Keyser, 1992, 1993).

(12) a. Mary kissed a house (a different house)
   b. Mary kissed a house (the same house)

Sequencing modification can be licensed in verbal compounds, via an intensive prefix that modifies a directional proposition, as in (135), but not the verbal complex formed by a verb and a particle, as in (136).

(13) a. to turn the chair over again
   b. to [turn-over] the chair again
   c. to [turn-over] the chair
   d. to [re-turn] the chair
   e. to [re-turn] the chair

These facts are consistent with the generalization that we established elsewhere, on the basis of Romance data (cf. Di Sciusco, 1994), that verbal prefixes, such as the intensive or the inverse prefix, c-extend the internal prefixes, namely the directional prefixes. Similar facts, even though more limited, are observed in English.

(14) a. porter/reporter/reporter
   b. reporter/reporter
   c. to lighten/to lighten
   d. to re-lighten/to lighten
   e. V
   f. V
   g. V

Thus, sequencing modification can be licensed within compounds via prefixes, as an adjunct to a prepositional prefix. This is predicted by our theory since this is achieved via adjunction.

3.2. Delimiting modification

Moreover, in XP structure, a DP or a PP complement may add an endpoint to the event denoted by the verbal projection, as discussed in Terenyi, 1983, 1994; Di Sciusco and Kipper, 1994; Pustejovsky, 1995; Di Sciusco, 1997.

It has also been established that the presence of a specific DP object or locative PP may have a delimiting effect on the event denoted by a verbal projection. Where an object refers to the property of an event having a distinct, definite, and inherent outcome in time (Terenyi, 1994).

(15) a. a ran for one hour/“in one hour” (activity)
   b. a ran the mile “for one hour” (accomplishment)
   c. a drove the car for one hour “for one hour” (activity)
   d. a drove the car “for one hour” (accomplishment)

Neither, non-specific opaque objects do not have a delimiting effect.

(16) a. Mary laughed for one hour “in an hour”
   b. Mary laughed “for one minute” “in one minute” (Terenyi, 1994)
   c. John ran a great run “in an hour” (activity)

This is also the case for deverbal compounds, where the nominal non-head is not delimiting.

(17) a. Marathon running “in an hour” “for an hour” is fun.
   b. Pasta eating “in an hour” “for an hour” is hard.

In compounds, the nominal expression included in a deverbal compound cannot have a delimiting effect on the event denoted by the deverbal head because the non-referential, non-specific expression is in adjacent position.

Thus, delimiting modification is blocked for deverbal compounds, where the nominal expression within has no effect on the event structure of the deverbal head. This follows from our theory that the nominal expression is not in a head-complement configuration of the conceptual interface. It is interpreted as a non-referential and non-specific in the head-adjunction structure it is a part of at that interface.

3.3. Measuring modification

Measuring modification, a manifestation of the head-complement configuration, is instantiated by a class of degree modifiers found in XP structure, which modifies the part of the change of state in the event structure.

(18) a. a closes the door “partway”
   b. a walks “halfway” to New York

The adverb “partway” modifies the final resulting state of the event, to supply a new final state only part of the distance to the original final state. This kind of interpretation has been discussed by Terenyi and Hanyi (1995) and has been represented formally by Parsons (1996).

“Measuring modification, unlike sequencing or delimiting modification, may only occur in XP structure. Prefixes which are candidates for a measuring interpretation, such as adverbs, do not in fact provide that interpretation. Evidence comes from the possible interpretations of the sentences, as well as from the verb classes they may apply to, which is not the same set.”

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(19) a. *mended the door pathway
   b. *mended halfway to y
   c. mended halfway's y

Measuring modification is not found within the verbal morphology because it crucially involves the composition of a verb with its complement, which cannot occur in syntax. Measuring cannot modify within a word because it requires a complement, a referential specific DP, not found within the word at the conceptual interface.

The following morphological consequences follow from the absence of measuring modification in the basic adjunct and head composition of words. First, devolved complements will not include a category that can be interpreted as a path.

(20) a. *mixed the paint completely
   b. mixed the (completely) paint

Second, given D&J's (1987) definition of the head of the word and Kayne's (1994) LCA, the fact that measuring modification requires a complement and that such modification cannot be obtained within the word lends further support to the view that complements cannot be lexically within the word at the conceptual interface. In fact, argument modification in derivational morphology is only possible to the left in adjunct position.

(21) a. to presuppose
   b. *be presupposed
   c. to presuppose
   d. *be presupposed

This follows from our hypothesis that X's are canonical adjunction and head configurations at the conceptual interface, while XPs are canonical Spec-head-complement configurations.

4. Referentiality

In XPs, both spec-head and head-complement configurations may support the referential and the specific features for nominal expressions. We predict that these features are not visible at the conceptual interface for X expressions such as compound, the CTC of which is an Adjunct-head configuration.

Let us first distinguish two sorts of interpretation for a nominal expression: referential and non-referential, as depicted in (22), where the referential interpretation further matures into specific and non-specific. Let us assume, with Chomsky's (1986) argument of Haar in his evidence, that specific moves out of the nuclear scope (the VP), whereas referential non-specifics are subject to existential closure. Let us further assume that nonreferential non-specifics category are subject to adjunction.

(22) a. referential: specific
   b. non-referential: non-specific

The referential and non-referential interpretations are exemplified in (23), respectively. The difference in interpretation is reflected in a difference in structure, with specific referential specific nominal may undergo passive for instance, this is not the case for non-referential non-specific ones.

(23) a. *He ate the pasta.
   b. He ate some pasta.
   c. He ate pasta.
   d. *Pasta was eaten.

Relevant to our purpose is the fact that the nominal expression included in a compound is non-referential and non-specific.

The lack of referentiality of the nominal expression in the compound is evidenced by the fact that it may not undergo passive, (23b), it may be the antecedent of a pronoun, (23c), and it can be licensed in gapping structures, (23d).

(24) a. John propped the shelf today.
   b. *Shelf was propped by John today.
   c. This propped shelf is in marble and it is in gold.

Matsunaga (1996) observed that the referential as well as the non-referential interpretations were available for concrete objects.

(25) a. Mary danced a beautiful dance.
   b. *A dance beautiful was danced by Mary
   c. The result of the activity of dancing is beautiful (referential, non-specific).
   d. The activity of dancing is beautiful (non-referential, non-specific).

As expected, passive is not possible with the non-referential, non-specific reading.

(26) a. A beautiful dance was danced by Mary and it wasango.
   b. A beautiful dance was danced by Mary and everybody was delighted.
   c. A beautiful dance was danced by Mary and it was never-ending.

Moreover, a concrete object with a non-referential reading cannot be the antecedent of a pronoun nor it be licensed in a gapping structure, as the following examples show.

(27) a. Mary danced a delightful dance, and it was attractive.
   b. Mary danced a never-ending dance, and it was attractive.
   c. *Mary danced an attractive dance and it was a sudden dance.

Borer (1994) following Stowell (1989) assume that the difference between referential and non-referential nominality is set in categorical terms. Referential nominality are DPs, while non-referential nominality are NPs. This position is also taken by Matsunaga (1996) to distinguish the interpretation of a concrete object.
(31) a. DP
   b. DP
   c. DP
   D NP
   D NUMP
   D NP

   a, some
   [e] NUM NP
   [e] NUM N

   many, these
   these, a

   Borer, (1994)

(32) a. FP
   b. FP
   c. FP
   Spec
   F
   F VP
   V NP

   [be] V
   [be] smile

   Matsumoto, (1996)

However, analyses that capture the differences between referential and non-referential nominals in terms of a categorial difference are difficult to hold for compounds, where the definite article, but not a numeral may be licenced. French compounds are ungrammatical with a numeral, compare (33) and (34).

(33) a. un coup de soleil, un trompe-l’ceil, un bons-l’accou, un avec-le-sou
   The definite article projects a DP structure in these compounds. However, the interpretation of the DP is non-referential and non-specific.

(34) a. Ce vin est un vrai coup de soleil.
   This wine is a real thrill-quencher.
   b. *Ce vin est un vrai coup de soleil.
   This was cut off by this wine.
   c. *C’est un vrai coup de soleil, est efficace lorsqu’il est persistante.
   *This thrill-quencher is good when it is strong.

What prevents a referential specific interpretation for Basque? We claimed in D-Sicillo (1995b) that the nominal expression included in the compound is an adjunct to D before Spell-Out and at the conceptual interface.

(35) N
   V N
   coup de soleil

Given the strong R feature of D in Romance (Longchamp, 1994), the overt adjunction is forced by the strong features of D in the language under consideration and is sustained by the fact that the adjacent structure is not subject to DP movement such as passive, as well as other syntactic properties of DPs.

5. Summary

Thus, reanalyzing the presence of XP structure in N, we show that our theory captures, in configurational terms, basic differences between the interpretation of compounds and the interpretation of phrases with respect to passivization, definiteness modification and specific reference at the conceptual interface. As manifestations of the spec-head-complement configuration, these relations and the features they bear are not susceptible to an X coordinated head configuration at the conceptual interface.

6. Advantages

In this last section, we identify three theoretical advantages of our proposal. The first is that such construction-specific conditions are no longer required in the grammar of compounding.

This, to rule out the compounding of subjects, such as in the examples in (51) above, construction-specific constraints have been proposed in the literature, including the First Specifier Principle and the Subject Condition.

(36) First Specifier Principle

All verbal compounds are formed by the incorporation of a word in first specifier position of the verb.

Roemer and Sagart (1978; 208)

(37) Subject Condition

The SUBJ argument of a lexical item may not be satisfied in compound structure.

Selkirk (1982:34)

A second theoretical advantage of our proposal is that no independent aspectual ASP node is required in the derivation of verbs, so the restrictions relative to aspectual modification follow from the configuration, head-adjunction preventing modifying modification to be obtained word internally.

In fact, ASP nodes (Travis, 1992; Borer, 1993) are partial descriptions for aspectual modification. They fail to predict the basic moodphrase asymmetry with respect to aspectual modification, as our configurational theory predicts.

(38) N
   V ASP
   Spec, ASP
   [be] coup de soleil

N

129
In our theory, the base output conditions impose a strong requirement on the form of words and phrases. The two sorts of grammatical objects must be configurationally distinct at the interface in order to be properly interpreted by the performance systems. Our part of the distinction lies on the visibility of the head-complement configuration in phrases and its non-visibility in words. This asymmetry makes the correct predictions with respect to numeral modification.

A third theoretical advantage of our proposal is that no head-movement is required to account for the lack of specific reference for the nominal expression included in a compound (Baker, 1988; Black, 1991).

This is a welcome result: in null-movement violations the Unifiability Condition on movement of the Base Phrase Structure Theory (Chomsky, 1994).

(39) Unifiability

A chain is uniform with respect to its pronominal status.

The chain created by head-movement violates Unifiability since the tail of the chain is a minimal category and the head of the chain is both minimal and maximal.

(40) \[
\begin{align*}
\text{VP} & \\
\text{NP} & \\
\text{N} & \\
\end{align*}
\]

Thus, head-movement is not a possible sort of movement and that is not available for word-formation (including compound formation), given Unifiability on the one hand and a configurational definition of category types on the other.

References


Distinguishing Derivational Prefixes from Initial Combining Forms

Abstract: The definition of prefixes is based upon formal characteristics which do not allow for a clean distinction between prefixes and initial combining forms (ic's). Even though the differentiation between prefixes and ic's can be represented on a continuous scale, arguments are given in favor of a clear-cut distinction between typical prefixes (derivational elements) and typical ic's (compounding elements). A detailed definition of prefixes is provided, and derivational affixation is compared with compounding. An explanation is given of the reasons why some ic's can lose their stem-like characteristics and lean towards prefixes to such an extent that they are fully identified with them. This paper ends with a list of Italian prefixes, and the list of ic's which are most similar to them.

0. Introduction

This paper focuses on the definitions of derivational prefixes and on the criteria distinguishing preflxion from compounding and those which distinguish prefixes from initial combining forms (also called prefixeds, format, neo-classical element, confus, etc.).

The commonly accepted definition of prefixes — "a bound form that can be productively attached to the left of a word (in the sense of a free lexical element)" — is unsatisfactory because of its vagueness. Such a definition is not sufficient to identify the prefixes of a language in a consistent way. For example, the collection of elements defined as "prefixes" in two authoritative grammars and in a few dictionaries of contemporary Italian amounts to 106 forms, but there is unanimous agreement only on 10 of them in spite of the fact that each source mentions approximately 80 to 90 forms.

The main disagreement concerns the classification of elements which some regard as prefixes and others as initial combining forms (henceforth ic's). The principal reason for this disagreement is that the definition of prefix is essentially a formal one. Since prefixed words and words formed by an ic plus a word are similar, both from a formal (bound form / free form) and a functional point of view (non-head/ head), we need more precise criteria to characterize prefixes and distinguish them from ic's, in addition to the positional criteria and the syntactic autonomy of the elements.

For this purpose, I will suggest a set of properties defining (proto)typical derivational prefixes. I will then compare the characteristics of affix derivation to those of compounding. My definitions of prefix and of compound refer to the Italian language, but they may also be extended to the other Romance languages. The distinction between prefixes and ic's applies more generally and concerns other languages as well.

Even though the differentiation between prefixes and ic's can be represented at a continuous scale, I would argue in favor of a clear-cut distinction between typical prefixes (that is, affixes that operate according to derivational rules) and typical ic's (that is, stem-like elements that operate according to compounding rules). Unlike words and affixes, ic's do not form a natural class; rather, they are a heterogeneous set of foreign elements interacting with the elements and the formative processes proper to a specific language. The wide usage of technical and scientific terms is everyday language, and processes of grammaticalization can make some ic's lose their stem-like characteristics. The ic's which are at a more advanced stage of grammaticalization have lost their original contextual identity; they show a tendency to play a substitutive role with respect to the other element in a complex word, and tend to the more general in meaning, expressing cognitively relevant, recurring components of meaning which are organized in paradigmatic relations with the meaning expressed by prefixes.

The suggested set of properties defining (proto)typical derivational prefixes makes it possible to draw a list of prefixes in the Italian language. By working out the criteria distinguishing preflxion from compounding, as well as the characteristics typical of ic's, we will be able to reduce to a minimum the number of elements for which there is still a margin of arbitrariness in distinguishing between prefixes and ic's. We will also be able to justify the decision to assign them to either the one or the other kind of element or the other.
3. The distinction between prefixation and compounding

The distinction between derivation and compounding, between affixes and bound elements centered on the syntactic autonomy criterion shows its limits when we consider words formed by two of cf's (e.g. onomotopoeia, geology) which are rightfully regarded as compounds even if they violate the definition of compounding based on the syntactic autonomy of components.

Scrutinized (1984: 75) gives several arguments — which I have summarized in the following first points — for these elements to be considered as lexical stems, combined in compounds, by positing that affixes of these elements do not share:

- an affix cannot be a prefix in some words and a suffix in others,
- affixes cannot be “factored out”,
- the position of affixes is fixed, that of cf’s is not,
- a free element (= a word) cannot consist only of affixes,
- cf’s have a suppletive semantic relation with words.

Let us now look carefully at Scrutinized’s arguments one by one.

a) The first point is valid, but it has a limitation. It only applies to the limited number of cf’s that can occupy both the initial and the final position with no difference in meaning (e.g. It. bio in Bionico “bacon” and endico “amphibious”); gen in geology “geology” and popo in hipopó “hypotenuse”). However, it does not help us to distinguish prefixation from cf’s combined with words.

b) Prefixes too can be factored out. For example, Eng. pre- and in-, exclam., Genn. fe-

order (English “charge” or “discharge”). Dutch ge- on verboons (“orders and have”).

c) Scrutinized gives examples of composite compounds, a kind of compounding in which the order of elements is not significant. He makes the example bio-Eng. bio-Scot.

compared to Anglo-Eng. Scot.

However, this property is the consequence of this specific type of compounding and not of the use of cf’s. In compounds having the structure specifier-head, the order is meaningful; see: logomachia “logomachy”, logographia “logography”, logocentric “logocentric” as against logography “logography”, pedologo “pedology”, pedogogy “pedology”, or the order is determined by the fact that the cf’s can only occupy one position, either initial or final; see the English pseudosyllabry vs. the impossible word “morppseudo”.

d) If it is true that outside the foreign-learned vocabulary it is not possible that a word is formed by two affixes only, it is also true that in Latin it is impossible to form words formed by two or more stems (Latin: compounds are generally formed by the feature-preserving only two of them). In many languages there is a subset of the vocabulary that behaves unusually in certain morphological processes, and consists of loan words having a “learned” constitution. Besides cf’s, it contains clear affixes (e.g. the English suffix -ly, which is usually joined to stems of Latin origin, as in occasional, profanity, and words like the English curvilinear, pl. curvilinearis, beside curvilinearum).

e) Scrutinized’s example bio-, meaning “life” and anemoge- meaning “wind” point to semantic relationships between cf’s and words; but there are also semantic relationships between affixes and words, e.g. pre- and before, post- and after, re- and ago, and between cf’s and words belonging to closed classes (for example, locative prepositions and adverbs): ex-, extra- “out”, endo- “in”, ex- “down”, an,on “behind”.

To sum up, Scrutinized’s criterion, apart from the first (which is useful, but of limited scope), are not very helpful in clearly distinguishing between affixes and cf’s. However these criteria give a very useful, yet often overlooked insight: cf’s are a heterogeneous set with different characteristics and behaviors.

4. Further complications

Three more phenomena make the distinction between compounding and prefixal derivation more tenuous.

First and most important: some cf’s can be employed as determiners even before words (and not only in combination with other cf’s), that is, in conformity with the typical structure and function of prefixation (bound form/free form) (specifier/ head) (e.g. It. macriforme, strophocristato, permesso). Second, prefixes, which are predictably combined only with free words, may appear to be combined with bound words (e.g. Eng. nuclea, produc, reuni, conn). Third, some prefixes are used as free words (e.g. It. super meaning “gasoline, petrol”).

The third point concerns idiosyncratic behaviors of an extremely small number of prefixes. Rather than prefixes, they can actually be seen as truncated forms.

The word-like meaning these self-standing prefixes express is that of the former complete word which underwent a truncation process. The second point stems from electronic cases. These are words with a Latin origin, not formed according to productive word formation rules. The first point observes a consideration since it is the link of formation process involving cf’s which most resembles prefixation.

5. The need for a definition of the prefix

We have seen that, in order to distinguish between prefixes and cf’s, and to define out a set of homogeneous elements which can be defined as prefixes, the property of syntactic autonomy is not sufficient. Neither is it helpful to work out another criterion that might serve the same purpose on its own, for example, a criterion of etymological or derivational nature (Reversals of space do not allow us to discuss these matters here).

The reason for this failure is that attempts were made to identify cf’s by discriminating them with prefixes without having an adequate definition of prefix. Whatever it has not been possible to identify a cf by showing that it may occur at the first and last element of a word with no difference in meaning, an attempt was made to prove that it is a bound element other than a prefix. But this reasoning demands independent criteria for “real” prefixes, as well as a comparison between prefixation and compounding.

In order to establish whether we are dealing with the two different processes and look for lexical elements, or with one process and one kind of element, it is therefore necessary to draw up the set of properties defining a prototypical model of prefix and of
prefixed word. It is then necessary to compare the behaviour of bound initial elements, according to these properties (taking into account tendencies in usage and quantities and distributional data), so as to see which of these elements conform to the proposed model and thus can be defined "real prefixes". In the other hand, this will enable us to see which elements having behaviour and properties typical of compounding, gradually depart from it, and lean towards the definition of prefix.

In paragraphs 6 to 9 I will suggest a definition of prefixation and of compounding, and I will discuss how compounding forms relate to the two formative processes. I have adopted this way of approaching rather than an intentional definition of prefix because of's are not a named class in languages. They are bound stem-like elements combined in compounds belonging to technical and scientific registers. Many of them are not become part of common language, and stay apart from the word formation system. Some of's become part of the language through grammaticalization and lexicalization processes, and their behavior range from that of autonomous words to that of derivational affixes (see table in paragraph 6).

6. The defining criteria of prefixes

The following list suggests a set of properties identifying the prefix productively used in the formation of words of common usage in the Italian language (it can be extended to other Romance languages with slight modifications).

1) They are prefixes (= bound elements) without a semantic category (= N, A, V) that attach to the left of a lexical base in order to modify its conceptual meaning.

2) They form new words by attaching to words; they do not productively form words combined with affixes or other bound elements.

3) They can play a role in the formation of para-syntactic verbs, that is, verbs like in Italian avere "to arrive", sapere "to know", for which the corresponding non-prefixed verbs — avere, sapere — do not exist.

4) They occur only in the initial position of a word (a prefix can be preceded by an other prefix within certain restrictions).

5) They act as determiners (they are not in coordinative relation with the words which they are attached to, nor with other prefixes).

6) They select bases mainly according to semantic criteria. They can thus violate the Unanimity Base Hypothesis, even in the modified version proposed by Scattone (1984).

7) They express functional-relational meanings (as opposed to both lexical and grammatical ones); pronominal or enclitic-like knowledge is not necessarily required to interpret the compositional meaning of prefixed words.

8) Their meaning is generally known to all speakers.

9) They form endocentric words of which they are not the head: the category, the gender and other inherent features of prefixed words (e.g. inflectional, animacy) remain the same as those of the base word.

10) They can affect all the meanings of the base word or only part of them. In this second case, the characteristics inherited by the prefixed word are a subset of those proper in the base and match the selected meanings.

11) Some prefixes can be used recursively and have (like all prefixes) their semantic and syntactic scope over the whole complex word.

7. Compounding

Let us now look briefly at the definition of compounding: (Based on Italian primary compounding).

- Compounding combines two stem-like elements.
- The elements of compounds have an independent lexical meaning.
- The semantic relation between the elements is not explicitly signaled; consequently, the meaning of compounds allows for several possible interpretations.
- A head-element can be a non-head in another compound.
- The typical relation between constituents is subordinate, but coordinative or exocentric constructions are also possible.

8. Different kinds of combining forms

By comparing the properties of compounding with those of affixal derivation, it is possible to work out a set of criteria which help us to identify if's and their behaviour with respect to word formation processes.

The criteria of comparison I have used between compounding and affixal derivation are as follows:

- Position: the affix has a fixed position, the constituent of compound does not.
- Combinational capacity: the affix does not combine with other affixes; the constituent of compound combines with derivational and/or functional affixes.
- Relation between constituents: derivation only allows for a substitutive relationship, compounding also allows for a coordinative relationship.
- Head position:
  - Derivatives are always right-headed, productive compounds are left-headed;
  - Both derivational and functional affixes are typically endocentric.
- Semantics: affixes have a relational meaning which requires a complementing semantic feature, and they clearly indicate the semantic relation between the elements of the derived word. The constituents of compounds have a denotive lexical meaning, which is semantically autonomous; the relation between the constituents is not clearly expressed; as a consequence, the meaning of compounds is much less precisely determined compared to that of derivatives.
- Formal criterion: the affix is a bound element; the constituents of compounds are free elements.

