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Volume 201

Wolfgang U. Dressler, Oskar E. Pfeiffer,
Markus Pöchtrager and John R. Rennison (eds.)

Morphological Analysis in Comparison
MORPHOLOGICAL ANALYSIS IN COMPARISON

Edited by

WOLFGANG U. DRESSLER
OSKAR E. PFEIFFER
MARKUS PÖCHTRAGER
JOHN R. RENNISON

University of Vienna
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Introduction

Wolfgang U. Dressler, Oskar E. Pfeiffer,
Markus A. Pöchtrager & John R. Rennison

The Seventh International Morphology Meeting was held in Vienna, Austria, from the 16th to the 18th of February 1996 and consisted of a main section and several workshops. It continued the series of biennial meetings held alternately in Austria and Hungary. The proceedings of the third and fifth meetings (both held in Krems, Lower Austria) had been published under the titles of "Contemporary Morphology" and "Advances in Morphology" with the publishing house Mouton de Gruyter.

This volume presents selected papers from the main section of this meeting (plus one contribution from the workshop on the acquisition of morphology). They deal with questions of morphological analysis in many fields. The comparative aspect comes through contrasts between compounding and derivation, derivation and inflection, the gradual emergence of morphology in language acquisition, and via the cross-linguistic spread of the investigations. They cover such areas as the morphology-syntax interface, agreement, the distinction or transition between derivation and inflection, straight derivation (suffixation and prefixation), composition, and the acquisition of morphology. We are going to introduce the volume by presenting the papers in this order of contents.

Edwin William’s paper investigates alternative positions about the extent to which syntax can actually have access to morphological information, i.e. whether words really are atomic units to syntax, recognizable only by their syntactic properties, or whether syntax and morphology can interact, e.g. in such a way that affixes occupy syntactic positions. He concludes in arguing against a minimalist position which would reduce typological distinctions between languages to lexical differences.
Andrew Spencer presents evidence against the model of Distributed Morphology from agreement facts in the ergative languages Chukchee and Koryak. In the course of his analysis, which pleads for a realizational view of inflection, he deals with the status of inflectional morphology, i.e. with the question whether the boundary between affixes and lexemes is only a minor one (as held by Lieber) as opposed to treating affixes and lexemes as totally distinct entities.

An ergative language, Basque, is also the object of Pablo Albizu and Luiz Eguren’s paper on ergative displacement and epenthetical prefixation. Their framework, Optimality Theory, allows them to treat these phenomena as violations of relatively low-ranked constraints, thus avoiding a violation of the highly preferred principle of ‘Obligatory Prefix’.

The (originally distributionalist) concept of position class is attacked by Joyce McDonough in her Athabaskanist paper, which argues for an alternative bipartite model. It presents a recursive extension of the binary division between stem and the affix attached to it and thus strives for greater theoretical depth of analysis.

Vladimir A. Plungian discusses a recurrent problem within agglutinating languages, sc. the frequent difficulty of deciding whether a morpheme is a clitic or an affix and, if the latter, an inflectional or derivational one. This is illustrated with agentive noun formation in the West African language Dogon.

Henry Davis presents alternative routes in Lillooet Salish for the formation of inchoatives and their relations to causatives and reflexives. Typological differences between Salish and, e.g., European languages are thus shown to be not of a categorial or morphosemantic nature, but due to different derivational histories.

With the example of English, Adrienne Lehrer argues against Beard’s separationist view of meaning and form in morphology and for the sign character of affixes. Although their meanings represent subsets of lexical meanings, they are relatively stable and exhibit the same basic semantic relationships of synonymy, antonymy and polysemy as lexical signs.

Lluïsa Gràcia and Miren Azkarate analyse Romance and Basque prefixes according to the head-complement-parameter and conclude that such analyses cannot only account for basic meaning differences between prefixes but also relate morphological to syntactic headedness and thus deepen the understanding of an inductive Greenbergian universal.

Verbal prefixes are also the subject of Mária Ladányi’s contribution to the productivity of Hungarian derivational morphology. She relates productivity both to semantic properties and to degree of grammaticalization within a synchronic and diachronic perspective.
Lluïsa Gràcia and Olga Fullana devote their paper on Catalan to verb compounds which attach a modifier to the following verb and discuss both structural and semantic consequences of their novel analysis.

Marianne Kilani-Schoch and Wolfgang U. Dressler present the evolution of fillers in early French language acquisition as evidence for a constructivist view of Natural Morphology whereby children construct their morphological modules from nonmodular bases.

In this way the present volume offers a kaleidoscope of different theoretical trends within the various domains of contemporary morphology.¹

¹The organizers would like to express their profound thanks for financial support particularly to the Bundesministerium für Wissenschaft und Forschung and to the Gemeinde Wien, for patronage to the University of Vienna and to the Austrian Academy of Sciences.
An optimality theoretic account for “Ergative Displacement” in Basque

Pablo Albizu & Luis Eguren

Under certain circumstances, an ergative DP is cross-referenced in Basque by means of an absolutive prefix with the same specification for person, instead of the expected ergative suffix. This phenomenon, currently known as “Ergative Displacement” (ED), does not have any syntactic and/or morphological consequences whatsoever. In this paper, an OT-analysis is developed for both ED and epenthetical prefixation in the Basque finite verb, in which these phenomena are viewed as violations, at the late level of lexical insertion, of two lower ranked Correspondence constraints — PARSE(FEATURE) and DEP (“No epenthesis”), respectively, in order to avoid a violation of the highly penalized OBLIGATORY PREFIX constraint.

1. Introduction

In this paper an analysis is developed for so called “Ergative Displacement” (ED) in Basque within the sub-theory of Optimality Theory (OT) (cf. Prince & Smolensky 1993) known as Correspondence Theory (McCarthy & Prince 1994, 1995). The analysis tries to derive the phenomenon from a hierarchy of well-founded, violable constraints — instead of using language-specific, ad hoc rules — and strongly supports two much debated theoretical issues: namely, late lexical insertion and the existence of an autonomous post-syntactic morphological component.

Section 2 introduces relevant features of Basque verbal morphology, and contains some basic assumptions on the morphology of Basque verbal inflected forms.

In Section 3, ED in Basque is described as a mismatch between syntax/morphology and lexical insertion, by which, in some particular contexts, a syntactic AGR ergative node surfaces as an absolutive marker with the same specification for person. Two initial (and rather unnoticed) remarks on ED are also made and justified: first, “displaced” ergatives are consistently ergatives not only syntactically, but also morphologically; second, the existence of a prefixal “position of exponence” (cf. Noyer 1992) within Basque inflected verbs may account for the application of ED, as well as for another closely related property of the Basque verbal inflectional system, namely the insertion of “default prefixes”.

Section 4 makes explicit OT-fundamentals, as well as a model of lexical insertion which incorporates some of the Correspondence Theory postulates on the relations that hold between inputs and outputs.

Our Correspondence Theory-based analysis for ED in (Standard) Basque is presented in Section 5. In short, ED is viewed as a violation of a less penalized PARSE(FEATURE) constraint in order to obey a higher ranked OBLIGATORY PREFIX constraint. Putting it in other words, the obligatoriness of a prefixal position in the finite Basque verb will force the underspecification of the feature [ERG] with the result of an absolute lexical entry being inserted under a morphosyntactic ergative node. The array of (morphological) circumstances under which either ED or the insertion of “default prefixes” take place in Standard Basque is then shown to result from a particular hierarchy of independently-motivated, very general constraints.

2. Basque verbal morphology: basic data

Basque is a fairly clear-cut head-final language which displays a rich array of phonetically realized case morphemes on NPs. It is also an ergative language (cf. (1a–b)). However, subjects of unergative intransitive verbs are marked with an ergative morpheme in Basque. See Laka (1993b) for an analysis of Basque unergatives as non incorporated transitive predicates, which fits within the general picture of Basque as a morphologically ergative language.

Moreover, the language has ergative, absolutive and dative affixes on verbal forms, which agree with their corresponding arguments (cf. (1b–c)) and allow for a three-way pro-drop (cf. (1d)).

The following abbreviations will be used in the glosses: AUX = Auxiliary; ERG = Ergative; ABS = Absolutive; ABSERG = “displaced ergative”; ALLO = Allocutive; ASP = Aspect; DEF = Default prefix; DAT = Dative; PREDAT = pre-Dative; 1–2–3 = First, second and third person; PL = Plural; SG = Singular; MASC = Masculine; FEM = Feminine; FORM = Formal; INF = Informal; TNS = Tense marker; PRES = Past; PAST = Past; PREDAT = pre-Dative; 1–2–3 = First, second and third person. We will maintain this ambiguity until we argue for the strictly default nature of this kind of prefix in Section 3.

1 (1) a. Ni-Ø berandu etor-tzen N-aiz  
   1ABS late come-ASP ISGABS-Aux  
   ’I usually come late’

2 The following abbreviations will be used in the glosses: AUX = Auxiliary; ERG = Ergative; ABS = Absolutive; ABSERG = “displaced ergative”; ALLO = Allocutive; ASP = Aspect; DEF = Default prefix; DAT = Dative; PREDAT = pre-Dative; 1–2–3 = First, second and third person; PL = Plural; SG = Singular; MASC = Masculine; FEM = Feminine; FORM = Formal; INF = Informal; TNS = Tense marker; PRES = Present; IRR = Irrealis; MD = Mood; TEMP = Temporal epentheses. In the glosses (1b) and (1c) there is some ambiguity as regards the proper nature of some prefixal material in Basque verbal forms, that is, the prefix D- is characterized both as a third person singular absolutive morpheme and as a default prefix. We will maintain this ambiguity until we argue for the strictly default nature of this kind of prefix in Section 3.
b. \texttt{Ni-K Jon-\textsc{i} ume-a-\textsc{Ø} ekarr-i D-i-O-T\textsc{\textsc{i}-ERG} John-\textsc{DAT} child-the-\textsc{ABS} bring \textsc{DEF(3ABS)-AUX-3SGDAT-1SGERG}}

'I have brought the child to John'

c. \texttt{*Ni-K Jon-\textsc{i} ume-a-\textsc{Ø} ekarr-i D-U-T\textsc{bring-ASP \textsc{DEF(3ABS)-AUX-1SGERG}}}

'I have brought the child to John'

d. \texttt{pro\textsubscript{1} pro\textsubscript{1} pro\textsubscript{3} ekarri D\textsubscript{1}+O\textsubscript{2}-T\textsubscript{1}}

As the examples in (1a,b) also show, most verbal forms are analytic in Basque and, in that case, an aspectual morpheme is attached to the main verb, whereas all other inflectional markers show up on the auxiliary in a canonical order, up to now, that of (2):

\begin{equation}
(2) \quad \textsc{V-ASP ABS-AUX-DAT-ERG}
\end{equation}

However, a very reduced number of verbs, such as \textsc{joan} 'to go' and \textsc{ekarri} 'to bring', shown in (3a) and (3b) respectively, have synthetic forms also, which convey a punctual aspectual meaning. As can be seen in (3c), the linear arrangement of agreement morphemes is one and the same for both analytic and synthetic forms:

\begin{equation}
(3) \begin{array}{l}
\texttt{a. Etxera N-oa-ki-O home.to 1SGABS-go-PREDAT-3SGDAT} \\
\quad \text{‘I am going to him (just now)’} \\
\texttt{b. D-akar-ki-DA-ZU \textsc{DEF(3ABS)-bring-PREDAT-1SGDAT-2ERG/FORMAL}} \\
\quad \text{‘You (formal) are bringing it to me (just now)’} \\
\texttt{c. ABS-V-DAT-ERG}
\end{array}
\end{equation}

There is also a three-way distinction with respect to tense in Basque — present, past, and irrealis, which is phonetically realized only when referring to the past, and surfaces at the rightmost edge of the verbal complex. This is all illustrated in (4):

\begin{equation}
(4) \begin{array}{l}
\texttt{a. Ni Madriler\textsubscript{a} N-indoa-\textsc{Ø} larunbatean (Present) 1ABS Madrid.to 1SGABS-go-PRES Saturday.on} \\
\quad \text{‘I am going to Madrid on Saturday’} \\
\texttt{b. Ni Madriler\textsubscript{a} N-indoa-\textsc{N} larunbatean (Past) 1SGABS-go-PAST} \\
\quad \text{‘I was going to Madrid on Saturday’}
\end{array}
\end{equation}
c. Ni Madrilera ba-N-indoa-Ø larunbatean   (Irrealis)
   \[\text{if-1SGABS-go-IRR}\]
   ‘If I was going to Madrid on Saturday’

d. ABS-Root-DAT-ERG-T

A Modal morpheme can also be present, which has phonetic content in the case of potentials and is null for indicative, subjunctive and imperative moods. As shown in (5), the modal affix appears between the dative and the ergative:

(5) Eman D-i-eza-GU-KE-ZU
   give DEF(3ABS)-PREDAT-1PLDAT-MD-2ERG/FORMAL
   ‘You (formal) can give it to us’

The canonical order of Basque verbal affixes we have arrived at so far is represented in (6). Table (7) shows the whole array of person agreement morphemes in the language.3

(6) ABS-Root-DAT-M-ERG-T

<table>
<thead>
<tr>
<th></th>
<th>ABS</th>
<th>ERG</th>
<th>DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st sg.</td>
<td>n-</td>
<td>-t / -da-</td>
<td>-t / -da-</td>
</tr>
<tr>
<td>2nd sg. informal</td>
<td>h-</td>
<td>-k / -n</td>
<td>-k / -n</td>
</tr>
<tr>
<td>masc. / fem.</td>
<td>-a- / -na-</td>
<td>-a- / -na-</td>
<td></td>
</tr>
<tr>
<td>3rd sg.</td>
<td>Ø</td>
<td>o</td>
<td></td>
</tr>
<tr>
<td>1st pl.</td>
<td>g-</td>
<td>gu</td>
<td>gu</td>
</tr>
<tr>
<td>2nd sg. formal</td>
<td>z-</td>
<td>zu</td>
<td>zu</td>
</tr>
<tr>
<td>2nd pl.</td>
<td>z-</td>
<td>zu</td>
<td>zu</td>
</tr>
<tr>
<td>3rd pl.</td>
<td>Ø</td>
<td>Ø</td>
<td>Ø</td>
</tr>
</tbody>
</table>

3 Within a certain degree of variation amongst dialects and social registers, verbal forms in Basque may also contain a non argumental “allocutive” marker, which refers discursively to a second person singular addressee and takes the phonetic form of a second person singular ergative or dative. Allocutive morphology in Basque shows a most curious mismatch between syntax and morphology: while having a syntax of its own (it does not appear in subordinate clauses and never cross-references a lexical NP), its morphology replicates that of 2nd person singular ergatives or datives in certain contexts (see Oyarçabal 1993 for an analysis).
The empty slots in the table in (7) point to the fact that we believe that there are no lexical entries for third person absolutes in Basque. Table 1 in (7) also shows how a certain amount of complexity is to be found within the paradigm of Basque second person verbal morphemes, in which oppositions regarding gender (masculine vs. feminine) and familiarity (formal vs. informal) are introduced. Gender distinctions only hold for ergative and dative second person informal markers, and not for the absolute one. Formality, on the other hand, entails morphological plurality in Basque, and, therefore, prompts the occurrence of a plural marker (in the absolute case), an extra plurality marker would then distinguish a true second person plural from a formal (singular) second person:

(8) a. \texttt{H-a-tor-Ø} \\
\texttt{2ABS-TEMP-come-PRES} \\
‘You (inf.sg.) are coming’

b. \texttt{Z-a-to-Z-Ø} \\
\texttt{2ABS-TEMP-come-PL-PRES} \\
‘You (form.sg.) are coming’

c. \texttt{Z-a-to-Z-TE-Ø} \\
\texttt{2ABS-TEMP-come-PL-PL-PRES} \\
‘You guys are coming’

The data in (8) also illustrate how person and number features of verbal agreement nodes may split into two different morphemes in Basque. This language has no marker for singularity, so that fission of person and number will only take place in instances of plural agreement. However, this splitting is not mandatory: it is not found when ergatives or datives are first plural or formal singular second person. In all other cases (namely, in second and third true plural ergatives and datives, as well as in all plural absolutes — including formal singular second person) fission of person and number features apply. The options are summarized in Table 2 in (9) (leftmost morphemes in Table 2 are always person markers, while plural affixes, if any, appear to their right).
Table 2. Split between person and number markers

<table>
<thead>
<tr>
<th></th>
<th>Absolutive</th>
<th>Ergative</th>
<th>Dative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Plural</td>
<td>g-(-z-,...)</td>
<td>-gu</td>
<td>-gu</td>
</tr>
<tr>
<td>2nd sg. Formal</td>
<td>z-(-z-,...)</td>
<td>-zu</td>
<td>-zu</td>
</tr>
<tr>
<td>2nd Plural</td>
<td>z-(-z-,...) -te</td>
<td>-zu -e</td>
<td>zu -e</td>
</tr>
<tr>
<td>3rd Plural</td>
<td>Ø(-z-,...)</td>
<td>Ø...-te-</td>
<td>Ø...-e-</td>
</tr>
</tbody>
</table>

3. "Ergative Displacement": A description and initial remarks

The phenomenon known as "Ergative Displacement" in Basque can be briefly described as follows: "Under certain conditions, agreement with ergative DPs is marked on the verb by means of an absolutive affix which has the same specification for person, surfacing so in the canonical position of absolutives (namely, preceding the verbal root)."

ED shows up only when the following three conditions are met in an inflected form in Basque: first, the absolutive has to be third person; second, ergative agreement must be first or second person; and third, tense has to be either past or irrealis, two morphological contexts that can be uniformly characterized as [−Pres] on independent grounds. These three conditions are illustrated in the examples in (10), (11) and (12), respectively. In example (10a) a verbal form is introduced with a 2nd person absolutive that blocks the displacement of the Ergative, as opposed to (10b), where the Absolutive is 3rd person and ED takes place.6

markers display different forms for singular and plural, as shown in the examples in (i)–(ii). In (ii) the true plural marker is the morpheme (/-IT-/ of the auxiliary gaitu; still, first person singular and plural absolutive markers (/n-/ and /g-/) differ:

(i) Ikus-ten N-a-u-Ø-Ø  
see-ASP 1SGABS-TEMP-AUX-3SGERG-PRES  
"He sees me"

(ii) Ikus-ten G-a-IT-u-Ø-Ø  
see-ASP 1PLABS-TEMP-PL-AUX-3SGERG-PRES  
"He sees us"

6 Glosses such as the one in (10b) — that is, ABSERG — are meant to represent a "displaced ergative" (a morphosyntactic ergative which is lexically realized as an absolutive, as will become clear in this and following sections).
An optimality theoretic account for “Ergative Displacement” in Basque

(10) a. Gu-k zu-Ø ikusi Z-int-u-GU-n  
    we-ERG you(FORM)-ABS see 2SGABS/FORM-PLABS-AUX-1PLERG-PAST  
    ‘We saw you (formal)’
b. Gu-k Peru-Ø ikusi G-en-u-en  
    1PLABSERG-PLERG-AUX-PAST  
    ‘We saw Peru’

In (11), as compared to (10b), we see how the ergative morpheme has to be 1st or 2nd person in order to be displaced. On the other hand, whenever both the absolutive and the ergative are 3rd person, a “default prefix” is inserted. Such default prefixes may be viewed as “secondary exponents” (in Noyer’s 1992 terms) of tense: as can be seen in (11a-c), the default prefix takes a different phonetic form depending on the tense of the inflected verb (some evidence will be offered below that points to the fact that the prefixes at hand are not allomorphs of 3rd person absolutive, but morphological epentheses that lack any morphosyntactic specification of their own, apart from their prefixal nature and their being secondary exponents of tense):

(11) a. Peru-k Miren-Ø ikusi-i D-u-Ø  
    Peru-ERG Miren-ABS see-ASP DEF(3ABS)-AUX-PRES  
    ‘Peru has seen Miren’
b. Peru-k Miren-Ø ikusi-i Z-u-eN  
    DEF(3ABS)-AUX-PAST  
    ‘Peru saw Miren’
c. Peru-k Miren-Ø ikusi-i ba-L-u-Ø  
    if-DEF(3ABS)-AUX-IRR  
    ‘If Peru had seen Miren’

Finally, the examples in (12) show how ED takes place in either past or irrealis, but not in the present tense:

(12) a. Gu-k Peru-Ø ikusi-i D-u-GU-Ø  
    we-ERG Peru-ABS see-ASP DEF(3ABS)-AUX-1PLERG-PRES  
    ‘We have seen Peru’
b. Gu-k Peru-Ø ikusi G-en-u-en  
    1PLABSERG-PLERG-AUX-PAST  
    ‘We saw Peru’
c. Gu-k Peru-Ø ikusi ba-G-en-u-Ø  
    if-1PLABSERG-PLERG-AUX-IRR  
    ‘If we had seen Peru’
However, the phenomenon is even more complex. Notice first that ED has no syntactic consequences.\(^7\) This is shown, for instance, in (13a, b), where ergative verbal forms with and without "displacement" both require the same ergative marker on the subject DP, and share identical binding relations:

(13) a. Gu-\text{\textsc{k}} geure burua ikusten d-u-GU
    we-\text{\textsc{erg}} ourselves see-ASP DEF(3ABS)-AUX-\text{\textsc{iplerg}}-PRES
    'We usually see ourselves'
    b. Gu-\text{\textsc{k}} geure burua ikusi G-en-u-en
    we-\text{\textsc{erg}} ourselves see-ASP 1PLABSERG-PLERG-AUX-PAST
    'We saw ourselves'

In short, what we have here is an ergative Agr node in the syntax that, at some postsyntactic stage, behaves as if it were an absolutive marker. Hence, ED provides conclusive evidence for the existence of an autonomous postsyntactic morphological component (cf. e.g. Halle & Marantz 1993, 1994).

In order to capture such a mismatch between syntax and morphophonology, recent Distributed Morphology-oriented analyses on the topic (Bonet 1991; Albizu 1995; Eguren 1995) have claimed in different ways that "Ergative Displacement" results from the application, at the postsyntactic level of Morphological Structure (MS) in Basque, of a series of either readjustment or impoverishment rules, that change the morphosyntactic feature matrix of the ergative agreement node, and make it equal to that of the absolutive. An absolutive lexical entry with the same specification for person would then be inserted under such a manipulated M\(^9\).

These proposals turn out to be inappropriate, we believe, on both theoretical and empirical grounds: first, they just develop a set of descriptive rules; and second, they wrongly predict that "displaced" ergatives behave morphologically as absolutes do.\(^8\) Three different empirical arguments come in support of our claim that ("displaced") ergatives are not absolutes morphologically.

\(^7\) Syntax-oriented analyses in which ED was considered to be either some kind of antipassive construction or an instance of split ergativity are convincingly discussed, and rejected, in Laka (1993a) and Gómez & Sainz (1995).

\(^8\) A most inspiring and well built alternative proposal on ED can be found in Laka (1993a). We share some of Laka’s insights, but disagree with her as regards the general theoretical framework. On Laka’s view, ED in Basque results from a subatomic (downward) movement which takes place at the syntax-PF interface and is licensed by a phonetically realized governing functional head (either tense or mood). We believe that this kind of mechanism is both language-specific and rather permissive. Some of the data which is brought forth in this paper might be troublesome for Laka’s approach as well. We will not be discussing the details here though.
Consider first the auxiliary alternation displayed in Basque by unaccusative verbs (always followed by the auxiliary *izan ‘to be’) and transitive verbs (always accompanied by the auxiliary *edun ‘to have’). The contrast is shown in examples (14) and (15a). As can be seen, the selection of the auxiliary in this language is determined morphologically by the presence or absence of an ergative morphosyntactic specification on the verb. If so, the use of the transitive auxiliary *edun ‘to have’ with the “displaced” ergative in (15b) clearly points to its ergative nature:

(14) Ni-Ø berandu etor-tzen N-a-iZ-Ø
     1-ABS late come-ASP 1SGABS-TEMP-IZAN-PRES
     ‘I usually come late’

(15) a. Gu-k Peru-Ø ikus-i d-U-GU-Ø
     we-ERG Peru-ABS see-ASP DEF(3ABS)-*EDUN-1PLERG-PRES
     ‘We have seen Peru’

b. Gu-k Peru-Ø ikus-i G-en-U-en
     1PLABS-ERG-PL-*EDUN-PAST
     ‘We saw Peru’

We come to the same conclusion if allomorphy of plural markers in Basque is taken into consideration. Let’s look for instance at (16a–b), where independent person and plural markers can be isolated. In these two examples, both the absolutive and the ergative first person plural affixes take the same phonetic form /g-/, namely the absolutive realization, but yet the plural markers associated to them differ — whereas in (16b), it is the affix -EN- that shows up with the “displaced” ergative, in (16a), it is the canonical plural allomorph -IT- that accompanies the absolutive:

9 The asterisk on *edun ‘to have’ means that this is a reconstructed form.

10 The peculiar morphophonology of auxiliaries *izan and *edun when an extra allocutive marker (see footnote 3) is added to some of its forms calls for a strictly morphological analysis for the allomorphy under discussion in the text, and goes against any syntactic conditioning:

(i) erorí Da
    fall DEF AUX
    ‘He/She has fallen’

(ii) erorí D-U-K (cf. erosí D-U-K ‘You have bought it’)
    DEF(3ABS)-AUX-ALLO
    ‘He/She has fallen (and I am telling you-inf.masc.)’