On the basis of the above criteria, it is possible to draw the following table (overleaf) on the basis of Meroni (1994:283) which depicts the behaviour of if's as compared to the two poles consisting of prototypical derivational affixes and typical constituents of compounds.
In this table, "a" indicates a characteristic typical of derivational affixes, "c" indicates a characteristic typical of constituents of compounds, except for column 4b, where "c" indicates endocentric formation and "s" exocentric formation. Where "a", "b", "c", "s", appear, the first characteristic prevails over the second.

9. A list of prefixes

For reasons of space, my comments on the table will be limited. The table shows clearly the multiple behaviours possible in the whole set of cf. Many cf, though they are bound-forms and occupy a fixed position, have the typical behaviour of constituents of compounds, particularly with respect to semantics and the kind of relationships they have with the other members of a complex word. The conclusion we may draw is that the properties of some cf's cannot be applied to them all, and that cf's as a whole cannot be equated to affixes.

Restricting my comments to lefts, and returning to the issue of their distinction from prefixes, the data in the table shows that the left's most similar to prefixes on those in group 1.

In addition to the properties included in the table, there are two more that help distinguish left's from prefixes:

1. Whether it is possible for them to combine with words and/or with cf's.

2. Which register they belong to: everyday language as opposed to technical and scientific language.

The great majority of words formed with cf's result from a combination of one cf's and belong to the technical and scientific register. In most cases, the meaning of cf's is only known to the people specialized in a particular field. When a similar word is used in everyday language (e.g. It. affiliate "telephoney", fr. afféter "inflammation", adj. afféter "hydrogen"), the speakers are not usually able to distinguish the elements that make it up, and to give them their proper meaning. However, when a cf is attached to the left of several different base words (e.g. It. evoluzione, economia, economista, eccovoluzione, protosafarico, protostenting, protocorona, protomateriali) it is next probable that speakers will be able to assign this kind of complex word. This is because they will recognize at least one familiar until that is the word, and that is moreover the head of the formation. The compositional meaning of the "cf's + Word" type is easier to understand than the type consisting of two cf's. Since the base word is easier to understand, it will also be easier to interpret the meaning of the cf's. So, the more an cf's used before words in formation of complex use, the more likely it is to become part of the competence of speakers. The structural analogy between this kind of formation and prefixation helps to associate (and in some cases identify) the left's involved and prefixes.

Keeping these last two points in mind, the margin of uncertainty between prefix and left's narrows. And now the most probable candidates to prefix status are (those depicted in group number 1) the left's which mainly combine with words, which are known and used by the majority of speakers, and express a functional and relational meaning. Assigning these elements to the category of prefixes or to that of cf's requires some arbitrary judgment. (However, this only concerns a small number of forms). Among these are a few which show all the defining properties of prefix, even though sometimes they are used in combination with cf's to coin technical and scientific terms. Therefore, in a synchronic perspective, the following terms can be considered as prefixes:

<table>
<thead>
<tr>
<th>Criteria</th>
<th>1</th>
<th>2</th>
<th>4a</th>
<th>4b</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>Protox. Affix</td>
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<td>a</td>
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<td>a</td>
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<td>a</td>
</tr>
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<td>1-endo, -oligo</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>e</td>
<td>a</td>
</tr>
<tr>
<td>2-into, -ign</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>c</td>
<td>a</td>
</tr>
<tr>
<td>3-aquo, -bio</td>
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<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>c</td>
</tr>
<tr>
<td>4-lipo, -melano</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>e</td>
<td>a</td>
<td>c</td>
</tr>
<tr>
<td>5-lipo, -mid</td>
<td>a</td>
<td>a</td>
<td>a</td>
<td>a</td>
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<tr>
<td>6-mena, -oid</td>
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<td>a</td>
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<td>a</td>
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<td>7-cortex, -micro</td>
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<td>a</td>
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<tr>
<td>8-cortico, -gono</td>
<td>c</td>
<td>a</td>
<td>c</td>
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<td>a</td>
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<tr>
<td>9-dikanto, -bio</td>
<td>c</td>
<td>c</td>
<td>a</td>
<td>e</td>
<td>a</td>
<td>c</td>
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<tr>
<td>10-terno, -cercato</td>
<td>c</td>
<td>a</td>
<td>a</td>
<td>e</td>
<td>c</td>
<td>a</td>
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<tr>
<td>11-socio, -angle</td>
<td>c</td>
<td>a</td>
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<td>a</td>
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<tr>
<td>12-into, -ginge</td>
<td>c</td>
<td>c</td>
<td>e</td>
<td>a</td>
<td>e</td>
<td>a</td>
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<tr>
<td>Pronoun Comp.</td>
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</tr>
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</table>
REFERENCES


10. Conclusion

In this talk I have argued that prefixes and composition are two separate processes involving elements of different kinds:

 prefixes form a heterogeneous set which can interact both with the lexical elements and the word formation processes of a language. Their presence in compounds and their bound status are favorable conditions for their grammaticalization. The id's expressing receiving components of meaning in paradigmatic relation with the meaning expressed by prefixes, and that are employed several times as determiners preceded to a word, can become so similar to prefixes as to fully identify with them.

An accurate definition of the notion of prefix, the comparison between such definition and the case identifying the constituent of compound, and a detailed analysis of the behavior of initial bound elements have made it possible:

- to define the set of Italian prefixes;
- to identify, motivate and contextualize the inevitable overlapping between processes and formative elements that are actually different.

1. Introduction

The focus of word formation has been an area of great controversy in morphological theory. Positions vary from a strong lexical view, which makes the lexicon to be the only place of word formation (Asenoff and Spenader, 1984; and D. Scassellati in Williams, 1987 among others), to a modular theory of word formation, which argues that word formation takes place both at lexical and post-lexical levels (Shibatani and Kageyama, 1980).

The strong lexical hypothesis maintains that the syntactic structure of a word can be found in the internal structure of words. Thus, word formation rules such as compounding and incorporation cannot occur during the course of syntactic derivation whether such derivation is in the overt syntax or at LF. On the other hand, the modular theory allows the morphological rules to access multiple grammatical components, presumably all of the following: the lexicon, syntax (even covert) and phonology. This paper presents supportive evidence for the latter position, a modular theory of word formation. The particular construction we discuss is the inalienable Object (O) construction in Japanese. The IO construction may be understood as a phrasal construction from the English Propositional Adjective such as blue-eyed and grey-haired.

The analysis carried out for the Japanese IO construction casts doubt on the strong lexicalist hypothesis, since it involves word formation outside of the lexical component, in the course of syntactic derivation. On the other hand, the proposed

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INALIENABLE OBJECT CONSTRUCTION IN JAPANESE

The paper discusses the inalienable Object (O) construction in Japanese and argues that an ad hoc analysis of this construction necessarily precludes post-lexical incorporation and adjectivalization. It will be shown that, while the IO construction in Japanese resembles ordinary SOV sentences, it exhibits a number of properties which depart from those of the canonical verbal construction. The analysis which captures all the properties of the IO construction crucially depends on the modular conception of word formation found in Shibatani and Kageyama (1980), thereby constituting a piece of evidence for the theory.
analysis of the IO construction is compatible with the modulational conception of word formation.

In Section 2, we will introduce the general structure of the IO construction. In Section 3, we will show that the IO construction in Japanese at first glance resembles ordinary SOV sentences, but exhibits many properties which differentiate it from canonical verbal constructions. In Section 4, we will then argue that the only plausible analysis which captures all the properties of the IO construction crucially depends on the modular conception of word formation. Specifically, we claim that the IO construction is a type of light verb construction, and it instantiates cases of incorporation and adjectivalization that are \textsc{unsyntactic}, but \textsc{post-lexical}. Section 5 serves as a summary and conclusion.

2. Inalienable Object (IO) construction
Examples of the Japanese IO construction are given in (1).

\begin{enumerate}
\item {\textsc{atomi}} mee-ni s-te nuni
\item {\textsc{syono-ni}} ga \textsc{yuri} me-te \textsc{si-te-ni}.
\end{enumerate}

\textit{The girl is blue-eyed.}

The IO construction can be contrasted with the two pre-modifying adjectival and predicative function. When it appears pre-nominally, it has the general pattern shown in (2a), which 

proposed, and we will postpone our discussion of the actual forms \textsc{si-te-ni} and \textsc{si-te-ni} to later (see Section 3). The IO construction is semantically similar to the English Possessive construction such as \textsc{blue-eyed} and \textsc{pretty-fish}. The entire construction modifies an entity by defining some inalienable property of that entity. That the property in question must be inalienable is illustrated by the inanonymity of (3).

\begin{enumerate}
\item {\textsc{ai-ni}} \textsc{ti-ti} s-te m-te \textsc{ai-ko-ni}.
\item {\textsc{White} \textsc{man}} \textsc{ACC} + \textsc{PART} \textsc{girl}. \textsc{girl} with a \textsc{white} \textsc{house}.
\end{enumerate}

3. Properties of the IO construction

3.1. A new verb is a light verb

To our knowledge, little attention has been given to the Japanese IO construction in the literature, and existing studies of it are superficial. These ignore the IO construction with ordinary SOV sentence. For example, Kamimura (1990) and Ueda and Nakayama (1993) make no distinction between (4a), which we call the \textit{IO construction}, and (4b), which exemplifies an ordinary SOV sentence.

\begin{enumerate}
\item {\textit{Mary}} \textit{-j-si} me-te \textit{si-te-ni}.
\item {\textit{Mary}} \textit{-j-si} me-te \textit{si-te-ni} (\textit{Ordinary SOV}).
\end{enumerate}

\textit{Mary is the owner of a new house.}

Note that (4a) in (2a) has the same form as (2b), and its subject-role (AGENT, THEME) is its arguments. In this sense, \textit{new} is a regular full-fledged verb. However, characteristics that \textit{new} in the IO construction is a full-fledged verb is the present tense. Either it seems that the subject \textit{new} gets a \textit{theme} thematic role from the agentive marked \textit{new}, and \textit{new} is void of meaning. This becomes clear when we try to substitute \textit{new} with a content verb which has a similar meaning. As the inanimacy of (2) indicates, no content verb can replace \textit{new} in (3). On the other hand, (2b) shows that a heavy verb \textit{new} can be substituted by a content verb.

\begin{enumerate}
\item {\textit{Mary}} \textit{-j-si} me-te \textit{si-te-ni}.
\item {\textit{Mary}} \textit{-j-si} me-te \textit{si-te-ni}.
\end{enumerate}

\textit{Mary is the owner of a new house.}

The contrast between (5) and (6) indicates that \textit{new} in the IO construction, unlike \textit{new} in ordinary SOV sentences, neither assigns theta-roles nor has a specified meaning in 2013.

Traditionally, this type of \textit{new} which is void of meaning and does not have its own agreement structure has been called a "light verb" in Japanese. Discussions of light verbs as particularly prevalent in the literature on the Verb-Noun (VN) construction in Japanese, which we will come back to in Section 4. Here, let us note that the presence of the light verb \textit{new} requires a special mechanism of theta-role assignment and any analysis of the IO construction should take it into account.
3.2. NP-ACC and *suru* are inseparable

We now turn to the second property of the IO construction which differentiates it from ordinary SOV sentences. That is, the accusative-marked NP in the IO construction cannot be separated from the light verb *suru*. For example, the accusative-marked NP is invisible in a syntactic movement operation such as scrambling, a common phenomenon in Japanese, by which the constituents of a sentence are freely rearranged via IP adjunction (Suno, 1985). However, scrambling cannot be applied to the accusative-marked NP in the IO construction. Compare (7) and (8).

(7) *sawari* me wa Mary ga *suru* ni tooru.
    blue-A eye-ACC NOM do PART-be-PRES
    Mary has blue eyes/ is blue-eyed.

(8) kirei na *orya* me wa Mary ga *sureru* ni tooru.
    pretty-A earnings-ACC NOM do PART-be-PRES
    Mary is wearing pretty earnings.

*Mary is wearing pretty earnings.*

The ungrammaticality of (7) indicates that scrambling of the accusative-marked NP is disallowed in the IO construction. On the other hand, scrambling of the object NP is possible in an ordinary SOV sentence, as in (8). Any analysis of the IO construction should address the reasons why the accusative-marked NP in the IO construction does not undergo movement.

3.3. ECM compatibility

A third fact peculiar to the IO construction is that it can serve as a complement clause in the so-called ECM construction. In Japanese, the subject of an embedded clause can be marked exceptionally as accusative. However, the embedded predicates that allow this possibility are limited to adjectives and nominal *copula* di (Kuno, 1997). Hence (9a) and (9b) are grammatical, whereas, (9c), in which a verb appears as the complement predicate, is ungrammatical.

(9) a. *John wa [Mary o kowai ni] to omou.*
    J-TOF NOM-ACC pretty-M CTMP think-PST
    'John thought Mary to be pretty.'

b. *John wa [Mary o tanai ni] to omou.*
    J-TOF NOM-ACC thin-M CTMP think-PST
    'John thought Mary to be thin.'

c. *John was [Mary o *gokudou o uki ni] to omou.*
    J-TOF NOM-ACC school to come-PST CTMP think-PST
    'John thought Mary to have gone to school.'

Now, observe the asymmetry between (10) and (11).

(10) *John ga [Mary o hicch Activity* to omou.*
    J-NOM NOM-ACC blue-A eye ACC do PART-be-PRES CTMP think-PST
    'John thought Mary to be blue-eyed.'

(11) *John ga [Mary o nai oryana o *tai ni] to omou.*
    J-NOM ACC pretty-M earnings ACC do PART-be-PRES CTMP think-PST
    'John thought Mary to be wearing pretty earnings.'

In (10), the IO construction appears as the complement clause of the ECM construction, whereas in (11) an ordinary SOV sentence is embedded in the IO construction. The grammaticality of (10) and the ungrammaticality of (11) show that

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4 Except for the verb, which must be placed at the end of the sentence.

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3.4. Modification by degree adverbs

The fourth property unique to the IO construction concerns adverbial modification. Consider (12).

(12) a. *Mary ga odokorahodo* me wo mo *suru* ni tooru.
    J-NOM is pretty-M eye to come-PST be-PRES
    Reading 1: Mary is very blue-eyed.

    Reading 2: Mary has very blue eyes.

b. *Mary ga *sokeru* me wo mo *sureru* ni tooru.
    J-NOM is pretty-M eye to come-PST be-PRES
    Reading 1: Mary is very blue-eyed.

    Reading 2: Mary has very blue eyes.

The sentence in (12a) is ambiguous. In the first reading, the adverb *odokorahodo* 'to a surprising degree' has scope over the entire predicate, adjusted to the projection of *sura*. In the second reading, it takes a narrower scope which covers only the pre-nominal adjective *me* 'eyes'. In the latter case, the adverb is adjusted to the projection of the adjective, rather than to the projection of *sura*. The relevant structural configurations are illustrated in (13a) and (13b), respectively.

(13) a. Reading 1: wide scope

    a. *John ga odokorahodo* *sureru* ni tooru.
    J-NOM is pretty-M be-PST be-PRES
    b. *Mary ga *sokeru* me wo mo *sureru* ni tooru.
    J-NOM is pretty-M eye to come-PST be-PRES

b. Reading 2: narrow scope

    a. *John ga odokorahodo* *sureru* ni tooru.
    J-NOM is pretty-M be-PST be-PRES
    b. *Mary ga *sokeru* me wo mo *sureru* ni tooru.

Notice that when *odokorahodo* appears sentence initially, the second reading disappears, as in (12b). The unavailability of the second reading can be attributed to the fact that *odokorahodo* is more deeply embedded for this particular reading, as shown in (13b). Extraction from this position is not licensed, as it breaks a *4-6, NP*.

That the structure in (13a) is possible is a property specific to the IO construction. The relevant class of degree adverbs modify mainly adjectives and adverbs, but not verbs. Consider (14) for an illustration of this property.

(14) a. *Mary ga kirei na *orya* me wo mo *sureru* ni tooru.
    J-NOM is pretty-M earnings-ACC do PART-be-PRES
    'Mary is wearing very pretty earnings.'

b. *odokorahodo* *sureru* ni tooru.

---

5 We assume a minimal tree structure following Chomsky (1995).

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3. 5. Sara is obligatory in participial form

Finally, let us turn to a discussion of the form of Sara in the IO construction. The possible and impossible forms of Sara in the two types of IO construction are shown in (15a) and (15b), respectively. Compare the patterns in (15) with those in (16).

(15) Sara in IO construction

a. Pre-nominal IO:

- noi-moe
- no-i-moe
- no-i-te
- no-i-te-F

b. Predicative IO:

- nga no i mo e
- nga no i mo e

(16) Sara in ordinary SOV

a. Pre-nominal:

- kiri-o na ya进去
- kiri-a na ya进去

b. Predicative:

- nga kiri-o ya进去
- nga kiri-a ya进去

Notice that m=in both the pre-nominal IO and the predicative IO, as well as m=in in the predicative IO are not possible, as shown in (15), but all these forms are possible in ordinary SOV sentences, as shown in (16).

Let us examine the patterns in (15) more closely. First, notice that m=in in pre-nominal IO is possible, whereas m=in in the predicative IO is not, though in both cases the form m=in is used. Second, notice that the grammatical m=in in the pre-nominal IO does not have the post tense interpretation which is normally associated with the function m=in in Japanese. Third, the m=in form is excluded in both the pre-nominal IO and the predicative IO. Fourth, as in the predicative IO, the presence of ciao a=be is obligatory. Finally, the pre-nominal IO allows the m=in form, as well as the s=te=te-F form, while the same does not hold for the predicative IO.

These observations can be explained if we postulate that Sara in the IO construction must take the participial forms, s=te=te-F, assuming that s=te=te-F is both the past tense suffix and the participial suffix. First, the m=in is allowed in the pre-nominal IO but not in the predicative IO because Sara is a natural account; bare participles may appear in a reduced relative clause, but not in a matrix clause. Second, the ungrammaticality of m=in follows, as the form m=in is not a participle form. If we assume that, is before ciao a=be is an allomorphic variant of ciao a=be, the reason that the forms m=in ciao a=be are obligatory in the predicative IO is clear; the predicative IO, m=in in the participial form must be supported by a verbal ancillary. Finally, we can now properly characterize the two types of pre-nominal IO, m=in appearing in a reduced relative clause, whereas m=in ciao a=be appear in full (i.e., boxed) relative clauses.

We have argued that the various restrictions on the form of Sara which are specific to the IO construction amount to the fact that a participial form is obligatory for Sara in this construction. In Section 4.2, we will discuss why this should be the case.

3. 6. Summary to Section 3

The following summarizes all the properties of the IO construction we have discussed so far:

Properties of the IO construction

A. Sara is a light verb.
B. Accessive-marked NP is not extractable.
C. The IO construction overrides the Double = constraint.
D. The IO construction overrides the restriction on the complement predicate in ICN.
E. Dative adverbs can modify Sara.
F. Sara must take a participial form.

4. Analysis

We have so far demonstrated that the IO construction departs from canonical SOV sentence in a number of ways. It is our task now to propose an analysis which can account for the observed properties. We believe that the properties of the IO construction listed in Section 3.6 can be divided into the following two groups: (i) those which cannot be exploited if we postulate that the NP=ACT and Sara form is a unit rather than an ordinary object-verb pair, and (ii) those which follow if we posit that the IO predicate is an adjective. The properties A, B, and C above constitute the first group, and D, E, and F, the second group. We will argue that the two groups of properties follow from the postulation of two post-predicate morphological operations. INCREMENTATION and ABSTRACTIVIZATION, respectively. We will show that both operations are required for data-rule discharge, and thus can independently be motivated. In accordance with the modularist view, but contrasting the strong lexicalist view, we will conclude that the proposed incrementation and subsequent abstractivization necessarily occur at a post-predicate level since the incorporated nominal in this case is a plural compound of the type *Adjective + Sara*.

It seems that the distinction between the present participle form, -ing, and the past participle form, -ed, is normalized in Japanese, and in used uniformly in both cases. In passing, we do not mark "passive participles" since Japanese has an independent passive morpheme, -a=be.

One supportive fact for this treatment of -ing variation is that the verbal stem form is identical in two cases.

6 The pattern is much more rigid than those of the so-called Type-4 verbs (Kudoichi, 1987).
4.1. Incorporation of A × N compound

We argue that the first group of properties can be captured if we postulate that the light verb saru induces an incorporation of the theta-role-bearing nominal. In order to facilitate our discussion, let us briefly refer to a parallel analysis proposed for another type of the light verb construction, the verbal noun (VN) construction. Verbal nouns, similar to English deverbal nouns such as destruction and examination, can take arguments and assign theta-roles to the arguments. An example of VN construction is given in (17).

(17) Mary goes to kaeru-o
M NP L with incorporation-ACC-DO-PSS

'Mary talks with John.'

In (17), the theta-roles assigned to the NPs Mary and John come from the VN (tates ‘conversation,’ not the light verb saru. Sara, therefore, does not assign any theta-role to sara.

Assuming a strict locality condition for theta-role assignment (Chomsky, 1981) and that the arguments must appear inside the projection of the head in order to receive a theta-role, (17) is in trouble: at first glance. In (17), Mary and John seem to be base-generated inside the projection of the light verb saru, not the VN. There must be an operation which enables VN to transfer its theta-roles to the otherwise empty argument structure of the light verb. In recent works under the Minimalist Program (Chomsky, 1995), the process has been identified with Baker’s (1988) incorporation. Satu and Hoelscher (1994), as well as Dobrovolsky (1994), argue that VN in (17) undergoes LF incorporation into sara. The process is illustrated in (18).

\[ \text{Mary} \rightarrow \text{Mary ( incorporates into sara) } \]

We do not have space to reproduce the detail of the LF incorporation analysis. Here, we want to stress that if incorporation is tied to the requirement of theta-role discharge, it must be the case that it is always triggered in the light verb construction. As we have observed earlier, sara in the IO construction, too, is a light verb. The THESS arguments, which is assigned to the external argument in the predicative IO construction, comes from the inalienable property NP; not from the verb saru. Sara in the IO construction incorporates the inalienable property argument. The resulting complex structure inherits the argument structure of verbal nouns via incorporation.