As can be seen in (i)–(ii), the allocutive in izan unaccusative verbs, first, takes the phonetic form — and occupies the place — of a 2nd person singular ergative, and second, conditions the allomorphy of the root (-u-), whereas the argument structure of the verb has not been changed (that is, no transitivization of the verb has taken place).
   Peru-ERG we-ABS see-ASP IPLABS-PLABS-AUX-3SGERG-PAST
   ’Peru saw us’

   b. Gu-k Peru-Ø ikus-i G-EN-u-en
   we-ERG Peru-ABS see-ASP IPLABS_ERG-PLERG-AUX-PAST
   ’We saw Peru’

Still, the most conclusive evidence against an Impoverishment Rule approach, in which the ergative is changed into an absolutive, is the existence of instances of multiple ergative exponence in certain varieties of Basque, as illustrated in (17), where the ergative morpheme is discharged twice, once as an absolutive prefix, once as an ergative suffix:

(17) Telebista-Ø logelan G-en-euka-GU-n
television-ABS bedroom.the.in 1PLABSERG
   1PLERG-have-IPLERG-PAST
   ’We had our TV in the bedroom’

Therefore, in the light of the data presented so far, we will hold the idea that “displaced” ergatives are true ergatives both syntactically and morphologically, and will explore henceforth a different alternative that locates the phenomenon of ”Ergative Displacement” exclusively at the (late) stage of lexical insertion.

But before turning to that, let us first try to identify the underlying morphological motivation that triggers the application of ”Ergative Displacement” in Basque. Such property becomes apparent if we put together three phenomena presented already. These are, first, the linear location of 1st and 2nd person absolutes (cf. (18a)); second, ”displaced” ergatives (cf. (18b)); and third, the insertion of default material in pre-root position (cf. (18c)):

(18) a. ikus-i N-a-u-Ø-Ø
    see-ASP ISGABS-TEMP-AUX-3ERG-PRES
    ’He has seen me’

   b. ikus-i N-u-en
    see-ASP ISGABS_ERG-AUX-PAST
    ’I saw it’

   c. ikus-i D-u-t-Ø
    see-ASP DEF-AUX-1SGERG-PRES
    ’I have seen it’

These three morphological processes have a complementary distribution in the language, thus conspiring to keep the pre-root position lexically realized in inflected forms: that is, a first or second absolute is inserted if there is a first or second absolute argument, whereas, whenever the absolute is a third person, either ED takes place or a default prefix is inserted.
Following Noyer’s (1992) analysis for Discontinuous Bleeding in classical Arabic, we interpret these facts as evidence for the existence of a prefixal “position of exponence” in Basque inflected verbal forms, which has to be obligatorily filled by some prefixal lexical material.

In order to strengthen this standpoint, let us consider an independent syntactic construction in which the default prefixal marker is obligatorily attached to the verb in spite of the fact that arguably no morphosyntactic absolute feature is present. The case is illustrated in (19a–b). These sentences contain an instance of a class of verbs (begiratu ‘to look’, eutsi ‘to hold’, etc.) which are lexically marked as assigning dative Case to their Theme argument. Accordingly, agreement with the two verbal arguments is marked on the verb by means of ergative and dative affixes; since in these cases there is no absolute agreement node, then the insertion of the default prefix (in a [+pres] context) or ED (in a [−pres] context) becomes mandatory.

(19) a. Miren-i begietara begira-tu D-i-O-T
Miren-DAT eyes:the.to look-ASP DEF-PREDAT/AUX-3SGDAT-1SGERG
‘I have looked at Miren’s eyes’

b. Miren-i begietara begira-tu N-i-O-n
1SGABSERG-PREDAT/AUX-3SGDAT-PAST
‘I looked at Miren’s eyes’

Recapitulating so far, we have arrived at two different generalizations as regards to Ergative Displacement in Basque: first, ED must be located at the very late stage of lexical insertion (it is neither a syntactic phenomenon, nor the result of postsyntactic morphological rules turning an ergative into an absolute), and second, there exists a prefixal “position of exponence” in Basque inflected verbs which has to be mandatorily filled up by a lexical item. If these assumptions are on the right track, the ultimate reason both for ED and for the insertion of “default prefixes” would be the fact that this prefixal “position of exponence” has to be obligatorily filled as a morphological well-formedness condition within the autonomous post-syntactic Morphological

11 In its strictest interpretation, which is the one we adopt here, by “position of exponence” a morphological position of obligatory realization is designated which is provided by some autonomous postsyntactic morphological structure. Besides their obligatory realization, positions of exponence are also typically characterized by being filled up by an heterogeneous group of affixes, and by always having an explicit default realization as well (see Noyer 1992). Crucially, these three attributes hold true for Basque: the language has default prefixes, namely /d-, z-, l-/ in (11); the pre-root position contains ergative as well as absolute features; and finally, the complementarity in the insertion of all these affixes guarantees that the prefixal position is lexically realized across the board.
Structure of the language).\textsuperscript{12} We will work out these ideas in Section 5, but let us first briefly review our basic theoretical assumptions in the next section.

4. Theoretical background and lexical insertion

First of all, we will adopt a general model of grammar as the one depicted in (20), in which a postsyntactic Morphological Structure (MS) connects syntax with PF (e.g. Halle & Marantz 1993; Noyer 1992). MS is so advocated to be (partially) autonomous from both syntax and phonology, having its own primitives and principles.\textsuperscript{13}

\begin{equation}
\text{(20)}
\begin{array}{c}
\text{Lexicon} \\
\downarrow \\
\text{Syntax} \\
\downarrow \\
\text{Morphological Structure (MS)} \\
\downarrow \\
\text{Phonetic Form (PF)} \\
\downarrow \\
\text{Logical Form (LF)}
\end{array}
\end{equation}

As for our theoretical framework, we will assume the basic tenets of Optimality Theory (e.g. Prince & Smolensky 1993, McCarthy & Prince 1994, Archangeli & Langendoen 1997), amongst them:\textsuperscript{14}

a. Universality. Constraints are independently motivated and (mostly) universal.

b. Ranking. Individual grammars are obtained by the imposition of a specific strict dominance order on constraints.

c. Violability. Constraints may all be violated in principle. The winning candidate, namely the final output, does not have to be violation-free, but the one that best satisfies the constraint hierarchy, that is, the one that violates constraints which are ranked the lowest in the constraint hierarchy.

\textsuperscript{12} Related ideas can be found in Ortiz de Urbina (1989), Laka (1993a) and Gómez & Sainz (1995).

\textsuperscript{13} It is just the kind of facts we are discussing in this paper — the existence of a strictly morphological prefixal "position of exponence" and the insertion of epenthetical prefixes — which call for the existence of an autonomous MS.

\textsuperscript{14} For an introduction to OT-approaches to morphology, see Russell (1997).
d. Parallelism. Well-formedness constraints select among some candidate set of forms, which are evaluated in parallel. Consequently, there will be no rules nor serial derivations.

In particular, we will approach ED and prefixal epenthesis in Basque within the sub-theory of OT known as Correspondence Theory (McCarthy & Prince 1994, 1995). Correspondence Theory extends the set of constraints that regulate the relations between base and reduplicant in reduplication phenomena to the relation that holds between phonological inputs and outputs. Along these lines, the same correspondence constraints will be claimed to apply in the mapping from syntax/morphology to lexical insertion.

In Section 3, we have tried to show that both ED and the insertion of prefixal epenthesis in Basque inflected verbal forms must be located at the very late stage of lexical insertion within the MS of the language. In the spirit of Noyer (1993), the model of (late) lexical insertion we have in mind is represented in (21):

\[(21) \textbf{Lexical Insertion} \]
\[
\text{Input from Syntax/Morphology} \quad \downarrow \quad \text{GEN} \]
\[
\text{Lexical candidates} \quad \text{EVAL} \]

In (21), the syntax/morphology provides the input — a set of hierarchical feature matrices. The operation GEN — an array of inviolable grammatical principles — will then generate the set of lexical candidates that will be filtered out by the Evaluation procedure — a hierarchy of violable universal and/or language-particular constraints, so that the proper lexical entry is inserted under a particular M0. Let us now develop in detail the model of lexical insertion we have in mind.

We will first assume the idea that terminal nodes (or morphemes) are complexes of semantic and morphosyntactic features, but lack phonological features. Terminal nodes are organized into hierarchical structures in the syntax, and therefore the formation of inflected words is partially determined by the principles and operations of the syntactic component. In this respect, we will postulate that the Agr terminal nodes in Basque (absolutive and ergative) consist of hierarchical structures of morphosyntactic features such as those represented in (22):

\[(22) \begin{align*}
\text{i. AGR} & \quad \text{(Abs)} \\
\text{ii. AGR} & \quad \text{(Erg)} \\
\end{align*} \]
We will also assume that the supply of phonological features is achieved by "late" insertion of vocabulary items into the morpheme nodes (see for instance Halle & Marantz 1993, 1994). In (23) the vocabulary entries in Basque that might compete for insertion under the nodes in (22) are listed. In (24) the morphological characterization we assign to the default prefixes is added:

(23) Lexical entries for Absolutive and Ergative person markers:

i. Absolutive:

\[
\begin{align*}
+1 & \rightarrow /n/ \\
+2, \neg \text{Formal} & \rightarrow /h/ \\
+1 & \rightarrow /g/ \text{ in env. } \_\_ \_ [\text{Pl}] \\
+2 & \rightarrow /z/
\end{align*}
\]

ii. Ergative:

\[
\begin{align*}
+1, \text{ERG} & \rightarrow /t, \text{-da}/ \\
+2, \text{ERG, } \neg \text{formal, } \text{+masculine} & \rightarrow /k, \text{-a}/ \\
+2, \text{ERG, } \neg \text{formal} & \rightarrow /n, \text{-n}/ \\
+1, \text{Pl, ERG} & \rightarrow /\text{gu}/ \\
+2, \text{Pl, ERG} & \rightarrow /\text{zu}/ \\
+3, \text{ERG} & \rightarrow /\text{"}/
\end{align*}
\]

(24) Lexical entries for default prefixes:

\[
\begin{align*}
& \rightarrow /d/ \text{ in env. } \_\_ \_ + \ldots + [\text{+Pres}] \\
& \rightarrow /z/ \text{ in env. } \_\_ \_ + \ldots + [\text{\neg Pres, +Past}] \\
& \rightarrow /h/ \text{ in env. } \_\_ \_ + \ldots + [\text{\neg Pres, } \text{\neg Past}]
\end{align*}
\]

Three facts are specially relevant for our purposes in the list in (23)-(24). First, this characterization of Vocabulary items parallels to some extent that of terminal nodes in (22), insofar as, for instance, Abs person markers are also less specified than Erg person vocabulary items: the former lack the feature [ERG], the latter have. A second point that has to be stressed as regards the list in (23)-(24) is that we are assuming that Basque has no vocabulary entry for 3rd person absolutes (see sections 2 and 3). And third, as the lexical entries in (24) show, we believe that default prefixes are not just phonetic epentheses; on our view, these default prefixes are lexical entries which are "morphologically" characterized as being prefixes and as being conditioned by tense, although they do not discharge any M0.

We will finally assume that the insertion of vocabulary items, that is the relation between morphosyntactic input (morphological nodes) and lexical outputs (phonological forms), is regulated at least by the following violable Correspondence constraints, which tend to ensure the identity between input
An optimality theoretic account for “Ergative Displacement” in Basque

and output (cf. McCarthy & Prince 1995).\(^{15}\)

a. MAX — “No deletion”
   Every element of \(S_1\) has a correspondent in \(S_2\).

b. DEP — “No epenthesis”
   Every element of \(S_2\) has a correspondent in \(S_1\).

c. UNIFORMITY — “No Coalescence”
   No element of \(S_2\) has multiple correspondents in \(S_1\).

d. INTEGRITY — “No Breaking”
   No element of \(S_1\) has multiple correspondents in \(S_2\).

5. Proposal

Our basic insight on ED in Basque is the following: instances of ED are just cases in which a \textsc{Parse(Feature)} constraint is violated, so that an \textsc{[ERG]} feature on Ergative morphosyntactic nodes is underspecified, therefore allowing for the insertion of an absolutive prefix instead of a more specified ergative suffix. This may be so just in order to avoid a violation of a higher condition in the ranking of constraints, namely, the fact that a prefixal position of exponence has to be obligatorily filled in Basque inflected verbs. As for default prefixes in Basque verbal forms, we believe they are inserted — whenever they are — for the very same reason also: the prefixal position of exponence has to be lexically filled.\(^{16}\)

In our view, ED follows basically from the interaction of two different constraints — \textsc{Parse(Feature)} and \textsc{Obligatory Prefix} — at the point in which (late) lexical insertion takes place. The first one is a universal constraint that belongs to the MAX family of Correspondence constraints (see Section 4), that is, those constraints which ensure that every element in the input has a correspondent in the output.

\(^{15}\) In addition, a set of Generalized Alignment constraints (cf. McCarthy & Prince 1993, 1994) will properly linearize the affixes with respect to the base and to each other, that is, will ensure for instance that prefixes and suffixes surface as such.

\(^{16}\) The leading idea will then be that a less penalized constraint (either \textsc{Parse(F)} or an “Avoid Epenthesis Condition”) is violated in Basque inflected verbal forms in order to prevent a violation of a more penalized constraint (“Fill the Prefixal Position of Exponence”). Remember also that the prefixal position of exponence can be filled by three kinds of verbal prefixes in Basque: first or second absolutives, “displaced” ergatives, and default prefixes. As mentioned in Section 3, these three types of prefixes show a complementary distribution in Basque inflected verbs: it will become apparent below how this complementarity follows from a specific hierarchy of constraints in Standard Basque.
1. **PARSE(F):** Every feature in the morphosyntactic input has a correspondent in the lexical output.

The second constraint is language-specific and imposes the obligatory lexical realization of a prefixal "position of exponentce" in Basque (see Noyer 1992, and Section 3).\(^{17}\)

2. **OBPREF:** Basque finite verbal forms must have a prefix.

The two constraints are hierarchically ordered in Basque as shown in (25):

\[(25) \text{ Standard Basque: } \text{OBPREF} \gg \text{PARSE(F)} \]

Such a hierarchy accounts for much of the data we have been discussing in this paper as regards ED in Standard Basque. Take for instance (26) below, where the input from the syntax is the verb *eraman* 'to bring' which has an Absolutive agreement node specified as 2\(^{nd}\) person singular informal, an Ergative agreement node defined as 1\(^{st}\) person singular and a past tense node. (Recall from Section 3 that the presence of a 1\(^{st}\) or 2\(^{nd}\) person absolutive blocks the application of ED):

\[(26) \text{ Input from Syntax: } \text{Root-2sgAbs(informal)-1sgErg-Past} \]

<table>
<thead>
<tr>
<th></th>
<th>OBPREF</th>
<th>PARSE(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. <strong>H</strong>-inderama-DA-n</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[2,-formal]-Root-[1Erg]-[Past]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. <strong>N(e)</strong>-H-inderama-n</td>
<td></td>
<td>*!</td>
</tr>
<tr>
<td>[1]-[2,-formal]-Root-[Past]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For the sake of simplicity, just two candidates are considered in (26): *hinderamadan* 'I was bringing you (informal)' and *n(e)hinderaman*. Both candidates fulfill the OBPREF constraint, but the one in (26b), in which ED has taken place, violates PARSE(F). The winning candidate in Basque is *hinderamadan* in (26a), which violates none of the well-formedness conditions in the tableau. Accordingly, the ranking of constraints we are proposing in (25) will correctly account for the blocking effect of 1\(^{st}\) and 2\(^{nd}\) person absolutive affixes on the application of ED, that is, ED would always be "more expensive" than just

\(^{17}\) Such a constraint might be viewed as a morphologization of an ancient phonetic and/or syntactic constraint that blocked sentence-initial verbal roots in proto-Basque (see Gómez & Sainz 1995).
inserting a 1st or 2nd person absolutive lexical entry.\(^{18}\)

Let us consider now the tableau in (27). As opposed to (26), the input from the syntax provides now a 3rd person absolutive morpheme, that is, the proper morphological environment for ED to take place in Standard Basque (see Section 3):

\[(27) \text{Input from Syntax: Root-3sgAbs-1sgErg-Past} \]

<table>
<thead>
<tr>
<th></th>
<th>3sgAbs-1sgErg-Past</th>
<th>OBPREF</th>
<th>PARSE(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. N-erama-n</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>[1]-Root-[Past]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. erama-DA-n</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>Root-[1ErgErg]-[Past]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Two candidates are included in the tableau above by now. The competition is that between neraman ‘I was bringing it’ in (27a) and eramadan in (27b). In the latter, the lexical entry /da/ is inserted into the ergative node, fulfilling PARSE(F). Yet, the prefixal “position of exponence” is empty, so violating the OBPREF condition. Compare this to the evaluation of the winning neraman. In this case, it is the lowest ranked PARSE(F) that is violated, since an absolutive prefix has been inserted under the Ergative morphosyntactic node and the [ERG] feature has been underspecified; however, the higher OBPREF constraint is crucially satisfied, therefore determining its selection as the optimal output.

In (27), our view on ED is clearly illustrated: ED is just a violation of the lower ranked PARSE(F) constraint in order to prevent a violation of the higher ranked OBPREF condition. Notice that, for this idea to work, it has to be crucially assumed that there is no lexical entry for 3rd person absolutes in Basque (see sections 2 and 4). Were this not the case, the insertion of a (phonetically empty, but morphologically active) 3rd person absolutive lexical item under a 3rd person absolutive morphosyntactic node would violate no constraint, as it is the case with 1st or 2nd absolutes in (26), and, contrary to the facts, that outcome would always be preferred to any other alternative (either ED or default epenthesis).\(^{19}\)

\(^{18}\) Any other alternative would be more expensive: For instance, the insertion of an extra prefixal epenthesis (Z-) would violate DEP. See below.

\(^{19}\) Some other potential candidates in (27) like DA-erana-n ([1Erg]-Root-[Past]), in which a suffix has filled the prefixal position of exponence would be ruled out by specific Alignment constraints that would dominate PARSE(F) in the ranking. On the other hand, notice that the non-existence of a 3rd person absolutive lexical entry also violates PARSE(F)–the 3rd person of
But in (27) two potential candidates generated by GEN have been intentionally ignored, and this has been so because their exclusion requires the addition of two new Correspondence constraints to the hierarchy. The two additional well-formedness conditions are DEP ("Avoid epenthesis") and INTEGRITY (see Section 4). These two fairly natural constraints point to the fact that both the insertion of epenthetical lexical material (and X⁰ with no M⁰) and the duplication of morpheme realizations (two X⁰s for the one M⁰) are marked phenomena, which have to be motivated in order to happen. The constraints might be formulated as follows for the correlations between morphosyntactic inputs and lexical outputs:

3. **DEP**: Every Vocabulary Item must correspond to a morphosyntactic node

4. **INTEGRITY**: No morphosyntactic node corresponds to more than one lexical entry.

Such two constraints rank between OBPREF and PARSE(F) in Standard Basque, with INTEGRITY dominating DEP. (The motivation for this latter ranking will become clear below when dealing with present forms.)

(28) Standard Basque:  **OBPREF >> INTEGRITY >> DEP >> PARSE(F)**

Consider now the tableau in (29). The input from the syntax is the same as in (27), but two new candidates are taken now into consideration. These two are neramadan in (29c), where the ergative morpheme is discharged twice as /n-/ and /da/, and zeramadan in (29d), with insertion of the default prefix /z-/:

(29) Input from Syntax:  **Root-3sgAbs-1sgErg-Past**

<table>
<thead>
<tr>
<th>3sgAbs-1sgErg-Past</th>
<th>OBPREF</th>
<th>INTEGRITY</th>
<th>DEP</th>
<th>PARSE(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. N-erama-n</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1]-Root-[Past]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. erama-DA-n</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Root-[1Erg]-[Past]</td>
<td></td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>c. N-erama-DA-n</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[1]-Root-[1Erg]-[Past]</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Z-erama-DA-n</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>def-Root-[1Erg]-[Past]</td>
<td>*!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

the Absolutive morphosyntactic node is not parsed. This might be handled by means of the joint effects of a Recoverability condition on deletion (see Bonet 1991) and some kind of an Economy constraint ("The fewer affixes, the better" (cf. Noyer 1993)). We will not go into the details of this insight here.
The first two candidates both satisfy DEP and INTEGRITY, so the addition of such constraints will make no difference with respect to the results in (27). Take now the form *neramadan* in (29c). This form will exhibit a violation of INTEGRITY because of the double lexical insertion into the Ergative node. As for *zeramadan* in (29d), the insertion of the default prefix violates the higher DEP constraint. Accordingly, the candidate *neraman* in (29a), which only fails to satisfy the lowest constraint of PARSE(F) will be chosen as the optimal output.

Let us next offer an account for the non-application of ED with 3rd person ergatives (not even in those cases in which all other conditions are met, that is, whenever Abs is 3rd person and tense in [−Pres]):

(30) Input from Syntax: Root-3sgAbs-3sgErg-Past

<table>
<thead>
<tr>
<th>3sgAbs-3sgErg-Past</th>
<th>ObPREF</th>
<th>INTEGRITY</th>
<th>DEP</th>
<th>PARSE(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. erama-Ø-n</td>
<td>*</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Root-[3Erg]-[Past]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Z-erama-Ø-n</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Def-Root-[3Erg]-[Past]</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Unlike with 1st and 2nd person ergatives, ObPREF may not be satisfied through the underspecification of the [ERG] feature in this case, just because of the absence of a lexical entry for 3rd person absolutives in Basque. The position of exponence may then be left empty, as in *eraman* in (30a), in clear violation of the ObPREF constraint, or may be filled by an epenthetic prefix, as in *zeraman* in (30b). The higher ranking of ObPREF relative to DEP correctly determines the choice of the latter as the optimal output.

Still, we have not explained the present forms pattern yet. Unlike [−Pres] (past and irrealis) forms, [+Pres] inflected verbs do not undergo ED, but insert a default prefix in pre-root position instead (see Section 3). As it stands, the ranking in (28) predicts no asymmetry between [+Pres] and [−Pres] forms, so favoring the application of ED across the board. Such a puzzle might be solved in a straightforward manner by assuming that, in the case of present verbal forms, an additional “HOMOPHONY constraint is playing an active role in the evaluation of the morphological outputs.”

5. “HOMOPHONY. Avoid homophony.”

The relevance of such a constraint for present forms in Basque appears to be

---

20 “HOMOPHONY” belongs to a family of global surface Correspondence constraints that would handle the fact that languages tend to show a one-to-one correspondence between sound patterns and meanings (“One Form, One Function”. See Russell 1997).
well-founded on the basis of at least two different instances of *HOMOPHONY that would arise had ED taken place in the context of a present tense. These are shown in (31) and (32). The examples in (31a)-(32a) reproduce the actual output in Standard Basque, with the insertion of the epenthetic prefix /d-/; the examples in (31b-c) and (32b-c), on the other hand, illustrate the pairs of homophonic forms that would have been created by the application of ED. In (31), there arises a conflict between two homophonic present forms (verbs with 3rd person absolutive and 1st or 2nd person ergative, on the one hand, and forms with 1st or 2nd person absolutive and 3rd person ergative, on the other), in (32), the identity is between present and irrealis tense forms.