The extension of the incorporation analysis to the IO construction enables us to capture the properties A, B, and C of the IO construction given in Section 3.6. First, that saru is a light verb (property A) motivates the incorporation analysis. Second, that the accusative marked nominal is not excludable (property B) results from the fact that the incorporated nominal is invisible to movement operations; third, that the Double object constraint does not hold (property C) receives an explanation as the accusative case marker, attached to the incorporated nominal, can be said to be “framed” and lose its ordinary syntactic function.2

There are two questions we need to address when we apply the incorporation analysis to the IO construction: Q1: What exactly incorporates into the light verb saru? Q2: At what level does the incorporation take place? Let us first address Q1. Incorporation is a head-to-head operation. In the case of VN construction, what incorporates into the light verb saru is the verbal noun itself, and nothing else. In the case of the IO construction, too, we assume that a nominal head incorporates into sara. However, there is evidence that the incorporated nominal in this case is a compound of the type Adjective × Noun (A × N). Backward piping in Japanese is known to respect morphological integrity but not syntactic constituency and, therefore, can serve as a strong “wordhood” test (Kageyama, 1989). Deleting a noun is normally allowed without deleting the adjective which modifies it. However, the same does not hold in the IO construction. Hence, the contrast between (19) and (20).2

(19) *Mary wa ao-i me-o ni inai ni
M TOP [blue-AD adj-ACC] DO-PART be-PSS

Jane wa konro-o me-o ni ita ni
J TOP [brown-AD adj-ACC] DO-PART be-PSS

'Mary has blue eyes, and Jane, black ones.'

(20) Mary wa kizuna ni inai ni
M TOP [no-AD adj-ACC] DO-PART be-PSS

Jane wa kizuna ni ita ni
J TOP [no-AD adj-ACC] DO-PART be-PSS

'Mary is without pretty supplies, and Jane, cute ones.'

The backward piping test indicates that A × N in the IO construction form a morphological unit, that is, a compound. We thus propose that what undergoes incorporation in this A × N compound. (21) demonstrates the relevant derivation.

\[ \text{sat} \rightarrow \text{sat} \]

\[ \text{blue-AD adj-ACC DO-PART} \]
\[ \text{A × N compounding} \]

Since the A × N compound is the input of incorporation, we need to determine when it is formed before we can address Q2. Let us, therefore, determine when incorporation takes place. There are various facts which suggest that the relevant compound formation takes place post-lexically, operating on phrases. We mention two such properties here.

First, the phonological properties of the A × N compound in the IO construction is very different from those of lexical compounds. Lexical compounds in Japanese often

2 of footnote 2.
undergo "sequential vsn" or sandhi (Kaburuma, 1993; 1995; Vance, 1987). Sandhi is a process wherein the first sound of the second element of the compound, generally a native Japanese word, becomes voiced, as illustrated in (22). As shown in (23), however, this process does not take place at the case of the A + N compound in the IO construction.

(22) men + kae, > [kamae]  (k > g)
    'read'  'face' = 'read face'

(23) men + kae + o, > [kamae kae]  (men + g given)
    'read'  'face-ACC' = 'read-face-ACC'.

Second, while lexical compounds are subject to the Japanese Language Constraint (AIC) which disallows monosyllabic and disyllabic proforms to appear word medially (Pace, 1969), the A + N compounds in the IO construction are not. Observe the difference between (24) and (25).

(24) a. [kara-arai] wa mousai-i
    dish-washing:TOP difficult
    "Dish-washing is difficult."

b. *[kara-aran] wa mousaitai
    dish-washing:TOP difficult-AD
    "Dish-washing is more difficult."

(25) a. kabe no ka-bi wa hori-mo ni
    wall-GEN wall:TOP blue-AL-color-ACC do-NINT be-PRES
    "The wall of my house is blue-colored."

b. *[kabe no ka-bi wa hori-mo ni]
    wall-GEN wall:TOP like this-blue-color-ACC do-NINT be-PRES
    la. "The wall of my house is like-these-colored."

In (28B), the disyllabic pro-AL forms appear inside the IO construction, contra the AIC. We take the behavior of the A + N compound with respect to the AIC, as well as sandhi, to be an indication of its plural origin. Since the relevant compound shows both word-like and phrase-like properties, we conclude that it is a plural compound that is formed post-lexically in the course of syntactic derivation.

Now let us turn to the question of what level the incorporation takes place. If the A + N compound is formed lexically, it would be possible for the subsequent operation to take place either in the lexical component or in the post-lexical component. However, since the A + N compound is formed post-lexically, it immediately follows that the incorporation, too, occurs post-lexically.

4.2. Adjectivization

Let us now turn to the explanation for the second group of properties. Our assumption has been that the A + N compound in the IO construction instantiates a headless internal theta-role, THE memes. After the incorporation, zero inhabits this internal theta-role. Recall that it is the subject NP of the predicative IO which eventually realizes this theta-role. This means that there still is a step missing in our derivation in (21). We somehow need to assign the internal THEemes theta-role to the subject NP. One may postulate that the subject NP is base-generated as an internal argument and undergoes external argument assessment. However, this option is not tenable since zero clearly assigns accusative case. Burns's generalization (Burns, 1986) states that a verb assigns accusative case if and only if it has an external theta-role, and vice versa. As zero assigns accusative case, it should follow that it also assigns an external theta-role. How is it possible for zero to "externalize" the inherited internal THEemes theta-role?

We propose that the answer to this question is a morphological operation, adjectivization. Specifically, we claim that, when the category of the IO predicate is changed from verb to adjective, its thematic structure is shoved in such a way that its internal theta-role gets externalized. The characterization of "adjectivization" is due to the insight of Levin and Rappaport (1985). They argued that the externalization of the internal theta-role observed in the English adjectival passive formation is a by product of the adjectivization of passive participles, resulting from the interaction between the properties of passive morphology and the general property of adjectives such that they obligatorily assign external theta-roles.

The postulation of adjectivization can, at the same time, account for the properties D, E, and F of the IO construction as Section 5.6. That is, the IO construction can appear as the complement clause of the ECM construction (property D) is no longer puzzling, as the IO predicate is an adjective, in accordance with the restriction posed on the underlying ECM predicate. That zero in the IO construction can be modified by adjectival adverbialized degree adverbs (property E) is no longer surprising for the same reason. Finally, that zero in the IO construction obligatorily takes the participial form (property F) receives a natural account if we hypothesize that the input of adjectivization must be a participial form (e.g., English participial adjectives [broken heart, late night, surprising fact]), with a proposal awaits to be in accord with the facts in other languages.

5. Summary and Conclusion

In this paper, we have discussed the Japanese inalienable Object construction. We have analyzed the relevant construction by postulating two post-lexical operations: noun incorporation and adjectivization. The A + N compounds in the IO construction exhibit both word-like and phrase-like properties, suggesting that they are a plural compound, post-lexically formed in the course of syntactic derivation. As a lexical construction, the subsequent two operations, incorporation and adjectivization, also take place post-lexically. Since the end product is an adjective, the IO construction can be said to be a plural counterpart of the English Possessive Adjective (e.g., 'my ear').

The analysis which is necessitated by the IO construction has an important implication for the theory of word formation. In the sense that our analysis yields, we have shown evidence against the strong lexicalist hypothesis, which denies the occurrence of word formation outside the lexical component. On the other hand, our analysis is compatible with the moderate theory of word formation (Shibatani and Kager, 1988, Kager, 1993). It is coarse for our analysis of the IO construction for the morphological rules can operate outside the lexical component. One can retain the often-asked question "Does syntax have access to morphology?" and "Does morphology have access to syntax?" Our answer is clearly yes.

References


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TURKISH POSSESSIVE COMPOUNDS

ABSTRACT

In this paper, I propose an analysis to account for the syntactic and semantic properties of possessive compounds in Turkish. These constructions have lexical heads that are affixed with the third person singular possessive marker. Unlike syntactic possessive constructions, the non-heads of the possessive compounds do not carry genuine cases. I propose two functional projections, *Possesive Phrases* and *Genitive Phrases*). I show that the syntactic properties of the possessive compounds are a consequence of the interaction between these projections, and the semantic properties of these constructions is a reflex of the semantic of *third person*.

1. Introduction: In this paper, I examine Turkish possessive compounds which have lexical heads that are affixed with the third person singular possessive marker. These compounds and syntactic possessives share the property of having lexical heads to which the possessive marker is attached. The difference between possessive compounds and syntactic possessives is the presence of the possessive marker on the non-head of the syntactic possessives. Examples of possessive compounds and syntactic possessives are shown in (1) and (2) below. The data in (1a) and (2a) also show that in the absence of the possessive marker the structures are interpreted as attributive-head, i.e. root, compounds. In the examples in (1b) below, the head is a non-derived noun, *kutu* 'box' and in (2b) the head is a deverbal construct, *kaptan* 'captain'.

(1) a. Root Compound: sinyalo kutu try box
   b. Possessive Compound: sinyalo kutu-uy try box-pass

(2) a. Root Compound: silindir kaya-k cylinder, lime-fruit
   b. Syntactic Phrasal: silindir-ku kaya-ku try-3sg box-pass

The data in (1) and (2) illustrate that the possessive marker is a reflex of the semantic of *third person*.
b. Possessive Compound:
  a. kid designated to be used with cylinder shaped container
  *a kid shaped as a cylinder
  b. Symmetric Possessive
  a. kid designated to be used with cylinder the kid is shaped as a cylinder

The structural difference between the possessive compounds in (3b) and (2b) and the symmetric possessives in (1a) and (2a) have a semantic reflex. The possessive compounds are non-referential and non-specific, i.e. generic and the symmetric possessives are referential and specific.

There are some additional facts that need to be considered. These are shown in (3) and (4). (3) shows an ambiguous string, which can either be an example of the interaction between a symmetric possessive and a possessive compound or as an example of the interaction between a symmetric possessive and a root compound. In either arrangement, the negative marked nominal has to precede the generic root head as in (3a). The opposite ordering in (3b) is unacceptable.

(3) a. Hity-in omaysak kuttu-in
    *Nugum tay bus-poss
    (i) *Hity’s box which boys are stored
    (ii) Hity’s box which is a box
    b. omaysak Hity-in kuttu-in
    *Nugum bus-poss
    (i) *Hity’s box in which boys are stored
    (ii) Hity’s box which is a box

The facts in (4) show the effects of subject-poss in symmetric possessives. (4a) shows that a first person singular marked possessive marker allows the subject poss to drop without any symmetric/semantic consequence. In other words, the structure will always be interpreted as a symmetric possessive. On the other hand, (4b) and (4c) show that, if the possessive marker is third person singular, dropping the subject possess will yield only the possessive compound interpretation. Negative marked third person singular possessives has to be present for the structure to be interpreted as a symmetric possessive:

(4) a. (oss-in) omaysak kuttu-in
    Ntay bus-poss
    (i) *my box which boys are stored
    (ii) my box which is a box
    (iii) *a box which boys are stored

2. Analysis: The analysis is based on the principle of morphology which allows to have both abstract and concrete versions of a given morpheme (Chomsky 1970). The analysis also assumes that the concrete version of the morphemes attract to their lexical heads in the morphology component of the grammar and words enter syntax fully inflected. The analysis also assumes feature checking as outlined in the Minimalist Program (Chomsky 1995).

2.1. Symmetric Possessives and Possessive Compounds: I propose that in order to understand the properties of possessive compounds, we need to formulate an account of symmetric possessives. The proposed structure of symmetric possessives is shown in (5). The head of the structure is the abstract morpheme, POSS, which selects a DP complement. This abstract morpheme is [-N] and it also has a [TP] feature, [ ] and case feature. The [-N] feature of the abstract head is checked by the concrete morpheme which has the same feature. The lexical possessive morpheme attaches to the lexical head in the morphology component of the grammar. This lexical head undergoes head movement to check the [-N] category feature of the abstract head. The abstract head projects a Possessive Phrase whose specifier position is filled by the [DP, [pp] and [Case] feature of the head are checked in a (spec-head) relation. The structure is derived by lexical insertion, i.e. merge. The spot of POSS is the generic case to be checked. Along with Lageo and Smallwood (1977), I assume that structural case and morphological case are distinct. Therefore, any nominal with any case can be picked up during enumeration to fill the (spec-Head) position. But unless the nominal that merges to that position has the
genitive morpheme the case of the position and the nominal that fills that position will clash, case feature checking will fail, and the derivation will crash. Therefore, only genitive marked nominals will occur [open ParenP].

(6) Syntactic Possessive

[DP nΠ [Refl] [DP oyuncak-ı] [Genitive]]

N            POS            D            L            POS

kutsan-ı     kut-ı

the box in which a particular toy is stored.

Now consider the derivation of possessive compounds. The generic interpretation of the string should follow from the structure of the possessive compound. We might suggest that the structure results from the abstract head POSS, selecting either a DP (as in (6) above) or an N as complement, and that another N may head adjunct to Poss as shown in (7) below:

(7) Possessive compound

N            POS            N                POS

N            N

kutsan-ı     oyuncak-ı

the box in which toys are stored.

The problem with this proposal is that the structure above is not permissible. Since neither nominal in (7) projects further, according to Bare Phrase Structure Principles (Chomsky 1995) their category must be nominal.

Let us consider another possibility. In possessive compounds the non-head is in a thematic relation with the lexical head. Givón (1982) refers to this type of relation as an abstract relation of possession which does not have any reference to reality at the moment of speaking, i.e. non-referential and non-specific. From (1c) and (3), we know that the lexical head can also be in a referential and specific possession relation with the non-head. These referential and non-referential possession possibilities can be structurally represented as the abstract POSS morpheme projecting two specifiers, one referential and specific possession (DP) and one non-referral and non-specific possession (NP) as shown in (8) below. The structure that will result is the interaction between a syntactic possessive (DP specifier) and a possessive compound (NP specifier), i.e. the representation of (3).

One major criticism of the structure in (8) is that the relative position of the specifiers, though providing a grammatical string shown in (3) do not follow from any independent principle. In order to address this issue, I propose to develop a classification of Turkish nominal phrases. Consider the different types of nominal phrases occurring in direct object position, as exemplified in (9). (a) has a determiner + N direct object and this direct object has an overt case marker. In (b) we have a (number + N) direct object. This direct object does not have an overt case marker. In (c) we have an [V] direct object. This direct object does not carry an overt case marker either.

(9) a. HilâyÖ bu kitâb-ı okudu-ı. Hilây-Nov the book-acc read-pas-3sg

b. HilâyÖ bu kitâb-ı okudu-ı. Hilây-Nov this book-acc read-pas-3sg


‘Hilây read the book’

I propose that the direct object in (9a) is referential and specific; the one in (9b) is referential and non-specific; and the one in (9c) is non-referential and non-specific, i.e. generic. As (10) shows, it is not necessary to have an overt determinator for a nominal phrase to be referential and specific. The semantic information is encoded in the possessive case marker.


b. Hilây-Nov book read-pas-3sg

‘Hilây read the book’

(11) summarises the semantic properties of nominal phrases in Turkish:

(11) a. DP NumberP

b. DP NumberP

[Ref] [Non-Ref] [Ref] [Non-Ref]

[Generic] [Non-Generic] [Generic] [Non-Generic]

Now let us reconsider the structure of synatctic possessives. (12) shows that both the referential and possessive markers are affixed to N of DP’s. Turkish has direct demonstrative pronouns describing the closeness of the object to position 1 to the speaker.

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In an utterance like "That box which toys are stored"

(14)

Hay-su oyuncak kuru-su

-ye-gen

say

box-poss

'a Hay's box in which toys are stored'

Hay's toy which is a box'

For the case being let us note the ambiguity issues and address the interaction between syntactic possessive and the possessor compound, which is mainly the ordering of the genitive marked nominal phrase and the genitive nominal phrase. The string in (14) has one possessive head, and one referential and specific possessive (Hay in "Hay's") and one generic possessive (oyuncak "toy"), and one lexical head (kuru "box"). To account for these facts, I proposed two specifiers for one functional head. Recall that the relative ordering of the constituents in (8) was not motivated. Consider the following examples: which shows that if the complement of the abstract POSS is referential and specific (DP), the specifier of POSS has to be referential and specific (DP, see (15a,b,c)). On the other hand, if the complement of abstract POSS is non-referential and non-specific (NP), the specifier can be either non-referential and non-specific (NP see (15d,e)) or referential and specific (DP see (15f) or both (15g)).

(15)
a. bu oyuncak su kuru-su

This toy's box

toy that box-poss

b. oyuncak su kuru-su

This toy's box

toy that box-poss

c. oyuncak kuru-su

This toy's box

toy box-poss

d. oyuncak su kuru-su

This toy's box

toy box-poss

e. Hay-su oyuncak kuru-su

Hay's toy's box

toy box-poss

f. Hay's box

toy box-poss

g. Hay's toy's box

toy box-poss

The facts shown in (15a) and (15b) cannot be accounted for structurally. The only possible explanation, then, is a semantic one: it seems that a referential and specific possessor can only have a referential and specific possessor, a form of semantic incompatibility (Glazer & Hasson 1994; Ylikarja 1995). On the other hand a generic possessor can have either a specific and referential possessor or a generic possessor.

Now let us turn to the structural representation of the interaction between a syntactic possessive and a possessive compound. There are two possible derivations. These are
shown in (16). In both structures two specifier positions are created. One for non-referring and non-specific referential position (DP), and one for referring and specific referential position (QP). (16a) and (16b) show different order of mergers. In (16a) first an NP merges and then a DP. In (16b) the order is reversed. Either one can represent the derivation of the string in (16b), in (16a), or already proposed, DP moves to [SPEC, GeneralP] to check referentiality and specificity. In (16a) even if the NP is closer to the specifier position of the GeneralP, even if it moves to [SPEC, GeneralP], it does not have the appropriate features to check the features of referentiality and specificity of the specific position, causing the derivation to crash. Therefore, in (16b) given that the DP is the only constituent which has the appropriate features of referentiality and specificity to check the features of the head G, it is the constituent to move to [SPEC, GeneralP]. Therefore, the observed ordering then follows from the principles and the mechanisms of the theory.

(16)

![Diagram](image)

Before I address the last question listed in (3), I account for the ambiguity found in the string (3), which is repeated as (14) above. The representations in (17) below provide the two structures that account for the ambiguous string. In (17a) we see an example of the interaction between a syntactic possessive and a possessive compound. In (17b) we see a syntactic possessive and a root compound interaction.

(17)

![Diagram](image)

2.2. Pro-drop: syntactic possessives and possessive compounds. Recall the strings in (4), which are repeated below:

![List of strings](image)
Given the analysis provided in the previous section, (1Aa) is ambiguous as we expect it to be. But (1Ab) can never be interpreted as generic in the absence of an overt possessive in [spec, GenNP]. On the other hand, in the absence of an overt third person genitive pronoun the construction can only be interpreted as generic as shown by the variation in (1Bb) and (1Bc). It is proposed that this is due to the semantic difference between the first and second person subjects on the one hand and third person subjects on the other. This difference between number and person has been recognized by different researchers over the years although the effects of the distinction vary from language to language. For instance, in Athabaskan this distinction is expressed in number and person marking for the first and second persons, and only number for the third person (Bice and Saxon 1994). For Labadnoi the choice of intransitive vs. transitive mood is determined by the person agreement markers, where the first and the second person pattern together, and third person has a different behavior (Johns 1995). In Turkish this difference is semantic, i.e., referentiality and specificity. The first and the second persons are referential and specific, the third person is generic. This distinction is limited to personal pronouns only. The same is not true for possessive. It appears that the pragmatics of possessive requires them to be referential. Therefore, in the absence of an overt referential and specific genitive 3rd person (singular) subject pronoun which is needed to check the referentiality and specificity features of [spec, GenNP], a structure with the third person possessive marker will be interpreted in generic. Words are usually considered to be generic (Di Sciullo and Williams 1987). Therefore, generic third person singular syntactic possessive are interpreted as words. Compounds are words that have complex structural. Therefore, syntactic possessives with 3rd person singular heads without overt possessive subject are interpreted (possessor) compounds. That is to say, Turkish possessive compounds are not lexically derived, but they are one type of syntactic possessive which are interpreted as generic due to the lack of a referential and specific subject. Thus they are generic.

3. Conclusion: The analysis provided in this paper clearly shows that Turkish possessive compounds are syntactic and not lexical. Syntactically, Turkish possessive compounds are projections of two distinct functional heads: POSS and C. At the same time, semantically, Turkish distinguishes between referential and specific person markers (1st and 2nd) and generic person marker (3rd). Syntactic possessive which lack a referential and specific third person subjects have generic interpretation. The "word, i.e., compound" forms of these syntactic possessive is a consequence of the semantics of genericity which is also a semantic property of word.

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References:


INHERENT INFLECTION IN POLISH AS INPUT TO MORPHOLOGICAL DERIVATION

The present paper examines the phenomenon of inflection feeding derivation in modern Polish. Although markers of contextual inflection in Polish do not appear word-internally, markers of inherent inflection can be followed by derivational suffixes, especially by highly productive ones. Only a small section of lexemes containing word-internal inflectional morphemes in Polish can be analyzed as derived from less-cultivated (regular) word forms. Inflectional morphemes occurring inside derivational morphemes in Polish include stem-forming inflectional morphemes found in comparative or superlative degree forms of adjectives, in past participles, present (active) participles and passive participles. Polish participles are also shown to undergo conversion into adjectives and adverbs.

1. Inflectional categories in Polish

Recent coursebooks for students of Polish morphology (e.g., Laskowski 1984, Sztyniński 1996) list the following morphological categories as being inflectional in Polish: case, number, gender, tense, person, mood, voice, aspect and degree. A distinction is drawn between inflectional endings (markers of agreement) and stem-forming inflectional morphemes. The latter are employed to build extended (secondary, derived) stems of lexemes, such as for instance the comparative and superlative degree stems of adjectives. Congregational paradigms of verbs include, apart from the basic verb stem, four extended stems, namely the imperative verb stem, the past tense stem and two participial stems. Stem-forming inflectional morphemes in Polish can be regarded as markers of inherent inflection (in the sense of the term proposed by Boito 1996). As will be illustrated below, inherent inflections can feed derivation in modern Polish.

2. Markers of comparative and superlative degree occurring word-internally

Derivatives considered in this section exhibit formal and semantic affinity to comparative or superlative forms of adjectives. The morpheme -niej- is the regular comparative marker, while the prefix non- marks the superlative degree of adjectives. The data in (1-2) demonstrate that irregular inflectional forms (which exhibit stems as

[1] The status of the category of aspect is controversial. In contrast to Laskowski (1984), Grzegorzewski (1997) regards aspect as a lexical category. Consequently, a reflexes from deriving lexemes which are derived from secondary (derived) imperfectives.

CTEMOPSY or suppletion can function as input to derivation since they are entered in the lexicon.

(1) adjectival prefixed verbs
   a. polnijżeć 'to heighten' (cf. wyszyć 'higher' from wysoki 'high, tall')
   b. pogłoszyć 'to warn' (cf. gorączka 'warm', from gorączka)
   c. poniżeć 'to surpass' (cf. wpłynąć 'higher' from wpływać)
   d. spółpóźnić 'to deteriorate' (cf. długość 'better' from długość 'good')
   e. przesunąć 'to lessen' (cf. przesunąć 'smaller', from malą 'small', little')
   f. zwiekodzić 'to increase' (cf. wiekść 'bigger', 'larger', from wiek 'big', large')

(2) one noun (names of qualities - Nomina Easoria)
   a. bliznoć 'the quality of being closer in time or space' (cf. blizkość 'close', from blisko, 'close')
   b. lepkość 'the quality of being better' (cf. lepszy 'better', from dobry 'good')
   c. małymoc 'minority' (cf. mniejszy 'smaller', minority')
   d. najlepszy 'the quality of being the best' (cf. najlepszy 'best', from najlepszy
   e. najmłodszy 'the quality of being the youngest in rank or age' (cf. najmłodszy
   f. niesćuk 'the quality of being lower' (cf. niskość 'lower', from niski 'low')
   g. wiekość 'majority' (cf. wiek 'bigger', 'larger', from wiek 'big', large')
   h. wynikosć 'superiority' (cf. wyższy 'higher', superiorism')

The word-form strategy 'older, elderly, senior' (the comparative degree of status 'old'), which gives rise to the derivatives given in (3), should also be regarded as lexicalized because it exhibits a semantic shift.

(3) miscellaneous nouns and adjectives derived from status 'older, senior'
   a. starszy 'elderly'
   b. starszy 'older child in kindergarten'
   c. starszy 'seniority'
   d. starszy 'the quality of being older'
   e. starszy 'the seniors, the officers of high rank'

The data in (4) show that highly productive derivational suffixes, e.g. -cie, can attach to regular comparative forms and produce names of qualities (NE).

[2] All examples from Polish given below occur in a slightly simplified spelling since Polish diacritical marks indicating palatalization of consonants and realization of vowels are not available in the international version of the word processor employed here. In accordance with standard Polish orthography, I use the digraph 'cz' to represent a velar fricative. The digraph 'cz', 'dz' stand for post-alveolar affricates while 'cz' in a post-alveolar fricative.

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(4) neo-Nomina Ensendi (NE)

a. *bivatara* 'the quality of being white' (cf. *bivat* 'whiter')
b. *jamaijera* 'the quality of being favor or clearer' (cf. *jamaij* 'fatter, clearer')
c. *madijera* 'the quality of being younger' (cf. *madi* 'younger')
d. *poditjera* 'the quality of being more beautiful' (cf. *podit* 'more beautiful')
e. *tawama* 'the quality of being more cheerful' (cf. *tawama* 'more cheerful')
f. *swallam* 'the quality of being more sensitive' (cf. *swallaman* 'more sensitive')
g. *bwallam* 'the quality of being more agile' (cf. *bwall* 'more agile')

Some of the names of qualities in (4) are felt to be non-institutionalized (e.g. 4g) and the list of NE can be easily extended with novel formations.

3. Derivatives from past tense forms (or past tense stems) 

The lexemes discussed in this section appear to contain the past tense marker -t-. The nouns in (5) belong to the realm of expressive morphology. Creation of nonce-formations exemplifying the patterns in (5) is highly prohibitive, especially when such more dense poetics:

(5) neo- [ -t, -u, -s, -n nouns]

a. *gwekebi* 'swelling' (gwebe *'swell') became swollen and synonymously 'swollen'
b. *gwekebi* 'one that has grown rotten or carious' (cf. *gwekebi* (t) decayed, grew rotten and synonymously 'corrosion, cancer')
c. *gwekebi* (colloq.) 'dead fellow' (cf. *webi* (t) died and synonymously 'dead')
d. *gwekebi* (colloq.) 'swallowing' (cf. *webi* (t) died and synonymously 'swallow')
e. *gwekebi* (colloq.) 'chilly fellow' (cf. *webi* (t) felt chilly and synonymously 'chilly')
f. *gwekebi* (colloq.) 'chilly person' (cf. 5a above)
g. *gwekebi* (colloq.) 'nasal' (cf. *webi* (t) decayed, went rotten, putrid and synonymously 'rotten, decayed, putrid')
h. *gwekebi* (of box) 'bad bread'
i. *gwekebi* (pl.) 'rotten fruit'
j. *gwekebi* (par.) 'dyer'
k. *gwekebi* (par.) 'grouse'
l. *gwekebi* (par.) 'grouse'
m. *gwekebi* (par.) 'grouse'

The terms in (6) below are best analyzed as lexicalized (as there are few derivatives exemplifying such patterns and some of them are obscure). The formations in (7), in contrast, represent productive patterns of derivation and many of them may be felt to be nonce-formations.

(6) neo- [ -t, -u, -s, -n nouns]

a. *swallaman* (obsolvent) 'possessions of a man who died leaving no successor(s)' (cf. *swallaman* (t) died and left someone behind' and *swalaman* (t) left behind at someone's death')
b. *swallaman* (made up) 'swelling' (cf. *swall* in 5a)
c. *swall* 'carcass, the body of a dead animal' (cf. *swall* (t) fell, died and synonymously 'dead')
d. *swall* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy, frowny')
e. *swall* 'fat, portly' (cf. *swall* in 5a)
f. *swall* (t) 'frozen layer of earth in the Far North that unfreezes during a short summer' (cf. *swall* in 5a)

(7) neo-derivatives (Nomina Ensendi) and -n noun-derivatives

a. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
b. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
c. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
d. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
e. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
f. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
g. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
h. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
i. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
j. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
k. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
l. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')
m. *swallaman* 'fattening, fattening' (cf. *swall* (t) grew fatty or mushy and synonymously 'fatty, mushy')

The formations listed in (5-7) above cannot be derived directly from past tense verb stems since the suffixes -t, -u, -s, -n are the only ones that attach to adjectival, not to verbal, bases. Consequently, it is the adjective terminating in the sequence -t which must serve as the immediate input to the suffixation processes in question. However, I shall argue below that the data in (5-7) instantiate the
phenomenon of inflectional fusing derivation since the resultative of a adjective is a question are derived from past tense stems through conversion (adjunctification).

An argument supporting such an analysis is the formal identity of past tense stems and corresponding resultative adjectives. When past tense forms are morphologically irregular, resultative adjectives exhibit the same kind of allomorphy. This happens in the case of the verb spotniac, 'to swell, inf.' -spotniac (cf.) swell-FUTURE - spotniac (cf.) swollen - comparatively 'swollen' (not the lack of the thematic suffix -no in past tense forms and in the resultative adjectives) or the verb awsiur 'a die, inf.' - awsiur (cf.) dies - 'smart' (bliki) dead - 'narrow' dead (observe that the quality of the root vowel is the same in the past tense form and the resultative adjective).

It can be argued, moreover, that resultative -ly adjectives show semantic affinity to past tense forms and exhibit the internal syntax of finite verb forms.

Firstly, they convey the idea of the past, which is expressed by the presence of two expressions such as wznosni 'yesterday', praed obcia 'a moment ago' or jesieni 'in autumn' in the phrases wznosni obcia 'the flowers that opened yesterday', praed obcia obcia 'the man that arrived a moment ago', and opdla jesieni 'leaves that fell down in autumn'. This is not possible with other derivational adjectives, as shown in wznosni obcia wznosni wydawa 'interminable yesterday lecture' or wznosni praed obcia 'refreshing a moment ago breath of air'.

Secondly, resultative adjectives resemble finite verb forms in allowing modifiers denoting reason (cause), e.g., gospod 2. gody wodzi 'hogs snout from hunger'; possible is niesieni kori 'letters turned yellow with age'.

Thirdly, the negative particle nie does not attach to -ly adjectives (as happens in the case of other adjectives, e.g., normi 'not new' or niesierp 'impossible') but is applied as a separate word, e.g., nie grodzko 'not rotten' and nie realizow 'that has not blossomed yet'. Consequently, the rules of Polish orthography interpret -ly adjectives as verb forms. Tokarski (1951) analyses such adjectives as representing the category of 'participle action'.

Finally, there is some cross-linguistic evidence suggesting that Polish resultative adjectives derive from past tense stems (which are analyzed as past participles in Tokarski 1951). It is only unaccusative (ergative) verbs in Polish which have related resultative -ly adjectives. Hoekstra (1998) postulates the participial-adjective conversion as one of the links employed in determining ergative and unergative verbs. Ergative verbs in Dual allow their past participles to be used as adjectives. The same phenomenon can be observed in English, where the past participles fallen and without (but not come or mean) can modify nouns. Maekawa (1999) demonstrates that also in Modern Greek past participles of ergative verbs convert to adjectives.

3. Suffixal derivatives from passive participles

The section of the paper deals with derivatives of passive participles in Polish, i.e., with forms containing word-externally the inflectional affix -en- or its phonologically conditioned allomorphs -en- and -e.

The nouns listed in (8-9) exhibit verbal semantic (and formal) affinity to passive participles since they denote personal Patients and, less commonly, inanimate affected objects.

4. Suffixal derivatives from passive participles

The section of the paper deals with derivatives of passive participles in Polish, i.e., with forms containing word-externally the inflectional affix -en- or its phonologically conditioned allomorphs -en- and -e.
There is a notable difference between the nouns in (9) and those in (10). The former are formally and semantically related to passive participles derived from perfective (prefix) verbs. The nouns in (10), although exhibiting a qualitative (decisive) interpretation, are formally related to passives of imperfective verbs. I would like to suggest that the nouns of objects in (10) are derived from adjectival passives. Adjectival passives are, in turn, derived through conversion from verbal passives. Dependent passive any-adjective adjectives given in (10) in brackets can be characterized as stative, qualitative and perceptive, no matter whether they are derived from imperfective or from perfective verb forms.

5. Conversion of participles into nouns or adverbs

Both passive participle and present (active) participles in Polish can undergo conversion into nouns (i.e., substantivization), as shown in (11)-(12) below. Active (present) participles can be formed from imperfective verb stems only and they contain the adjectival morpheme -ow-. The formations given in (11) are semantically lexicalized.

(11) a. cienie 'shades and veil' (cf. cienie 'hidden, in the shade')
    b. dane (pl.) 'data' (cf. dany 'given')
    c. okolowany 'accused' (cf. okalan 'accused')
    d. przewidziany 'chairman' (cf. przewidywanie 'predicting (over time)')
    e. sierowat 'frosty' (cf. sierowate 'frosty')
    f. zanieczyszczonym 'fifty' (cf. zanieczyszczone 'fifty')

Substantivized passive and active (present) participles in (12) can be formed in a fairly productive manner and they have extensively human reference. They preserve the internal syntax of verbs and can occur with complement or adjectives characteristic of finite verb forms and verbal participles.

(12) a. pokrzywdzony pióra
    b. przeszkadzany zagrany
    c. wyzwany zatrzymany
    d. znanego znanego
    e. znany znanego

6. Conversion as syntactic word-class exchange or as semantic extension

There is no agreement within the linguistic literature as to the proper treatment of conversion. The phenomenon in question is treated as purely syntactic word-class exchange or as derivational process. This is partly due to the variety of processes involved in the totality of conversion. Merland (1968), for instance, treats nouns-to-verbs or verbs-to-nouns conversion in English as an instance of morphological derivation (i.e., zero-derivation) while the cases of partial conversion, such as the occurrence of the verb phrase the wealthy and the poor, are analyzed as involving functional transposition of words (i.e., a temporary change of their syntactic function). Within the framework of Cognitive Linguistics, Grzywacz (1998) analyzes zero-derivation in English as

The data in (13) appear to indicate that verbal present participles undergo conversion into adverbs. However, while verbal active -owy participles denote a process in progress, e.g., podnoszona teraz mrok podnosił lampę 'a lamp which is now lightening the darkness of the room', the forms terminating in -owy which give rise to the adverbs in (13) denote a property of an object, e.g., pokazal szybką 'the whitening powder', as is characteristic of adjectives.

(13) a. czubia 'with the cutting effect' (cf. czubia 'cutting')
    b. zwożony 'about explosions breaking up the rocks' (cf. zwożony 'breaking up rocks')
    c. podnoszony 'nonmoving' (cf. podnoszony 'nonmoving, non-moving')
    d. podnoszony 'eye' (cf. podnoszony 'eye', jumping)
    e. podnoszony 'with the warming up effect' (cf. podnoszony 'warming up')
    f. podnoszony 'with the brightening effect' (cf. podnoszony 'brightening, brightening')
    g. szybką 'producing the brightening effect' (cf. szybką 'blinking')
    h. szybką 'with the strengthening effect' (cf. szybką 'strengthening')

It seems justified to assume that the adverbial in (13) are related to adjectival adjectives. Such adjectives are derived from verbal present participles through conversion (adjectivalization) and therefore show closer semantic/syntactic relationships to verbal participles than deverbal -owy adjectives do (such as morose-ly 'sullen' cognate to the verb morscenie 'to mean, to mark').
a process of semantic extension and hence being of of essentially the same nature as synonymy and metaphor.

Various types of conversion have been proposed in this paper to occur in Polish. Derivation of resultative adjectives (such as woody "faded, withered" describes a section 3 above) from past tense stems can be regarded as a non-effectual morphological process, involving a change of inflectional paradigm, syntactic word-class and syntactic properties of the derivational base.

Conversion of Polish verbal passive participles into derivational adjectives (proposed in section 4) constitutes a special case of semantic extension. It results in a modification of the meaning of participles but does not affect their syntactic properties and involves no change in their inflectional paradigm. Both adjectival resultative passives and verbal passives agree in case, number and gender with their host. They cannot be inflected for degree, they form no Nomina Elisandra and cannot take the negative prefix in. Moreover, participial resultative adjectives and verbal passives can occur with adjectives, complements and adverbs of manner, as in the sentence Przesadne kalorie zyska w ostatnim roku przez mojego meno. I've brought cucumbers picked by my mother last year. Adjectival passives which function as derivational bases for the nouns in (9) differ from corresponding verbal passives in their inability to follow the copula verb have 'to become' and ability to take the copular verb 'to be'.

Similarly, present (active), -ity participles and derivational adjectives share the inflectional paradigm and the choice of complements but differ mainly in their syntactic interpretation.

Formation of adverbs terminating in -nie (listed in 13 above) involves a change of syntactic category and inflectional paradigm and can be treated as functional shift. It assumes, however, that just as the remaining types of conversion mentioned earlier, adverbialisation is a morphological process.

Subsequent derivation of present and passive participles illustrated in (12) in section 5 instantiates a temporary use of verbal participles in the function of nouns (or noun phrases). It exhibits similarity to partial conversion in English and can be regarded as a syntactic (not a morphological) process.

3. Inflection/derivation continua: Class-changing inflection

It is notable that not one of the derivatives discussed in the present paper contain inflectional endings (i.e. markers of agreement) embedded word-externally and proceding derivational affixes. In other words, existential inflection cannot find morphological derivation in Polish while some types of inherent inflection can.

In view of Demir's (1980) criteria for distinguishing prototypic and non-prototypic inflection, most types of inherent inflection in Polish do not constitute prototypical instances of inflection. This is the reason why the inherent status of passive participles or comparative degree form is still a controversial issue among Polish morphologists.

The idea that inflectional processes cannot be separated from derivational processes in a non-arbitrary fashion was expressed by Adam H. and Jerzy Kury-
8. Conclusion

The Polish data analyzed in this paper indicate that inherent and non-protothetic (i.e. stem-forming) inflection can find non-protothetic (i.e. highly productive) suffix derivation. Moreover, stem-forming verbal inflections can constitute an input to re-affixal (hence also non-protothetic) morphological processes, namely adjectivization, and adverbialization of verbal participles.

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HYPOTHESES ON THE STATUS OF NUMBER

Abstract

Number is often cited as an obvious example of an inflectional category. Yet there are considerable problems. Nine hypotheses about number are considered in turn, and all but one are shown to be false. For instance, not all languages have number; in those that do it is not necessarily inflectional. When we consider the distinction between inherent and contextual inflection we see that the number values for these two may not match (evidence from Miya). Thus rather than being a textbook example of inflection, number proves to be a specially interesting category.

Introduction

A category often held to be prototypically inflectional, namely number, proves lien uniformity in its status cross-linguistically than was once thought (Boas 1993, 1996, vs Marks 1996). We shall consider nine relevant hypotheses in turn, disproving most of them, and thereby showing that number is more complex than is generally recognised.

Number as an inflectional category

In discussions of inflectional morphology, the category chosen for illustration tends to be number. It is used by Bloomfield (1933: 222-224), Stump (1990: 94), and Matthews (1991: 31), to name just three. And it is, after all, one of the phi-features. But what does it mean when we talk of a particular category, in this case number, as inflectional? We approach this question by investigating a list of reasonable hypotheses, the sort of hypotheses that writers may have had in mind when they chose number as the category for illustrating inflectional morphology. That is to say, we examine various possible interpretations of the claim that number is inflectional. Rather than adding to the discussion of the meaning of inflectional, which is not our primary concern in this brief paper, we shall choose the cases discussed so that they are as far as possible consistent cases, where different definitions of inflectional (in the broad sense to cover both inherent and contextual inflection) converge on the same result.

Hypothesis 1: All languages have the category of number and it is inflectional

At least the first part of this claim is widely accepted. For instance:

All languages have grammatical categories involving at least three persons


The reasonable claim appears to be unassailable. Let us consider Perish, the only remaining member of the Murs family, spoken in 1997 by some few people along the Masi River (Amazonas, Brazil). It has been described by Evans (1980) on the basis of four months of intensive contact with the Perish, updated (1997) after five years of fieldwork. He states (1986: 217): "there are no plural forms in Perish." This holds even for pronouns, whose first forms are as follows (1986: 286):

<table>
<thead>
<tr>
<th>Form</th>
<th>English Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>first person</td>
<td>Singular</td>
</tr>
<tr>
<td>second person</td>
<td>Plural</td>
</tr>
<tr>
<td>third person</td>
<td>Plural</td>
</tr>
</tbody>
</table>

Table 1: Personal pronouns in Perish

There are no special plural forms for these pronouns. This means that Hispanic (third person) can be plural or singular, so this example shows (1986: 286):

(1) hispinoo sasaa

This means 'He already went to the jungle' or 'They already went to the jungle'.

There are ways of expressing what in other languages would be plurality, by conjunction, for instance (1986: 286):

(2) ti gai sii shi-p-i

IST 2ND also-RCB go-MPREF-PROX-COMPLET CERT

"You and I will go (i.e. we will go)"

[abbreviations: SIIgai, PROXmb, CERTen]

There are other means for expressing the notion of plurality: the associative/comitative pronouns and various quantifiers. But this does not mean that the language has a number category; after all, English can express duality through the use of two and both, but this does not mean that English has a dual. The grammar of English does not need to

1 The support of the British Academy and of the ESRC (grant R000235063) is gratefully acknowledged. I also wish to thank Norman Fraser and Andrew Hippisley for helpful comments a draft. A version was read at the First Mediterranean Morphology Meeting (Mykonos 1997). I am grateful to those present for useful discussion.

2 Others who have discussed the status of number include Kayne (1964: 167), who makes a distinction within inflectional forms of the same word between those which vary only in syntactic values (as with case) and those which differ semantically (as with number), and Heidel (1963), who adopts the opposite position to the common one, is arguing against an inflectional interpretation of number. Interestingly, in a brief discussion Drexlrat treats it as not prototypically inflectional (1989: 6). A recent psycholinguistic perspective is provided by Banyar, Lieber & Schrauder (1997).

3 See Scalise (1988), Flax (1994) and references there.
refer to a value "dual". Similarly in Pirlota, from Everett’s description, the grammar has no need to refer to a value "plural". We conclude that Pirlota has no number category.

Kusa (Old Javanese) is reported to have been similar to Pirlota in this respect, a not having plural sexes or pronouns, but marking number by conjuring pronouns or by quantifiers such as 'many' and 'all' (Becker & Usda 1974: 232).

From now on we shall consider only languages with a number category, and assume this in our hypotheses.

Hypothesis 2: Where number is found it will be inflectional.

This weakening of the original claim allows for there to be languages without number, but claims that where it is found, number will always be inflectional. It too is false, there is a universal list specifying that categories must be of a particular type. In fact genuine verbal number (rather than nominal number found on verbs by agreement) is typically derivational (Dure 1898, Motola 1986, 1988b). Verbal number has been clamped to exist in many languages. It is particularly widespread in North America, it is also found in the South Central Dusakan group of languages of southern India (Senevir 1979) and in many languages of Africa (Brooks 1995), the Chadic group being particularly well documented (Newman 1990: 51-82). A major analysis of the subject is that of Dure (1986); Frazier (1985) was a linguist and Motola (1986b) gives a diachronic perspective.

The meaning of verbal number is still not well researched; and the difficulty is compounded by the fact that the terminology is not standardized. For example, Eulenberg discussing a reduplicated verb in Hausa says that it represents:

*a derivational category widespread among Nilo-Saharan and Afro-Asiatic languages, though rather marginal in Niger-Congo. This category is variously known as the intensive, habitual, frequentative, repetitive, or plural verb. It has the general meaning of a repeated action, an action simultaneously performed by several agents, or an action performed on more than one object, or various combinations of these "plural" meanings.*

Eulenberg (1971: 73)

There are two main types of verbal number: event number and participant number. We will consider an example of event number here, and an example of participant number (from Georgian) below. Event number can be illustrated from Hausa (a Chadic language, Chadic being one of the branches of Afro-Asiatic), the data are five Eulenberg (1971: 73-74):

(3) man akọt mọmọ
LCOMPL send them

(4) man n’akọt mọmọ
LCOMPL send.PL them

Note that both have a singular subject and a plural object. Example (3) has a simple verb, but (4) has a verb with partial reduplication, which marks it as 'intensive' or 'plurale'. Example (3) can be used with the meaning "I sent them at the same time to the same place" and (4) would not be appropriate there. Both examples could be used with the following meanings:

(i) I sent them at the same time to different places
(ii) I sent them at different times to the same place
(iii) I sent them at different times to different places

Thus the plural verb of akọt indicates that the sending was not simple, rather it involved more than one time or more than one place - more than one 'sending-events'. Its use is not obligatory, however. Others think that the use of the 'plural' verb here indicates the number of sendings; it is an instance of verbal number.

Hypothesis 3: For a given language number will be either inflectional or not inflectional (but not both).

This claim is false: there is not necessarily one answer for a given language: number may be both inflectional and derivational. We cannot conveniently show this, together with proving the following, weaker claim:

Hypothesis 4: For a given lexical class, number will be either inflectional or not inflectional (but not both).