(31) a. D-arama-T
   b. N-arama-Ø
   c. *N-arama
   DEF-bring-1SGERG  ISGABS-bring-3SGERG  ISGABSERG -bring
   ‘I am bringing it’  ‘He is bringing me’  ‘I am bringing it’

(32) a. D-u-T
   b. ba-N-u-Ø
   c. *N-u-Ø
   DEF-have-1SGERG  if-1SGERG-haveIRR  ISGERS-have-PRES
   ‘I have it’  ‘If I had it’  ‘I have it’

On the basis of these data, we will assume that an *HOMOPHONY condition is relevant for the evaluation of present forms in Basque. This constraint will rank between OBPREF and INTEGRITY:

(33) Standard Basque:
   OBPREF >> *HOMOPH >> INTEGRITY >> DEP >> PARSE(F)

The Evaluation procedure for the selection of the optimal output for present forms is represented in tableau (34):

(34) Input from Syntax  Root-3sgAbs-1sgErg-Pres

<table>
<thead>
<tr>
<th>3sgAbs-1sgErg-Pres</th>
<th>OBPREF</th>
<th>*HOMOPH</th>
<th>INTEGRITY</th>
<th>DEP</th>
<th>PARSE(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. N-arama-Ø</td>
<td><img src="image1.png" alt="image" /></td>
<td><img src="image2.png" alt="image" /></td>
<td><img src="image3.png" alt="image" /></td>
<td><img src="image4.png" alt="image" /></td>
<td><img src="image5.png" alt="image" /></td>
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<tr>
<td>b. N-arama-T-Ø</td>
<td><img src="image6.png" alt="image" /></td>
<td><img src="image7.png" alt="image" /></td>
<td><img src="image8.png" alt="image" /></td>
<td><img src="image9.png" alt="image" /></td>
<td><img src="image10.png" alt="image" /></td>
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<tr>
<td>c. arama-T-Ø</td>
<td><img src="image11.png" alt="image" /></td>
<td><img src="image12.png" alt="image" /></td>
<td><img src="image13.png" alt="image" /></td>
<td><img src="image14.png" alt="image" /></td>
<td><img src="image15.png" alt="image" /></td>
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<tr>
<td>d. D-arama-T-Ø</td>
<td><img src="image16.png" alt="image" /></td>
<td><img src="image17.png" alt="image" /></td>
<td><img src="image18.png" alt="image" /></td>
<td><img src="image19.png" alt="image" /></td>
<td><img src="image20.png" alt="image" /></td>
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In the tableau in (34) only the four relevant candidates are evaluated. In (34a), the candidate *arama, which shows ED, is highly penalized because of its
An optimality theoretic account for “Ergative Displacement” in Basque

violating *HOMOPHONY, as just argued; in its turn, the form aramat in (34c) is filtered out, as it violates ObPREF. The competition between the two remaining candidates naramat in (34b) (in which the ergative has been discharged twice) and daramat in (34d) (in which a default prefix has been inserted) is determined in favor of the latter, as INTEGRITY is crucially ordered higher than Dep in the constraint hierarchy of Standard Basque.

6. Conclusion

In this paper, we have argued for an Optimality-theoretic account of so called “Ergative Displacement” in Basque, which might have relevant implications for both verbal inflectional morphology of Basque and general morphological theory. For Basque, we have established, first, that ED is confined to the mapping between Morphology and PF — namely, to the process of Vocabulary Insertion, and second, that there exists a prefixal “position of exponence” within Basque verbal inflected forms whose obligatory lexical realization motivates either the application of ED or the insertion of “default prefixes”. As to the general theory of morphology, in this paper we have tried to show the superiority of a constraint-based approach to ED over a rule-based analysis. In addition, our proposal strongly supports both late lexical insertion and the existence of an autonomous post-syntactic morphological component.

Acknowledgments

The analysis we lay out here is a refined version of the one developed in our talk “Ergative Displacement in Basque” at the 7th International Morphology Meeting, in which previous work by Albizu (1995) and Eguren (1995) was reformulated within the Optimality Theory framework (Prince & Smolensky 1993). The first part of the heading is reminiscent of Laka’s (1993a) analysis of...
the phenomenon at hand, and although it does not really fit with our view of ED as a violation of a PARSE(F) constraint, no new term will be coined here (and that is why it goes within inverted commas). We are very thankful to three anonymous reviewers and to all those who, with their comments and criticism, made us realize that there should be a more satisfactory way to handle the phenomenon. The research underlying this work has been partly supported by a grant from the DGICYT to the research project PB95–0178, by a Pre-Doctoral Fellowship (BF92.006) from the Department of Education of the Basque Government and by a Humanities Fellowship from the University of Southern California.

References


Salish evidence on the causative-inchoative alternation

Henry Davis

This paper brings data from a lesser-known language (St’át’imcets, also known as Lillooet Salish) to bear on the problem of cross-linguistic variation in the causative-inchoative alternation. In contrast to better-known European languages, which derive many inchoatives from causative roots via reflexivization, St’át’imcets appears to derive all causatives from inchoative roots. I show that even in such a strongly causative system, however, there also exists an additional set of derived inchoatives which — as in European languages — show reflexive morphology. The existence of such forms indicates that two derivational paths are universally available for inchoatives; this in turn allows us to account for cross-linguistic variation in the causative-inchoative alternation without appealing to a difference in underlying lexical semantic representations.

1. Causatives and anti-causatives

Studies such as those of Nedjalkov (1969) and Haspelmath (1993) have revealed cross-linguistic variation in the morphological encoding of the causative-inchoative alternation. Languages appear to differ in the direction of morphological derivation, yielding either causative or anti-causative derivations.

In a causative derivation, causative predicates are morphologically derived from inchoative predicates, as in (1–3):

**Slave** (Athapaskan: Rice 1991):
(1) a. zháthiž̄i
   ‘Heads get roasted.’

   b. zháthiž̄i-h-si
   ‘S/he roasted heads.’

**Turkish** (Altaic: Comrie 1981):
(2) a. Hasan öl-dü
   ‘Hasan died.’

   b. Ali Hasan-l öl-dür-dü
   ‘Ali killed Hasan.’

**Chichewa** (Bantu: Baker 1988):
(3) a. Mtsuko u-na-gw-a
   ‘The waterpot fell.’

   b. Mtsikana a-na-u-gw-ets-a mtsuko
   ‘The girl made the waterpot fall.’
In an *anti-causative* derivation, inchoative predicates are morphologically derived from causative predicates:

**Russian** (Indo-European: Comrie 1981):

(4) a. Tanja slomala palku  
    'Tanja broke the stick.'

b. palka slomala-\(s\)  
    (-\(s\) = anti-causativizer)  
    'The stick broke.'

**Hungarian** (Finno-Ugric: Comrie 1985):

(5) a. Zolt\'an cukrot old a vízben  
    'Zoltan dissolves the sugar in the water.'

b. A cukor a vízben old-\(ô\)dik  
    (-\(ô\)dik = anti-causativizer)  
    'The sugar dissolves in the water.'


(6) a. Jeskinivx magazin arkt-\(t\)  
    'The salesman closed the shop.'

b. Magazin p\(h\)-arkt-\(t\)  
    (p\(h\) = anti-causativizer)  
    'The shop closed.'

As noted by Haspelmath and others, the direction of derivation is often dependent on the nature of the predicate involved in the alternation. Internally caused (spontaneously occurring) events (e.g., 'grow', 'freeze', 'rot') tend to go in the causative (inchoative → causative) direction, while externally caused events (e.g., 'break', 'open'), tend to go in the anti-causative (causative → inchoative) direction. Predicates which may be either internally or externally caused are often found in an 'equipollent' alternation where neither the causative nor the inchoative variant is morphologically basic, or in a 'labile' (or 'zero-derived') alternation where a single form is used in both causative and inchoative contexts.¹

This means that in the vast majority of languages the direction of derivation is neither purely causative nor purely anti-causative — it is split along semantic lines, as illustrated by the following Swahili examples (from Haspelmath 1993; citation forms end in -\(a\)):

¹ The latter is typical of English, which treats both typically causative predicates ('burn', 'melt') and typically anti-causative predicates ('break') as labile or zero-derived.
Swahili (Bantu):

(7)  
<p>| | | | | | |</p>
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<tbody>
<tr>
<td>a</td>
<td>gand-a</td>
<td>‘freeze’ (intr.)</td>
<td>gand-ish-a</td>
<td>‘freeze’ (tr.)</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>vunj-ik-a</td>
<td>‘break’ (intr.)</td>
<td>vunj-a</td>
<td>‘break’ (tr.)</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>am-k-a</td>
<td>‘wake up’ (intr.)</td>
<td>am-sh-a</td>
<td>‘wake up’ (tr.)</td>
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</table>

Swahili treats ‘freeze’ as a causative alternation, ‘break’ as an anti-causative alternation, and ‘wake up’ as equipollent.

However, even taking into account the nature of the events denoted by particular verbs, the causative-inchoative alternation still displays a striking degree of cross-linguistic variation. For example, compare the Swahili examples in (7) above to their equivalents in Indonesian (8), a strongly ‘causative’ language, in that most causative predicates are morphologically derived from inchoatives, and Arabic (9), a strongly ‘anti-causative’ language, in that most inchoative predicates are morphologically derived from causatives:

Indonesian (Malayo-Polynesian):

(8)  
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<tbody>
<tr>
<td>a</td>
<td>membeku</td>
<td>‘freeze’ (intr.)</td>
<td>membeku-kan</td>
<td>‘freeze’ (tr.)</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>patah</td>
<td>‘break’ (intr.)</td>
<td>me-matah-kan</td>
<td>‘break’ (tr.)</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>(ter)bangun</td>
<td>‘wake’ (intr.)</td>
<td>mem-bangun-kan</td>
<td>‘wake’ (tr.)</td>
<td></td>
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</table>

Arabic (Semitic):

(9)  
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</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>ta-jammada</td>
<td>‘freeze’ (intr.)</td>
<td>jammada</td>
<td>‘freeze’ (tr.)</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>in-kasara</td>
<td>‘break’ (intr.)</td>
<td>kasara</td>
<td>‘break’ (tr.)</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>ist-ayqaza</td>
<td>‘wake’ (intr.)</td>
<td>?-ayqaza</td>
<td>‘wake’ (tr.)</td>
<td></td>
</tr>
</tbody>
</table>

Note also that in English all three alternations are labile (i.e. equipollent).

More generally, as emphasized by Haspelmath, we find a cross-linguistic continuum, with languages at either end strongly favouring either causative or anti-causative derivations, and those in the middle split along relatively (but by no means entirely) predictable semantic lines.

Such variation poses challenges for any restrictive theory of the mapping between lexical semantics and verb morphology. The problem is a classical one: how do we account for the observed cross-linguistic and intra-linguistic variation while maintaining a maximally close connection between the meaning of a predicate and its morphological realization? The issue is further sharpened by learnability considerations. It is often assumed that a child is innately equipped with universal alignment constraints which to a large extent determine the mapping between the semantics of a predicate and its morphosyntax; this is of obvious benefit during language acquisition, since knowing the meaning of a predicate will then determine its morphosyntactic realization. In the case of the causative-inchoative alternation, however, the mapping appears to be variable, since in some cases, the underived form appears to be...
inchoative, but in others, it appears to be causative: in this case, how does the child come to learn that a semantic relation between senses of the same predicate can be realized either by an anti-causative or a causative derivation?

There are three logical solutions to the problem. The first is to allow lexical semantic representations (LSRs) to vary from language to language, and from predicate to predicate within a language, so that they directly reflect underv-ed morphological representations (UMRs). In that case, if a given predicate in a given language undergoes a causative derivation, then its LSR will reflect the morphologically underv-ed inchoative alternant, whereas if it undergoes an anti-causative derivation, its LSR will reflect the morphologically underv-ed causative alternant.

The second solution is to assume a universally causative LSR. This view goes naturally with anti-causative derivations, since causative UMRs will be transparently related to causative LSRs. On the other hand, causative derivations pose a potential problem for this view, since there will be a mismatch between the (causative) LSR and the (inchoative) UMR.²

The third solution — exactly the inverse of the second — is to assume a universally inchoative LSR.³ This view goes naturally with causative derivations, which are based on inchoative UMRs, but not with anti-causative derivations, which are based on causative UMRs.

These three solutions are schematized in (10) below, using as an illustrative example the predicate ‘freeze’, which, recall, involves a causative alternation in Indonesian and an anti-causative alternation in Arabic:

\[(10) \text{ Three possible derivations for ‘freeze’ in Indonesian and Arabic} \]

\[\begin{array}{ll}
\text{Indonesian} & \text{Arabic} \\
[x \text{ freezes}] & [y \text{ causes } x \text{ to freeze}] \\
inchoative & \text{causative} \\
\text{membeku} & \text{jammada}
\end{array}\]

² There are two possible ways in which to apply such mechanisms. The first is to assume a morphological process deriving causatives from anti-causatives, or vice-versa. An example of such a process is the reflexivization operation used by some proponents of the anti-causative approach to derive inchoatives from causatives (see Section 3 below). The second way is to assume variable mapping between LSRs and UMRs, so that the same LSR can be mapped onto either a causative or an inchoative UMR, without there being a direct derivational relationship between the two alternants; this is the position advocated by e.g. Levin & Rappaport-Hovav (1995).

³ A fourth possible solution would be to assume that both causative and anti-causative alternants are universally derived from a third type of (possibly stative) LSR. See Hirose (1998) for a promising application of this idea to Cree.
Each of these solutions has in fact been proposed in the extensive literature on the causative-inchoative alternation. The first type (variable LSR) is advocated by Haspelmath (1993) on the basis of wide-ranging (though relatively superficial) cross-linguistic evidence. The second (causative LSR) solution has been advocated in a number of influential recent works on the lexicon, including those of Chierchia (1989), Levin & Rappaport Hovav (1995), Pustejovsky (1995), and Reinhart (1997). The third (inchoative LSR) solution formed the basis of much early work on causatives (e.g., within the tradition of Generative Semantics: see e.g. Lakoff 1970, McCawley 1968, and the papers in Shibatani 1976), was subsequently reanalyzed by Dowty (1979) within a Montague semantics framework, and has more recently been revived in post-GB syntax by Pesetsky (1995).

In the next sections, we will briefly examine each of these possibilities. I will argue first of all that the first solution (variable LSR representations) should be rejected on conceptual grounds. I will then argue that though anti-causative derivations are well motivated for some predicates in some languages, a uniformly causative approach to LSRs cannot account for languages at the extreme causative end of the causative/anti-causative continuum. I will provide evidence from St’át’imcets (Lillooet Salish) to support this claim. Finally, I will adopt a version of the underlying inchoative hypothesis where both LSRs and UMRs are universally inchoative and derivations are universally causative, but a further set of anti-causative operations is optionally available in order to derive anti-causativized inchoatives.
2. Variable LSRs

The variable representation approach entails that alternating predicates may have different underlying lexical semantic representations (LSRs) in different languages. This would mean that a predicate like ‘freeze’ would have a causative (transitive) LSR in Arabic but an inchoative (intransitive) LSR in Indonesian and Swahili (see (10a) above), while a predicate like ‘break’ would have a causative LSR in Arabic and Swahili and an inchoative LSR in Indonesian.

The advantage of this approach is that it maintains what Haspelmath (1993) calls “diagrammatic iconicity” — that is, a straightforward correspondence between morphological representations and LSRs. The disadvantage is that it does so by claiming that the semantic structure of apparently synonymous predicates can vary across languages — in other words, that a word like ‘freeze’ or ‘break’ can mean different things in different languages. It is not inconceivable that this is the case, but there are at least three problems entailed by such a claim.

First of all, it is not at all clear that a variable mapping hypothesis has any empirical content. In particular, there seems to be no independent way to test for the predicted semantic differences between apparently synonymous predicates in different languages, since these semantic differences are derived solely from their morphosyntactic behaviour. In the absence of independent semantic evidence, the claim that LSRs may vary cross-linguistically appears empirically vacuous.

Second, consider the learnability issues that arise from LSR variability. If LSRs were variable, a first language learner would not be able to access a unique LSR for a given causative-inchoative verb (since alternating verbs could be associated with either a causative or an inchoative LSR, or neither, depending on the target language). This would mean that the learner would be unable to employ a consistent semantics → syntax mapping in constructing preliminary morphosyntactic representations for causative-inchoative predicates; instead, the particular morphosyntactic form of an alternating predicate would determine its LSR, and hence its meaning. In other words, the acquisition mechanism of semantic bootstrapping would be unavailable to the learner. To the extent that such a mechanism is a necessary component of lexical acquisition (see Pinker 1984, 1989), a universal mapping is to be preferred over a variable one.

Third, there is a conceptual economy argument in favour of a universal rather than a variable mapping: it provides us with a simpler and more regular view of the lexicon. This view is elevated to a principle by Reinhart (1997):

**Lexicon Uniformity Principle**

Each verb-concept corresponds to one lexical entry with one thematic structure. The various thematic forms of a given verb are derived by lexicon-operations from one thematic structure. (Reinhart 1997: 6).

According to this view, all variation in the morphosyntactic expression of thematic information — both within and across languages — must be accounted for by rules, rather than by separate lexical representations. Such a move forms part of a broader strategy to minimize redundancy in the lexicon and to produce a maximally economical model of the grammar.

In view of these considerations, I reject the idea that the LSR for a given causative-inchoative predicate may vary from language to language. This means that an alternating verb like ‘freeze’ has the same LSR in Swahili, Indonesian, Arabic and English. The question now arises, of course, as to what that LSR might be.

### 3. The underlying causative analysis

The first possibility is that the LSR for all causative-inchoative pairs is causative, with the inchoative forms being derived by an “inchoativization” process which suppresses, saturates, or blocks the expression of the initial (causing) argument or event. This view is succinctly summarized by Levin & Rappaport Hovav (1995: 83):

…we assume that the alternating accusative verbs have a single lexical semantic representation associated with both their unaccusative and transitive forms, and that this is a causative lexical semantic representation. Thus, in terms of its lexical semantic representation the verb break of *The window broke* is a dyadic causative verb, just as the verb break of *Pat broke the window* is.


In the next section, I will examine six empirical arguments for the underlying causative hypothesis, four of them originally put forward by Chierchia (1989), the others from Levin & Rappaport Hovav (1995) and Pustejovsky
(1995). I will conclude that none of them provide convincing evidence for a uniformly causative LSR, while some actually provide evidence against it.

3.1. Six arguments for a causative LSR

3.1.1. Intransitive variants are more selectionally restricted than transitive variants
The first argument, from Levin & Rappaport Hovav, concerns selectional restrictions. The claim is that the transitive variant of a causative-inchoative pair is less restricted than the intransitive variant. This is meant to account for the English contrasts in (11–13):

**English:**

(11) a. The athlete broke the record  
    b. #The record broke.

(12) a. The waiter cleared the table.  
    b. #The table cleared.

(13) a. The dressmaker lengthened the skirt.  
    b. #The skirt lengthened.

However, what these contrasts really tell us is that we must distinguish the notion of “Causer” from that of “Agent.” The (b) cases, like most inchoatives, imply a lack of human agency. If we can find a situation where natural causes or magic is responsible for the event, then the (b) cases become acceptable.⁵

(14) a. The table cleared as if by magic.  
    b. Her skirt lengthened imperceptibly as the hem came down.

This fact is noted by Levin & Rappaport-Hovav, who make it an explicit condition on anti-causativization that the inchoative alternant must express an event that can occur without human agency. Note, however, that if the LSR is inchoative rather than causative, the absence of human agency in the intransitive cases is entirely expected, since agents may only be added via causativization. No extra stipulation concerning agency is necessary. Thus,

⁵ I have not been able to find a parallel case with ‘break the record’. However, as Levin & Rappaport-Hovav note, the meaning of ‘break’ in ‘break a record’ is idiomatic. This suggests that this meaning is simply stored in the lexicon, and is immune to lexical semantic (de)composition.
rather than supporting a causative LSR the argument from selectional restrictions actually runs the other way.\footnote{A reviewer suggests that since Levin \& Rappaport Hovav claim that all inchoative senses of the verb have a corresponding causative sense, but not vice-versa, the striking fact about (11–13) is not the putative non-availability of inchoative readings, but the universal availability of the corresponding causative readings. But if there is in fact no asymmetry between causatives and inchoatives with respect to available readings (aside from independently needed restrictions on agency) then there can be no grounds for claiming that the causative is more ‘basic’ than the inchoative, and the argument collapses.}

I conclude that selectional restrictions provide no valid argument for a causative LSR.

3.1.2. (In)stability of causative-inchoative pairs

The next argument for a causative LSR is based on the relative stability of the alternants of a causative-inchoative pair. The claim here is that if the intransitive but not the transitive half of the pair occurs as a lexical item in a language, then the transitive alternant is likely to be innovated, as in the (b) cases in (15) (English; from Levin \& Rappaport Hovav) and (16) (Italian; from Chierchia):

**English:**

(15)  
\begin{itemize}
\item a. The roof deteriorated.
\item b. %The pine needles deteriorated the roof.
\end{itemize}

**Italian:**

(16)  
\begin{itemize}
\item a. I pomodori sono cresciuti  
  ‘The tomatoes grew.’
\item b. %I figli, Gianni li ha cresciuti bene  
  ‘His sons, Gianni has raised them well.’
\end{itemize}

(Here, % signifies a form which is innovated and therefore acceptable to only some speakers or dialects.)

This argument is incomplete, however. In order for it to go through, it needs to be shown that no inchoative alternant is likely to be innovated in cases where only the transitive half of the alternation is lexicalized. It is true that highly agentive transitive predicates such as ‘compose’ (versus ‘decompose’), ‘murder’, and ‘sterilize’, which have no inchoative counterpart, are comparatively stable. However, the lack of an innovated inchoative in these cases follows independently from the fact that a human agent is intrinsically involved in the meaning of the predicate. As pointed out above, inchoatives...
cannot normally entail agency; the non-existence of the inchoative alternant follows from this restriction.\footnote{A reviewer points out the existence of many innovated inchoatives in Modern Greek, including σβηνω, originally ‘extinguish’, now ‘go out’. It is also worth pointing out that there are some exceptional cases in English where innovation take places from the transitive to the intransitive alternant, in spite of agency:}

Moreover, innovation also takes place with certain unaccusative verbs of appearance, analyzed both by Chierchia and by Levin & Rappaport Hovav as \textit{non-alternating.}

\textbf{English:}

(17) a. The rabbit disappeared.
   b. The magician disappeared the rabbit.

I conclude that the relative (in)stability of causative-inchoative pairs says nothing about the direction of derivation, and thus provides no argument either for or against a causative LSR.

\textbf{3.1.3. Reflexive morphology}

The most obvious argument for a causative LSR in languages like Italian or Russian is the presence of reflexive morphology on inchoative alternants, indicating that they have been derived from causatives by a lexical reflexivization process. As long as we maintain the idea that LSRs are in a one-to-one correspondence with UMRs, this type of anti-causative derivation provides compelling evidence for a causative LSR.

Italian examples from Chierchia (1989) are given in (18); as Chierchia notes, even inchoatives which lack a transitive counterpart sometimes contain reflexive morphology, as in (18b).

\textbf{Italian:}

(18) \begin{tabular}{lll}
 & \textbf{Transitive} & \textbf{Intransitive} \\
a. & rompere ‘break (tr.)’ & rompersi ‘break (intr.)’ \\
b. & aprire ‘open (tr.)’ & aprirsi ‘open (intr.)’ \\
c. & irritare ‘irritate’ & irritarsi ‘get irritated’
\end{tabular}

(i–ii) are not cases of middle formation (as in ‘These condominiums sell easily’). Middles have diagnostic properties (imperfective interpretation, presence of an adverb) which are not evidenced here. These cases thus appear to be genuine counterexamples to the inability of inchoatives to be innovated from agentive causatives.
b. –  (no transitive) inginocchiarsi  ‘kneel’
–  (no transitive) scontrarsi  ‘collide’
–  (no transitive) arrabbiarsi  ‘get angry’

It is clearly not an accident that anti-causative morphology is so often reflexive morphology; nor can the correlation be reduced to shared history, since unrelated languages show exactly the same pattern. This is illustrated for Russian and Nivkh below.

**Russian:**

(19) a. mat’ odevaet rebenka
   ‘Mother dresses the child.’
 b. mat’ odevaet s’ja
   ‘Mother dresses herself.’

(20) a. xozjain otkryvaet magazin v devjat’
   ‘The owner opens the store at nine.’
 b. jego magazin otkryvaet s’ja v devjat’
   ‘His store opens at nine.’

**Nivkh:**

(21) a. Ni pʰ-ola d’ud’
   ‘I wash my (own) child.’
 b. Ni pʰ-sud’
   ‘I wash (myself).’

(22) a. Jeskinivx magazin arkt-t’
   ‘The salesman closed the shop.’
 b. Magazin pʰ-arkt-t’
   ‘The shop closed.’

Note also that the anti-causative reflexive need not be a bound morpheme, precluding an analysis whereby the inchoative is historically derived from a reflexive construction, but reanalyzed as a simple (non-derived) form.

**German:**

(23) a. Er hat **sich** sehr verändert.
   ‘He has altered (lit.: changed himself) a lot.’
 b. Der Sturm hat **sich** sehr verstärkt.
   ‘The storm grew a lot stronger (lit.: strengthened itself a lot).’

Thus there is no doubt that the Chierchia/Reinhart analysis captures an important generalization concerning anti-causative derivations. However, it is much less clear whether this analysis can generalize to morphological...
systems where inchoatives show no reflexive (or, more generally, anti-causativizing) morphology whatsoever. The reason that such systems have not been investigated in detail is a geographical one: the distribution of languages with predominantly anti-causativizing morphology is overwhelmingly (Indo-)European, whereas the distribution of those with predominantly causativizing morphology is non-European, as pointed out by Nichols (1993):

...Indo-European languages are distinctive among the world’s languages in that most of them have only valency-decreasing devices such as passives and detransitivizers, lacking valency-increasing devices. Cross-linguistically, valency increasing devices are more common, and the most frequent is one consisting of passive and causative...

Since most of the detailed syntactic investigation of the inchoative-causative alternation has centred on Indo-European languages, the obvious problems posed by causativizing languages for a universally causative LSR have not been addressed in any detail. I will attempt to partially redress this imbalance in Section 4, where I will present data from St’át’imcets (Lillooet Salish), a language at the extreme causativizing end of the morphological continuum.