Surprisingly, perhaps, inflectional and derivational number may co-occur on a single verb. We shall see this is examples involving the participant type of verbal number, in the South Cushitic (or Kaffelian) language Georit (Akomoto; 1982-248, 460-477, quoted in Dure 1986b):

(5) ləmə-lo mo-vid-a də də-ja ne
John PRV-PRV-enter-AOR.3.SG and PRV-œ-š-œ-AOR.3.SG
"John entered and sat down" (PRV = prority, AOR = action)

(6) 1əmp ni mo-vid-i də mo-vid-a
my-AG parent-PL-NOM PRV-PRV enter AOR.3.PL and
judge
PRV-œ-š-œ-AOR.3.PL
"My parents entered and sat down" [AG indicates an agreement marker; the ending -j in syneresis, covering nominative singular and plural, and genitive singular and plural].

The verb agrees in number in a straightforward way. This is terminological number expressed as the verb by agreement. It is inflectional. Additionally, though, the verb 'hit' (unlike the verb 'same') is one of those which has different derived forms according to whether one person hits (d-maš), or more than one (d-aš). The choice can be seen as a case of
Verbal number, determined by semantic considerations. Now consider what happens when there is a numeral phrase. Numerals require a singular noun (e.g., ’man’; the plural would be ’men’). The resulting phrase controls singular agreement.

(7) tees-s
   sam-i
   megbeeri-i
   to-to
   nda
   PRV-PRV-NOM
   Bind.SG-NOM
   PRV-PRV-enter-AGR.3SG
   and
   th-in-d-a
   PRV-PL-AGR.3SG

“My three friends entered and sat down.”

Singular agreement is found on both verbs. Yet the second, which has two forms according to the number of participants, shows the plural verbal form “is three,” rather than one participant involved in the action. In other words, the verb is plural in terms of verbal number, but this does not determine the agreement, which is singular. This is Georgian where we have derivational and inflectional number together. And they can take different values.

Our rejection of hypothesis 2-4 has depended on the notion of verbal number. Some might not accept that the verbal opposition in the Huaa and Georgian examples above is an instance of the category of number. It could be argued that this was a case of aspect. Repeated versus non-repeated action is a Salishan morphological distinction. There is a clear link between aspect and nominal number: if a language marks repeated action in some way, it is much more likely to be found when plurality is involved than without it in the real world, a single person is, for instance, unlikely to send a single package repeatedly. Alternatively, we might analyse the Huaa (Hawaiian) example as showing dislocation. The examples of participant number (as in Georgian) are perhaps harder to disentangle. However, for those who would restrict number to nominal number (including numeral) number expressed on the verb by agreement), it still does not follow that hypothesis 2-4 hold. They will be disproved using different evidence along with hypothesis 5.

Hypothesis 5: At least for the nominals in a given language, taking them together, number will be either reference or not reference (but not both).

We might expect that if there is inflectional nominal number, it will occur throughout the nominals. This claim too, is false. There can be splits within the nominals. This has been known for some time, but the theoretical consequences have not generally been thought through. There are several examples; we will take a less usual one, namely Murit, which belongs to the family of the same name and has about 9,000 speakers in southern eastern Jayaw. The data, originally from Drakos (1955: 19-20), are presented in Foley (1968: 78, 85:6).

Murit has four genders (which we designate IV in the examples), with nouns assigned to them as follows: gender I is for male humans, gender II for female humans and animals, gender III is mainly for plants and trees, while the semantic suffix makes up gender IV. First we see examples of genders I and II.

(8) dp-e
   smeem
   e-pe
   akik
   ka
   I-the man
   I-the light
   I-be
   “the man is light”

(9) dp-e
   smeem
   upe
   akik
   ka
   II-the female
   II-the light
   II-be
   “the woman is light”

(10) dp-e
    gat
    upe
    akik
    ka
    II-the dog
    II-the light
    II-be
    “the dog is light”

The agreement is prefixed on -pe “the” but infixed in the adjective akik “light”. In the plural, the forms are these:

(11) dp-e
    smeem
    ip-e
    akik
    ka
    PL-the person
    PL-the light
    PL-be
    "the people are light"

(12) dp-e
    gat
    ip-e
    akik
    ka
    PL-the dog
    PL-the light
    PL-be
    "the dogs are light"

There is just one plural agreement form for genders I and II. Anom “man” has the plural anim; while egiw “dog/dogs” does not change morphologically. There are, however, loans denoting animals which mark number, for instance a numeral “animal” has the plural numeral. Though not marking number itself, gat when plural takes plural agreements. For genders III and IV, the forms are these:

(13) dp-e
    de
    e-pe
    akik
    ka
    III-the wood
    III-the light
    III-be
    “the wood is light”

(14) dp-e
    behaw
    epe
    akik
    ka
    IV-the pole
    IV-the light
    IV-be
    “the pole is light”

Nouns of genders III and IV, those which are “below” animals, have no distinct plural forms and no plural agreement forms. (Note that the gender IV marker is the same as the plural marker for genders I and II.)

This is one instance of a more general claimed regularity. Smith-Stark (1974) proposed this version of the Animacy Hierarchy:

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As yet I have unfortunately been unable to gain access to a copy of the original.
He claimed that when plurality ‘spills’ a language, some top segment of the hierarchy will be involved in plural marking. For some languages there is a relatively clear split within the nominals, for others it is much less clear, with optional marking available in some positions on the hierarchy. What matters here, however, is that it is quite normal for nominals at different points on the hierarchy to behave differently with regard to number.

It is tempting to claim that number is inflectional for the count nouns of a language. However, this use of ‘count’ leads to circularity. If it means no more than the nouns which have inflectional number, to avoid circularity we would need to show that these denoted by nouns below the count noun threshold of the particular language, are not counted. This is certainly not the case for the Nyir examples discussed below (see especially example (16)).

The Nyir data suggest new hypotheses, in that the examples include marking of number both on the noun and through agreement. The first is an instance of ‘differential inflection’, while agreement shows the number of the noun (through the noun phrase of which it is the head) also has a role in contextual inflection (Bowen 1996: 28). There are at least two hypotheses to consider with respect to this distinction, one leading to the other.

**Hypothesis 6:** For all the nominals in a given language, number will be a category of inherent inflection or it will have a role in contextual inflection.

The Nyir data are sufficient to disprove this hypothesis. Nominals below the noun threshold are outside the number system, both in terms of marking number and in terms of agreement. We are not dealing with isolated exceptions but with a substantial proportion of the noun inventory.

This suggests a further hypothesis:

**Hypothesis 7:** For each use of each nominal the value of the number category for inherent inflection must match the value for its role in contextual inflection.

This makes the reasonable claim that those nominals for which number marking is available will match those which can bind noun phrases controlling number agreement. Thus there will be a single cut-off point on the Ancestry Hierarchy. If we are true, it would mean that for investigating number in nominals the inherent/external distinction was not relevant. However, we shall see that even this claim does not hold.

We might think of British English committee-type nouns here, since they allow plural agreement while standing in the singular. However, these are a special case in that their agreements need not be consistent (this committee, after long deliberation, have decided to ...). There is a more clear-cut counter-example: the relevant data are found in the West Chadic language Nyir (Schuch 1989); the split involves obligatory/optional number marking and obligatory/excluded agreement. Number is involved in agreement and hence

<table>
<thead>
<tr>
<th>masculine</th>
<th>singular</th>
<th>plural</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>n</em></td>
<td><em>n</em></td>
<td><em>n</em></td>
</tr>
<tr>
<td>feminine</td>
<td><em>n</em></td>
<td><em>n</em></td>
</tr>
</tbody>
</table>

Table 2: The demonstrative ‘this’ in Nyir (Schuch 1989: 172, 176). In addition there is an animate/inanimate distinction: the animate nouns are those which denote ‘all humans, men, if not all, domestic animals and fowl, and some large wild animals’. Large wild animals are the ‘grey area’. The remaining nouns are inanimate (1989: 175). This distinction is relevant for number marking in that animate nouns must be marked for plurality when appropriate.

<table>
<thead>
<tr>
<th>(15)</th>
<th><em>tiv</em></th>
<th><em>tiv</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>woman.PL</td>
<td>two</td>
<td>two</td>
</tr>
<tr>
<td>woman.SO</td>
<td>two</td>
<td>two</td>
</tr>
</tbody>
</table>

For inanimates in the other hand marking is optional:

<table>
<thead>
<tr>
<th>(16)</th>
<th><em>zv</em></th>
<th><em>zv</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>woman.PL</td>
<td>five</td>
<td>five</td>
</tr>
<tr>
<td>stone.PL</td>
<td>five</td>
<td>five</td>
</tr>
</tbody>
</table>

Animate plural nouns take plural agreement:

<table>
<thead>
<tr>
<th>(17)</th>
<th><em>n</em></th>
<th><em>n</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>this.PL</td>
<td>women.PL</td>
<td>‘these women’</td>
</tr>
</tbody>
</table>

Inanimate nouns, however, even if they are marked as plural, do not take plural agreement; they take agreement according to their gender in the singular:

<table>
<thead>
<tr>
<th>(18)</th>
<th><em>n</em></th>
<th><em>n</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>this.M.SG</td>
<td><em>z</em></td>
<td>‘these fireplaces’</td>
</tr>
</tbody>
</table>
This the status of number is different for animates and inanimates nouns. Marking of number is obligatory for animates but optional for inanimates. Number is semantically novel, since it is an agreement category; however, while agreement in number with animates is obligatory, plural agreement with inanimates is impossible. And, two interestingly, agreement with inanimates plural does occur, but in gender and not number. This shows that there are no agreement rule for inanimates when we might have expected to find number agreement, but where the latter fails to noun. Thus inanimates in noun number, marked optionally, but this number does not have a role in context. The value of the number category for the noun number could not be the value for its role in context. In context, the noun number is always be true.

Hypothesis 8: For the noun number in a given language, where the role of the number category differs from inherent inflection and contextual inflection, the role of inherent inflection will extend lower than the Animacy Hierarchy than that of contextual inflection.

This proposal be another reasonable but false supposition. Consider Markas's (1981) account of Ngaklan, a language of the Gunwingguan group, which had around 21 speakers in the late 1970's, at Balwan and Nakkar in Arnhem Land, Australia. Here we mark number of the verb is sensitive to position on the hierarchy.

"... in Ngaklan explicit non-singular marking on the noun is limited, noun that explicitly marked as non-singular can be cross-referenced as non-singular, but this possibility is limited almost entirely to human and sometimes animate nouns. Non-singular reference of inanimate NPs is generally not explicitly marked in the verb, and it is largely to be understood in the larger context of discourse."

(Markas 1983: 90)

The implication of the interaction between number and the Animacy Hierarchy is that the status of number as an inflectional category is much less straightforward than generally imagined. It really is not a simple inflectional feature (as plural) available to play a role in the syntax. It is also worth mentioning here that, to keep things simple, discussion has been restricted to singular and plural. Other values of the number category add whole layers of complexity--it is not the case that, for example, in a singular dual-plural system what is true for the plural will be true for the dual. They are very independently.

However, after several hypotheses which have been proved false, it is time to suggest a new one, which is hoped will prove correct:

Hypothesis 9: For the noun number in a given language, where the role of the number category differs from inherent inflection and contextual inflection, there may be counter-examples to the requirement of the Animacy Hierarchy in terms of inherent inflection but not in terms of contextual inflection.

We can illustrate the effect of this constraint from English, where the number split is very low on the hierarchy, being found within the inanimates. Nouns like sheep are therefore exceptional in terms of number marking:

(20) This sheep has been closed.

(21) These sheep have been closed.

Since sheep are animate, the noun would be expected to mark number (as indeed it once did). The noun is irregular in its singular inflection, but regular in terms of its role in context (it takes plural agreement when plural). Imagine a new lexical item peas (a closed sheep). It could not be the grammatical reversal of sheep:

(22) This peas has been fed. [hypothetical singular]

(23) These peas has been fed. [hypothetical plural: claimed impossible]

At first sight, the hypothetical system which is claimed to be impossible looks rather like that which is found in Muyi. The difference is that in Muyi there are two splits, different for noun marking and agreement, but both in accord with the Animacy Hierarchy. English sheep is not part of a regular split but is a lexical exception. Exceptions of this type are allowed, while the converse, like the hypothetical peas, are not.

Conclusion

Number which is taken to readily as an illustrative case of inflectional morphology, is a category whose status is hard to determine. We have seen a list of reasonable hypotheses which have been proved false, and just one which appears promising. The status of number is clearly worth pursuing further.

References


This research is continued in Corbett (forthcoming, in preparation).
Abstract

In this paper it is argued that the process of affixation is subject to a morphological constraint which determines the size of a word. Languages vary with respect to the affix space they have, that is, the number of affixes in a word depends on the number of slots available for affixes in that language. This hypothesis is based on certain morphological and syntactic differences between two Turkic languages, Turkish and Yukut. The morphological form of main and embedded verbs, the presence and behaviour of both stems, the interaction of affixation and auxiliaries, the cross-linguistic asymmetries in the presence of complementizers and double nominal constructions (possessive phrases and relative clauses) indicate that Yukut has a maximum number of three slots for inflectional affixes whereas Turkish has two. According to this proposal morphological and syntactic processes relating to inflectional morphology are not coextensive, and morphology is a separate component which contains restrictions on word length.

Introduction

One of the central issues regarding morphology is its status within the structure of grammar. This issue has become particularly relevant when approaching inflectional morphology. In a number of studies, inflection is characterised purely in syntactic terms, by means of representing inflectional affixes in syntax (Pokorny 1989, Chomsky 1993). The part morphology plays is reduced to lexical features and their role is deriving syntactic representations. The implicit assumption is that there is not much to be said about inflectional morphemes other than their syntactic manifestation. An alternative route of research highlights the differences between word structure and phrase structure (Di Sciullo and Williams 1983, Anderson 1992, Bresnan and McChesney 1995; Sells 1995, Di Sciullo 1996, Bach 1996, among others). One common factor in these studies is that, although there may be overlaps, morphological structure is not an extension of syntactic structure, and vice versa.

The proposal that I put forward in this paper supports the view that morphology is a separate component. Its architecture consists, among other things, a condition on word length characterised in terms of morphological slots. In particular, I propose that the number of slots available determines the upper limit of affixation. Based on the differences between verbal forms in main clauses and embedded clauses in Turkic languages, it will be argued that some of the differences in the inflectional paradigm of these languages can only be explained in terms of a cross-linguistic variation in morphological space. In addition, this hypothesis explains certain variations in the clause structure of Turkic languages. It accounts for the defective nature of the tense-aspect paradigm in relative clauses and sheds light on the placement of agreement morphology, the occurrence of complementizers, the availability of multiple nominal constructions and the presence of buffer stems. It also explains why certain forms which are syntactically allowed do not exist.

Parts 1 and 2 focus on main verbs and embedded verbs in Turkish and Yukut, a Turkic language spoken in north-eastern Siberia. A comparison of the two languages leads to the proposal concerning morphological templates in the third section. The fourth section gives further evidence for morphological templates. Section 5 provides a discussion of morphological slots, followed by the implications of the present hypothesis for syntax in the final section.

1. Turkish

1.1 Main verbs

Inflected verbs in Turkish are minimally composed of a stem followed by a tense suffix and by a subject agreement marker:

(1) Ben bahşi ye-di-m.

I fish-ACC eat-PAST-1

I ate the fish.

Other suffixes which may occur in the place occupied by the past tense marker are the following:

(2) Ben bahşi yi-yor-um.

I fish-ACC eat-PROGRESSIVE-1

I am eating fish.

(3) Ben bahşi yi-yor-um.

I fish-ACC eat-PROGRESSIVE-1

I used to eat.

I appear to have eaten. If I am going to eat...

The difference between temporal and aspectual suffixes do not have a bearing on the present analysis and will not be discussed here. For practical purposes, I will refer to all tense and aspect suffixes as TIA, and the part of the verb containing TIA suffixes and agreement as the inflectional domain. The inflectional domain follows grammatical function changing suffixes, models and negation. The data above indicates that the morphological structure of the main verb with respect to inflection is:

4. V-TIA/(TIA)-AGR

1.2 Embedded verbs

Verbs in complement clauses and object relative clauses are also inflected for TIA and agreement

5. Other types of embedded clause such as the subject relative clause which is not inflected for TIA or person will not be discussed here.
(5) a. Complement clause
   [Ben-im balık-i \ yedi-g-im] eats-fish-ACC is-eating-the-fish
   I-GEN fish ACC eat-PAST-AGR is obvious
   It is obvious that I eat the fish.

   b. Object relative clause
   [Ben-im ye-di-g-im \ balık]-i] barbunya.
   I-GEN eat-PAST-AGR fish red-mullet
   The fish that I eat is red mullet.

-dil' often denotes non-future events; it is morphologically replaceable only by the other form, -di-g', which denotes future events.

(6) a. Complement clause
   [Ben-im balık-i \ yedi]-i] biliniyor.
   I-GEN fish ACC eat-PAST-AGR is-known
   It is known that I will eat the fish.

   b. Object relative clause
   [Ben-im ye-di]-g-i \ balık]-i] barbunya.
   I-GEN eat-PAST-AGR fish red-mullet
   The fish that I will eat is red mullet.

In grammar of Turkish both -di-g' and -di-g' are treated as single morphemes, as they are in the generative literature (Dowsey 1986; Kennedy 1992), with the exception of Koray (1993) who analyses -di-g' as a separate morpheme. I suggest elsewhere (Güldal 1987) that this analysis is preferable for morphological reasons and extended it to include -di-g', hence -di-\'g and represented -g as the complementiser in Turkish. The motivation for this analysis is based on the fact that a syntactically distinct structure (subordination) is marked phonologically (-g being vowel length), shows below:

<table>
<thead>
<tr>
<th>Main clause</th>
<th>Subordinate clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>non-future</td>
<td>eye-de'm wi-'am</td>
</tr>
<tr>
<td>future</td>
<td>eye-de'm (that I ate)</td>
</tr>
</tbody>
</table>

There are a number of differences between embedded verbs and matrix verbs. Embedded verbs are only marked for future versus non-future specification, and they lack the array of TMA suffixes which occur in matrix verbs. Embedded verbs cannot occur with any of the markers in (2) (other than -cyeyeg). Then, they cannot have more than one TMA which is possible in matrix verbs.

(7) a. Ye\'-di\'-m eat-PAST-AGR
    b. "ye\'-di\'-\'m eat-PAST-AGR
    balık fish
    I used to eat
    (intended: interpretation: the fish I used to eat)

Finally, embedded clauses are nominal constructions, which is indicated by the fact that they occur with agreement suffixes from the nominal paradigm and that they are inflected for case. It then seems to be the case that the complementiser C has the dual function of marking nominalisation and subordination. The structure of the embedded verb is:

(9) V-TMA (+TMA)-C-AGR

A comparison of the structure of main verbs and embedded verbs indicates that the position occupied by an optional TMA marker in the main verb is taken up by the complementiser in the embedded verb.

(10) Main verbs
    V-TMA (+TMA)-C-AGR

Embedded verbs
    V-TMA (+TMA)-C-AGR

2. Yakut

2.1 Main verbs

As in Turkish, verbs in Yakut main clauses are made up of a stem followed by a TMA marker and a person marker:

(11) a. Min kir-ba-si si-ak\'-am
    I am the fish.

b. Min bal\'-i si-ey-am FUTURE I will eat the fish.

c. Min bal-bi-si si-2-bis the habit I eat fish.

However, unlike Turkish, Yakut verbs can only take one TMA, illustrated below:

(12) a. ye\'-de-bi\'-\'am eat-PAST-AGR

indicating that the structure of the matrix verbs is:

(13) V-TMA (+TMA)-AGR

2.2 Embedded verbs

In object relative clauses in Yakut the agreement marker attaches to the head noun:

(14) a. Min si-ak\'-am bal-bi\'-\'am
    I eat-PAST fish is swiffish.
    The fish that I ate is swiffish.

and it cannot occur on the verb as the ungrammaticality of (15a) illustrates. As in Turkish, the embedded verb does not have the array of TMA markers found in main verbs, illustrated by the ungrammaticality of (15b):

(15) a. "min si-ak\'-am bal-bi\'-\'am
    (intended interpretation: the fish that I ate)

b. "min si\'-y\'-\'am bal-bi\'-\'am
    (intended interpretation: the fish that I will eat)
The morphological structure of the embedded clause is:

(16) V-T AGR

3. A comparison of Yakut and Turkish morphology

Yakut and Turkish are similar in some respects of the unavailability of some T/A affixes in embedded clauses. However, there are non-trivial differences between the two. The inflectional domain of the main verb in Turkish contains three suffixes as opposed to two in Yakut. The number of suffixes is again three in Turkish embedded verbs whereas in Yakut embedded constructions there is one suffix each on the verb and on the head of the main construction, summarized below:

(17) Turkish

<table>
<thead>
<tr>
<th>Main verbs</th>
<th>Embedded verbs</th>
<th>Complementizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-T/NAGR</td>
<td>V-T/NAGR</td>
<td></td>
</tr>
<tr>
<td>V-T/AGR</td>
<td>V-T/AGR</td>
<td></td>
</tr>
</tbody>
</table>

Yakut

I suggest that these dissimilarities are the manifestation of a difference in the morphological structure of Turkish and Yakut. Turkish has three slots available within the inflectional domain whereas Yakut has two slots, illustrated below:

(18) Turkish

| V-T x3 | X2 x1 | X2 |

where X stands for any inflectional morpheme. The difference is thus reducible to the space that is available in each language: Turkish has a morphological template that has three slots for inflectional suffixes whereas the morphological template in Yakut has two slots.

The existence of morphological templates explains the absence of a second T/A suffix in embedded verbs in Turkish, this position being occupied by C. It also explains why the agreement marker in Yakut has to occur on the noun rather than on the verb in an embedded clause. If it were to occur on the verb it would require a nominalizer, as it is a nominal agreement marker. However, the presence of a nominalizer would nullify the effect of filling up the morphological space. An additional suffix, in this case, agreement, would violate the constraint that no more than two suffixes are allowed in Yakut.

4. Further evidence for the presence of morphological templates

The presence of morphological templates explains a number of constructions in Turkish and Yakut, such as the occurrence of buffer stems, the structure of nominalizers and possessive constructions.

4.1 Buffer stems

Both Turkish and Yakut use buffer stems as a strategy for further affixation. As explained in 1.2, the embedded verb in Turkish does not have the array of T/A affixes found in main verbs. A verbal form such as (19a) does not have a corresponding embedded form (19b), which is grammatical for the reasons explained above. Instead, (19c) corresponds to (19a).

(19) a. Oka-nan-ı-ı
   1 2 3
   read-HS-PAST-AGR
   You read.

b. okur-man-ı-ı
   1 2 3
   read-HS-PAST-C-AGRBuch
   the book that you read.

c. okur-man-ı-ı-ı
   1 2 3
   read-HS-AUX-PAST-C-AGRBuch
   the book that you read.