However, there are certain problems with reflexive morphology as a diagnostic for a causative LSR even in languages with overt reflexive morphology. One problem arises with predicates like ‘appear’ and ‘seem’ whose LSR neither Chierchia nor Levin & Rappaport Hovav wish to analyze as causative, but which still appear with reflexive morphology in strongly anti-causativizing languages such as Russian (24) and French (25):

**Russian:**

(24)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>kazat’sja</td>
</tr>
<tr>
<td>b.</td>
<td>pojavit’sja</td>
</tr>
<tr>
<td>c.</td>
<td>naxodit’sja</td>
</tr>
</tbody>
</table>

**French:**

(25)

<p>| | |</p>
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<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>se passer</td>
</tr>
<tr>
<td>b.</td>
<td>se trouver</td>
</tr>
<tr>
<td>c.</td>
<td>s’évanouir</td>
</tr>
</tbody>
</table>
None of these cases have transitive counterparts; it seems doubtful whether they could plausibly be related to a causative LSR. Since they still have reflexive morphology, their existence seems to cast doubt on the equation between reflexive morphology and reflexive syntax which forms the core of the Chierchia/Reinhart/Levin & Rappaport Hovav analysis.

### 3.1.4. Reflexive adjuncts

The fourth argument for underlying transitivity is based on the ability of alternating inchoative predicates to bind a reflexive adjunct, this is shown for Italian (and English) in (26) (examples from Chierchia 1989):

**Italian**:

(26) a. La porta si è aperta da sé
   'The door opened by itself.'

b. La nave è affondata da sé
   'The ship sunk by itself.'

These cases can be explained if the adverbial reflexive is subject to binding condition A and is bound by an underlying causer argument present even in intransitive alternants of causative-inchoative pairs. Chierchia argues that the intransitive form is in fact a (possibly zero-marked) reflexivization of the transitive, accounting for the presence of the reflexive adjunct.

However, it turns out that reflexive adjuncts are also available with non-alternating unaccusatives such as (27), which are argued by Chierchia to be fundamentally intransitive (i.e. not reflexivized transitives), as well as certain unergatives, such as verbs of emission (28), which according to Levin & Rappaport Hovav’s analysis are internally rather than externally caused, and therefore also non-reflexive.

**English**:

(27) The explosion occurred/happened/took place by itself.

(28) The alarm sounded/light flashed by itself.

If the presence of a reflexive adjunct is diagnostic for underlying causativity, these predicates (and in fact, virtually all eventive intransitive predicates) are

---

8 The predicates meaning ‘be located’ have transitive counterparts meaning ‘find’, but the intransitive and transitive alternants differ in interpretation, and thus cannot be related directly by a lexical operation of reflexivization.
underlyingly causative.\footnote{Levin & Rappaport Hovav point out that a reflexive adjunct modifying certain unergative verbs such as ‘laugh’ as in ‘Mary laughed by herself’ is most naturally interpreted as ‘alone’ rather than ‘without assistance’. However, this effect is easily negated by pragmatics — cf. ‘Mary was finally able to laugh by herself, once her jaw-brace was removed.’ The ‘alone’ reading is in fact confined to animate subjects, whether unaccusative or unergative — cf. ‘Mary died by herself’ — and is thus not relevant to the unergative-unaccusative distinction or the presence of a putative underlying causal agent.} It is conceivable that this is the case, though implausible in view of the existence of predicates of appearance, existence, and simple location which even in strongly anti-causativizing languages such as Russian or Italian fail other syntactic diagnostics for underlyingly causative LSRs (Levin & Rappaport Hovav 1995: 119–132). In any case, the reflexive adjunct test does not distinguish alternating causative-inchoative pairs in any consistent way from other (non-alternating) intransitive predicates.

3.1.5. Causal adjuncts

Pustejovsky (1995) points out that there is an additional class of adjuncts which might be construed as evidence for a causative LSR. These are causal adjuncts, which refer to the initial (causing) subevent of a transition, and may appear with inchoatives, indicating the presence of an underlying initial subevent in intransitive as well as transitive members of causative-inchoative alternations. Pustejovsky gives the following Italian examples:

Italian:

(29) a. La nave è affondata per l'esplosione.
   The boat sank from the explosion.

b. ?La nave è affondata per la bomba.
   *The boat sank from the bomb.

c. *La nave è affondata per l'aereo.
   *The boat sank from the plane.

Note that such adjuncts are non-agentive, as opposed to the agentive adjuncts (by-phrases) which characterize the passive alternation. Thus, compare the unaccusative in (29c) above to the passive in (30) below:

(30) La nave è stata affondata dall'aereo.
   The boat was sunk from the plane.

As Pustejovsky points out, this difference can be construed in terms of agent control (passive) versus event control (unaccusative). The question that then arises is how exactly to characterize event control: if it is a diagnostic for
transitivity, then the presence of event-related (causal) adjuncts constitutes a strong argument for a causative LSR; if, on the other hand, it can be characterized independently of transitivity, then its relevance is moot. We will return to this question in Section 5.

3.1.6. Aspectual diagnostics for a causative LSR

A final argument (again, from Chierchia 1989) is based on the aspectual similarities between causatives and inchoatives. Chierchia points out that in general causatives are telic, since they involve a process leading to a final transition, and so are inchoatives, since they specify a simple transition. This is naturally accounted for if inchoatives are derived from a causative LSR (by suppression of the causing process) — but unexpected otherwise:

If unaccusatives were simply listed in the lexicon as lacking an external argument, nothing would seem to follow concerning their aspect. Their distribution through various aspectual classes would be expected to be random, contrary to fact. (Chierchia 1989: 28).

There are two problems with this argument. (i) not all causatives are telic; and (ii) some telic causatives alternate with (atelic) states rather than (telic) transitions.

(i) There are causatives which mean something like ‘maintaining a state’. These test as atelic in English by the familiar for versus in PP-attachment test:

**English:**

(31) a. I stopped the police from searching my apartment for/*in an hour.
   b. I maintained my innocence for /*in the entire interrogation.
   c. I held the gun steady for/*in a minute.
   d. I shook him by the neck for/*in an instant.

While it is true that some of these predicates have no inchoative alternant, this would presumably be an accident of lexicalization for Chierchia, since their semantics would force him to adopt a uniformly causative LSR.

(ii) While inchoatives (which by definition involve a change of state) are naturally interpreted as telic, other unaccusative predicates are not. The clearest cases are certain unaccusative adjectives, as in (32–33a), including but not limited to those denoting psychological states (see Cinque 1990). Such adjectives have causative alternants, as shown in (32–33b). Moreover, at least some of them have no inchoative alternant, as shown in (32–33c), precluding an analysis whereby the causative alternants are indirectly related to the stative alternants via an intermediate inchoative derivation.
(32)  
   a. I was angry (at the government).
   b. The government angered me.
   c. *I angered (at the government).

(33)  
   a. The soil was moist (from the rain).
   b. The rain moistened the soil.
   c. *The soil moistened (from the rain).

Other adjectives of this type include ‘clean’, ‘dirty’, ‘dull’, ‘even’, ‘firm’, and ‘sharp’. Their existence clearly establishes that causatives may be derived from states as well as transitions. Since states are by definition atelic, but the causatives derived from them are telic, it is impossible to maintain the generalization that the aspect of an unaccusative predicate is identical to that of its causative alternant.

3.2. Conceptual problems for a causative LSR

Finally, I turn to a rather different type of consideration, this time based on conceptual economy.

Logico-lexical representations for inchoatives and causatives invariably build causatives from inchoatives. (For various formulations see Dowty 1979; Chierchia 1989; Parsons 1990; Pustejovsky 1991, 1995; Levin & Rappaport Hovav 1995; Reinhart 1997; van Hout 1996; Wunderlich 1997). All of these formulations assume a bi-eventual structure for causatives, with an initial causing process and a resulting transition or state. Below I give two: the first, based on composition of atomic predicates, is from Dowty (1979), the second is based on the aspectual calculus of Pustejovsky (1991).¹⁰

(34)  
   a. Intransitive break:
       [X BECOME broken]
   b. Transitive break:
       [Y DO-SOMETHING] CAUSE [X BECOME broken]

(35)  
   a. Intransitive break:
       \[e\]
       \[\bar{e}\]

¹⁰ Though it should be noted that Pustejovsky (1995) adopts the anti-causative analysis, and thus adopts the more complex representations in (34b) as the underlying event-structure for both causative and inchoative alternants.
b. Transitive \textit{break}:

\begin{center}
\begin{tikzpicture}
\node (T) {T};
\node (P) [below left of=T] {P};
\node (Te) [below right of=T] {T};
\node (e1) [below left of=P] {e_1}
\node (e) [below right of=P] {e}\node (en) [below right of=Te] {e_n};
\draw (T) -- (P);
\draw (T) -- (Te);
\draw (P) -- (e1);
\draw (P) -- (en);
\draw (Te) -- (e);
\end{tikzpicture}
\end{center}

Note that in both models, the inchoative forms part of the causative. Assuming a generative mechanism for lexical-semantic composition, this means the causative structure is derived from the inchoative structure.

Now, consider the relationship of morphological rules to lexical semantic rules. In a system based on causativization of an inchoative LSR, the simpler (mono-eventual) semantic substructure is equivalent to the simpler (intransitive) morphological substructure: there is a direct correspondence between the semantic and morphological derivations. On the other hand, in a system based on anti-causativization of a causative LSR, the semantically complex (bi-eventual) semantic substructure is equivalent to the morphologically simpler (transitive) morphological substructure: the correspondence is inverse. Thus on grounds of conceptual economy, the inchoative LSR is preferable to the causative LSR.

3.3. Is a \textit{universal} causative LSR viable?

We have now reviewed most of the major arguments for an anti-causative analysis of the causative-inchoative alternation. We have discovered the following problems:

(i) Some diagnostics (selectional restrictions, direction of innovation) are actually diagnostics for agentivity rather than causativity.

(ii) Others (reflexive morphology) fail to generalize to languages where inchoatives show no overt reflexes of anti-causativization.

(iii) Others (reflexive morphology, reflexive adjuncts, direction of innovation) overgeneralize to predicates which are semantically implausible as candidates for anti-causative derivations.

(iv) Others (aspectual parallels) are based on a limited subset of causative-inchoative pairs and fail to generalize to a broader range of data.

(v) An anti-causative analysis predicts that there is an inverse as opposed to a direct correlation between semantic and morphological derivations.

I conclude that there are both conceptual and empirical grounds for rejecting a \textit{uniformly} anti-causative analysis for the causative-inchoative alternation. Nevertheless, there seem to be equally strong grounds — both morphological
and syntactic — for assuming that at least some inchoative predicates in some languages are derived by lexical reflexivization from causative LSRs.

But now we seem to have backed ourselves into a corner: the most natural interpretation of the evidence we have examined so far seems to support the variable encoding option that we have already rejected on conceptual grounds. I will attempt to resolve this paradox in Section 5. First, however, we will examine further evidence from a language at the extreme causativizing end of the causativizing/anti-causativizing continuum: St’át’imcets (Lillooet Salish).

4. Salish evidence for an inchoative LSR

4.1. Roots are intransitive

Both morphological and syntactic evidence points to the conclusion that all roots in St’át’imcets (and in Salish more generally) are fundamentally intransitive. The morphological evidence is quite straightforward: in St’át’imcets intransitives may be unsuffixed (as in 36) but all transitives must be suffixed with an overt transitivizer (here the DIRECTive transitivizer -\(\text{VIn}/\text{Ni}\) and the CAUSative transitivizer -\(\text{s}/\text{t}\)).

St’át’imcets:

(36) a. Intransitive (bare stem)

\[
\begin{align*}
\text{q̌əmt} & = \text{‘to be hit (by thrown object)’} \\
\text{ʔuš} & = \text{‘to get thrown out’} \\
\text{p̕aŋʔu} & = \text{‘to be afraid’} \\
\text{̕iʔ} & = \text{‘to get here, arrive’} \\
\text{̕ak} & = \text{‘to be dry, to get dry’} \\
\text{̕q̌ə} & = \text{‘to be cooked, ripe’} \\
\text{zuq̌} & = \text{‘to die’}
\end{align*}
\]

11 St’át’imcets (\(\text{ƛ̕əʔyłəmət}\)) is a member of the Northern Interior branch of the Salish family. It is spoken by less than two hundred people in mainland southwestern British Columbia, Canada.

12 Orthography is standard American phonemic. Abbreviations are as follows: ABS = absolutive, ACT = active intransitivizer, AUT = autonomous, CAUS = causative transitivizer, CON = connective, DET = determiner, DIR = directivizer transitivizer, ERG = ergative, EXIST = existential, INCH = inchoative, INT = intensive, IRR = irrealis, MID = middle intransitivizer, NOM = nominalizer, OBL = oblique, OOC = out-of-control marker, OOC.REFL = out-of-control reflexive, PASS = passive, PL = plural, POSS = possessive, PROG = progressive, QUO = quotative, REDUP = reduplication, REDIR = redirective transitivizer, SG = singular, STAT = stative, SUB = subject. ‘\(=\)’ stands for a clitic boundary, ‘\(=\)’ for an affix boundary, and ‘\(\ldots\)’ for a reduplication operation.
In order to show that the syntax parallels the morphology, it is necessary to show that stems such as those in (36) are neither derived by a passive-like argument saturation, where the causer argument is existentially closed, nor by a reflexive-like argument reduction, where the causer and causee arguments are identical (see Reinhart 1997 for details of these operations).

It is straightforward to show that unaccusatives in St'át'imcets are not passives. The relevant evidence is provided by implicit agent effects. In English, Italian and many other languages, passives such as that in (37a) may license agentive adjuncts (see the Italian examples in (25) above), in contrast to unaccusatives (37b), which may not (Grimshaw 1990; Pustejovsky 1995).

**English**

(37) a. The boat was sunk (by the French).

b. The boat sank (*by the French).

Exactly the same contrast is found in St'át'imcets. Alongside morphologically underived intransitive predicates such as those in the (a) cases of (38–40), there exist passives which are derived in the standard fashion by detransitivizing a transitivized predicate, as in the (b) cases:

**St'át'imcets**

(38) a. qə́mı̑t=Ø

\textit{hit=3ABS} \\
‘S/he was hit.’

\textbf{intransitive}

b. qə́mı̑t-š-tum

\textit{hit-CAUS-3SG.PASS} \\
‘S/he was hit.’

\textbf{detransitive}
The intransitive forms cannot license an oblique agent (41a), whereas the
detransitivized forms can (41b). Where an oblique phrase is permitted with a
fundamentally intransitive predicate, it is interpreted as an instrument rather
than as an agent (42a).

Thus, unaccusatives are not concealed passives.

The second possibility is that they are zero-marked reflexives. St’át’imcets
has two reflexives. The first is a detransitivizing morpheme -tú that only
attaches to stems with an overt transitivizer, and can thus be dismissed from
consideration as a possible source for the unaccusatives. The second is more
promising. St’át’imcets has a lexical reflexive morpheme, which has a number
of different realizations. These include two allomorphs of the “autonomous”
suffix -lx/-lx (whose distribution is determined by stress), the pan-Salish ‘middle’ suffix -m, and — significantly — a zero-marked form. Examples of each are given in (43).

(43)  a. **Autonomous-marked lexical reflexives:**
   - ūl-7x  ‘to stop (oneself)’
   - ūl-7x  ‘to stand up’
   - 7x*-7x  ‘to hide (oneself)’
   - ūx*əz*-7x  ‘to dance (white man style)’
   - ūx*āk-7x  ‘to wake (oneself)’
   - ūw-7x  ‘to climb’

   b. **Middle-marked lexical reflexives:**
   - ūs)x*-am  ‘to bathe’
   - ūs)p-um  ‘to breathe’
   - ūc)x*-am  ‘to wade’
   - ūs)x*-am  ‘to go up hill’
   - ūm-um  ‘to stoop’
   - ūmim-um  ‘to go upstream’

   c. **Zero-marked lexical reflexives:**
   - ūm-7xq  ‘to sit down’
   - ūqil  ‘to run’
   - ūq*úa  ‘to dance’ (Indian style)
   - ūqoqil  ‘to crawl’
   - ūs)xw*as7  ‘to come down a hill’
   - ūmim  ‘to go upstream’

See Davis (1997) for arguments that these are indeed all lexical reflexives.

The existence of the zero-marked reflexives in (43c) raises the question of whether the roots in (36) may also be zero-marked reflexives. However, there is one crucial difference between them: the reflexives are all agentive, whereas the unaccusatives are all non-agentive. This difference correlates with a number of syntactic and semantic diagnostics:

(i) St’át’imcets has two closely related but distinct suffixes, -m ‘want to’ and -m ‘almost’. Both these suffixes attach to intransitive predicates, but they are in complementary distribution: -m attaches to agentive predicates, -m to non-agentive predicates. Lexical reflexives (including middle and zero-marked allomorphs) take only -m (44), whereas non-agentive unaccusatives take -reate (45).

(44)  a. ūl-7x-ør ‘to want to stand up’
   b. ūs)x*-a ‘to want to go up hill’
   c. ūs)x-ør ‘to want to go home’
(45) a. čixₚ- álman/-alman 'to almost get there'
    b. kʰišₚ- álman/-alman 'to almost fall'
    c. zūqₚ*- álman/-alman 'to be almost dead, dying'

(ii) The "out of control" circumfix ka-...-a has a different interpretation when attached to agentive and non-agentive predicates (Demirdache 1997). With agentive predicates, it has an ability reading; when attached to non-agentive predicates, it has an aspectual reading and means 'suddenly, all at once'. Lexical reflexives (including middle and zero-marked forms) yield an ability reading (46), non-derived unaccusatives yield an aspectual reading (47):

(46) a. ka= x̓al-lax=kán=a
      OOC=stop=AUT=1SG.SUB=OOC
      'I was able to stop.'
b. ka= xáť-om= x̓kán=a
      OOC= go.uphill-MID=1SG.SUB=OOC
      'I was able to go uphill.'
c. ka= mičaʔ-q=kán=a
      OOC= sit.down=1SG.SUB=OOC
      'I was able to sit down.'

(47) a. lap n-š-ka= x̓al-a
      suddenly 1SG.POSS=NOM=OOC=stop=OOC
      'Suddenly I stopped (unexpectedly).'
b. ka= kʰiš-a ti=káh=a
      OOC=fall=OOC DET=rock=EXIST
      'The rock fell.'

(iii) The Státimcets equivalents of the reflexive adjunct cases discussed above differ for agentive and non-agentive predicates. Agentive predicates take the suffix -šút (historically related to the transitive reflexive -cút) yielding something like an "out of control reflexive" meaning — 'all by oneself'. Non-agentive predicates in contrast take the intensifying suffix -úl, which is neither synchronically nor diachronically related to a reflexive morpheme, and usually means 'really, too much'.13 Lexical reflexives (again, including middle

13 There are lexical exceptions to this generalization, in that certain non-agentive roots may also take -šút. These include ziktšút 'tree falls by itself', kʰisčút 'fall by accident', qantšút 'get hit by accident', pámptšút 'car' (literally 'fast by itself'). There seems to be a sub-generalization here: the relevant roots are non-agentive, but all entail the possibility of agency (though this also applies to the cases in (49)), so it is hard to see how to differentiate the two cases. In any case, the opposite generalization holds exceptionlessly: no agentive predicate takes -úl.
and zero-marked forms) pattern with agentive predicates (48), non-derived unaccusatives pattern with other non-agentive predicates (49).

(48) \text{tal-}lax-šút \quad \text{ti=}šš"uk\w^mi=t=a  \\
\text{stand-AUT-OCC.REFL DET=child=EXIST} \quad \text{The child stood up on her own (without anyone helping).} \text{\textquote{}}

(49) a. \text{ka=}šak\w^?=ûl=a \quad \text{ti=}k\w^nûst\=a  \\
\text{OCC=shatter-INT=EXIST DET=window=EXIST} \quad \text{The window broke by itself.} \text{\textquote{}}

b. za?-x\w^?=ûl \quad \text{ti=}pâth=a \\
\text{melt(INCH)-INT DET=butter=EXIST} \quad \text{The butter melted all by itself.} \text{\textquote{}}

All three of these tests distinguish non-derived non-agentive predicates like those in (36) from derived agentive predicates such as those in (43c). I conclude that the non-agentive predicates in (36) are not derived by lexical reflexivization. Since we have already seen that they are not derived by passivization, I further conclude that they are fundamentally intransitive: which means that for these predicates, St‘át’imcets shows a causativizing rather than an anti-causativizing direction of derivation.

4.2. Anti-causativization in a strongly causativizing language

I will now show that though non-derived inchoatives are fundamentally intransitive, St‘át’imcets also has a set of inchoatives which are clearly derived by lexical reflexivization.

We have already seen that autonomous-marked lexical reflexives are generally agentive:

(50) a. šál-\text{rack} \quad \text{š=Bucky}  \\
\text{stop-AUT NOM=Bucky} \quad \text{‘Bucky stopped.’}  

b. škâx-\text{rack} \quad \text{š=Bucky}  \\
\text{dry-AUT NOM=Bucky} \quad \text{‘Bucky dried himself.’}  

However, it turns out that there also exists a set of non-agentive autonomous forms:

(51) \text{qâx-}lax \quad \text{‘dry out’} \quad \text{q"ùm-}lax \quad \text{‘curl up’}  \\
\text{\textquoteright{}k\w^úc-}lax \quad \text{‘get crooked’} \quad \text{\textquoteright{}k\w^ulc-}dlx \quad \text{‘bend’}  \\
\text{\textquoteright{}kúp-}lax \quad \text{‘get twisted’} \quad \text{\textquoteright{} ول-}lxl \quad \text{‘bubble up’}
ś-txʷ-ilx  'go straight'  mùč-lax  'warp'
cáqʷ-lax  'redden'  nák-lax  'change'
ʔūč-lax  'run (dye)'  ᵃsč⁻sāč-lax  'tingle'
qíq⁻lax  'heal, scab'  zanp⁻ilx  'get tangled'

A textual example is given below, showing a clearly non-agentive use of the lexical reflexive:

(52) kʷán-aš=kʷú?  ?ayš  ni=n-ś-tá?=a
  take(DIR)-ERG=OUO then DET=1SG.POSS=NOM-aunt=EXIST
  ?i=q⁻šiʔ-xn=a,  ní=ʔú?  ś-cáq⁻miʔ-aš
  PL.DET=bark-foot=EXIST then=SO NOM=throw-REDIR-ERG
  ?a-tʔú,  plan  ?ayš  wa?  qʷúm-lax,
  to=over.there already then PROG curl up-AUT
látí?  pl’ukʷ  ?ayš
  there smoking then
  'Then my aunt took the shoes and she threw them off, they were already curling up and smoking.' (van Eijk & Williams 1981: 92).

Moreover, in a few cases, derived reflexive inchoatives are in free variation with underived unaccusative inchoatives:

(53) a. qʷum  -  qʷúm-lax  'curl up'
b. qíq  -  qíq⁻lax  'to heal'
c. ʔúlʔuš  -  ʔúlʔuš⁻ilx  'to gather, meet'

Thus, St’át’imcets, with a strongly causative morphological system, has both derived (anti-causative) and non-derived inchoatives.

It appears, then, that neither a uniformly anti-causative nor a uniformly causative analysis is adequate even for languages which show strongly anti-causativizing or causativizing morphology. In other words, both anti-causative and causative derivations are universally available.

5. Agentivity and causativity

So far, we have established that there exist both underived and derived (anti-causativized) inchoatives, and that — at least in the case of St’át’imcets — they may coexist in the same language. The next step is to ask what the difference — if any — might be between them.
5.1. Agents are derived

We will begin with an important asymmetry between inchoatives and causatives that is unexpected under an analysis where either a causative or an anti-causative analysis is available for any alternating predicate. The asymmetry is this: anti-causative derivations do not yield non-agentive intransitives from agentive transitives, whereas causative derivations may easily yield agentive transitives from non-agentive intransitives. This is illustrated in (54–56), which show the failure of anti-causative derivations from strongly agentive predicates in Gothic and English (see also (11–14) above):

Gothic (Haspelmath 1993):

(54) a. ‘tie’: agent-oriented meaning element:
   bindan ‘tie’ (causative) \[ \rightarrow \]
   *bundnan ‘(be) tied’ (anti-causative)
   b. ‘untie’: no agent-oriented meaning element:
      andbindan ‘untie’ (causative) \[ \rightarrow \]
      andbundnan ‘(be) untied’ (anti-causative)\(^{14}\)

English (cf. Levin & Rappaport Hovav 1995):

(55) a. The murderer cut the man’s throat.
   b. *The man’s throat cut.

(56) a. I wrote a letter.
   b. *The letter wrote.

(57–58), on the other hand, show that the equivalent (fundamentally intransitive) predicates in St’át’imcets may readily undergo a causative derivation, yielding an agentive predicate:

St’át’imcets:

(57) a. ḱaxʷ-úš ti=qáyxʷ=a
   sever-face DET=man=EXIST
   ‘The man got his throat cut.’

\(^{14}\) In support of the difference in agent orientation between ‘tie’ and ‘untie’, note the English contrast between (i) and (ii):

(i) *My shoelace came tied
(ii) My shoelace came untied
b. ḫatxʷ-ŭš-ōn-aš  ti-šqáyxʷ-ā  ti-wā?
   sever-face-DIR-ERG DET=man=EXIST DET=PROG
   murder-hand-MID
   ‘The murderer cut the man’s throat.’

(58) a. plan wa? ʔəš-māč  ti-piph-ā
   already PROG STAT-written DET=paper=EXIST
   ‘The paper is already written.’

   b. plan wa?  màč-ōn-āš  ti-piph-ā
   already PROG written-DIR-ERG DET=paper=EXIST
   ti-wā?  zwāt at-xl
   DET=PROG know.REDUP-ACT
   ‘The student already wrote the paper.’

Thus inherently agentive predicates may have inchoative alternants via a causative but not via an anti-causative derivation. This generalization can be explained by two further assumptions:

(i) Agentive predicates are always derived
(ii) Agentivity may not be suppressed

The hypothesis that agency is fundamentally derived is not new: see Hale & Keyser (1993, 1994), Kratzer (1994), Davis & Demirdache (1995). We will adopt here the Davis & Demirdache version, which is based on the event structure calculus of Pustejovsky (1991); see also van Hout (1996).

The basic idea of an event-structure calculus is that both roots and aspectual affixes (including transitivizers and intransitivizers) are associated with event structures, which are themselves composed of (combinations of) subevents. Arguments are associated with predicates as entailments of these subevents.

There are three basic event types, a state, a transition, and a process, shown in (59a), (b), and (c) respectively:

(59) a. S  b. T  c. P

   e  ¬e  e  e₁…………………eₙ

Primitive subevents may represent simple events. Thus a stative predicate may be represented by a state (60) and an underived inchoative predicate by a simple transition, as in (61).
Salish evidence on the causative-inchoative alternation

Stative predicate:

\[
\begin{array}{c}
S \\
\downarrow \\
e \\
\downarrow \\
\text{kax}
\end{array}
\]

'to be dry'

Underived inchoative predicate:

\[
\begin{array}{c}
T \\
\downarrow \\
e \\
\downarrow \\
\text{kax}
\end{array}
\]

'to get dry'

Transitive predicates, on the other hand, are represented by complex event structures consisting of two subevents, an initial process and a final transition. The basic aspectual template for a transitive predicate is shown in (62):

\[
\begin{array}{c}
T \\
\downarrow \\
\text{e1} \ldots \text{en} \\
\downarrow \\
\text{e}
\end{array}
\]

As pointed out in Section 3.2, there is a natural derivational relationship between simple inchoatives and causatives: causatives are derived from inchoatives by event composition.

Significantly, St’át’imcets (and Salish languages more generally) distinguish morphologically and syntactically between two types of transitive predicate: control and non-control transitives. Control transitives (suffixed with the directive transitivizer) entail agency, whilst non-control transitives (suffixed with the causative transitivizer) do not. The difference emerges clearly with inanimate subjects, which are compatible only with the non-control transitivizer:

\[
\begin{array}{c}
k\text{áx-añ-aš} \quad ?i=\text{ščúq”az”=a} \\
dry-DIR-ERG PL.DET=fish=EXIST DET=NOM=Bucky
\end{array}
\]

'Bucky dried the fish.'

\[
\begin{array}{c}
k\text{áx-š-aš} \quad ?i=\text{ščúq”az”=a} \\
dry-CAUS-ERG PL.DET=fish=EXIST DET=wind=EXIST
\end{array}
\]

'The wind dried the fish.'
Demirdache (1997), modifying the analysis of Davis & Demirdache (1995), proposes that the difference between these two types of transitive predicate (and hence, the difference between agentive and non-agentive transitives) lies in the mapping of the lexical content of a predicate onto its event structure representation. The basic idea is that in the control (agentive) case, the lexical content of the predicate is mapped onto both the initial process and the final transition: thus, (63a) will involve a process of drying leading to a transition from not dry to dry. Thus, we derive an event structure representation for a control transitive such as that in (64):

(64) **Control Transitive predicate:**

```
(64) Control Transitive predicate:

<table>
<thead>
<tr>
<th>T</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>e</td>
<td>e</td>
</tr>
</tbody>
</table>

(dry x) (dried y)

(káx-añ

"to dry something" (control)
```

The non-control transitive in (62b) also has a complex event structure, but this time the initial subevent remains unspecified, meaning that there is no intrinsic relation between causing event and the resulting transition. Thus the initial subevent could be anything — in the case of (62b), an event of wind-blowing causes an event of getting dry. This will yield the following event structure representation:

---

15 Formally, this is accomplished by an operation of **predicate cloning** shown in (i):

(i) a. (dry)* = λe λy [dry (y, e)]

b. (DIR)* = λV λe1 λx λy [V (x, e1) & V (y, e2)]

From (a) and (b), by lambda conversion:

c. λe1 λe2 λx λy [drying (x, e1) & dry (y, e2)]

Predicate cloning takes the lexical content of the predicate dry and maps it onto the transitive event structure of the intransitive (control) transitivizer in (ib) to yield a transitive predicate (ic) whose subevents have the same lexical content, in other words, an event of drying involving the argument y will lead to an event of getting dry involving the argument x.
Non-control Transitive predicate:

Here V is a variable over events, signifying the lack of connection between the two subevents.

Now, we are ready to define agency (again, from Demirdache 1997):

A participant in an event is an agent iff there is an intrinsic relation between the initial process and the resulting transition.

This distinguishes the control from the non-control cases: only the former instantiate an intrinsic relation between the two subevents.

There are two important consequences to this definition. First of all, it follows that agency always entails (event-structure) transitivity, since only complex events have an initial process as well as a resulting transition. This accounts for the fact that simple inchoatives like (59), which only have a single subevent, must be non-agentive, whereas transitives like (60), which are derived by event composition, may be agentive.

Second, in conjunction with assumption (ii) above (agents may not be suppressed) it predicts the existence of two different types of lexical reflexive: those derived from control transitives, which will be agentive, and those derived from non-control transitives, which will be non-agentive.\(^{16}\) In event structure terms, we can interpret reflexivization as an identity relation between the arguments associated with the two subevents of a causative predicate. This will mean that in both control and non-control reflexives, the argument associated with the initial process will be the same as the argument associated with the final transition. The difference between the two types will lie — just as with control and non-control transitives — in whether the lexical content of the predicate is mapped onto both subevents (control) or only the final transition (non-control).

\(^{16}\) Note that Chierchia (1989) also derives two types of reflexive, but in a slightly different fashion: for him, the (non-)agentivity of reflexives is determined by whether the internal or the external argument of an underlying causative predicate has been suppressed.
The event structure for an agentive lexical reflexive and for a non-agentive (inchoative) lexical reflexive in St’át’imcets are given below in (67) and (68), respectively:

(67)  **Control Reflexive predicate:**

```
    e1 ....... en  e
    
   (dry x)         (dried x)
```

\[ \text{káx-lax} \]

‘to dry oneself’ (control)

(68)  **Non-control Reflexive predicate:**

```
    e1 ....... en  e
    
   (V x)         (dried x)
```

\[ \text{čáx-lax} \]

‘to dry out, curl up’ (non-control)

In the non-control case in (68), an unspecified event (the variable V) involving x leads to x drying out; just as in the non-control transitive case in (65), there is no entailment of agency. This accords well with Chierchia’s intuition that (anti-causativized) unaccusatives are lexical reflexives in which the causing factor is some property of the entity which is undergoing the change of state.

We are now in a position to understand the difference between agent control and event control. Agent control is a relation between the agent of an event and an element it binds. Event control is the relation between an unspecified initial subevent and an event it binds. These two cases correspond to the control/non-control distinction we have seen overtly encoded in the St’át’imcets aspectual system.
5.2. Variable representation versus variable derivation

We now return to the unresolved issue of the nature of the variation we have encountered in the encoding of the causative-inchoative alternation. It is clear that the variation cannot be reduced to a simple cross-linguistic parameter: languages such as St'át'imcets contain both causative and anti-causative derivations. It is also clear that though there are cross-linguistic tendencies, we cannot reduce the variation to semantic differences between predicates: the same predicate may undergo either causative or anti-causative derivations, sometimes in the same language.

However, this does not mean that we are forced to adopt variable encoding in LSRs, an option that we have already rejected on conceptual grounds. Instead, we can now reduce the observed variation to the availability of different derivational paths. Simple inchoatives (of the type instantiated by underived inchoatives in St'át'imcets) are associated with a causative derivation. Derived inchoatives (of the type instantiated by non-control lexical reflexives) are associated with both a causative and an anti-causative (lexical reflexive) derivation. The two types have different morphological and syntactic properties, though the differences are subtle and often obscured by morphophonological opacity (in particular, by the universally available option of zero derivation).

The derivation of the two types of inchoative (simple and anti-causativized) is schematized below in (70):

\[
\text{(70) Causative and Anti-causative derivations} \\
\begin{array}{lll}
\text{LSR} & \text{MR} & \text{LEXICAL REALIZATION} \\
\text{Simple Transition} & \text{Verb-base (UMR)} & \rightarrow \text{Simple Inchoative} \\
\downarrow & & \\
\text{Accomplishment} & \text{Verb + causative} & \rightarrow \text{Causative} \\
\downarrow & & \\
\text{Accomplishment} & \text{Verb + reflexive} & \rightarrow \text{Reflexive inchoative (reflexivized)}
\end{array}
\]

The question remains as to why anti-causative derivations — which involve a two-step process of transitivization followed by detransitivization — should ever be preferred to the simpler causative derivations, which involve one less derivational step. This is, of course, part of the larger question as to why languages should ever prefer ‘imperfect’ derivations over perfect ones.

I suspect that the answer lies in a tension between two competing tendencies. On the one hand, lexical items in a language reflect the kind of meanings that are useful to speakers, in the sense that they represent concepts that
reflect our relationship to the world. For example, lexical verb meanings which strongly implicate agency like ‘build’ and ‘write’ are hard or impossible to conceive of as spontaneously occurring events; for this reason, they are cross-linguistically far more likely to be morphologically encoded by (agentive) causative forms than by (non-agentive) inchoative forms. Nevertheless, by hypothesis, even the most strongly agentive predicates are derived compositionally from inchoative LSRs and their corresponding intransitive UMRs. The point is that though the grammar automatically makes the inchoative alternants for these predicates potentially available, they are not realized as actually occurring lexical items, since there is no reason to employ a predicate with the meaning of ‘to spontaneously get built’ or ‘to spontaneously get written’. Note, however, these meanings are not impossible — they are not ruled out a priori by lexical semantics; rather, they are implausible, because the world does not work in the way that they describe. Hence pragmatics acts as a kind of filter on the lexicon. I will refer to this effect as pragmatic selection.

Pragmatic selection gives us a way of understanding why not all potential verb meanings and their corresponding morphological forms are actually realized as lexical items in a language. It does not, however, tell us why lexical realization should vary cross-linguistically — unless pragmatic conditions are themselves allowed to vary from language to language, which seems unlikely. Instead, we have to appeal to another, competing tendency, which I shall call morphological uniformity — the tendency for morphology to eliminate asymmetry in favour of formally regular paradigms and derivations. With respect to the causative-inchoative alternation, there are two directions in which morphological uniformity can drive a language. On the one hand, it can force all inchoative UMRs to be lexically realized, irrespective of their meaning. This will create a strongly causativizing system like that of St’át’imcets, where (simple) inchoative alternants are lexically realized even for agentive predicates. On the other hand, morphological uniformity can prevent the lexicalization of all inchoative UMRs, again leading to morphological uniformity, but in the opposite direction; this time, the only available derivation for non-agentive inchoatives will be via causativization and then anti-causativization, as in Russian, where even predicates like ‘appear’ and ‘be located’ are derived by anti-causativization.

Now, note that pragmatic selection and morphological uniformity frequently end up in conflict, since the former attempts to choose between potential lexical items on the basis of their pragmatic plausibility, irrespective of formal uniformity, while the latter attempts to impose formal uniformity on the realization of lexical items, irrespective of their pragmatic plausibility. It is this
conflict, I would like to claim, which leads to the kind of lexical variation and instability so characteristic of the causative-inchoative alternation.

It is important to point out the limits of this kind of account. It provides an explanation for the instability of the causative alternation, and defines the limits of possible variation, but it cannot predict which direction any particular language or language family will follow. This is not necessarily a drawback. The direction of change followed by a particular language is a complex function of its own previous history and the various intra- and extra-linguistic forces at work upon it. Thus, consider the preponderance of anti-causativizing languages in the European sprachbund (as noted by Haspelmath). The explanation for this cannot be either simply genetic (since it is an areal feature) nor typological (since European languages are not typologically uniform); instead, it must derive from a shared set of morphological developments which reflect relatively prolonged historical contact.

6. Conclusions

We begun this paper with an apparently intractable problem: how do we account for attested morphological variation in the causative-inchoative alternation, while at the same time maintaining the universality of Lexical Semantic Representations, and without losing the connection between morphology and lexical semantics?

The solution we have provided fulfills all of these criteria. Morphological variation is accounted for by postulating an extra layer of derivation, which distinguishes anti-causative from causative derivations. Following Chierchia, Reinhart, and Pustejovský, we have justified this extra layer by proposing that inchoative predicates may be derived (both morphologically and semantically) from causative predicates by a process of lexical reflexivization. However, on the basis of evidence from St’át’imcets, a strongly causative language, we have shown that, parallel to inchoatives derived from causatives, there also exist inchoatives which are (both morphologically and semantically) undervived. The existence of two distinct types of inchoative (sometimes in the same language) allows us to account for the observed variation in the causative-inchoative alternation by appealing to distinct derivational paths, rather than distinct underlying representations. Since we assume that morphological and semantic derivations proceed in strict parallel, this solution also allows us to maintain a transparent relation between morphology and lexical semantics, as desired.
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References


Prefixation and the head-complement parameter

Lluïsa Gràcia & Miren Azkarate

In this paper we demonstrate that the head-complement parameter that Lieber (1992) proposes to apply in syntax as well as in morphology can account for the distinction between two different uses of Romance prefixes. In one case, prefixes act as modifiers of the root, whereas in the other case, they act as heads at a certain level of representation, with the root acting as their complement. This hypothesis also explains why OV languages such as Basque have so few prefixed elements. Because it is an OV language, Basque can only have prefixes in modifier position.

Introduction

Taking as basis the distinction between transitive and intransitive uses of prefixes and prepositions made by Zwanenburg (1992, 1994), and the Licensing Conditions proposed by Lieber (1992) — especially the Head-Complement Parameter —, it will be demonstrated in this paper that:

I. The Licensing Conditions proposed by Lieber also account for the order of constituents in both the morphological and syntactic structures analyzed here.

II. The distinctions made by Zwanenburg are successfully explained by Lieber’s Licensing Conditions; and

III. The traditional distinction between head suffixes and non-head prefixes should be abandoned, since the set of prefixes which are heads — at least at a certain level — is much larger than the few verbal prefixes mentioned by Lieber (1992) for English, French and Dutch.

Moreover, the prediction will be made that in languages having complement-head order, namely languages where the head is final with respect to its complements, prefixation will be much less productive than in languages in which the head is initial. We will focus our attention on Romance languages (languages with a VO order), and on Basque (an OV language).

The paper consists of two sections: first, we present the relevant parts of the theoretical background that we assume, namely, the proposals by Zwanenburg and Lieber. At the same time, we present the data from Romance Languages and Basque. In the second section, we discuss the internal structure of prefixed words and justify it on the basis of their semantic content.
1. Theoretical background and the data

1.1. Zwanenburg’s hypothesis and Romance data

Firstly we will briefly present the hypothesis by Zwanenburg that distinguishes two uses of some prefixal elements. According to Zwanenburg (1992, 1994), most prefixal elements, prefixes or prepositions, can have two values. Sometimes the prefixed element appears as a simple modifier of the head (in this case, the lexical root) and therefore the derived word is righthanded. However, the prefixal element can also be a head. In this case the construction is leftheaded, and the root is interpreted as the complement of this head, as a prepositional phrase (PP). According to Zwanenburg, the existence of non-morphological word-creating rules introducing syntactic structures within words would account for these lefthead-head constructions. Zwanenburg calls the first use intransitive (prepositional) use and the second one, transitive (prepositional) use. We exemplify these two values of prefixes in (1) and (2) respectively.\(^1\)

(1) **intransitive use**

<table>
<thead>
<tr>
<th>Cat.</th>
<th>pre-cognició</th>
<th>pre-cognition</th>
<th>‘precognition’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sobre-bena</td>
<td>upper-bandage</td>
<td>‘upper bandage’</td>
</tr>
<tr>
<td></td>
<td>super-index</td>
<td>super-index</td>
<td>‘superscript’</td>
</tr>
<tr>
<td>Sp.:</td>
<td>pre-aviso</td>
<td>pre-warning</td>
<td>‘forewarning’</td>
</tr>
<tr>
<td></td>
<td>sub-indice</td>
<td>sub-index</td>
<td>‘subscript’</td>
</tr>
<tr>
<td></td>
<td>ante-proyecto</td>
<td>ante-project</td>
<td>‘preliminary sketch’</td>
</tr>
<tr>
<td>Fr.:</td>
<td>pré-chauffage</td>
<td>pre-warming</td>
<td>‘warming-up’</td>
</tr>
<tr>
<td></td>
<td>sur-dent</td>
<td>upper-tooth</td>
<td>‘upper tooth’</td>
</tr>
<tr>
<td></td>
<td>sous-jacent</td>
<td>under-lying</td>
<td>‘underlying’</td>
</tr>
<tr>
<td>It.:</td>
<td>pre-alarma</td>
<td>pre-warning</td>
<td>‘early warning’</td>
</tr>
<tr>
<td></td>
<td>sopra-detto</td>
<td>above-said</td>
<td>‘above-mentioned’</td>
</tr>
<tr>
<td></td>
<td>sotto-passaggio</td>
<td>under-way</td>
<td>‘subway’</td>
</tr>
</tbody>
</table>

(2) **transitive use**

<table>
<thead>
<tr>
<th>Cat.</th>
<th>pre-coma</th>
<th>pre-coma</th>
<th>‘precoma’</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>sobre-cella</td>
<td>over-eyebrow</td>
<td>‘part above eyebrows’</td>
</tr>
<tr>
<td></td>
<td>sota-barba</td>
<td>under-chin</td>
<td>‘double chin’</td>
</tr>
<tr>
<td>Sp.:</td>
<td>pre-tónico</td>
<td>pre-stressed</td>
<td>‘pretonic’</td>
</tr>
<tr>
<td></td>
<td>sobre-cama</td>
<td>over-bed</td>
<td>‘bedspread’</td>
</tr>
<tr>
<td></td>
<td>post-conciliar</td>
<td>post-conciliar</td>
<td>‘post-conciliar’</td>
</tr>
</tbody>
</table>

\(^1\) In Romance and Basque examples, we use a hyphen in order to identify the components of the word.
In (1) the derived word is interpreted as a subclass of the thing, property, or event denoted by the base. Then, a \textit{precognizio} ‘precognition’ is a previous cognition, a \textit{superindice} ‘superscript’ refers to an index placed above; \textit{sousjacent} ‘underlying’ literally means ‘lying under’, a \textit{sottopassaggio} ‘subway’ is a way which runs below, etc. In other words, the prefix is a modifier which can be interpreted as an adverb (usually of place or time). On the other hand, in (2) the derived word is not a subclass of the base, but an entity, property, etc. related to the base in terms of place or time. So, a \textit{sobrecella} is not a kind of \textit{cella} ‘eyebrow’, but rather the part located over the eyebrow; the \textit{dopoguerra} ‘postwar’ is not a kind of \textit{guerra} ‘war’, but rather the time after war; \textit{sousmarin} ‘submarine’ does not mean something related to a sea which is below (intransitive use), but rather an object (a ship) of under the sea; finally, the \textit{preistoria} ‘prehistory’ is not a previous \textit{storia} ‘history’, but the period before the history. In other words, in the examples in (2) the prefix acts as a real transitive preposition.

The semantic distinction made in the previous paragraph leads us to the conclusion that, besides the verbalizing prefixes \textit{en}- and \textit{de}- (considered to be heads by Lieber 1992), there are other prefixes — those which have a transitive use — which can also be taken as heads. In contrast, derived words containing an intransitively used prefix would have the structure modifier-head.

1.2. Lieber’s Licensing Conditions

Now, let us relate the distinction between transitive and intransitive uses of prefixes to the Licensing Conditions proposed by Lieber (1992). Lieber proposes a parameter that specifies the position of the head with respect to specifiers, modifiers and complements. Each language determines the values for this parameter once, therefore, the position of the head must be the same in syntax and morphology.\footnote{Lieber’s proposal, as our own, is based on traditional Government and Binding theory. As an anonymous reviewer pointed out to us, in more recent frameworks such as Kayne’s (1994) antisymmetry theory of syntax and Bok-Bennema & Kampers-Manhe’s (1996) application to}
(3) a. Heads are initial/final with respect to complements.
   b. Heads are initial/final with respect to modifiers.
   c. Heads are initial/final with respect to specifiers.

That is, if a language is head-initial with respect to complements in syntax, heads must also precede complements in morphology.

If this hypothesis is correct, we can predict that VO languages will have words of the type in (1) and (2). In contrast, OV languages will lack prefixes of transitive use; in other words, OV languages should not have prefixes in a head position.

1.3. Basque data

In order to see if our prediction is correct, let us now consider the data from Basque, an agglutinative SOV language. Basque is said to have almost no prefixes (see Villasante 1974). bir-/bir- (the equivalent of re-) and ez (‘non’) are the only productive prefixes nowadays in Basque, together with the Romance-borrowed des-.

(4) BIR bir-berotu re-heat
    bir-bateratu re-unify
    EZ ez-izate non-existence
    ez-formal non-formal
    DES des-berdin un-equal
    des-oreka un-balance

Although it is true that prefixation is not a frequent process in Basque, there are nevertheless words containing an initial element equivalent to Romance prefixes. According to Villasante (1974), originally these elements were nouns also used as postpositions. Consider the examples in (5):

(5) AURRE aurre-izate pre-existence
    aurre-abisu pre-warning
    GAIN gain-egitura super-structure
    gain-alde upper-part
    AZPI azpi-titulu sub-title
    azpi-multzo sub-set
    AITZIN aitzin-asmo pre-project
    aitzin-solas pre-words

Although it is true that prefixation is not a frequent process in Basque, there are nevertheless words containing an initial element equivalent to Romance prefixes. According to Villasante (1974), originally these elements were nouns also used as postpositions. Consider the examples in (5):
From *aurre*, which as a noun means 'front part' and as a postposition 'in front of' or 'before', we have *aurrea* 'forewarning'; from *gain*, 'top part' when used as a noun and 'above' as a postposition, we form *gaineitura* 'superstructure, the structure of above'; from its opposite *azpi*, 'lower part' or 'under', *azpititulu* 'subtitle, a title placed below', etc. As we can see, the examples in (5) belong to the type described in (1); that is, the head is the rightmost element and the first element, the prefix, is interpreted as a modifier.

According to Lieber's proposal, the structure prefix head — complement would be impossible, since Basque is righthanded with respect to complements. In fact, as shown in the examples in (6), the same elements seen in a prefixal value in (5) can be found as second elements; in these cases, they are heads which follow their complements, as required in Basque:

(6) AURRE historia-aurrea
    history-before
    'prehistory'
    eskol- aurre- ko
    school-before-of
    'preschool'

GAIN gitzurrun-gaine- ko
    kidney- above-of
    'suprarenal'
    gila- gain
    keel-above
    'piece over the keel of a vessel'

The examples in (6) parallel those in (2): *historiaurrea* means 'prehistory', the period before the history, and *gila* refers to the piece placed over the keel of a vessel.

Finally, there are also elements which always appear in second position, as seen in (7):

(7) ONDO bazkal-ondo
    lunch- close
    'afterlunch'
    bet-ondo
    eye-close
    'part above eyebrow'
ORDE  
dekan-orde  
dean- instead  
‘vice dean’  
lehendakari-orde  
president- instead  
‘vice president’  

OSTE  
gerra-oste  
war- after  
‘postwar’  
ate- oste  
door-behind  
‘place behind the door’

Ondo ‘side close to’ forms baskalondo ‘the time after lunch’, or betondo ‘the part of the forehead above the eyebrow’. Orde, which in one sense means ‘the substitute’, is used to form dekanorde ‘vice dean’, the substitute of the dean. Oste means ‘the rear/back part’ when used as a noun, or ‘behind/after’, as a postposition; when used as second element it is equivalent to the transitively used prefix post.

This analysis explains the traditionally observed fact that Basque is a language with few prefixed words: they are limited to the structure modifier-head, lacking those corresponding to the structure head-complement. Once again, it is interesting to note that the only possible prefixed words are those we can expect from the hypothesis by Lieber (1992).