(19b) contains the copular verb ‘be’ which, here, serves no other purpose than to act as a buffer stem to which additional affixes can be attached. Yakut also uses a copular verb as a buffer stem. A form such as (20a) which is semantically possible does not exist, as the morphological template of Yakut has two slots for the inflectional domain instead the copular verb ‘or’ ‘be’ is used solely for reasons of morphology.

(20) a. *olin-de-ı
   1 2
   est-AOR-PAST-AGR
   (Intended interpretation: I had been reading.)

b. Si-ı-ı
   1 2
   est-AOR-AUX-PAST-AGR
   I had been reading.

4.2 Modals

Modal auxiliaries exhibit similar properties. In constructions with the modal verb ba‘numay in Yakut, the two stems share the inflectional affixes. Again, as expected, neither stem has more than two suffixes, and the person marker can either appear on the main verb as in (21a) or on the auxiliary, as in (21b):

(21) a. *Sin-ı-ı
   1 2
   est-AOR-FUT-AGR
   may
   I will probably eat.

b. Sin-ı-ı
   1 2
   est-AOR-AGR-map-FUT
   I will probably eat.
4.3 Double possessives

Embedded clauses in Turkish and Yakut are nominal constructions which have similar properties to possessive phrases. In the possessive construction in Turkish, the possessive is in the genitive case, as in the subject of an embedded clause. Both constructions have nominal agreement:

(22) embedded clause

Possessive phrase

ben-im dik-ti-ti\-m elhese
I-GEN saw-PAST-C-AGR dress

I GEN dress-AGR

dress the dress that I served

The position of the agreement marker is embedded clauses makes it possible to have double possessive constructions in Turkish, where the relative clause is embedded in the possessive construction:

(23) ben-im yu ana-in dik-ti-ti\-m elhese-m
I GEN this your-GEN saw-PAST-C-AGR dress-AGR3

dress this dress of mine which you served

In Yakut, embedded clauses are also similar to possessive phrases:

(24) embedded clause

Possessive phrase

min a-ti\-b hah-m
I NOMI eat-PAST fish-AGR

h/NOMI fish-AGR

fish the fish that I ate

However, an embedded clause cannot occur within a possessive phrase:

(25) a. *min en ti-b hah-m
I you eat-PAST fish-AGR1

b. *min en a-ti\-b hah-m
I you eat-PAST fish-AGR1

c. *min en a-ti\-b hah-mos
I you eat-PAST fish-AGR1

Although morphologically well-formed, (25a) is ungrammatical because of the absence of an agreement marker. The occurrence of second person agreement marking on the embedded verb, as in (25b) results in grammaticality as well, due to the non-morphological and syntactic reasons. Although complying with the requirements of the morphological template, it is ungrammatical as a result of the presence of nominal agreement on the verb, as AGRE2 is a member of the nominal paradigm. If it were to appear, it would require a nominalizer. However, the presence of a would violate the template, as explained above, in section 5. The ungrammaticality of (25a) arises from two agreement markers occurring one after the other, a violation of slot-affix type mismatches.

5. The nature of morphological slots

The discussion so far has centered around motivating morphological templates and how they provide the slots for licensing affixes. A question that arises at this point concerns the licensing of affixes and slots. The fact that the order of affixes is not free and that there are restrictions on the co-occurrence of certain affixes indicate that affixes and slots must match, an issue discussed in Sells (1995). There it is argued that the occurrence of certain affixes in certain positions, as well as the non co-occurrence of particular affixes are due to their being typed to occur in a particular slot. The ungrammaticality of (25c) can then be explained in terms of slot-type mismatches, where, for two affixes of the same type (AGRI and AGRE2), there is only one slot. Similarly, there is no apparent reason for certain sequences in Turkish to be ungrammatical, except for slot-type mismatches, as in (26):

(26) *kar-sen-si\-t ak-si\-sam.
real-PROC-FUT-AGR

(translated: You will be reading.)

The only explanation for the ungrammaticality of (26) is that the progressive and the future markers are typed to occur in the same slot. This suggestion is supported by the grammaticality of (27) where both affixes occur in the first slot after the stem:

(27) gi-yor of-sa\-sam
read-RET AUX-FUT-AGR

You will be reading.

6. Implications for syntax

Certain aspects of the proposal regarding morphological templates are relevant to the structure of syntax. Firstly, the present proposal assigns reflexive to the morphological component. This is not, in itself, at variance with having a syntactic reflex for each reflexional affix. Morphological templates and slot-type matching requirements could determine certain aspects of reflexional morphology, and other aspects could be represented in syntax. The question is, of course, whether one component replicates the effects of the other component.

In current analyses in syntax, reflexional affixes are parsed as heads of functional projections. Following Pollock (1989) the earlier version of this research programme involves generating each functional category as a head. Words are then formed in the syntax as a result of head movement, in the Minimalist Programme (Chomsky 1993) words are formed in the lexicon but they still have to go through the process of head movement for feature checking. In both versions the order of the morphemes is determined by the selection properties of heads.

There is no a priori reason to object to such a design. In fact, it is even desirable to have a maximal projection for each functional head for its specifier and complement positions, if it can be shown that the presence of these positions account for the facts. In the interim there are a number of convincing arguments in favour of positing each functional category as a synactic head (Pollock 1989, Ouhalla 1991, Bobojek and Jonas
As is well known, one of the motivations behind the proliferation of functional projections within inflection is the contrast between word order variations in French and English, which is argued to be an outcome of a difference in the occurrence of adverbs in different specifier positions (Pollack 1989; Osthoff 1991). The difference between VSO and SVO languages from the difference between the ordering of trace and agreement morphology, and crucially, from the specifier positions that are available because of the status of these morphemes as syntactic heads.

For Turkish, there is compelling evidence regarding specifically that there are two specifier positions, one related to VP, the other to IP (Kornell 1995). However, it has to be seen whether the proliferation of functional categories serves a purpose in Turkish. To my knowledge, there is no evidence that Turkish requires the specifier positions associated with other inflectional elements. The role of the availability of various specifier positions in determining word order, as summarized above, does not apply to Turkish because these arguments are based on the interference of the position of the specifier with the path of head movement, both of which are on the left (for the languages mentioned in Pollack 1989 and Osthoff 1991). As Turkish is an SVO language, it has rightward head movement, whereas specifier positions are on the left. Therefore arguments based on the interference of specifier positions with head movement are irrelevant for Turkish. If the structure of a morphologically complex word is derivable by mechanisms specific to the morphological component, there is no reason to reason the complexity of the same word in syntax, unless there are independent reasons for doing so.

Conclusion:
Certain differences in the morphology of Turkish and Yakut can be explained in terms of morphological templates which determine the length of a word. The data indicates that Turkish has three slots in its inflectional domain and Yakut has two. Language internal and cross-linguistic variations in verbal and tonal morphology which are a consequence of this constraint are summarized below:

### References


<table>
<thead>
<tr>
<th>Verb Type</th>
<th>Turkish</th>
<th>Yakut</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main verb</td>
<td>V T/A - T/A - AG</td>
<td>V T/A - AG</td>
</tr>
<tr>
<td>Embedded verb</td>
<td>V T/A - C - AG</td>
<td>V T/A</td>
</tr>
<tr>
<td>Embedded clause</td>
<td>V T/A - AG</td>
<td>V T/A - N AG</td>
</tr>
<tr>
<td>Auxiliaries</td>
<td>V T/A - V T/A - AG</td>
<td>V T/A - V T/A - AG</td>
</tr>
<tr>
<td>Complementizer</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Double Possessive</td>
<td>V T/A - C AG</td>
<td>N AG</td>
</tr>
<tr>
<td>Structure</td>
<td>[X] [X] [X]</td>
<td>[X] [X]</td>
</tr>
</tbody>
</table>

The hypothesis regarding morphological templates is a morpheme-based approach which supports the presence of an independent morphological component. Although certain aspects of morphology overlap with phonology and syntax, and although certain properties of grammar may apply to all components, a morphological template is definable only in morphological terms. It does not seem to be reducible to phonological structure since morphemes which have one or more syllables, behave similarly with respect to morphological rules. It is not reducible to syntax either, as there seems to be partly morphological reasons for some inflectional phenomena to be as they are. One of the outcomes of this proposal is that it provides a theoretical explanation for morphological typology. If this proposal is correct, the description of the morphological structure of languages is isolating, synthetic and agglutinating can become more or less in terms of the morphological space they have.

It has recently come to my attention that Tousan (forthcoming) suggests that scope properties of certain adverbs might require an analysis where they are generated in the specifier of TP. At the time of writing this paper there wasn’t conclusive evidence for this suggestion.

It might be tempting to argue, along the lines of the ontosymmetry of syntax hypothesis (Kayne 1994) that Turkish is also left-headed, ie SVO, in which case it would have to be shown that the arguments above apply to Turkish as well. Kipnis (1996) has shown that positing an underlying SVO structure for Turkish creates insurmountable problem for the representation of clause structure.

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The status of tense within the domain of inflection has varied as well. Anderson (1992: 82-3) distinguishes four types of inflection:

- a) configurational (case)
- b) agreement (number concord on English verbs)
- c) phrasal (gender on English noun phrases, tense on verbs)
- d) inherent (gender on Latin nouns).

Booj (1994, 1996) distinguishes just two:

- a) contextual (number agreement on Dutch verbs)
- b) inherent (number on Dutch noun, tense on verbs)

Anderson's first three types, configurational, agreement, and phrasal (i.e. are subsumed under Booj's contextual type a). The types they label inherent are essentially the same.

Note: Arnaud and Paul Kipnisky make helpful comments on several points discussed here. Work on Yoruba was made possible by grants from the Academic Senate, University of California, Santa Barbara. Abbreviations are explained in the Appendix.
(Booj 1994:28). Tense is accorded different positions within the two schemes, however. Andersen classifies tense as phrasal (c) because it is a property that is assigned to a larger constituent within a structure (the clause), whereas in Booj it is realized on individual words (verbs). Booj concurs that tense has scope over a whole clause, but classifies it as inherent, because 'the tense of the verb is not determined by syntactic structure' (1994:30). A significant feature of inherent inflection noted by Booj is the fact that it can interact with derivation, an observation that argues against stage models in morphology. Booj's model also allows for a more specific formulation of the nature of the boundary between inflection and derivation. Compositional inflection, defined as 'that kind of inflection that is dictated by syntax (1994:2), differs closely from derivation where inherent inflection may differ from derivation to varying degrees.

For many languages, the various criteria for identifying inflection yield the same categorization of tense. For some, however, they do not, providing us with a better vantage point from which to compare their utility. Such a situation will be illustrated here with material from Central Alaska Yup'ik, a language of the Eskimo-Aleut family. It will be shown that Booj's schema accounts well for the sometimes surprising patterning of some markers synchronically and diachronically in the language.

1. Tense in Central Alaskan Yup'ik

At first glance, Yup'ik appears to exhibit a regular paradigmatic inflectional tense system similar to those of many European languages. Examples are drawn here from the speech of the Charles family of Bethel, Alaska, particularly Nick Charles, Ellen Charles, George Charles, Elizabeth Charles Ali, and John Charles. (Additional descriptions of the system are in Miller 1995, in press, and to appear, and Snyder 1996.) I am especially grateful to Elizabeth Charles Ali and George Charles for their help in transcribing and discussing the material.

(1) Basic tense suffixes

```
<table>
<thead>
<tr>
<th>Present</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>taga</td>
<td>taga</td>
</tr>
<tr>
<td>taga-ta</td>
<td>taga-t</td>
</tr>
<tr>
<td>taga-ta-a</td>
<td>taga-ta-t</td>
</tr>
<tr>
<td>taga-ta-a-a</td>
<td>taga-ta-t-t</td>
</tr>
</tbody>
</table>
```

In much spontaneous speech, the use of the suffixes appears quite straightforward, essentially the same as in English. Present tense verbs are marked for tense, while those referring to past events carry the past suffix. The above are the general future -t -t.

(2) Use of tense suffixes in conversation: Elizabeth Ali, speaker.

```
Wigga: taga-ta-a
I: taga-ta-a
```

'You see, I'm very hungry.'
corrupt
quwqiq
pi-wat-
pi-satu-
beak-ERATIVE
do-CONSEQUENTIAL-3SG.DIR.
because a bear was bothering them (no tense).

Franky-good
bother-not-detrimental
Franky-REDUP
bother-not-apparently-018-300
But Franky said that they (he and companion) were not bothered (no tense).

The Yup'ik tense markers are not absolute, as in English, but relative. In English, the deictic center of the tense system is generally the moment of speech. Past tense markers indicate a time before the moment of speech, and future tense markers a time after it. In Yup'ik the deictic center may be the moment of speech, as in (2) above, but within narrative, even short anecdotes, the deictic center is the narrative time. Events happening along the timeline of the narrative are annotated for tense. A past tense marker specifies a time before the current narrative moment, and a future tense marker a time after it. The reference time in (3) is Franky's visit to the camp. The past tense suffixes on 'there had been people' and 'they had served' specify a time before his visit, before the narrative moment. The clause stating that Franky and his friends were not bothered by a bear is unmarked for tense, because it is simultaneous with the visit.

A relative future can be seen in (4). Most of the events related in the narrative took place along the narrative timeline, so they are unmarked for tense. The final line, however, I would be unmarked, projects an event after the narrative moment.

(4) Relative Future: Sona Charles, speaker
(These two moose were looking at me.)
Wangi-eg
angguk-gluga
angguk-gluga
watch-PARTICIPAL-1PL.3SG.DIR.
As for me, I was watching them (no tense).

Past
na-tat
na-tat-ak
and
now-DU
then-approach.DIR.
and these two moose came suddenly (no tense)

Now
yavut
yavut
so
then I would be squandered. POKER-40.3PL.DIR.

The pattern is reminiscent of the historical present in English. In Yup'ik, however, narrative time must be assumed as the point of reference, because the tense system is a relative one. It is a matter of grammar. In English, the historical present is simply a stylistic option, a possible exploitation of an absolute tense system for stylistic effect. Of course one may evolve from the other diachronically.

A shift in the reference point to narrative time is not necessarily signalled formally in Yup'ik. There need not be an overt past tense marker to shift it away from the speech time. Often, of course, time is established at the beginning of a narrative with adverbs or longer explanations. The passage in (4) above, for example, opened with 'Last fall'. In the same way, shifts in the point of reference back to the moment of speech are not necessarily marked.

Even in the course of telling narratives, however, speakers do not always maintain a single point of temporal reference. Speakers often step out of the narrative world to add comments from their present vantage point. Such a shift can be seen below. As the narrative unfolded, there was no past tense marking. After a pause and a murmur from the audience, she made the statement in (5), this time with a past tense suffix.

(5) Shift in perspective: Sona Charles, speaker
'We went again (no tense) to see (no tense) Qilangiya. You see, we could not catch game [no tense]. And then these two accompanied us [no tense], these two from up there, Peter Alaska and another, travelling (no tense) with their own boat ... and Bob Qilangiya. (Mommy).

Faruq-eg
yana-tri-ak-ak-ak
die-PART-CONSEQUENTIAL-3SG
be-dead
that
The dead (PART-PLACE), that one.

Ayoso
nani
nashata-AK
yu-puk
be-o
luhit-1SG-DU
The two left last but least they arrived, and the weader was good ... J.

The dying clearly did not take place prior to the narrative time, when the two men were coming along in their boat. Mrs. Charles left the narrative time to mention the death of Mr. Qilangiya; the past tense on 'he died' situates his death prior to the moment of speaking, not the narrative. She then resumed the story with no signal.

Discussions of past habitual events generally exhibit systematic past tense marking on each clause. This is because there is no narrative timeline, no sequence of events.

(6) Past habitual: Sona Charles, speaker
August-ek:ek
nunavuq-gluga
aug-ler-mergui
die-PART-CONSEQUENTIAL-FAC-1SG.DIR.
gyana-pley-ak-ak-ak
be-o
luhit-1SG-DU
When we travelled, it used to be beautiful (PART-PLACE).

August-ek:ek
nunavuq-gluga
gyana-pley-ak-ak-ak
be-o
luhit-1SG-DU
When we first travelled in there
The clauses in this passage represent related comments around a theme, rather than the progression of a sequence of events.

Once the relative nature of the Yapik tense system is understood, it appears straightforwardly inflectional, according to most of the usual criteria for inflection. The tense suffixes do not appear to create new lemmas: verbs remain verbs. They affect none of the features cited by Scaife (1988:568) as attributable to derivation only: syntactic category, conjugation class, subcategorization features, or selectional features. They are fully productive. They are unaccompanied by blocking, by which tense marking on certain items would be avoided because of the prior existence of synonomy. Their alternation is regular, phonologically rather than lexically conditioned. Their semantic contribution is transparent and predictable, as well as abstract. The markers are also inflectional by Plank's criteria of relationality (1994:167b), specifying the temporal relation between the proposition and the speech act. Tense qualifies as inflectional even by the more elusive comcomparability criterion: there are no monosemosemic stems in Yapik that could replace a stem plus tense suffix. Furthermore, there are no independent words that could replace a tense suffix in a clause, though of course there are adverbs that cooccur with tense markers. The classification of the Yapik tense suffixes as inflectional is buttressed by the fact that tense is a commonly occurring inflectional category cross-linguistically.

The Yapik system does raise interesting questions about a feature often considered definative for the distinction between inflection and derivation: obligatoriness.

2. Obligatoriness

Among the characteristics of inflectional categories, the feature of obligatoriness has often been taken as criterial. Bybee (1985:83) remarks, for example:

One of the most persistent indefinable features in morphology is the distinction between derivational and inflectional morphology. While Impagliazzo seems to have an

invasive understanding of the distinction, the objective criteria behind this assumption have proved difficult to find. The most successful criterion is obligatoryness, applied to the definition of derivation and inflection by Greenberg 1956. Obligatory categories force certain choices upon the speaker.

An analysis of Yapik tense as obligatory entails the recognition of a meaningful zero: the lack of a tense suffix must signal time as well, either present or, more precisely, tense simultaneous with the deictic center. Such a characterization accords with what we have seen of the Yapik tense markers so far. Yet further examination of natural Yapik speech shows that verbs sometimes occur without tense marking when they represent events not simultaneous with the deictic center. The passage in (7) below describes a narrative sequence, appropriately unmarked for tense: getting up, drinking coffee, going down, stopping, shooting. Yet when Asisgator spoke, we might have expected a past tense within his utterance:

(7) Unmarked tense: Heni Daoko, speaker

"In the morning we woke up and it was raining. We had coffee and those two men, our companions, came up to have coffee too. Then your daddy said to them, 'Now over there, in the side of us, down on the edge of the lake and look to see if there is a bear.' The left and after some time they suddenly stopped, and they let it go. Asisgator [the father] said:

Colony

name

nam-in-tr-ia-8

down there it occurred to moose-catch ins-

They must have caught a moose down there [unmarked tense]."

He was making an observation, not telling a narrative, so we would anticipate that the deictic center for him would be the moment of speech. The sounds of the shot had already faded by the time he spoke. Yet his comment carried no tense marking.

An investigation of the use of such verbs without tense suffixes might suggest that the Yapik point of temporal reference covers a larger span of time than its English counterpart. The uses of the different tenses with the suffixes 'find' can be compared as follows. Mr. Charles reports that if he and a friend were out looking for a lost knife, and he suddenly spotted it, he could use the unmarked [present] tense as he was bending over to pick it up: 'nahusqulaq I'm finding it.' If he and his friend were some distance apart, so that after picking up the knife he had to make his way over to where the friend was searching, he could still use the same verb several minutes later to announce his good luck. If the two men were far from each other and then spent most of the day searching, he could use the same unmarked verb to announce his success to his with that evening. If his mother had been asleep when he returned, he could even use the unmarked verb to tell her the news the following morning. Mrs. Ali corroborated, commentting, "To her, it's still lost until you tell her.

Immediately after the interview, the mother turned to her own husband and use the past tense: naalusaiqgahiuq he apparently found it. The Yapik unmarked present tense then seems appropriate for a span of time encompassing not only the moment of speech, but as long as the preceding day and night as well.

But the difference is more interesting. Scavenging around the kitchen preparing dinner, I
might realize that I have mislaid my knife. Discovering it a few moments later, Min. All notes that I could use the unmarked suffixes just as I caught sight of it. Now if my husband had been on his way out when I began searching for the knife, but he returned 15 minutes later to find me engrossed in a book, having completed dinner preparations, I would use the past tense to announce my discovery: inukshukapuqapunatuq 'I found it.' This time the Yupik unmarked present tense seems to cover a spot no longer than 15 minutes.

The unmarked tense category does not of course indicate a specific span of time. It is used to convey immediacy, for what is portrayed as immediate rather than displaced experience. What is included within the realm of immediate experience can vary to a certain extent with the situation and the desire of the speaker. When Auyuittuq is speaking in (7) above, he was portraying the shooting of the moose as part of the current situation. The same was true of Mr. Charles announcing the discovery of his knife even after a day had passed. English shows a somewhat similar use of the present progressive for imminent futures (I'm leaving) but the similarity does not extend to past events. Yupik speakers systematically use the unmarked present for past punctual events that have current relevance, as in 'I find my knife,' 'catch a moose.' In similar situations an English speaker could use a perfect: 'I found my knife.' 'They've caught a moose.' The fact that the unmarked present covers both past and future events indicates that it is neither a perfect nor an imminent future marker, but simply a marker of tense relevance.

3. Paradigmaticity

A closer look reveals that the noun and verb suffixes operate in different domains. The verb suffixes indicate events in time, while the noun suffixes indicate referents. They need not match within a clause.

(12) No agreement: past tense
Elizabeth AL speaker
light
w+ati-r
husband: past-3Sg/3Pl
zal-INDICATIVE-3P
‘Her former husband is tall.’

(13) No agreement: future tense
Diana Charles, speaker
quillabali
pluenatuqap
boiling-2P/O/3P
continue: cuit-2Sg/2Pl/3P/Pl
mixtures: 4th-P
‘We bring them a boil, these (fish) that will be made into Eskimo ice cream.’

There is of course correspondence between sentence subfields and tense. The concomitants could be taken as the result of either grammatical constraints or simply the fact that speakers say things that make sense. In any case, there is little formal evidence that Yup’ik tense should be considered cocominal in Booj’s sense.

5. Interaction with derivation
Booj has proposed that the inherent inflection, unlike contextual inflection, can interact with derivation. Here the Yup’ik case becomes especially interesting. Yup’ik contains an unusually rich inventory of suffixes. It includes some suffixes that affect argument structure, or ‘claim that’- verbs—‘think that’, and ‘say that’, ‘think that maybe’, ‘say that maybe’. They introduce a claim or thinking. If the derived verb is inflected intransitively, it specifies that the person cast as the absolute thinks something about himself or herself. If it is inflected transitively, it specifies that the person cast as the negative thinks something about another, cast as the absolute. The verbs in (14) are derived from aspor ‘leave’, as in aspor ‘he’s leaving.’

(14) Derivational suffix -s: ‘say that’: Elizabeth AL speaker
Aspor
4912-ii-i-q
leave-2Sg/2Pl/3P/Pl
He says he’s (himself) is leaving

Tense markers can appear with derived verbs of claiming and thinking. A past tense suffix, for example, may follow the derivational suffix of saying to put the entire claiming event expressed by the derived verb stem in the past, as in (15).

(15) Past claim: Elizabeth AL speaker
Aspor
4912-ni-l-q
leave-2Sg/2Pl/3P/Pl
‘They said he was leaving.’

Tense markers may also precede the derivational suffix of saying. The past tense suffix in (16) puts the event claimed in the past.

(16) Claim about the past: Elizabeth AL speaker
Aspor
4402-qi-i-t
leave-past-2Sg/2Pl/3P/Pl
‘They say he is left.’

Tense suffixes may even occur both before and after the derivational suffix of saying.

(17) Past claim about previous event: Elizabeth AL speaker
Aspor
4402-qi-ii-t
leave-past-2Sg/2Pl/3P/Pl
‘They said he had left.’

The tense markers can and do interact with the derivational morphology. The capacity of inflected verbs to serve as the input to derivational processes has consequences for related features considered characteristic of inflection. The tense markers are not always ‘root’ affixes, occurring at the margins of words. As we can see from examples (16) and (17), tense affixes can appear inside of derivational affixes, closer to the root. The tense suffixes could also be said not to have an invariant order with respect to other suffixes; as seen above, they occur sometimes before and sometimes after the derivational suffix -s:... They could even be said to apply recursively, that is, to their own output, with the mediation of suffixes like -s:...

The situation is actually just what would be predicted by Booj’s scenario. Yup’ik tense would be classified as inherent derivation.

Inherent inflection is the kind of inflection that is not required by the syntactic context, although it may have semantic relevance. Examples are the category number for nouns, comparative and superlative degree of the adjective, and tense and aspect for verbs. Inherent inflection is more similar to derivational, and it may lead word formation, unlike contextual inflection, which is peripheral to inherent inflection. Language acquisition and language change also appear to reflect this distinction. (Booj 1996.2-3)

Booj notes further that ‘contextual inflection leads to be peripheral with respect to inherent inflection’ (1996.11). All nouns and verbs in Yup’ik consist of a base (root), any number of optional prefixes, and one and only one obligatory ending. On nouns, the ending specifies number and case. If the noun is possessed, the ending encodes the possessor and possessed in a transitive pronoun suffix. On verbs, the ending consists of two parts: a mood marker and a pronominal suffix complex. The endings would qualify as inflectional suffixes by any criteria. They are obligatory and paradigmatic, they comprise a closed set, they are fully productive and applicable to all stems, they show only phonologically conditioned allomorphy, and they contribute predictable meanings. Their order is invariant, and they are not recursive. They do not
food derivation. They would generally be considered contextual inflections. On nouns they specify case and number in possessive forms, and case is optionally highly contextual syntactically. On verbs, the mood suffixes function relate clauses to the larger discourse event (indicative, interrogative, optative) or to each other (participial, subordinate, continuation). The pronoun suffixes specify the core argument of the clause. Yup'ik morphology thus shows a structure perfectly in accord with Bloom's division of inflection into inherent and contextual. The contextual categories in Yup'ik are always word-final, and the inherent categories, particularly tense, are word-internal.

6. The shifting of categories over time

Yup'ik also shows us that morphological categories do not necessarily occupy fixed positions between derivation and inflection. The past tense suffix -tro is not reconstructed for Proto-Alutiiq (Forrsedt, Jacobson, and Kaplan 1995). Jacobson 1984 derives it from a combination of the nominal past tense suffix -tlo plus the verbalizing suffix -tro. The suffix -tro can be attached to either noun stems or verb stems, but it always derives a noun stem. Former N', the one that Yup'ik. It is thus a past nominalizer, always including a specification of past time. (Ouster automatically appears as the stop q-word first.)

(18) Historic elements of past-stem -tlo -tro -u -u.

\begin{align*}
\text{angana} & \quad \text{'his boat'} & \text{aung-} & \quad \text{to leave'} \\
\text{angapa} & \quad \text{'his former boat'} & \text{aung-} & \quad \text{the one who left'} \\
\text{aung-} & \quad \text{'boat'} & \text{aung-} & \quad \text{is a boat'}
\end{align*}

The derivational meanings of the modern past tense suffix -tro might be explicable in part as relics of its earlier source, literally 'to be the one that Vu'd'.

Markurs may apparently slide along the continuum between derivation and inflection in either direction. The suffix -tro also appears as an etymological element in a number of other suffixes, some highly derivational. It has been compounded with the suffix -tro to supply of, for example, to yield a new suffix -qotlornu- 'empty container which held N'.

(19) Element of new derivation:

\begin{align*}
\text{qotlonu} & \quad \text{empty container which held the'}
\end{align*}

Of special interest is the separate evolution of the past tense nominalizer -tro into a modern inflectional suffix (ending), the past contemporaneous mood -tro when (in the past). In use can be seen in example (18), repeated here in part.

(20) Past contemporaneous mood: Elizabeth Ak, speaker

\begin{align*}
\text{angapa} & \quad \text{mulaklu} \\
\text{angap-tro} & \quad \text{angap-tro} \\
\text{aung-} & \quad \text{aung-}
\end{align*}

\text{watch-PARTICIPATIVE-3SG:}

\text{aung-} & \quad \text{aung-}
\text{leave-PAST-PARTICIPATIVE-3SG:}

\text{aung-} & \quad \text{aung-}
\text{He watched them as they were leaving (in their leaving).}

\text{Compare angapa. 'In their boat.'} \text{Contemporatives like aung-} \text{('as they were leaving') are no longer novel, however. A nominal identifying those leaving is in the absolutive case ('there' is intransitive), rather than the ergative (positive) case.}

(21) Past contemporaneous with absolutive case: Elizabeth Ak, speaker

\begin{align*}
\text{angapa} & \quad \text{mulaklu} \\
\text{angapo} & \quad \text{angapo} \\
\text{aung-} & \quad \text{aung-}
\text{qotlonu} & \quad \text{qotlonu}
\text{the fruit (ABSLUTIVE) was leaving}
\text{aung-} & \quad \text{aung-}
\text{qotlonu} & \quad \text{qotlonu}
\text{compare angapo. 'In their boat.'} \text{Intransitive verbs, the traces of the nominals stem are disappearing. The past contemporaneous mood is usually (though not always) followed by the same verbal transitive pronominal suffixes that appear with other connective nouns.}

7. Conclusion

Yup'ik tense marking provides us with an example of a system that would be perplexing for traditional accounts of inflection, but that is predicted by the proposal of Boosj (1994, 1996) for separating contextual from inherent inflections. Once the relative nature of the system is understood, and it is seen that speakers exploit the unmarked present to convey a sense of immediacy, the system shows most marks of prototypical inflection. Tense suffixes do not create new lexemes: verbs remain verbs with essentially the same meanings, and syntactic category, conjugation class, reorganization features, and thematic features remain intact. The markers are fully productive, and their semantic contributions are transparent and predictable. They are obligatorily and paradigmatically. On the other hand, the tense suffixes can interact with derivation. This is just the correlation of features proposed by Boosj to characterize inherent inflection. At the same time, a closer look at the shallow history of the suffixes themselves reminds us that the position of markers along a continuum from derivation to inflection is not necessarily fixed for all time. The suffix -tro has been seen to evolve in several directions, from derivational to more derivational, to inherent inflection, and to contextual inflection.

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Appendix

The transcription used here is in the practical orthography developed by the Alaska Native Language Center in Fairbanks. Abbreviations in glosses are as follows:

- ARG: Argumentative
- ARG-M: Argumentative-Miscellaneous
- COV: Covative
- CON: Conditional
- CON-CONT: Concessive-Conditional
- CON-M: Concessive-Miscellaneous
- EMPI: Empiric
- FUT: Future
- HAB: Habitual
- IND: Indicative
- INF: Intransitive
- LOC: Locative
- PL: Plural
- PR: Personal
- PS: Participle
- SINC: Sincere
- TR: Transitive

References


ON THE BOUNDARIES OF INFLECTION AND SYNTAX

Abstract

This paper examines the status of object clitic pronouns and preverb al particles in Greek. Evidence, both empirical and theoretical is presented, which shows that these elements exhibit two types of properties. In some ways they behave as independent syntactic units, but in others (both phonologically and syntactically) they seem attached as affixes to the grammatical word which they modify. We propose to capture this intermediate character of clitics and particles by treating them on the one hand as independent words in the lexicon and, on the other, by having them undergo a merging operation, namely Move-Iconcorporate, within syntax. This 'tail-brings them together with their host grammatical word, to form a new type of unit, which we call syntactic word, following D. Siciliano and Williams (1987).

1. Introduction

The precise definition of "word" becomes problematic when we consider the status of elements such as clitics and particles which behave like affixes in some ways but also like full words in others. We will try to show that the intermediate character of these elements is due to the fact that on the one hand they exist as full words stored in the lexicon, but on the other, during the derivation, they combine with other full grammatical words creating a new syntactic unit which we call syntactic word following D. Siciliano and Williams (1987). In other words we will argue that clitics and particles may be seen as separate and independent lexical entries but end up as affixes in the syntactic component. We will try to support this position by focusing on the following specific questions:

a) What is the status of object clitic pronouns in Greek? Note that these elements cannot be bound within a functional head since they do not have a grammatical function and yet in some ways behave like affixes (see Zec, 1983).

b) What is the status of the preverb al in Greek which expresses grammatical information similar to that expressed by bound morphemes?

2. Functional categories of the Greek clitic

a) Some significant aspects of the Greek clitic

1) Greek is a null-subject language with rich pronominal subject agreement (e.g., see the present tense of the verb γράφω: I write) in (1)

(1) sing. γράφω (1st), γράφει (2nd), γράφει (3rd), plur. γράφουμε (1st), γράφετε (2nd), γράφουν (3rd)

2) There is no infinitive, the only non-finite forms are the gerund (2) and the transitive dependent form, namely the non-finite (3), which is only found preceded by the auxiliary έχω (4)

(2) γράφοντας

(3) γράφων

(4) έχω γράφει

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(2) γράφειν writing
(3) γένειν
(4) ἐγράφω ‘I have written’

ii) The imperative, which has its own inflectional endings, divides the Greek
linguists into those who interpret it as a finite form (Philippaki-Warterburge
The imperative is like the non-finite gerund as far as the order of the object clinic
pronouns is concerned unlike the other verb forms, imperative and gerund precede the
clitics.
Clauses may contain a monostelic verb (3) or a periphrastic one preceded by the
auxiliary eine (4).

(5) ACTIVE

| imperfective | perfective
|--------------|--------------|
| root | root
| γενεῖν | γενεῖν
| γένειν | γένειν

The syntactic structure (the configuration of the functional categories involved in
the derivation) of the monostelic verb forms is the one represented in (7) and of the
periphrastico the one in (8). The derivation involves the operation of head movement
of the V head to the relevant functional categories in order to check out the
inflectional features which carry as it abides the syntactic structure fully reflected from
the lexical/morphological component (Chomsky 1995). The order of the functional
categories reflects the ways the morphological exponents are arranged (ENL represents
the fixed agreement and tense features)

(7) ENL

(8) ENL eine VOICE ASPECT VPL V...

The auxiliary eine expresses perfect (AspectTense) and thus in its content it is a
verb of the functional category. However, this functional role of eine cannot lead to an analysis
which treats the periphrastico perfect constructions as single grammatical words, member of
the verb paradigm, which would enter the Syntax from the Lexicon, because the two
elements of the periphrastico often appear syntactically separate (9-10):

(9) a) Maria me exi pales feres stereosoria
Marry me has many times stopped
b) Mary has stopped me many times
(10) a) Exi stereosoria! Nikos ton adelto su!
Has stopped! Nick your brother!
b) Nikos stereosoria! ton adelto su! Has stopped! Nick your brother!

Thus, eine is a separate lexical entry of the category V and of the subcategory form,
selecting the non-finite monostelic verb form, but in an auxiliary, it is not a core
representative of the lexical category verb because it does not get the full complement of grammatical
properties in that it has no theta-logic. So, the syntactic representation consists of two
lexical heads: a higher V (the auxiliary) and a dependent lower V (the main uninflected
verb) neither of which has the full complement of verb properties.

3. Object clinic pronouns
The monostelic verb whether monostelic or periphrastic may be preceded by one
or two object clinic pronouns (indirect (ei) - direct (ōo)).

(11) a) to συ επάτα
   a) I wrote
   b) tu συ επάτα
   c) to συ επάτα
   d) to συ επάτα

(12) a) to ευ επάτα
   b) tu ευ επάτα
   c) to ευ επάτα
   d) to ευ επάτα

Thus, the order is:

(13) to ei do. ENL eine VOICE ASPECT VPL...

Such constructions present us with the question whether clinics are suffixes (Joseph 1998),
licensing a pre in the argument position, or independent syntactic units (Philippaki-
Warterburge 1977, 1987), generated in the object argument position and moving to adjoin
somewhere in the syntactic configuration, leaving a trace behind.

In what follows we will advance syntactic, morphological and phonological arguments,
both empirical and theoretical, which support the analysis of object clinic
pronouns in Greek as syntactically separate units. Furthermore, we propose that this
analysis holds for both situations, i.e. when only the clinic pronouns are present in the
construction but also when we have both clinic pronouns as well as lexical object DPs
(clinic left dislocation and clinic doubling constructions). In these cases the clinic is still
viewed as the argument proper, while the corresponding lexical DP is interpreted as an
adjunct combined with the clinic and providing either a topic (clinic left dislocation) or
some sort of apposition (clinic doubling constructions).

A.1. Syntactic evidence
1. Object clinics in Greek are not agreement markers because they are optional
   elements.
2. Object clinics when present constitute the object arguments as shown by the fact
   that lexical object DPs when co-occurring with the clinics are not arguments, since they
   cannot receive the main stress of the sentence (14).

144.
(31a) *Xes to ayon ma kaajaro vivlio to Chomsky
b. Xes ma kaajaro vivlio to Chomsky
c. To vivlio to Chomsky ma ayon
The book by Chomsky I bought it yesterday

d. *Xes to ayon ma kaajaro vivlio to Chomsky

(35a) *Po vivlio ayon?
b. *Po vivlio to ayon?

Which book did you buy?

Given that wh-movement leaves a coincided trace with which the moved wh-phrase forms a chain the irregularity of (35b) follows from the fact that under the analysis the trace following the verb is derived by the movement of the pronoun like, as shown in (36a).

(36a) *ty ayon met po vivlio
b. *po vivlio ayon met

In (35b) the trace forms a chain with the clitic and for this reason it cannot also form a chain with the wh-element. Nor can we have two coincident chains with one included within the other. We must note however that, although the constructions as in (35a) are the normal and most frequent ones, while (35b) are ungrammatical, the latter may become more acceptable if the sentence is extended with, for example, some adverbial as in (17).

(37a) *Po vivlio to ayon met
b. *po vivlio ayon met

Such evidence may seem to undermine our analysis. However, this evidence is rather weak because constructions as those in (17) are ranked and rare and more significantly because the wh-construct in such constructions is not straightforwardly questioned but has a topic reading. It is possible, therefore, to argue that (37a) is a construction where the wh-DP is a full deletion construction analogous to:

(38) To John in 1st. Xes
John him I-saw yesterday
As for John, I saw him yesterday

where the distalized DP requires coordination with the element [clitic 1]. For more on this issue see Amagase (1986, Artificial (1996), Theoreticum-Kongres (1986-7).

The affix analysis cannot capture the right choice of clitics according to the subcategorization frame of the main verb in the periphrastic constructions in which the clitic appears adjoining to the auxiliary, though constrained by the main verb.
3.3. The phonological evidence

1) Stress: In Greek each grammatical word (in the traditional narrow sense) carries one stress only. Furthermore each stress must occur on one of the last three syllables. This constraint is referred to as the anapenthesic stress rule or the prosodic rule (Holtze, Mackridge & Philippakis-Warthurst 1995). Derivationally and inflectionally (again in the narrow sense) related words may show differences in the position of the stress as shown in the following examples:

27a. 
quan

28a. nom. m. 
mafrána

nafrána

nafrána

nafrána

In all the examples, both nouns and verbs, the assignment of stress is constrained by the inflectional rule but more importantly from our point of view, the adjustment is achieved by shifting the stress (or reassigning the stress) in ways that will satisfy the constraints. Let us now examine what are the consequences for the position of stress when one or two clitics are attached to a grammatical word (as enclitics) increasing the length of the form and creating units which violate the inflectional rule, as in the case of imperatives.

30a. 
la

b. lafrána

c. lafrána

d. lafrána

What we observe here is that there is not any shifting of the underlying stress (no reassignment of stress). Instead the inflectional rule is restored by the development of a secondary stress on the penultimate of the total string. This shows that cliticization is a different process from inflection proper and that it operates after inflection has been completed. It takes place in a larger domain than a word domain, in the sense of the relevant tests in Zoiky (1985: 288). These phenomena are naturally handled within a theory that recognizes that the allomorphs on the stress takes place within the stem after combining clitics with their hosts.

4.3. The phonological evidence

4.3.1. These forms and their functions

In addition to clitic pronouns a verb may be preceded by one of the two negative particles and one of the two mood clitics. These are the whose prototypical use is to express futurity, which marks the subjunctive mood, the negative particle for the indicative is (epi), while for the subjunctive it is (epi). The possible combinations are shown below:

33a. 

b. b
c. c
d. d
e. e

The analysis will be assumed here is the following (Philippakis-Warthurst 1994b, 1995) and is a subjunctive mood marker generated under a Mood (MOD) functional
4.2. The intermediate status of particles

Irrespective of the specific details of the analyses of these particles we must now come to the question relevant to the issue of the interface between syntax and morphology, namely whether these particles should be analysed as affixes of the verb or as independent and separate syntactic elements.

4.2.1. Particles as affixes

If the combination [particle-verb] constitutes a single phonological unit as far as stress is concerned:

(37a) O Nonki [in 3pl] [ka lef}

(37b) [nyi] [in 3pl y rayi]

(37c) [nyi] [in 3pl y rayi]

4.2.2. Particles as independent syntactic elements

If all the arguments offered above that auxiliary exi is a separate lexical entry stand that of noun verb, we must reject the view that particles are affixes, because in their treatment as affixes we would then have to analyse that they should appear as affixes both on the metadiscursive verb form and also on the auxiliary one forms, as in (41). This duplication is both redundant and counterintuitive.

(41a) * N m 3pl exi ke fra metathesis

(41b) * N m 3pl exi ke fra metathesis

4.2.3. The paradox of the intermediate status of particles

We can now draw the conclusion that particles are separate independent syntactic forms which enter the sentence as independent syntactic elements and not as affixes, but by the end up united with the verb form which they grammatically modify. Thus, the noun [particle-verb], though it is not a unit in the Lexicon, consists of two independent syntactic elements, nevertheless it can function as a unit in the syntactic component. The challenge is to find a formal account of this phenomenon.
5. The formal account of the intermediate status of clitics and particles

The whole of the verb group consists of a lexical entry for the verb plus a number of reduced grammatical elements which also constitute separate entries at the Morphology/Syntax interface. This conclusion, however, leaves unexplained the evidence that these verb groupings occur as single units for the purposes of some phonological and syntactic phenomena.

The solution, which we believe will satisfy both types of properties of these elements in one which formally recognizes two different types of word (see also Di Sciullo & Williams 1987; Proper words, or grammatical words (the morphological objects of genitive or Dative) in Di Sciullo and Williams; terms), is that which unites the syntax as separate entities. These are the units of the Morphology/Syntax interface. These are the inflectional complete members of the narrowly defined verb paradigm, as well as those words which are other monosemous particles (particles, clitics). Another type of word, which we may call secondary or syntactic word is formed subsequently after the interface. This unit consists of such reduced lexical elements as particles and clitics in combination with the grammatical word that contains the head of the construction. The questions that are raised now are the following:

How do the particles and clitics combine into a single syntactic word with the verb?

a. Where precisely does this union take place?

Some theoretical details are in order here. In the minimalist program (Chomsky 1995) functional/grammatical information is projected on the syntactic structure by means of functional heads. These heads consist of various grammatical features to be satisfied either by verb movement (Operation Attract/Move) or by merging a functional word (Operation Merge). Most parties in Greek Voice, Aspect, INFL, and MO (when imperative) are satisfied by means of verb movement, their morphophonological exponents are affixed to the verb root (verb head) in the Lexicon/Morphology component before syntax. This is what we refer to as a grammatical word. On the other hand, NEG, FT and MO (subexponents) are satisfied by means of merging a particle (the negative de or the future de, and the subjunctive mer). No verb movement is required, and actually it is banned as ungrammatical. The theory thus predicts that there is no motivation for the units of the verbal group. However, we presented evidence showing that the verbal group constitutes a unit for some syntactic operators (localization, ellipsis, co-ordination). In order to solve this problem we propose a merging operation, which unites all these elements in the syntactic component, in terms of the syntactic operation of Merge. We call this operation Move-Incorporate.

It may be argued that our proposal is facing a theoretical problem. According to the main thrust of the MP, movement is constrained by the economy principle of Last Resort, and it is thus restricted to take place only in order to satisfy certain functional features of morphologically empty functional heads. Our rule Move-Incorporate, however, involves full lexical items and not simply features on lexical heads and thus may be undesirable. To overcome this problem we suggest that the grammatical affixes of the head and the verb are withheld and that the particles carry thefeatures of the verb, which needs to be satisfied in the syntax. Thus, particles are grammatical words that do not carry a conceptual feature but a functional one, but an empty functional head. Given these assumptions we propose the derivation process as follows:

All the functional information coming from the Lexicon is satisfied either by moving the verb all the way up to the functional heads attracted by their abstract features, or by inserting a particle under the relevant functional head. If the derivation contains a clitic at some point of the derivation, the clitic will move to adjourn to the INFL-V head creating an INFL-V. If a structure contains particles these will be marked by (\*V) feature. In fact all projections relevant to the grammatical realization of the verb will be marked by this feature. Thus a verb group structure will be as in (46)

(46) MD'\*V \*V\*V INFL'
               \*V \*V\*V
                \*V \*V\*V

A merging operation will now apply moving the unit containing the grammatical word for the verb (the head word) to the next category until one single unit is created. Thus INFL-V will be attached. It will move to incorporate it to create the node FV. The negative particle de will attach the FV, which will move to incorporate to the NEG creating the NEG plus FV. This is what is called Move-Incorporate, and so on.