2. Morphological structure and semantics

2.1. Morphological structure

Consider now the kind of structure required in order to account for the data analyzed in Section 1. As a first attempt we propose the structures in (8) and (9) for the prefixed words in (1) and (2), respectively:

(8)  \[
\begin{array}{c}
X \\
P \\
X
\end{array}
\]  \hspace{1cm}  \text{intransitive use}

(9)  \[
\begin{array}{c}
PP \\
P \\
N
\end{array}
\]  \hspace{1cm}  \text{transitive use}
The structure in (8) is not problematic: the head is the rightmost element and the category of the complex word is that of the head. The structure in (9) is more complicated and requires justification. Consider the structures in (10) and (11):

(10)  
```
    N
   / \  
PP   ØN
  /   |
pre- historia
```

(11)  
```
    N
   / \  
A   -in
  /   |
PP   ØN
  /   |
sous- mar
```

In (10), the head of the whole construction is a zero suffix, whereas the prefix is similar to a preposition which takes the complement to its right; thus, the prefix/preposition and the noun form a constituent (here called PP) which, in turn, is the modifier of the zero suffix. In (11) an adjective-forming suffix is attached to the noun formed by a zero suffix which gives the noun category to the PP whose head is the transitive prefix.

When proposing structures such as those in (10) and in (11), we are assuming the analysis presented by Zwanenburg (1992), and by Walinska de Hackbeil (1985) for the prefix en-. Zwanenburg leaves aside the question of the possible zero suffix defended by Walinska, but if we assume that this zero suffix exists, we can explain the fact that the adjectival suffixes, such as French -in in (11), can appear to attach to a PP. The zero affix in effect changes the PP to a noun, and thus the suffix -in can attach. Although the basis for derivational suffixes such as -in can be created by recategorization without a zero affix, the semantics of these prefixed words requires the existence of this null affix.

This zero affix systematically has the categorial feature N and its effect on the Lexical Conceptual Structure of the base is regular. This behavior allows us to propose the existence of this zero affix, similar to the zero affix proposed by Lieber (1992) for French compounds of the type essuieglace 'wind-
shield’, where the affix converts a verbal phrase (essuie + glace) into a noun. As for gender, examples such as those in (12) suggest that the noun to which the prefix is attached determines the gender of the derived word:

(12) | It. | pre-istoria | storia (fem.) → preistoria (fem.) |
     | Sp. | pos-guerra  | guerra (fem.) → posguerra (fem.) |
     | Cat. | sobre-cella | cella (fem.) → sobrecella (fem.) |
     |     | over-eyebrow | ‘part above eyebrows’ |

The fact that the gender of the complex word depends on the gender of a non-head constituent could be a problem and therefore the proposal of a zero suffix would not be satisfactory. However, the examples in (13) show that many times the gender of the derived word does not coincide with the gender of the base; in those cases, the derived word is masculine, the non-marked gender of the zero affix which we consider to be the head of the noun:

(13) | It. | dopo-barba | barba (fem.) → dopobarba (masc.) |
     | Sp. | sobre-mano | mano (fem.) → sobremano (masc.) |
     | Cat. | sota-màniga | màniga (fem.) → sotamàniga (masc.) |
     |     | sobre-taula | taula (fem.) → sobretaula (masc.) |
     |     | over-table  | ‘tablecloth’ |

More to the point, several of these nouns can be either masculine or feminine:
It. sotto-coppa coppa (fem.) $\rightarrow$ sottocoppa (masc./fem.)
under-glass 'coaster'
sotto-gola gola (fem.) $\rightarrow$ sottogola (masc./fem.)
under-neck ‘ribbon of a hat which is tied under the neck’
Cat. sota-copa copa (fem.) $\rightarrow$ sotacopa (masc./fem.)
under-glass 'coaster'

All this suggests that there might be some diachronic process which could account for the gender change, a question that should be worked out more thoroughly and that goes beyond the scope of this paper.

2.2. **Semantic interpretation**

Let us now look into the semantic interpretation of the examples in (2). As we said, the meaning of the derived words in (2) can be paraphrased as in (15):

(15) \[
\begin{array}{c}
\text{time} \\
\text{place} \\
\text{situation} \\
\vdots
\end{array}
\quad \begin{array}{c}
\text{before} \\
\text{after} \\
\text{over} \\
\vdots
\end{array}
\quad X
\]

We can thus suppose that ‘time’, ‘place’, ‘situation’, etc. is the meaning of the zero affix and that this meaning is modified by ‘before’, ‘after’, ‘over’, etc., the meaning of the prefix. The concrete interpretation of the zero affix can depend on the semantic content of the nominal root: *history* denotes a time, *coma* a state, and so on.

These observations can be accounted for in terms of Lexical Conceptual Structure (LCS) (see Jackendoff (1990)), which could be something similar to the one proposed in (16):

(16) \[
\text{LCS of the derived word}
\]
\[
	ext{prehistory}
\]
\[
\text{[Time Y [ BEFORE ([Time X)])]]}
\]

In a first step, the LCS of the prefix, which corresponds to a function (BEFORE, AFTER, etc.) is combined with the LCS of the root, a Thing, a State, a Time, etc. In a second step, this complex LCS is subordinated to the LCS of the zero affix, which, in turn, corresponds to a Thing, State, a Time, etc. located in time or space at the point indicated by the subordinated LCS.
It is worth noting that this analysis reflects the fact that in the structure in (10) the head of the complex word is the zero affix, although the head of the first constituent is the prefix. Likewise, adjectives like those in (17), from Spanish, mean ‘related to a period/event/place... after the Concile, or under the water’:

(17) post-concili-ar
post-concili-ar
'post-conciliar'
sub-acuá(t)-ico
sub-water-ic
'subaquatic'

This is exactly the semantic interpretation which corresponds to the structure in (11). In other words, the meaning of relational adjectives containing a prefix of transitive use is much more accurately reflected by the structure in (11) than by the traditional representation in (18):

(18) A
    Pref A
    sub acuático

If our analysis is correct, we can expect that the words containing a non transitive prefix, such as those in (1), will not have the meaning corresponding to the zero affix, but only that of the prefix combined with the root. In fact, this is exactly what happens, as we can see in the paraphrases in (19):

(19) Sp. preaviso previous notice  'prewarning'
    Cat. superíndex superior index  'superscript'
    It. precotto cooked before  'precooked'

2.3. The position of modifiers

Finally, we must address why the modifier in the examples in (1) appears to the left of its head, when in Romance languages the modifier usually follows the head in syntactic constructions.³

³ As an anonymous reviewer pointed out to us, some Romance compounds such as Catalan guardia(s) civil(s) (guard-civil, ‘civil guard’) or ciutat(s) dormitori (city-dormitory, ‘dormitory town’), show a head-modifier order. Nevertheless, most of them have internal inflection. That fact
In (21) we present other examples that show that in morphological constructions the head usually follows the modifier.

\begin{verbatim}
(21) Cat. mal-parlar curt-circuit
    ill-speak short-circuit
    ‘to speak ill’ ‘shortcircuit’

Sp. mal-hablado corto-circuito
    ill-spoken short-circuit
    ‘foul-mouthed’ ‘shortcircuit’

It. benvoluto corto-circuito
    well-loved short-circuit
    ‘beloved’ ‘shortcircuit’

Fr. bien-aimé court-circuit
    well-loved short-circuit
    ‘beloved’ ‘shortcircuit’
\end{verbatim}

Why does the modifier precede the head in morphology? A possible hypothesis could be that modifiers always precede heads in D-structure. When in Romance languages the head raises to check its inflectional features, the modifier remains to the right of the head. We show this movement in (22):

\begin{verbatim}
(22) suggest that they can be analyzed as the lexicalization of a syntactic constituent. See Gràcia & Fullana (in press).
\end{verbatim}
On the other hand, this syntactic movement does not take place at the morphological level, and, as a consequence, the word is rightheaded and the modifier remains to the left:

In (23), the constituent that moves to INF is the highest node $X^0$, which contains the head root preceded by the modifier.

3. Conclusions

We have argued that the structure of some prefixed words in Romance languages can be easily explained on the basis of their meaning. The distinction proposed by Zwanenburg between transitive and intransitive uses of prefixal elements and the Licensing Conditions by Lieber have been adopted to distinguish prefixes which act as modifiers from those which are heads on a first level. We think that the analysis presented here for prefixes accounts for the intuitions of speakers about the structure of prefixed words. Moreover, it makes the right predictions about languages such as Basque, which are rightheaded, since it predicts that this kind of language lacks transitive prefixes. Our hypothesis is thus more explanatory than those previously suggested to date.
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References


Catalan verbal compounds
Internal order and argument interpretation

Lluïsa Gràcia & Olga Fullana

The aim of this paper is to propose a structure for Catalan compounds formed by a verbal root, the head, preceded by an inalienable possession noun (IPN). These compounds pose two problems: (a) they seem to hold an OV order instead of the regular VO order of Catalan; and (b) the Theme of a verbal phrase headed by these compounds is also interpreted as the possessor of the IPN within the compound. We claim, first, that the IPN is not a complement of the verbal root but a modifier. Second, the double interpretation of the object is a consequence of a process of lexical subordination of the IPN’s Lexical Conceptual Structure to the Lexical Conceptual Structure of the verbal root in the lexical process of composition.

Introduction

In this paper we propose an analysis for a type of Catalan verbal compounds, some examples of which are listed in (1):

(1) cama-trençar1 leg:break ‘to break the leg(s) (of an animal)’
cor-glaçar-se heart:freeze-INc ‘to get frightened’
coll-trençar neck:break ‘to break the neck (of a person)’
sang-cremar-se blood:burn-INc ‘to get impatient’

These compounds are formed by a verbal root, the head, preceded by an inalienable possession noun (IPN henceforth). Where they appear these constructions can be easily related to sentences in which the IPN is contained in a syntactic constituent headed by a simplex verb, as shown in (2a) and (2b):

(2) a. El caçador va cama-trençar l’ocell.
the hunter PAST leg:break the bird
‘The hunter broke bird’s leg(s).’
b. El caçador va trençar la cama a l’ocell.
the hunter PAST break the leg to the bird
‘The hunter broke bird’s leg.’

1 In Romance examples, we use a hyphen to facilitate the identification of the compound’s two roots.
The compounds in (1) pose two problems. The first has to do with order in the syntax and in the morphology. If we accept, following Lieber (1992) among others, that the order of constituents must be the same in both components, then the traditional analysis that considers the compounds in (1) as having a structure object-verbal head would be in contradiction with this generalization because Catalan is a VO language.  

On the other hand, it is intuitively clear that the possessor of the IPN in (2a) is interpreted both as the Theme of the compound verb and as the Possessor of the IPN within the compound. How can this double interpretation of an argument be explained? We defend the following hypothesis:

I. The IPN is not a complement of the verbal root, but a modifier. As a modifier, it will not receive the thematic role Theme of the verbal element. The argument that will realize the Theme role is the Possessor of the IPN.

II. Catalan modifiers (at least, verbal modifiers) are always generated in a pre-head position, both in morphology and in syntax. In syntactic structures, however, they appear after the head because the head raises to check its features. In morphology, on the other hand, this movement does not exist, so the modifier remains at the left of the head.

III. The double interpretation of the object of the compound is a consequence of a process of lexical subordination of the IPN’s Lexical Conceptual Structure to the Lexical Conceptual Structure of the verbal root in the lexical process of composition.

We have organized the paper in the following way: first, we present the data from Catalan and from other languages; in the second part, we defend the idea that the IPN is a modifier of the verbal root and it is not the object, and we compare these compounds with other Catalan compounds of a similar structure. In the third section, we propose an internal structure for these compounds. The fourth part is devoted to semantic interpretation, and, finally, we will justify why we consider that for these compounds a lexical analysis is better than a syntactic derivation.

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2 According to Lieber (1992), there is a parameter that fixes the position of the head with respect to complements, modifiers and specifiers. Each language chooses the value of this parameter which serves for both syntax and morphology. Licensing Conditions in (i) define this:

(i) Licensing Conditions
a. Heads are initial/final with respect to complements.
b. Heads are initial/final with respect to specifiers.
c. Heads are initial/final with respect to modifiers.
1. The data

Romance languages have very few verbal compounds. Among them, the compounds in (1) are a special kind which is not found in all Romance languages. In Catalan, however, this kind of compound is not unusual, and we have found more or less one hundred words of this kind. Most of them contain an IPN as a first element, as we can see in (3) and (4), nevertheless, in some cases the noun is not an IPN, as in (5):

(3) cama-trencar leg:break 'to break the leg(s) (of an animal)'
cor-glaçar-se heart:freeze-INC 'to get frightened'
sang-cremar-se blood:burn-INC 'to get impatient'
coll-rencar neck:break 'to break one’s neck'
pell-obrir-se skin:open-INC 'to chap'

(4) coll-portar neck:carry 'to carry on one’s shoulders'
cor-bategar heart:beat 'the heart’ + ’to beat'
peu-calcigar foot:tread 'to tread on'

(5) aigua-batre water:beat 'to splash water'
aigua-barrejar-se water:mix-INC 'to meet (two rivers)'
terra-trémer earth:shake 'to quake'

The difference between (3) and (4) is that in (4) the IPN cannot be interpreted as an object; it is clearly a modifier (locative in collportar or instrumental in peu-calcigar), or a subject (in corbategar). The noun in (3), as we have seen before, has been interpreted as the object of the verb. In (5), on the other hand, the noun before the verbal root is always interpreted as those in (4). Leaving aside the compounds in (5), we can see another difference between (3) and (4): whereas in (3) the possessor corresponds to the deep internal argument of the complex verb (see (6a)), this is not the case for the verbs in (4), where the possessor is the subject (as in (6b)):

the hunter leg:breaks the bird
‘The hunter breaks bird’s leg.’
b. El pare coll-porta el nen.
the father neck:carries the child
‘The father carries the child on his shoulders.’

Although this kind of compound is not general in Romance languages (they do not exist in either French or Italian), they are abundant in Occitan dialects.
(see (7), from Klingebiel (1988)) and we can also find some cases in Spanish (see (8)) with the same interpretation of Catalan compounds.3

(7) gorjo-badà  throat:open ‘to open wide one’s mouth’
came-poudà-s  leg:break-INC ‘to break the leg(s) (of an animal)’
sang-birar  blood:turn ‘to upset (morally)’
chap-lavar  head:wash ‘to scold’

(8) perni-quebrar  leg:break ‘to break the leg(s) (of an animal)’
mani-atar  hand:bind ‘to bind the hands (of a person)’
ali-quebrar  wing:break ‘to break the wing(s) (of a bird)’

Similar compounds are found in Germanic languages, as shown in (9) and (10):

(9) They fingerprinted/browbeat/brainwashed the suspect. (from Rice & Prideaux 1991)
(10) Läkaren hjärt-opererade patienten. (Swedish)
        doctor.the heart:operated patient.the
        ‘The doctor operated the patient’s heart.’
        (from Josefsson 1993)

2. The IPN as a modifier of the verbal root

As said before, Catalan linguists have always analyzed the compounds in (1) as having the structure noun object-verbal head (see Mascaro (1985), Gavarró (1990), among others). If this analysis were correct, it would be very difficult to maintain Lieber’s hypothesis according to which parameters of order have the same value in both the morphology and syntax of a language. Since we consider that Lieber’s hypothesis should be maintained if at all possible, we will try to explain these compounds in another way.

Compounds such as those in (4) are not problematic for our aims, because the IPN is clearly a modifier of the head, and therefore they are not a counter-example to the claim that Catalan is always left-headed with respect to complements. The compounds in (3) are less clear, because the IPN could be understood as the object of the verbal root, as we can see in the paraphrases in (11):

3 In Spanish it seems that this kind of compound is not productive any longer. The vowel i in its compounds has been interpreted as a linking vowel (see García Lozano 1993 among others); diachronically, it could be related to the Latin genitive or a Latin thematic vowel.
Nevertheless, the paraphrases in (11) are not the only paraphrases appropriate for this kind of compounds, as we can see in (12):

(12) coll-trencar-se (NP) trencar-se pel coll (NP) break-INC by the neck (NP)to break his/her/its own neck
coll-tombar del coll NP turn of/from the neck NP ‘to turn NP’s neck’
cor-ferir del cor NP hurt of/from the heart NP ‘to break NP’s heart’
ull-ferir ferir a l’ ull NP hurt in the eye NP ‘to impress negatively NP’

Whereas in (11) the possessor is a prepositional object (in traditional terms a possessive dative) of the object IPN, in (12) the possessor is the object and the IPN appears as a modifier, parallel to the Greek accusative. Intuitively, it is clear that the entity affected by the action is the possessor, and that it is affected in the part denoted by the IPN. In other words, the IPN modifies the predicate formed by the verb and the possessor: in (12), for example, neck (or by the neck) modifies the action of break NP.

We conclude that the IPN in compounds of the type of camatrencar should be treated as a modifier of the verb rather than as its object.
This analysis allows us to generalize on the structure of verbal compounds in Catalan: all of them have the same structure modifier-head. In (13) we present all the possible kinds of verbal compounds in Catalan:

(13) a. aigua-batre (see (5)) [N+V]
b. coll-portar (see (4)) [IPN+V]
c. cama-trencar (see (3)) [IPN+V]
d. mal-parlar
   ‘to speak ill of’ [Adv.+V]
e. car-vendre
   ‘to sell at an expensive price’ [Adj.+V]

Moreover, this generalization can be extended to another kind of predicative compounds, those formed by a noun (generally an IPN) and an adjectival or participial root that is the head:5

(14) a. un ocell ala-llarg
   a bird wing:long
   ‘a long-winged bird’
   un home cama-curt
   a man leg:short
   ‘a short-legged man’
   El noi és cara-prim.
   the boy is face:thin
   ‘The boy is thin-faced.’
   un ocell ala-ferit
   a bird wing:hurt
   ‘a hurt-winged bird’

b. una poma gel-cuita
   an apple ice:cooked
   ‘an iced apple’
   El estava creu-clavat.
   he was cross:fixed
   ‘He was crucified.’
   Ell es va quedar pal-plantat.
   he INC PAST remain stick:planted
   ‘He remained dead still.’

5 The compounds N+A are very productive not only in Catalan but also in Spanish. See García Lozano (1993) for a descriptive study of this kind of compound.
As for verbal compounds, when the noun is not an IPN (as in (14b)) it is clearly interpreted as a modifier (comparative, causal, locative, etc.). The same analysis can be given for the cases in (14a): the subject of the adjective is the possessor, and the IPN in the compound delimits the scope of the predication: an *alallarg* bird is a bird long in the wings. The adjectival root modifies the possessor, but this modification affects it only in the part denoted by the IPN. The paraphrases in (15) show this relation:

\[(15)\]
\[
\begin{align*}
\text{un ocell llarg d’ales} & \quad \text{‘a long-winged bird’} \\
\text{a bird long of wings} & \quad \text{‘a long-winged bird’} \\
\text{un home curt de cames} & \quad \text{‘a short-legged man’} \\
\text{a man short of legs} & \quad \text{‘a short-legged man’} \\
\text{El noi és prim de cara.} & \quad \text{‘the boy is thin of face’} \\
\text{The boy is thin-faced.} & \quad \text{‘the boy is thin-faced.’}
\end{align*}
\]

We conclude that all Catalan predicative compounds have the same structure modifier-predicative head.

3. The structure of 

\[
\text{NV}_v\text{ compounds and the position of the modifier}
\]

We have concluded that the structure of Catalan verbal compounds is modifier-head. At this point we must account for why it is that in compounds, that is, in morphology, the modifier precedes the head when in syntax it follows the verb, as shown in the examples in (16):

\[(16)\]
\[
\begin{align*}
\text{parlar malament d’algú} & \quad \text{vs.} \quad \text{mal-parlar} \\
\text{ill speak of somebody} & \quad \text{ill speak} \\
\text{‘to speak ill of somebody’} & \quad \text{‘to speak ill of somebody’} \\
\text{vendre cara la casa} & \quad \text{vs.} \quad \text{car-vendre} \\
\text{expensive sell the house} & \quad \text{expensive sell} \\
\text{‘to sell the house at an expensive price’} & \quad \text{‘to sell the house at an expensive price’}
\end{align*}
\]

We propose that verbal modifiers are generated to the left of the verb in both morphology and syntax. However, in syntax the verb must raise over the modifier to check its inflectional features. After movement, the modifier appears to the right of the verb. This movement is represented in (17).
On the other hand, in morphological constructions the verbal root does not move, but rather appears in the preverbal basic position, as in (18):

Compounds of the *camatrencar* type can be treated in the same way:

In proposing these structures for compounds, we are assuming the proposal of Ackema (1995) on the internal structure of words. In this sense, the modifiers in (18) and (19) appear in an adjunct position. As a consequence, we assume that in (19) the IPN cannot receive the thematic role Theme from the verbal head, because of its non-argumental position. The complex verb, then, will have an internal argument.
There still remains one question to be accounted for. How can we explain the relationship between the IPN and its Possessor? The structure in (19) does not reflect this dependence.

4. The semantic interpretation

Let’s recall that the object of compound verbs such as camatrencar is interpreted as the Theme of the complex verb, as we have justified in (19), and also as the Possessor of the IPN. It is not easy to justify this double interpretation structurally as it seems to violate the Theta Criterion. Our solution in based in the following points:

I. First, we assume that theta-roles are not primitives of grammatical theory, but rather that they derive from the Lexical Conceptual Structure (LCS).

II. Second, there are principles that regulate the mapping from LCS to argument structure, that is the mapping from lexical semantics to syntax.

III. Third, not all variables in LCS have to be projected in argument structure.

IV. Two variables in LCS can be projected in syntax as a single argument, sometimes by means of a lexical process of subordination.

None of these assumptions are original, and they have been proposed by Jackendoff (1990), Lieber (1992), Hale & Keyser (1993) and Levin & Rappoport (1988), among others.

When a lexical process combines a verbal root like trencar ‘to break’ and a nominal root as cama ‘leg’, an IPN, the corresponding Lexical Conceptual Structures also combine to form the LCS of the compound. For example, the LCS of the inchoative form of break would be roughly that in (20a), and the LCS of an IPN, that in (20b); the latter contains a variable corresponding to the possessor (we assume with Vergnaud & Zubizarreta (1992) that an IPN has an argument, the Possessor):

\[(20)\]
\[
\begin{align*}
\text{a. LCS of trencar} & \quad \{\text{event y BECOME BROKEN}\} \\
\text{b. LCS of cama} & \quad \{\text{thing leg (OF z)}\}
\end{align*}
\]

When these two LCS are combined, the one corresponding to the noun is subordinated at the LCS of the verb (the head of the compound). The variable of the IPN blends with the variable of the verb and they are projected in the
argument structure of the compound as a single argument. This will be the internal argument of the compound. Since it is related to two variables in LCS, it has the double interpretation corresponding to the Theme (for (20a)), and to the Possessor (for (20b)). We cannot explain why the fusion of the two variables is necessary, but we have verified that it is always the case when an IPN appears in a morphological construction (see Fullana (1994) and (1995)).

We conclude that the relationship between the IPN and its Possessor can also be accounted for if we analyze the compounds as in (19).

The proposal we have presented for compounds such as camatrencar explains why the example in (21a) is not well-formed:

\[(21)\]
\[
\begin{align*}
\text{a. } & \text{Els nois van cama-trencar el got.} \\
& \text{the boys PAST leg break the glass}
\end{align*}
\]
\[
\begin{align*}
\text{b. } & \text{Els nois van trencar el got.} \\
& \text{the boys PAST break the glass}
\end{align*}
\]

Els nois van trencar el got.

The boys broke the glass.

If the internal argument of the compound el got ‘the glass’ is linked both to the variable of the verbal root and to the variable of the IPN, this argument has to be semantically compatible with the two elements of the compound. Although a glass can be broken, it cannot be the possessor of a leg, and thus (21a) is ill-formed.

Furthermore, it also explains why (22a,b) are ill-formed, whereas (22c) is grammatical:

\[(22)\]
\[
\begin{align*}
\text{a. } & \text{*sopa-menjar el puré} \\
& \text{soup:eat the purée}
\end{align*}
\]
\[
\begin{align*}
\text{b. } & \text{*llibre-llegr una carta} \\
& \text{book:read a letter}
\end{align*}
\]
\[
\begin{align*}
\text{c. } & \text{aigua-batre la paret} \\
& \text{water:beat the wall}
\end{align*}
\]

It is difficult to imagine a context in which soup or book can be interpreted as modifiers of to eat or to read. When a modifier interpretation is possible, as in (22c), the compound is well-formed. Note that in this case the nominal root is not an IPN and therefore the object of the compound has no semantic relation to it.

Another prediction of our hypothesis is that if the verbal root is unergative, the IPN will not be related to an object, but to the only argument of the verbal

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6. By blending, we understand a process in which two variables in the LCS, at a semantic level, project into a single argument in the argument structure, that is in syntax.
root, the subject. In (23) the Possessor of the INP coincides with the subject of the compound:

(23) a. L’ ocell ala-batega.
    the bird wing:beats
    ‘The bird flaps its wings.’

b. L’ home cor-batega.
    the man heart:beats
    ‘Man’s heart beats.’