We have presented a merging operation Move-Incorporate, which acts in a syntactic way, subsumed in fact under the Operation Move. However we must now clarify the differences between Move-Incorporate, relevant to the merging of independently existing lexical items, and the standard Move, which operates in order to check functional information represented as features on the heads of all functional categories. The differences are as follows:

i. The features which motivate the Move-Incorporate are associated with independently existing lexical items and not with morphologically empty functional nodes.

ii. Move-Incorporate is relevant to X\*V and not to X\*V

iii. Move-Incorporate results in right adjunction with the host lexical word, whereas Move or results in left adjunction.

iv. The motivation for Move-Incorporate is not to eliminate the functional features of an empty head, but it is the result of the grammatical affix of the particle to the head as well as in its morphophonologically dependent status.

6. Conclusion

In our analysis, which draws a distinction between grammatical and semantic word, the debate among various analyses revolving around the lexical vs. functional character of clitics and particles is revisited. The phonological, morphological and semantic facts which point to the lexical independence of these items are satisfied by their original lexical status. On the other hand their morphophonological dependence and their forming a single unit with their hosts, as if they were affixed, is satisfied by the cliticization and Move-Incorporate operations triggered by their functional role to grammatically modify their host and the fact that they are morphophonologically reduced. Thus their immediate status is revealed to be the result of their syntactic within the derivation and the paradigm of their conflicting properties is thus resolved and explained.

References

INFLATION AND INFORMATION

Abstract
An information-based approach to morphology provides a simple and clear method of distin-
guishing among morphological operations, by focusing on their informational effects. One
value of making distinctions on these grounds is the internal order it brings to morphological
processes, another is the possibility it allows for generalizations across the domains of mor-
phology and syntax.

5. Introduction
Two debates inform current morphological theory. One has to do with the status of mor-
phemes. Morpheme-based theories focus on identifying discrete phonological sequences and
accounting for the effect of their presence. Pointing to the many morphological phenomena
that do not involve the addition of a discrete phonological piece, non-morphemic morphologi-
ical theories focus rather on accounting for the kinds of relationships that can exist between
and among stems and words. A second debate has to do with whether the principles governing
morphology are fundamentally distinct from the principles governing syntax. The two issues
are logically independent in fact, but in practice they are not. In general, morpheme-based
theories also take the position that the principles governing the structure of words and those
governing the structure of sentences are essentially identical, while non-morphemic theories
say that the principles governing the two domains are fundamentally distinct.

After establishing the assumptions under which the investigation will proceed, the body of
the paper expands on the information-based theory of inflection offered in Steele 1990 and
titled "Articulated Morphology." Like all information-based theories, Articulated Morphol-
ogy focuses on the informational relationships among linguistic objects, that is, on the differ-
ences in information between one linguistic object and another. As a processual theory, Ar-

ticulated Morphology is also fundamentally concerned with the processes that yield these dif-
f
erences. The heart of this paper is an information-based distinction among three kinds of op-
erations—those that add information to the output (the object they operate on), those that
take information from the output (the subject to which they are applied), and those that
change information, but do not eliminate information from the output. Given the pri-

tency of these kinds of informational effects, it is possible to conceptualize more clearly the
character of inflection, derivation, and compounding. Further, the classification of morpho-
logical operation types corresponds simply and intuitively to a classification of syntactic op-
eration types.

Information-based theories of syntax have achieved wide currency. In contrast, the study of
morphology from an informational perspective is in its infancy. This paper redresses this
asymmetry and, in the process, offers a new perspective on similarities with the principles of
syntax. Although the interest in morphemeless morphological theories has contributed to the
development of an information-based view of morphology, being information-based does not
mean that it derives a position on the existence of morphemes. That is, it is logically possi-
able that an informational difference between two linguistic objects would always be associ-
and with the presence of discrete phonological sequences. The logical possibility, however, is not an article of faith; rather, it is an empirical question. Articulated Morphology does not require the existence of morphemes and easily accommodates the phenomena driving the development of non-morphemic theories. In regard to the issue of the principles of syntax and morphology, then, the information-based approach argued for here affords generalizations across the two domains, a conclusion more commonly associated with morpheme-based theories.

2. Background

I begin with three assumptions. First, drawing on information-based syntactic theories (like HPSG or LFG) and consistent with the morphological work of Anonoff 1994, I take linguistic objects, whether they involve stems, words, phrases or sentences, to be signs involving a phonological part, a semantic part and, crucially for this paper, a syntactic part.

1. [phonology]
   [syntax]
   [semantics]

Second, I assume that the syntax of a sign is an articulated attribute-value structure. That is, each of the three parts of the sign in 1 involves a set of features and associated values. Because I will take no position for the purposes of this paper on the internal structure of the phonological and semantic parts, 2 expands accordingly the centre of a sign only. Each of the superordinated Ps stands for an attribute; the lower-case letters represent values.

2. [phonology]
   \[P_i : X_j\]
   \[P_n : a_k\]
   \[P_m : c_l\]
   [semantics]

Third, morphological and syntactic operations take signs and manipulate their properties. Three logical possibilities present themselves: An operation may (a) modify, (b) add to, or (c) subtract from the information represented in the attribute-value structure of the operated. Although, as we will see, these three logical possibilities are not entirely mutually exclusive, I present a schematic representation of each as an independent option.

3. Informationally Additive Operation:

   - Property X \[\rightarrow\] (Property X & Property Z)
   - Informationally Functional Operation:
     - Property X \[\rightarrow\] (Property Y)
     - Informationally Subtractive Operation:
       - Property X & Property Z \[\rightarrow\] (Property X)

An example from Potawatomi (an Algonquian language) illustrates the first type and also gives a general sense of the approach to be adopted.1 Interactive verb stems in Potawatomi may include information about the animacy and person of their subjects. The inanimate stem for a.

1 The analysis on which this example is based is found in Stolte 1995. The Potawatomi data are drawn from the published work of Hollett. The Lihuep data used later in this paper are from my work with the late Villama Hyde and are written in the orthography introduced in Hyde 1971.

"Fall down" requires an animate third person subject. (Concentrate with the focus on the syntax of a sign, the phonological and semantic properties are maximally simplified. The phonology is the orthographic representation. The semantic properties appear as a simplified predicate calculus.)

4. [phon.: i.e.]
   [synt.: ANIMATE \[\rightarrow\] PERSON - 3]
   [sem.: FALL DOWN(s)]

A word includes not only information about the animacy and person of the subject, but also information about its number. So, the word en-a 4 they fall down requires an animate third person plural subject.

5. [phon.: i.e.]
   [synt.: ANIMATE \[\rightarrow\] PERSON - 3
   [NUMBER: pl.]
   [sem.: FALL DOWN(s)]

The attribute-value pair having to do with number differentiates a word (which has it) from a one (which does not). The mapping between 4 and 5 is a morphological operation that takes an animate third person stem and yields an animate third person plural word, by both changing the phonology and adding "NUMBER: pl." (The operation in 6 adds both the attribute NUMBER and its value, in order to emphasize the fact that the domain lacks number and the codomain includes number. It could equally be the case that the domain includes the attribute and the operation adds only its value.)

6. [phon.: Z]
   [synt.: ANIMATE \[\rightarrow\] PERSON - 3
   [NUMBER: pl.]
   [sem.: VO]
Principle 2 refers to the character of operations. The operation in 6 that adds number information to a stem and yields a word. However, it is not the case that all morphologically simple suffixal stems include a particular person value. Morphologically simple transitive intransitive stems, for example, are subject to operations that demote the person of their arguments. The animate transitive stem verbs 'see' and 'hear' for example, can occur in the following complex forms: 'see' see-anun, 'see' see-anun, 'see' see-anun, and 'see' see-anun. The operations in 10, each of which has a distinct informational effect on the attribute PERSON, yield this array:

10. a. Person: Z
   
   System: [P]  
   
   Phrase [P] ANIM- [P]  
   
   b. Person: Z
   
   System: [P]  
   
   Phrase [P] ANIM- [P]  
   
   c. Person: Z
   
   System: [P]  
   
   Phrase [P] ANIM- [P]  
   
   d. Person: Z
   
   System: [P]  
   
   Phrase [P] ANIM- [P]

The contrast between the operation in 6 and the operations in 10 illustrates the distinction between operation types allowed by Principle 2. The Potowanomus operations that add number take stems and yield words. The operations in 10 that add person take stems and yield stems. These operations illustrate one more point that is essential to our discussion. The schematic statements about addition, subtraction, and modification in 3 do not differentiate between attributives and values. Our focus here is on values. Addition always involves the addition of a value; modification always changes a value; and subtraction always removes a value. It is logically possible, as noted above, that some operations might involve both an attribute and a value and others only a value. Because we will assume that stems and words include the same attributes, only the latter is an option.

11. a. Addition:  
   
   [F]  
   
   [F] s

   b. Modification:  
   
   [F] s  
   
   [F] y

   c. Subtraction:  
   
   [F]  
   
   [F] y

12. Syntactic CATEGORY:  
   
   NUMBER.

   ASPECT:

   SUBCATAGORIZATION:

   Every stem and a value for the features CAT and SUBCAT must be added in addition a value for the features ASP and N. The values available to the last three are reasonably familiar, only the first requires any introductory comments. Although we could employ any of a variety of terms to distinguish among category types, I continue from previous discussion (e.g. Stee 1988) the mnemonic labels 13, where 'pos' indicates the possibility (or the impossibility, respectively) that a stem may combine with a possessive and 'abs' indicates the impossibility (or the possibility, respectively) that a stem may combine with an absolutive. (Absolute is the term used in Uto-Aztecan for a set of morphs -a, -i, -i, -l, -s, -t, -w that appear in the citation (or absolute) form.)

13. CAT:  
   
   -pos

   [F]  
   
   cat:  
   
   [F] abs

   haruwa 'bear'

   qensuq 'squirrel'

   tsupa 'sky'

   CAT:  
   
   -pos

   [F]  
   
   cat:  
   
   [F] abs

   litlal 'sing'

   samsus 'tear'

   pulu 'lick'

   The informational effect accompanying the addition of the morph -s changes the categorial requirement of a stem. As illustrated in 14, stems including this morph are based on numbers of the first category, but they behave morphologically like numbers of the fourth.

14. a. haruwa 'bear'

   [F]  
   
   haruwa 'my (my) bear'

   *samsuwa

   b. tsupa 'sky'

   [F]  

   tsupa 'my (my) sky'

   *samsuwa

   These data can be captured with a morphological operation that modifies the categorial information of a stem – replacing the value 'pos', 'abs' with another value of the same type 'pos', 'abs'.
15. 

<table>
<thead>
<tr>
<th>Phon.</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syntax</td>
<td>CAT: pos1</td>
</tr>
<tr>
<td></td>
<td>CAT: pos2</td>
</tr>
</tbody>
</table>

Another example is useful to underline the character of modification as replacing one value with another of the same type. In addition to the attribute CAT (egypt), the syntax of Luxrio stems includes information about their subcategorization possibilities. (See Steele 1991 for an extensive discussion.) For example, pet:pol’s ‘kick’ requires two arguments, a subject, which need not have lexical instantiation, and an object-marked object; also ‘sing’, in contrast, requires only a subject, which similarly need not be lexically instantiated. Ex. 16 provides two simple examples and 17 illustrates how the subcategorization properties are to be represented. The latter case ‘why mark’ identifies the formal property of the obligatorily present argument; it must be marked for object; the capital ‘SUBCAT’ indicates the necessity of a subject but does not carry requirement as to its formal character.

\[ a. \text{ ponnas}^{1} \quad \text{pum pone}^{2}\text{’boun} \quad \text{‘They are kicking their hands.’} \]
\[ b. \text{ shebq}^{3} \quad \text{up} \quad \text{She is singing.’} \]

17. 

<table>
<thead>
<tr>
<th>Phon.</th>
<th>poler</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synatx</td>
<td>CAT: pos1</td>
</tr>
</tbody>
</table>

Semant: LUCKY(y)\[ \]

<table>
<thead>
<tr>
<th>Phon.</th>
<th>kefer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synatx</td>
<td>CAT: pos2</td>
</tr>
</tbody>
</table>

Semant: SING(x)\[ \]

Luxrio has a morphological causative, the effect of which is to change the subcategorization properties of a stem, as the contrast between 16a and 18 will make clear.

\[ a. \text{ ponnas}^{1} \quad \text{pum pone}^{2}\text{’boun} \quad \text{‘They are making them kick their hands.’} \]

The semantic information of the stem poler me is, thus, distinct from the semantic information associated with the stem poler:2.

\[ b. \text{ shebq}^{3} \quad \text{up} \quad \text{She is making them sing.’} \]

19. 

<table>
<thead>
<tr>
<th>Phon.</th>
<th>pone/ae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synatx</td>
<td>CAT: pos2</td>
</tr>
</tbody>
</table>

Semant: LUCKY(x; y)\[ \]

The difference between 17a and 19 might appear to be characteristic as addition of ‘ – obj’ after all, an ‘additional’ argument in SUBCAT. However, the value of an attribute is not internally decomposable. Just as the operation in 15 replaces a complex value with another complex value, the causative operation replaces one non-decomposable argument structure type with another.
As the value for CAT indicates, 'numq' is subject to operations introducing neither the absolutive nor the possessive. Rather, stems of this type may undergo any one of a set of tense operations.  

24. 'numq: 'is hunting'  
   'numq: 'will hunt'  
   'numq: 'was hunting'  
The forms in 22, in contrast, are not subject to tense operations, but they do exhibit different possibilities relative to the absolutive and the possessive.  

25. possessive only [CAT: -poss, -abs]  
   possessive and absolutive [CAT: -poss, -abs]  
   absolutive only [CAT: -poss, -abs]  
   unmarked for 'is to hunt'  
   'numq: 'big hunting'  
   'numq: 'is hunting'  

These facts can be accommodated by a set of aspect operations. Each takes a stem where the value for ASP is not specified and adds a value to this attribute; each, in addition, takes a stem specified [CAT: -poss, -abs] and replaces the value for this attribute with another of the same type. The three operations in 26 exemplify, therefore, as operation type that simultaneously adds and modifies information.

26. a. generic:  
   Phon. A: CAT: -poss, -abs  
   ASP: generic  
   Phon. B: CAT: -poss, -abs  
   b. changing:  
   Phon. A: CAT: -poss, -abs  
   ASP: changing  
   Phon. B: CAT: -poss, -abs  
   c. unchanging part:  
   Phon. A: CAT: -poss, -abs  
   ASP: unchanging part  
   Phon. B: CAT: -poss, -abs  

The aspectual operations provide information about aspect not found in the stems in which they apply, but they also change the category of the stem -- i.e., in regard to aspect they are informationally additive, but in regard to category they are information changing. If inflection and derivation exhaust our choices, the options are clear.

27. a. informationally additive = inflection  
   b. informationally modificational only = derivation  
   c. informationally modificational = derivation  

In fact, the option in 27b has been proposed in Lieber 1992. If her account of such complex operations is correct, we would identify aspect as derivation and expect it to pattern with examples of simpler derivation types like -di in 15.

Lieber assigns all morphemes but inflectional affixes a 'categorical signature', a bundle of attributes which, for each morpheme, may be used but not be accompanied by values. Inflectional affixes are accompanied by a reduced set of attributes, and each attribute present must be specified with a value. The categorical signature of a word is constructed from the information contributed by the morphemes it contains, according to a system of 'percolation'. First, given a binary branching tree, one branch leads to a 'head' and the other to a non-head. Second, the information from whichever morpheme is the head is percolated to the dominating node; if the head lacks information found in the non-head, this additional information is carried up as well. Consistent with Lieber's view that an inflectional affix cannot be a head, its partial information structure can only be added to the categorical signature of the dominating node. In derivational word formation, the value for a feature of a head morpheme will supersede or override that of an inner morpheme. Features from inflectional morphemes can never override features from their heads, but can only fill values unspecifed at the categorical signatures of their heads. Inflectional word formation is therefore additive in a way that derivational word formation is not. (p.112) En 28 reformulates the operations in 15 in conformity with Lieber's proposals.

28. a. -si  
   Phon: A: CAT: -poss, -abs  
   ASP: SUBCAT: null  
   Phon: B: CAT: -poss, -abs  
   b. -di  
   Phon: A: CAT: -poss, -abs  
   ASP: SUBCAT: null  
   Phon: B: CAT: -poss, -abs  
   c. -di  
   Phon: A: CAT: -poss, -abs  
   ASP: SUBCAT: null  
   Phon: B: CAT: -poss, -abs  

As with the general difficulties associated with posting morphemes (richly detailed by Verderber 1992, among others), this analysis is reasonably consistent with the comparable analysis of -di above.

The flaws in Lieber's notion of inflection are obvious, however, when we consider an example, like Luisito aspect, which simultaneously adds and modifies information. Because Luisito as-
post overwrites the value for CAT, as Lieber’s account it must be of the same morphological type as Lautenschläger 44 - that is, derivational. The morpheme ‘analysis’ for example, would have the clausal signature in 32.

As the head of the structure in 36, presumably, it would override the stem’s value for CAT by ‘head precedence’, supplying it as a value for ASP. Because morphemes lack a value for SUBCAT, the subcategorization value for ‘ Items would fill in by ‘Backup Precedence’.

In terms of the behavior of the resulting stems, the model in 27a as interpreted in 29 and 31 seems an incorrect result. First, no aspectual element replaces the subcategorization properties of the stem with which it combines, a fact that is without explanation in Lieber’s analysis. It is simply an accident in this analysis that heads that are aspectual elements lack a value for SUBCAT. Second, any operation that is partially informationally modificational, like the causative, precedes the aspectual operations, and no operation with any modificational effect possible after the aspectual operations. On Lieber’s analysis, the causative and other modificational operations could just as well follow the aspectual operations, since all are derivational.

Of the two models in 27 that in 27a seems the best characterization of the mapping from informationally effects to the distinction between inflection and derivation. That is, we can identify operations that are informationally modificational only with derivation and we can identify with inflection operations that involve informationally additivity, wherever other informational effects might have. This model can be presented somewhat more formally as follows:

31. Derivation:

\[
\begin{align*}
\text{Inflection:} & \quad \left[ T \middle| \, g \right] \Rightarrow \left[ T \middle| \, g \right] \\
\text{Compounds:} & \quad \left[ T \middle| \, g \right] \Rightarrow \left[ T \middle| \, g \right] \\
\end{align*}
\]

On this model, inflection has a broader domain than does derivation within the informational parameters at issue. It follows, as well, that the morphological types involved will also have a wider range. The examples offered above demonstrate this latter point. The Lautenschläger examples of derivation and inflection both involve mapping from stem to stem, but the Penaw astonishing examples of inflection include an operation mapping from a stem to a stem (as in 10) and an operation mapping from a stem to a word (as in 6).

5. Compounding

To complete the picture we must consider, if briefly, the informational domain of compounding. Given the options offered at the outset, the informational ‘area for compounding must be informational subtraction.

In 32, Compounding.

\[
\begin{align*}
\text{Inflection:} & \quad \left[ T \middle| \, g \right] \Rightarrow \left[ T \middle| \, g \right] \\
\end{align*}
\]

An example is found again in Lautenschläger. The operation adding the morph ‘wants’ (‘want’ ‘to’) requires stems that are specified [ASP, unchanging], but the resulting stems lack a value for ASP. Both facts are illustrated in 13. The requirement of an aspectual value in the operand is represented by the morph ‘-e’ on the stems looks ‘sing’ and polls ‘dance’; this is a morph like the three present in 12 above. The fact that the combination with ‘wants’ is [ASP] is indicated by the presence of the tense-aspect morph – ‘preter’; this morph is actually exclusive with aspect, as demonstrated in Section 4.

5.2. Non-incontro ‘wants’

The operation that adds the morph ‘wants’ thus, must destroy the aspectual information associated with the stem, consistent with 32.

Phon: \(X\)  \text{Synt:}\text{CAT:}\quad \text{abs}  \quad \text{post}  \quad \text{ASP:}  \quad \text{unchanging}  \quad \text{SUBCAT:}  \quad \text{[...]}  \\
Phon: \text{X+icho}  \quad \text{Synt:}\text{CAT:}\quad \text{abs}  \quad \text{post}  \quad \text{ASP:}  \quad \text{SUBCAT:}  \quad \text{[...]}  \\

The operation in 34 involves more than substitution; it also modifies the value of CAT, ‘post’ to ‘abs’, ‘post’. Assuming that this is a reasonableness representative example of compounding, it suggests that, like inflection and unlike deriving, compounding need not be informationally simple but can have multiple informational effects. Furthermore, the informational complexity for both compounding and inflectional operations involves the possibility that information can be modified as well as subtracted or added respectively.

35. Derivation:

\[
\begin{align*}
\text{Inflection:} & \quad \left[ T \middle| \, g \right] \Rightarrow \left[ T \middle| \, g \right] \\
\end{align*}
\]

The model in 35 makes a final prediction about the mapping between the three informational
options and the three morphological domains: No operation is simultaneously additive and subtractive.

6. Conclusion

Ex 35 maps the informational effects of addition, modification and subtraction onto traditional morphological divisions. But the primitives are the informational effects themselves. That is, the three-way informational division in Ex 35 is a fundamental fact about morphological operations, whatever label might be applied to any of the three types. Thus, having established the pervasive informational effects for morphological operations, we can consider a parallel in syntax. Although the standard view of syntax is not processed, the informational effects are arguably not exclusive to the morphological domain.

A prima facie case exists for the semantic subtraction of information. This possibility is represented explicitly in the categorial grammar operation of function application. For example, a transitive verb has the category V/PNP: application of this category to an NP yields a VP: VNP NP → VP. The combination of elements to yield many standard phrasal categories, in fact, involves the elimination of information associated with the 'non-head.' Informationally additive syntactic operations appear to be much more limited. Required is something that maintains (at least some of) the information in a syntactic domain while adding new information. The one reasonably good example might be the addition of clitics. For example, the Lusitano second position clitic complements supplies the speaker's assessment of the situation described in its complement. The contrast between the two sentences in 36 is illustrative.

36. a. non n asksay aq 'I'm sick.'
   l cllitic complex: is sick
   b. too kunam asksay aq 'I'm sick, I gather.'
   l cllitic complex: is sick

Think of the complement to the clitic complex (e.g. non asksay aq) as something with a temporal value. The clitic complex doesn't change or eliminate this value; rather, it adds to it a judgment. We might represent this as follows:

37. Clitic: [TNS:x] → [TNS:x; JUDGE:z]

Finally, the requirements for informational modification limit the syntactic application. The one syntactic operation that arguably involves the replacement of one value with another of the same type is agreement across the members of a constituent. The most telling example is a case like Hapi where the dual is the result of a plural subject and a singular verb.

Although these syntactic examples demand further scrutiny, the potential parallels with morphology are intriguing. Intuitively, morphological compounds most closely resemble simple function-argument relationships and citation in the most morphological part of syntax.

References