As expected from our hypothesis, when a verbal root is transitive, the IPN can have its Possessor in the subject or in the object of the compound:

(24) a. El pare coll-porta el nen.
    the father neck:carries the child
    ‘The father carries the child on his shoulders.’

b. En Joan va peu-calcigar en Pere.
    the John PAST foot:tread the Peter
    ‘John trod Peter’s foot.’

En Joan va peu-calcigar la mà de la Maria.
    the John PAST foot:tread the hand of the Mary
    ‘John trod Mary’s hand (with his foot).’

In the cases we analyzed earlier, with break, freeze, burn, turn, etc., the verbal root is ergative. We assume that the causative value of the compound is a consequence of a posterior process of causativization. Then, in all these cases the IPN has its Possessor in the deep object of the verb, the only argument of the verbal root.

5. The lexical origin of the compounds

Let us briefly justify why we have not proposed a syntactic analysis based on an incorporation rule for these Catalan compounds. Some of the problems we find for a hypothesis based on a syntactic incorporation à la Baker (1988) are the following:

I. First, why does the IPN move? It is clear that movement is not necessary and that the analytical constructions are synonymous with those with the compound.

7 We do not reject the possibility that, in other languages where incorporation is an usual process, it could exist syntactic incorporation of any internal argument.
II. Second, Catalan is not an incorporating language. It seems odd to postulate syntactic incorporation like that of the incorporating languages only for these constructions. On the other hand, this process is absent from most other Romance languages and is very restricted in Catalan.

III. Third, and the more important, how can we explain the incorporation from a subject or an adjunct position? The trace left by the IPN would violate the Empty Category Principle.

All these facts can be explained more easily if the compound is generated in the lexicon instead of being a consequence of a syntactic process.

6. Conclusions

We conclude that Catalan compounds such as camatrencar are not a counter-example to Lieber’s hypothesis on the order of constituents. The IPN is a modifier of the verbal root and, as with all verbal modifiers, it is generated before the head. In syntax verbal modifiers appear after the verb because of the verb movement to check the inflectional features of the verb.

On the other hand, the apparent paradox of the thematic interpretation of the object of the compound has been explained. The object is interpreted as the Theme of the verb and as the Possessor of the IPN because this direct argument is related to two variables in the LCS of the compound: that of the internal argument of the verbal root (the Theme), and that of the argument of the IPN (the Possessor).

Finally, we have demonstrated that a lexical analysis for these compounds is preferable to one based on syntactic movement.

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References

Are fillers as precursors of morphemes relevant for morphological theory?
A case story from the acquisition of French

Marianne Kilani-Schoch & Wolfgang U. Dressler

This paper deals with the compatibility of acquisitional facts with grammatical theories. We present a case study of emergence of (semi-)auxiliaries and subject clitics from fillers, i.e. underspecified positional place holders, and show how this fits the integrated model of Natural Morphology and constructivism. This model assumes that internal grammatical modules are not innate but constructed by the children and that the construction process encompasses the two first acquisitional phases of pre- and protomorphology. In pre- and protomorphology, segmental and prosodic phonology are not clearly distinguished from morphology because they have not yet dissociated into separate modules or submodules.

The development of fillers in the child studied is a story of grammaticization of form and meaning which seems to give credit to this model of successive linguistic dissociations. Starting out as extragrammatical formal devices pointing both to phonology and morphology, fillers acquire a morphotactic status when prosodic-phonological position is replaced by morphological position. In a subsequent step their pragmatic meaning becomes more grammatical, i.e. more morphosemantic. The end point of the process, when fillers completely correspond to adult morphemes (which then replace them), coincides with the first indices of the emergence of morphology as a separate module.

1. Introduction

1.1. Generalities

In many grammatical theories, the importance of first language acquisition is taken as paramount (at least much lip service is paid to it): take the learnability issue throughout most of the history of generative grammar, or within our own framework, Natural Morphology, the insistence on relative ease/difficulty of acquisition. Despite such persistent claims, it is difficult to draw conclusions from studies of early phases of acquisition for grammar theory, and especially for morphology, at least for the following main reasons:

1. It is very hard to understand what a small child does, thinks, and knows (or cognizes) about language, and s/he is even much less of a little linguist than a (non-linguist) adult native speaker.

2. In order to draw conclusions for a theory of (morphological) grammar, three fairly comprehensive types of theory are needed: a) a theory of (morphological) grammar, b) a psycholinguistic theory of early language acquisition,

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1 Cf. Dressler, Mayerthaler, Panagl & Wurzel (1987), Kilani-Schoch (1988), Dressler (1997a,b,c)
c) a bridge theory (see Botha 1979) which establishes links between a) and b) and guarantees that findings within the area of b) are relevant for the area of a). We know from history of science (both epistemology and sociology of science) that any theory can easily adapt to disturbing facts by subtle modifications, but in our case we have three theories where any modification can dramatically change the (ir)relevance of b) to a). In other words, any grammar theory a) can be effectively shielded from potentially dangerous acquisitional evidence by subtle modifications in either of the two theories of b) and c). These epistemological points can be easily exemplified with the methodological arguments in Slobin (1997a, b) and in Menn (1996 and other contributions on learnability in the same volume).

3. Issues of the acquisition of morphology have been linked to morphological theory in a profound, elaborated and empirical way much less than in syntax — with the notable exception of the “past tense” quarrel between generativists and connectionists.2

Therefore, our own endeavors here cannot be conclusive but only provocative. We hope to be able to show that certain acquisitional facts are both compatible with our own morphological theory and merit to be tackled by other theories, particularly when they appear to pose prima-vista difficulties for some theoretical claim (or implicit assumption or consequence thereof).

It is universally acknowledged that children start to acquire morphology later than phonology, lexicon and syntax, and that there are some syntactic and lexical precursors to later morphology, such as morphologically unmarked lexical items in some elementary syntactic constructions. In addition, prosodic phonology has to be considered (see Peters 1997 and below). We are not dealing here with precursors of morphology at large but, more specifically, with precursors of morphemes and morphological rules. Here we may particularly cite extragrammatical reduplications, surface analogies and truncations (see Dressler & Karpf 1995: 101–103; Voeykova 1997, Iturrioz Leza 1997, Dziubalska-Kołaczyk 1997, Protassova 1997, Kilani-Schoch et al. 1998), and specifically fillers.

1.2. Previous research on fillers

The relation between fillers and the development of grammatical morphemes has been widely recognized in the literature on early language acquisition, but

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2 For our stance see Sánchez Miret, Koliadis & Dressler (1997). Most of the other acquisitional work within generative grammar is morphosyntactic rather than purely morphological, e.g. there is no purely morphological parameter-setting issue.
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Fillers are seen as one type of strategy to approach acquisition problems, in that they mainly replace unanalyzable grammatical material of adult speech such as articles, determiners, clitics, auxiliaries and other function words. Fillers usually do not exceed one syllable and consist most frequently in an unstressed vowel (Peters & Menn 1993; Bottari et al. 1993, 1993/1994; Veneziano & Sinclair 1997; López-Ornat 1997), more rarely in a consonant (Grégoire 1937; Peters & Menn 1993; Peters 1996) or in a consonant followed by a vowel (Peters & Menn 1993; Peters 1996; López-Ornat 1997; Vollmann 1997).

Fillers generally occupy slots in prosodic structures and cannot be derived from adult forms through phonological processes. All authors agree on the role and importance of the positional properties of the linguistic structure in explaining the development of fillers (e.g. Bottari 1993/1994: 329, “positional approach” of Peters 1996: 1). Crosslinguistic extensions have been given by Peters 1997: 163–166, 184f). What, however, remains unanswered and controversial, is the kind of grammatical knowledge implied by the use of fillers. Two main positions can be distinguished.

Bottari et al. (1993), (1993/1994: 343) argue against the “phonetic imitative hypothesis” where fillers serve to complete the phonetic shape of an input string and where the change from phonetic imitation to morphosyntactic competence is due to some sort of phonological bootstrapping. They also argue against the “strong morphophonological hypothesis” where fillers are “phonologically altered realizations of specific morphological items”; instead they defend a syntactic point of view on fillers by assuming that they are morphophonologically underspecified functional heads that mark the syntactic positions of the corresponding real morphemes (p. 328, p. 343). Fillers demonstrate “an acquired consciousness of some properties of the underlying structural configurations of linguistic strings” (p. 328). Shortly summarized: “(proto)syntax first, morphology later”, a view which fits to other generative studies on the acquisition of morphology (e.g. Lust, Suñer & Whitman 1994).

A different position is held in the pioneering study of Peters & Menn (1993) and by Veneziano & Sinclair (1997). Both positions can be characterized as assuming a “phonology first, morphology later” path of acquisition (Peters & Menn 1993: 743), i.e. filler children rely first on prosodic and phonological structure to reproduce and build grammatical morphemes. The development

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3 But Sophie, the child of our French corpus (see 1.4), also has “lexical fillers” (see below 2.1) and fillers replacing monosyllabic predicates, e.g. 1;9.22 a là, which may be interpreted as nins là ‘come here’. The same is true for the German-acquiring boy Bernd (cf. Kilani-Schoch et al. 1998; Vollmann 1997).
of grammatical morphemes makes use of "phonological toeholds" (Peters & Menn 1993: 746), i.e. it starts with a phonological representation of morphemes sensitive to prosodic positions in the sentence.

Veneziano & Sinclair (1997) in their hypothesis of surface sonoric properties in early fillers concentrate on the role of segments: they describe how the child’s abstraction and generalization of the most frequent vocalic sounds preceding nouns (Veneziano & Sinclair 1997: 26) leads to an incipient grammatically-based organization (Veneziano & Sinclair 1997: 37).

1.3. Aims of the paper

In this paper we want to present a case story of how certain French grammatical morphemes emerge from fillers. Our theoretical framework consists in the integration of Natural Morphology and constructivism (see Dressler & Karpf 1995). We assume that internal grammatical modules are not innate but are constructed by children according to an active interplay between general predispositions and input stimuli. Before they have achieved construction of the nucleus of a morphological module, to which extragrammatical operations of expressive morphology do not belong, at least two important phases of acquisition are distinguished: the premorphological phase is a phase where morphological operations occur (both extragrammatical ones and precursors of later grammatical rules) but where no system of grammatical morphology has yet become dissociated from a general cognitive system that handles, inter alia, words of whatever form. In this phase, extragrammatical forms are predicted to abound. The next phase, the protomorphological phase of language acquisition, can be defined as the period where the system of morphological grammar and of its subsystems start to develop without having reached the status of modules and submodules (see Dressler & Karpf 1995; Dressler 1997a). Here creative, grammatical morphology starts, albeit more according to analogical pattern formation than rule-governed creativity. Our main point is then that the emergence of grammatical morphemes from fillers fits this integrated model of Natural Morphology and acquisitional

4 This implies that we are opposed to Anderson’s (1992) model of split morphology.


6 Extragrammatical operations resemble morphological rules but violate some principle of morphological grammar, e.g. blends, backformations, echo-word formation and similar reduplications.
constructivism, whereas, so far, it has not been accounted for in any other model of theoretical morphology and may present difficulties to some of them when combined with typical assumptions about learnability. Thus we will emphasize the grammaticization process of fillers in connection with the pre- and protomorphological development.

1.4. The corpus

Although several children of the Pre- & Protomorphology Project are filler children (see Kilani-Schoch et al. 1998, Christofidou & Kappa 1998), here we limit ourselves to the French data of Sophie (Kilani-Schoch 1997, Kilani-Schoch 1998). Further research will be devoted to indepth crosslinguistic comparison.

1.4.1. Sophie’s pre-, proto- and modularized morphology

1.4.1.1. Premorphology (1;6.14–1;10.4)
Sophie’s premorphology phase is characterized by a predominance of holophrases. At the end, however, the 2-word stage is reached. Verbs have no more than two different forms, categories used are present 3. singular indicative, infinitive, imperative, a few past participles and later on periphrastic future.

Since fillers have to be distinguished from purely phonological processes, a short summary of the phonology of Sophie is presented here.

All consonants but the back voiced consonants /γ/, /g/ (plus the marginal phoneme /ŋ/) and /r/ (only in final position) and all vowels are acquired in premorphology. The most frequent tendencies affecting consonants in premorphology are not restricted to this phase but continue well into modularized morphology. These tendencies are fronting, substitution of fricatives by occlusives, labialization, denasalization, also in harmonizing and reduplication processes which are very common during this phase. Gliding, however, is more typical for premorphology only.

Substitution processes of vowels are mainly: denasalization (1;7.5 /atʃ/ for encore /əkɔʁ/, ‘still’), lowering (1;8.12 dar for dort /dɔʁ/, ‘sleeps’) and depalatalization (1;7.5 do for deux /do/ ‘two’), the first two processes still occurring in

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7 Sophie, born in Lausanne (Switzerland), has been recorded at home every ten days between 1;6.14 and 3;8.9, by her mother, in situations of play and while looking at picture books.
8 Transition subphases separate the three main phases.
9 1 year 6 months 14 days — 1 year 10 months 4 days.
10 See Kilani-Schoch (1998) for the acquisition of number in the verb.
modularized morphology. There is no general centralization process which substitutes other vowels with schwa. Hence the filler schwa (see 2.1.) cannot have such a phonological motivation.

Truncations are particularly frequent with /l/ and /r/, with a preference for the initial position (1.7.15 /i/ for il est là /i/la/ ‘he is here’), and with (initial) /v/ and /s/.

The truncations of word-initial consonants and of word-initial syllables and the insertion of fillers (see 2.) contribute to a preference for a word-initial structure VCV, combined with a preference for binary, iambic feet. Ternary feet become frequent only later.

1.4.1.2. Protomorphology (1;1 1.19–2;1.18). In protomorphology, demarcated by a syntactic spurt, a first advance in article use and the disappearance of onomatopoetic words, the child starts to construct morphology. First analogical verb forms appear and some paradigmatic activity slowly develops. Sophie builds a few mini-paradigms with up to three forms per verb.

In phonology, the inventory of consonants has been completed. Harmonizing processes are frequent during the whole phase. In addition to clusters, truncations still occur particularly with initial consonants (or syllables of polysyllabic words), and several word tokens become vowel-initial. However, it appears that most of these truncations are accompanied by a vowel change (1.11.19 /atalõ/ for pantalon /patalõ/ ‘trousers’). The status of the vowel is unclear: either it is a vowel of the word which has been changed according to the phonological substitutions mentioned above or it is a new vowel added after the truncation, in other words a filler (see 2.1. on this point). Recall that the changes â, a, ë → å are not common processes in Sophie’s corpus. Truncations of initial consonants (syllables) occur much less after 2.2.13, i.e. in the transition to modularized morphology. Interestingly, from this date onwards, the frequency of fillers drops drastically.

1.4.1.3. Modularized morphology (2;4.22). Sophie’s modularized morphology, preceded by a ten-weeks transition period, seems to begin with a sharp and continuing increase of new inflectional categories, e.g. periphrastic future, imparfait, verb plural, etc. All inflectional categories used have now become productive. Syntactic complexity improves, e.g. Sophie has, in addition to subordinate clauses, frequent and various infinitive complement clauses with correct prepositions. Three-argument-clauses appear, as well as coordination.
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2. Fillers

2.1. Lexical fillers

We have considered and counted as fillers any additional (vocalic) element occurring in the initial position of, or before, a word. These vowels are mainly /a/, /a/ and /e/, /e/. The two main sentence slots filled are the prenominal and the preverbal slots. We have also included vowels that could be considered to stand for a syllable of a truncated word or to substitute initial vowels of a word, provided that the fillers cannot be accounted for by phonology. We call this last category lexical fillers as opposed to fillers replacing clitics and other grammatical words, e.g. 1.8.22 /opə/ for lapin /lapě/ ’rabbit’, 1.9.13 /apə/ for éléphant /êlefã/, 2.0.10 /atana/ for Tatiana /tatjana/. In contrast, 1.11.7 /êsiv/ for lessive /êsiv/ ’washing’, 2.0.10 /œnir/ for venir /vanir/ ’come’ can be interpreted phonologically (see 1.4.1.1). The same holds for 2.0.18 /œve/ instead of enlever /œve/ ’take out’ with denasalization and cluster simplification (cf. 1.10.16 /œve/). For the variant /œve/, however, there is no safe phonological interpretation; therefore, the initial schwa may be a filler.

An argument for our analysis in terms of lexical fillers can be drawn from the later development (see 2.2.) of simultaneous reduction of fillers and of word-initial truncations which produce vowel-initial words. Generally speaking, lexical fillers fit into the sequential phonological pattern served by the use of fillers (see 2.2).

2.2. General characterization of fillers

Fillers, in general, occur already in the first recordings of Sophie, increase drastically between 1.10.4 and 1.11.29 where they peak. From 2.2.13 onwards, fillers decrease and grammaticalize. Before their very last period (from 2.4.22 and on), where they continuously decrease, fillers show a temporary new increase between 2.4.1 and 2.4.12.

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11 CV additions are scarce, e.g. 1.8.12 da dört /dadbr/, variant of a dört for till dort /ildbr/ ’he is sleeping’.

12 There are around 120 examples out of a total of 1590 fillers between 1.6.14 and 2.5.14, i.e. lexical fillers represent only 7.5% of all filler tokens.

13 This category has been eliminated in Bottari et al. (1993/1994)’s study whereas it is central for the analysis of Veneziano & Sinclair (1997). Grégoire (1937: 193) already raised the problem.

14 140 F/389 words, i.e. 140 fillers versus 389 words.

15 69 F/718 words.
In relation to the phases of pre-, proto- and modularized morphology, fillers can be characterized in the following way: in premorphology, fillers have a prosodic function, first without any clear morphology-determined differentiation, they appear in unstressed positions before a stressed item. The production of Sophie can be characterized by a basic pattern of unstressed F+1/2 syllables, e.g. /œdo/ for (il y en a) deux /œdo/ ’(there are) two’, /œdodo/ for (il fait) dodo ’(he) sleeps’.

The fillers are predominantly realized as schwa during premorphology, however there is much variation and there are also many /a/, less /e/.

Monosyllables prevail in early premorphology. Fillers do not necessarily replace a morpheme of the adult language, (e.g. 1;1.7 /etala/ for c(e)lui-là /suila/ ’that one’), but may be added to fit the basic phonological pattern, cf. lexical fillers (2.2).

At the end of premorphology and in protomorphology, fillers become more grammatical, i.e. in addition to their phonological functions, they acquire a syntactic function, e.g. 1;1.29 prepositional

(1) a teillon e Sophie for File camion F(de) Sophie, ‘Sophie’s truck’.

2;1.8 clefting

(2) a Maman a donne for F(c’est) Maman F(qui) donne ’it’s Mum who gives’.

In the transition period to modularized morphology, fillers become more and more grammaticized, i.e. many of them are non-ambiguous phonetic approximations of grammatical morphemes.

In modularized morphology, the few remaining fillers are in competition with their morphological replacements.

Notice that fillers illustrate clearly the non-linearity of language development, for example their drastic decrease from 2;2.13 onwards (i.e. during the transition to modularized morphology) is not directly related to the development of

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16 See also Sourdot (1977) and Veneziano & Sinclair (1997). Later, fillers do not occur preferentially with monosyllables, hence their function cannot be reduced to a rhythmic compensation for defective monosyllabic feet.

17 See also Bottari et al. (1993/1994: 355) for a distinction between true instances of fillers (or monosyllabic place holders, as they call them) and later phonetic approximations.

18 E.g. grammaticized object fillers: 2;7.5 faut a parquer, with a for la (for la voiture ’the car’) ’we must park it’, 2;7.18 peux /e/ chercher toi? with /e/ for les /les pantoufles ’the slippers’) ’can you look for them’.
articles or of clitics. Bare nouns increase temporarily in Sophie up to 2;3.9. On the other hand, the increase of clitics in (modularized) morphology does not simultaneously compensate for the disappearance of fillers, since many bare verbs persist well into modularized morphology.

Vowel quality changes match exactly the demarcation between pre-, proto- and modularized morphology. Fillers become predominantly /a/ (in contrast to earlier /ə/), from 1;11.19 onwards, i.e. at the beginning of protomorphology, whereas with modularized morphology, from 2;4.22 onwards, /ɛ/ and /e/ tokens surpass /a/ tokens, and schwa disappears.

3. Filler + Infinitive

In this part of the paper we look in detail at one particular structure with fillers that occurs in Sophie’s language, i.e. the structure F+Inf(initive), e.g.

(3) 1;9.13 /açače/ for chercher /ʃɛʃe/ (in imperative meaning) ‘look for’

(4) 1;9.22 /əwar/ for (je veux) voir /vwar/ ‘(I want to) see’.

F+Inf is especially interesting because it does not fit an adult pattern: it is a child’s construction which more than any other reveals a constructivist, self-organizing grammatical activity. As we will see, no simple interpretation in terms of reduction of a grammatical structure, e.g. subject+modal/semi-auxiliary+Inf, is sufficient (cf. for example Pierce 1992).

F+Inf (208 tokens) emerges at 1;9.13 and disappears between 2;4.22 and 2;5.27. In other words, the evolution towards the adult language takes 8 months.

3.1. Development

3.1.1. Period I (1;9.13–1;11.19)

F+Inf has first three meanings: a regulatory (Halliday 1975: 19) or imperative one, a modal one, e.g. volitional, and a descriptive one.

Examples of regulatory and volitional meaning are (3), (4) above and the two following (5) and (6), respectively:

(5) 1;9.22 /anene/ Maman for donner Maman /dɔne/ ‘give, Mum’

(6) 1;9.13 /atetir/ for (je veux) sortir /sɔtir/ ‘(I want) to go out’.
Example of descriptive meaning:

(7) 1.9.13 /ove/ for laver /lave/ = (il) lave
    ‘(he) is washing’.

At 1.10.16 a future meaning starts, which is another instance of a modal meaning:

(8) /anir/ for (il va) venir /vanir/
    ‘(he will) come’.

Notice that the distinction between future and past meaning with verbs of the 1st conjugation is sometimes very difficult. Indeed some examples seem to argue in favor of ambiguity. For example, in the following dialogue, the structure F+stem /-e/ is ambiguous:

(9) 1.11.7
    mother: tu vas tomber!
        ‘you will fall’
    Sophie: /apab/ for *(vais) tomber /tõbe/
        ‘(will) fall’
    m: tu vas tomber, attention
    S falls
    S: /apab/ for ?(suis) tombée / tôbe/
        ‘fell’
    m: tu es tombée, oui
        ‘you fell’.

The vowel of the filler shows no obvious difference from one occurrence to the next, whereas the meaning changes.

3.1.2. Period II (1.11.29–2.1.8)

At about 1.11.29 there is a dissociation in meaning between F+Inf forms and F+finite forms.

F+Inf forms have the future, volitional and regulatory meaning (e.g. (10)–(11) below), whereas F+finite forms (e.g. (11)–(12) below) have a descriptive meaning.

1.11.29

(10) /asetir/ for (il veut) sortir
    ‘(he wants to) go out’

(11) /asaj/ for *aseyer /asje/ (analogical Inf)
    = asseoir /aswar/ for imperative assieds-(toi) /asje/
    ‘sit down’. 
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2.0.10

(11) /ɔ/ balance /ɔ/ bateau for (il) balance (le) bateau

'(the) boat is swinging'

(12) /ɔ/ dort /e/ bébé for (il) dort (le) bébé

'(the) baby is sleeping'

Prosodic-phonological position of the filler seems to be replaced by morphological position (see 4.3).

The dissociation in meaning disappears while the structure F+Inf is expanding. This is the third period.

3.1.3. Period III (2;1.18–2;4.1.)

From 2;1.18 onwards, examples of descriptive F+Inf are more numerous, e.g. 2;1.18

(13) /ɔ/ faire (to)boggan for (il) fait du toboggan

'(he) is sliding' 19

And many examples of F+Inf are cases of ambiguity, corresponding both to present (descriptive) or to modal/periphrastic future verb forms (see below). Moreover, bare infinitives also show several instances of the same descriptive meaning. 20 The other examples of F+Inf have a future or volitional meaning and very sporadically a regulatory meaning.

3.1.4. Period IV (2;4.12–2;5.27)

This is the last period of F+Inf.

Most of the examples have a non-ambiguous future value, e.g. at 2;4.12

(14) après a pleurer bébé for après il va pleurer bébé

'later (the) baby (will) cry'

Moreover, they have to be analyzed as immediate precursors (grammaticized fillers) of periphrastic future structures, i.e. of adult structure. Consider:

i) instances of alternation between va and a, e.g. at 2;4.12

(15) va /pasçlé/ Maman a /pasçlé/ for Maman va consoler /kəsçlé/

'Mum will console',

19 Instead of one isolated example per corpus there are now 4 tokens/17 F+Inf at 2;1.18, 9/18 at 2;2.0, 5/18 at 2.2.13, 6/14 at 2.3.22

20 2–3/23 Inf at 2;1.18, 5–7/31 at 2;2.0, 13/47 at 2;2.13.
ii) the fact that the fillers are exclusively /a/. No /a/, no /s/.

iii) in the ensuing recording session (10 days later, 2;4.22), there are only five examples of F+Inf but many examples of a va+Inf (also of a veux+Inf).

In other words, at this age of 2;4.12, the occurrences of /a/ appear to be phonetic reductions of the semi-auxiliary va (10 tokens). And more generally speaking, the productivity of the semi-auxiliary va at 2;4.22 is parallel to the disappearance of the structures F+Inf. As to the modal veux, at 2;4.12 one example of F+Inf only can be analyzed as a volitional veux+Inf reduction:

(16)  a faire caca for (je vais/veux) faire caca
      ‘(I will do/I have to do) a pooh’.

This form cooccurs with veux and also va:
(a few utterances later)

(17)  a veux faire caca for (je) veux faire caca
      ‘(I) have to do a pooh’.

(18)  a va faire caca for (je) vais faire caca
      ‘(I) will do a pooh’.

Note that in regional French of Lausanne, X veut Inf is also used with the future meaning ‘X va Inf’, also in the mother’s input to the child.

A new deontic modal meaning seems to appear in three examples, e.g.

(19)  a pas prendre for (elle doit) pas prendre
      ‘(she should) not take’.

3.2. Fillers as precursors: functional ambiguity

As it appears often in functional analysis (see Dressler 1995), one operation may fulfill two different functions. This happens also with Sophie’s fillers. In fact we suggest that the same filler can fulfill two different functions at the same time (see examples (16) and (19) above), i.e. the two contiguous positions to the left of infinitive are simultaneously filled by a unique filler.

Fillers are two types of precursors (see the examples dicussed above): precursors of subject clitics in pronominal preverbal position21 and precursors of modal/semi-auxiliary verbs in verbal position. In several examples, each of the two analyses may be entertained at the same time, although with different degrees of probability: in (15) above, /a/ clearly replaces va. The preceding parallel clause makes an interpretation ‘Maman elle console’ highly improbable.

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21 Later on there appear a few instances of precursors of object clitics: see note 18.
Also in (14) the interpretation of /a/ as the semi-auxiliary va is more probable than an interpretation as il or il va because of the adverb après and because of the development of pleurer in the corpus: from 2;2.27 onwards, the 3. present singular is either accompanied by the clitic il or is bare, in other words, there is no filler substituting a subject clitic with pleure after 2;2.0. Moreover, at 2;5.27 a structure similar to (14) appears for the first time with the full semi-auxiliary but without the (in case of postverbal subject) obligatory coreferential subject clitic:

\[(14) \quad \text{va pleurer celui-là for (il) va pleurer celui-là} \]

`'(he) will cry that one'`.

For the analysis of the filler in (14) as an approximation of the semi-auxiliary, consider also, at 2;3.22, the following sequence:

\[(21) \quad \text{mais ouvrir a rive for mais (j'ai envie d')} \quad \text{ouvrir un livre} \]

`'but (I would like to) open a book'`

\[(22) \quad \text{envie d'ouvrir a rive for j'ai envie d'ouvrir un livre} \]

`'(I) would like to open a book'`

\[(23) \quad \text{a l'ouvrir a rive for j'ai envie de l'ouvrir un (le) livre} \]

`'(I would like) to open it, a (the) book'`

In (23) one can induce the interpretation of /a/ as the semi-auxiliary from the previous sentences (21, 22), with ellipsis of the subject.

On the other hand, the occurrence of fillers with full modals from 2;4.1 and on, allows only the clitic analysis, e.g. still at 2;6.24:

\[(24) \quad \text{a veux montrer for (je) veux montrer} \]

`'(I) will show'`

But several examples of F+Inf in the corpus are ambiguous, i.e. they can receive both interpretations in the same context. This is especially the case when Sophie talks about her actions, e.g. at 2;3.21

\[(25) \quad \text{a faire un petit tour,} \]

where F+Inf may correspond to (je) fais or (je) vais faire or je (vais) faire or je vais faire

`'(I) go/(will) go for a ride'`
Thus (25) and (26) are four-ways ambiguous. For each of the three analyses 1) $F$ = subject clitic + present, 2) $F$ = semi-auxiliary + Infinitive with ellipsis of subject clitic, 3) $F$ = subject clitic with ellipsis of semi-auxiliary, 4) $F$ = subject clitic and semi-auxiliary at the same time, there are clear parallels in the corpus.

Similar examples of ambiguity occur between $w/vux$ (see 3.1.4) and between compound past and periphrastic future (see 3.1.1).

Trying to solve such ambiguities and to look for biunique relations between form and function (both in types and tokens), in view of Slobin’s (1985: 1227f) unifunctionality operating principle, seems to follow the wrong track. For such examples are far too frequent to be interpreted as instances of fortuitous ambiguity. They rather represent polyvalence (plurifunctionality) of fillers. In case of fortuitous ambiguity, one might expect that Sophie sometimes corrects an ambiguous structure in order to make it less ambiguous. However, the only example of correction of our ambiguous constructions which appears in the corpus does not occur immediately after the ambiguous construction but only after the mother’s intermediate turn (2.4.1):

(27) S: a saraser a piscine for (je vais) chercher la piscine
    ‘(I will) look for the swimming-pool’

m: la piscine c’est dans les cochons alors
    ‘the swimming-pool is in (the book of) the pigs’

S: moi chercher for moi (je vais) chercher
    ‘me look for’ ‘I (will) look for’.

And example (15) goes even in the opposite direction.

Hence, the least variable, and thus most relevant, property of fillers seems to be their position (Peters 1996) rather than their function.

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22 “If you discover that a linguistic form expresses two closely related but distinguishable Notions, use available means in your language to distinctly mark the two Notions” (p. 1228).

23 Sequences of two fillers are not prohibited by phonotactic constraints. In other contexts, examples actually do occur (type-token ratio of sequences of fillers: 17 types /38 tokens): 2.1 18 /ea/ maman là for (c’est la) maman là ‘(it is) the mother there’, 2.4 1 /ia/ fait for (il a) fait ‘(he has) done’, etc.

The non-existence of filler sequences before infinitive is a further argument for our analysis of $F+Inf$ if the ambiguity of the filler in this position were fortuitous, the occurrence of filler sequences would be expected.
As we have seen above (1.), it has already been established that fillers represent a prosodic and phonological strategy: in the early period, the child retains some rhythmic and phonological structure: this means for Sophie *unstressed vowel + 1/2 syllable(s)*, the last one being stressed. The first unstressed vowel, i.e. the filler, is just an indication for something missing and does not specify how much and what is missing. In other words, whether there is one or two slots to be filled in this position is not yet relevant for the child. Only the main prosodic contrast between unstressed and stressed position is retained. This seems to differ from Peters & Menn’s (1993) and Peters’ (1996) child Seth, who developed in a later stage (but as early as 22 months) a sequence of two fillers for subject and modal position in modal constructions (Peters 1996: 5). Sophie does not go through such a process of sequential splitting of fillers. As we have seen above (3.1.4), grammaticization of fillers before infinitive means only that the filler has a more restricted correspondence to the adult targets (i.e. only to semi-auxiliary *vou* or modal *vou/t*), and has a non-ambiguous meaning, and is in strict variation with full modal/periphrastic future (even in its close vicinity). But later, before the emergence of the adult form, the filler does not split into two more grammaticized ones as in Peters & Menn’s (1993) and Peters’ (1996) child. Either it is dropped (see all examples of subjectless periphrastic forms), or it is replaced by the adult form, or, if there are two subsequent slots where a filler might be placed, it goes into the left position, whereas the right slot is filled with the adult form (e.g. (17), (18), (24) above). This might represent a candidate for a language-specific difference in the development of fillers, possibly due to the monosyllabic structure of French modals and of the periphrastic future semi-auxiliary, as opposed to disyllabic English catenatives.

**3.3. Primitive selection of a preferred pattern**

As to the chronological development of Sophie’s fillers, we suggest that she applies a general strategy of using, as far as long as possible, the same basic phonemes, i.e. she elaborates and modifies slowly and carefully on some basic patterns (cf. Vihman 1981). Thus Sophie seems to be an example of a conservative and selective child.

The *F+Inf* structure originates in early speech: the first infinitive sentence used by Sophie, already before the recordings, is the frozen structure *à boire* ‘(give me) to drink’. It seems that this structure is selected very early in the input by the child as a preferred structure both for pragmatic reasons (frequency and importance of situations where the child wants the feeding bottle) and for phonological reasons: this structure fits the basic phonological
pattern unstressed V + 1/2 syllable(s) with final stress. This basic phonological pattern starts with her first productions and persists up to modularized morphology, see the frequent prothesis, as in (28–29):

1:11.7/2:0.0

(28) /ɔpavy/ for t’as vu [tavy] ‘you have seen’
(29) /apyvwa/ for tu vois [tyvwa] ‘you see’

The vowel quality of fillers is further evidence for the hypothesis of the selection of a preferred primitive phonological structure: although in the premorphological phase, filler vowels are, in order of frequency, /ɔ/, /a/, /ɛ/, /e/ (see 2.1.), /a/ is the most frequent filler before infinitives, which seems to be due to the model of à boire. In the protomorphological phase, the primitive pattern a + 1/2 syllable(s) is extended with the consequence that /a/ becomes the most frequent filler.

4. Conclusion

Within Sophie’s construction of morphology, the evolution of fillers is a process of successive slow and partial modifications of the system which exists at each point of development, both in form and meaning (Kilani-Schoch et al. 1998).

We have described one preferred structure from its early pragmatic and phonological motivation through its semantic specialization and grammaticalization up to its disappearance in favor of an adult form (periphrastic future and modal constructions, i.e. mainly vouloir+Inf, but later also pouvoir+Inf, devoir/falloir+Inf).

4.1. F+Inf and the demarcation between pre-, proto- and modularized morphology

We have distinguished four periods in the development of the structure F+Inf:

Period I: 1:13–1:11.19
Period II: 1:11.29–2:1.8

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Period III: 2.1.18–2.4.1
Period IV: 2.4.12–2.5.27.

The large period I has been characterized by the prevalence of a pragmatic over a semantic meaning, e.g. the regulatory meaning. In other words, this meaning is a pragmatic feature of various speech acts (orders, requests, deontic assertions) and is bound to the context of situation. A more pragmatic meaning is typical for premorphology, to which the major part of period I belongs. We may compare the development of diminutives from a purely pragmatic to an additional semantic meaning (Dressler 1994; Ceccherini et al. 1997; Gillis 1997; Stephey 1997).

The dissociation in meaning between \( F+\text{Inf} \) forms (future, volitional & regulatory meaning) and \( F+\text{finite} \) forms (descriptive meaning) in period II (at about 1.11 29) represents system-building innovations typical for protomorphology. Indeed period II is fully included into protomorphology: it starts in its first subphase (1.11.19–2.0.10) and ends in the second one (2.0.22–2.1.18). Notice, however, that this dissociation in meaning is still speech-act-determined, and that there is no division of modal, aspectual and tense meaning. Hence there are not yet real morphosemantic oppositions.

In period III, \( F+\text{Inf} \) extends its descriptive meaning. Period III belongs mainly to the transition from protomorphology to modularized morphology.

Period IV starts with the last rise of \( F+\text{Inf} \). This structure is fully grammaticalized as immediate precursor of the periphrastic future during the transition from protomorphology to modularized morphology. With the beginning of modularized morphology, \( F+\text{Inf} \) begins to disappear, i.e. to be completely replaced. In this way the development of fillers fits the overall development of Sophie’s early morphology.25

4.2. Comparison with previous studies

If we compare the results of our analysis with previous literature on fillers (see 1.2.), Bottari et al.’s (1993) and (1993/1994) syntactic explanation cannot apply to either lexical fillers or fillers replacing main verbs (see note 3), because they neither qualify for the status of the functional head nor of Spec or Comp. Moreover, as Veneziano & Sinclair (1997) have noted, Bottari et al.

25 Since adult French has neither productive diminutive formative nor (non-Latinate) noun-noun-compound formation nor derivational possessive formation, there are no prime candidates for early-acquired word formation, and therefore the development of fillers in French cannot be compared with that of word-formation rules (in contrast to Italian, Greek and German, cf. Kilani-Schoch et al. 1998).
first have proposed to account for fillers which occur in “illicit” positions of the adult language in terms of “a hypergeneralization constructed on the basis of linguistic experience” (1993: 214), but in their second paper, Bottari et al. have given up to study such cases.

In contrast, our results fit the basic thesis “phonology first, morphology later” of Peters & Menn (1993), López-Ornat (1997) and Veneziano & Sinclair (1997), but the range of our longitudinal study is more representative than either of theirs: the premorphological phase is little discussed in Peters & Menn (1993), whereas the late (and maybe most productive) phases of fillers lack in López-Ornat (1997) and Veneziano & Sinclair (1997). For example, there are hardly any instances of F+Inf in this study of the acquisition of French.

In addition, our study has related the development of fillers, much more than previous studies, to the development of the other parts of grammar.

In difference to Peters & Menn (1993) and Veneziano & Sinclair (1997), we have identified regression phases from an already reduced use of fillers to a temporary new increase (see 2.2).

4.3. Grammaticization of fillers and Natural Morphology

The development of Sophie’s fillers gives new evidence for a constructivist approach to language acquisition (see also Veneziano & Sinclair 1997, López-Ornat 1997). Sophie constructs parts of grammar from a previous phonological basis: in these constructions she does not simply imitate adult targets but follows a creative acquisition path of her own. The relatively slow development of fillers regards not only forms but also leads to always more specific and more grammatical meaning distinctions.

Sophie’s development of fillers is a story of grammaticization of form and meaning. It starts out as an extragrammatical formal device. The use of the reduced vowel and of rather unmarked, frequent vowels points to segmental phonology, its position to prosodic phonology, but the fact that fillers (with the exception of the very low percentage of lexical fillers) are precursors of grammatical morphemes points to morphology as well. This fits well to the, already otherwise supported, assumption of a pre-modular stage where morphology, segmental and prosodic phonology have not yet dissociated into separate modules or submodules. From the point of view of the observing linguist, this (and the facts of 3.2) may be analyzed as functional ambiguity, but for the little child it is rather welcome functional polyvalence, as a way for applying the minimax principle (of expending least effort for maximal effect) to constructivist, autopoietic pattern selection.
When, in the protomorphological phase, creative morphology as precursor of later morphological grammar is added to (less active) pattern selection, one option is that extragrammatical devices in the realm of morphology (cf. Dressler & Karpf 1995) are marginalized, if they cannot be integrated into future morphological grammar. Another option is that the device, as with our fillers, allows the strategy of successive grammaticization, in order to be saved, at least temporarily, by a conservative child. Segmental-phonological variation is reduced, and prosodic-phonological position seems to be replaced by morphological position (see 3.1.2), sc. as the first morpheme of the phonological word (whether it corresponds to one or two adult morphemes or to none, see 3.2, 3.3). The new morphotactic status of the filler position is followed by morphosemanticization, i.e. we find a transition from a pragmatic to a grammatical (morphosemantic) meaning. Then, in the beginning phase of modularized morphology, fillers have to be completely fitted to target morphology, i.e. to the child’s uptake (see Harris 1992) of adult morphological grammar. Since this implies a clear correspondence to adult morphemes, fillers offer no surplus value anymore, i.e. in terms of functional polyvalence, also because functional polyvalence itself is given up in favor of the preference for (bi)uniqueness (as posited already for earlier periods by Slobin 1985: 1227f and Clark 1993). On the contrary, this preference26 induces the child to give up fillers alongside adult equivalents.

This story fits our model of integrating psycholinguistic acquisitional constructivism with the grammatical theory of Natural Morphology very well. We cannot exclude that the evolution of fillers, as in Sophie and, apparently, also in children learning other languages, also fits some other model integrating a psycholinguistic acquisitional theory with some other morphological theory. But as long as nobody has tried to propose such models, fillers appear to pose problems, at least prima vista, to models which integrate inflectional morphology into syntax (because no close syntax-dependence can be detected in the evolution of fillers27), to Beard’s (1995) separationist model, or to strong, nativist assumptions of internal modularity. With this we hope to have indicated the relevance of such acquisitional studies for morphological theory and to stimulate further research in this direction.

26 One of the main universal preferences of Natural Morphology, see Kilani-Schoch (1988: 121).
27 As acknowledged in recent acquisitional literature explicitly or implicitly (Peters & Menn 1993; Veneziano & Sinclair 1997).
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Productivity as a sign of category change
The case of Hungarian verbal prefixes

Mária Ladányi

The main purpose of this paper is to define some criteria for differentiating between a subclass of Hungarian verbal prefixes which consists of morphotactically still analyzable (in a sense morphologically complex) verbal prefixes and their source of grammaticalization: case-marked determinerless NPs. In the paper it will be shown that, concerning the status of debatable elements, an increasing degree of morphological productivity is a substantial sign of grammaticalization that has been completed. It is also argued that productivity has its basis in semantics. The paper is organized as follows: In the Introduction the problems to be dealt with are presented. Section 2 gives an analysis of one Hungarian verbal prefix as an illustration. In Section 3, synchronic facts given in the previous Sections are put into a historical perspective, and a productivity criterion hypothesis is outlined. Section 4 tries to check the productivity criterion hypothesis analyzing some preverbal elements in Hungarian, and finally, Section 5 contains the conclusions.

1. Introduction

1.1. Difficulties in defining the category of verbal prefixes

Defining the category of verbal prefixes in Hungarian involves difficulties. One of the reasons is that in their syntactic behaviour verbal prefixes are very similar to other preverbal elements. In a recent article (Komlós 1992) the author also emphasises these similarities, e.g. the pre- or postverbal position of the above mentioned elements depending on focus. (For a discussion of this see also Kálmán 1985a, 1985b; Farkas & Sadock 1989; and Pléh, Ackerman & Komlós 1989). Some examples:

(1) a. be-megy
   in-go
   ‘(s)he goes in’ →

   b. nem megy be
      not go in
      ‘(s)he does not go in’

(2) a. fel-vág valami-t
     up-cut something-ACC
     ‘(s)he cuts up something’ →

     b. nem vág fel valami-t
        not cut up something-ACC
        ‘(s)he does not cut up anything’
(3)  a. mozi-ba megy
cinema-in go
‘s/he goes to the cinema’ →

b. nem megy mozi-ba
not go cinema-in
‘s/he does not go to the cinema’

(4)  a. fá-t vág
wood-ACC chop
‘s/he chops wood’ →

b. nem vág fá-t
not chop wood-ACC
‘s/he does not chop wood’

where be ‘in’ and fel ‘up’ are verbal prefixes and parts of morphological formations (prefixed verbs), while the nouns mozi-ba ‘to the cinema’ and fá-t ‘wood-ACC’ are case-marked determinerless NPs. This similarity shows the dual nature of the verbal prefix + verb combinations: syntactically they are separate entities but morphologically underlie further processes (e.g. derivation) as a single unit. That is the reason why (in addition to the traditional term ‘verbal prefix’) nowadays they also are called prefixal preverbs.¹

Most Hungarian verbal prefixes, especially the so called primary ones — e.g. be ‘into’, ki ‘out’, le ‘down’, fel ‘up’, meg PERF, el ‘away’, át ‘across’, rá ‘onto’, etc. — do not have morphological structures synchronically.² However, there are some relatively recent verbal prefixes which morphotactically are analyzable: they seem to have a complex structure of noun + case marker.

(5)  hát-ra
back-onto
‘backwards’

(6)  hely-re
place-onto
‘into a place’

(7)  vég-ig
end-to
‘to an end, till’

¹ As in Ackerman 1990, 1995. Cf. ‘[they] do not display a synchronic syntactic relation to the verbal stem and their composition with the verbal stem is reminiscent of derivation via affixation in languages with inseparable prefixes such as Russian...’ (Ackerman 1990: 1).

It is especially difficult to differentiate between this (morphotactically still analyzable, and in a sense morphologically complex) type of verbal prefixes and their source of grammaticalization: case-marked determinerless NPs. There are cases when it seems very problematic to decide whether an element with this morphological structure is already a verbal prefix or still a noun with an inflectional ending.

The issue of whether an element is a member of the verbal prefix category or not has often been decided intuitively. That is why so many different lists enumerating them exist. The main purpose of this paper is to define some criteria for differentiating at least between the above mentioned subclass of verbal prefixes and their source of grammaticalization: nouns with inflectional ending. The hypothesis I would like to argue for is that the notion of morphological productivity can be used as an important category membership criterion for the debatable elements. Of course, productivity — which is affected by many factors — should not be a criterion in itself; but in our case it is the most characteristic feature of the category-changing process.

I will not use here a quantitative notion of productivity. I am interested in the qualitative factors, and especially the forces of semantics, that determine under which circumstances an element can become productive.

2. An illustration: the Hungarian verbal prefix agyon

It seems useful to begin with the analysis of an indisputable element which is included in every list as a verbal prefix, but structurally seems to be similar to the debatable elements. I have chosen the verbal prefix agyon ‘to death, to excess’ for this purpose. In his discussion of the verb agyon-ül (to death-hit)
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‘kill’ Hadrovics (1969: 35) observes that agyon is already a prefix “because it is able to play a role in combination with many other verbs and has distanced itself considerably from its original meaning”.

2.1. Relevant facts about agyon

First I would like to show the relevant facts about this verbal prefix and its co-occurrence possibilities with various verbs.

Historically, the verbal prefix agyon was a morphologically complex formation — a noun with an inflectional ending:

(8) agy-on
    brain/head-on
‘on the head’

From a synchronic point of view, the verbal prefix agyon is morphosemantically opaque, i.e. not a complex formation any more. In the synchronic system of Hungarian it has two characteristically different but related meanings: agyon is (as verbal prefixes in general are) polysemous:5

(9) agyon1 = ‘to death’
    agyon2 = ‘to excess’

and it can be attached to verbs to the highest degree of productivity in its second meaning.

2.2. Attachment of agyon to verbs

If we take into consideration verb groups according to the categorization of situations, it can be stated that the verbal prefix agyon is generally attached to verbs indicating dynamic, durative, and telic (imperfective) situations.6 It cannot be attached to static, non-durative or inchoative verbs, as in (10), (11), and (12), respectively.

(10) a. él ‘live’ (static) →
b. *agyon-él


(11) a. (meg)fog ‘catch’ (non-durative) →
   b. *agyón-fog

(12) a. kezd ‘start’ (inchoative) →
   b. *agyón-kezd

To verbs indicating atelic situations agyon can only be attached together with the appropriate form of reflexive pronoun magá-t (oneself-ACC ‘her- or himself’) with the situation changing to telic, and the verb becoming transitive, e.g.:\(^7\)

(13) a. dolgoz-ik
   work-3SG(intr.)
   ‘(s)he works’ →
   b. agyon-dolgoz-za magá-t
   excessively-work-3SG(tr.) oneself-ACC
   ‘(s)he overworks (herself) himself’

The verbal prefix agyon can typically be attached to transitive verbs and sometimes also to intransitive verbs that are used together with directional adverbials. In this latter case the prefix changes the argument structure of the verb: functionally it takes the place of the adverbial, whereas the verb becomes transitive, e.g.:

(14) a. a fej-é-be lő valaki-nek
   determiner head-POSS3SG-into shoot somebody-DAT
   ‘(s)he shoots into somebody’s head’ →
   b. agyon-lő valaki-t
   to death-shoot somebody-ACC
   ‘(s)he shoots somebody down’

This is in accordance with the fact that in a telic situation the goal of the action is indicated by a direct object, a directional adverbial or a verbal prefix.\(^8\) (As mentioned before, agyon can also be attached to some intransitive verbs indicating atelic situations, but only together with a reflexive pronoun. There are some exceptions where agyon also goes with intransitive reflexive verbs — instead of intransitive verbs with reflexive pronouns — such as szár ‘it dries’ → agyon-szár ‘it dries excessively’, fagy ‘it freezes’ → agyon-fagy ‘it

\(^7\) In addition to the 3SG form we have a full paradigm here: magam(-at) myself-ACC ‘myself’, magad(-at) yourself-ACC ‘yourself’, magá-t her- or himself-ACC ‘her- or himself’, magákat ourselves-ACC ‘ourselves’, magatok(-at) yourselves-ACC ‘yourselves’, maguk(-at) themselves-ACC ‘themselves’.

For each meaning the semantic groups of verbs agyon goes with can be defined.

In its first meaning agyon can be attached to verbs indicating strong physical effects, where agyonVx (Vx stands for any verb of the given group) means ‘kill something or somebody using physical force’, as e.g. in (15), (16), and also in (14) rewritten as (17):

(15) a. ver valaki-t
     beat somebody-ACC
     ‘(s)he beats somebody’ →
     b. agyon-ver valaki-t
     to death-beat somebody-ACC
     ‘(s)he beats somebody to death’

(16) a. a szív-é-be szúr valaki-nek
     det.heart-POSS3SG-into stab somebody-DAT
     ‘(s)he stabs at somebody’s heart’
     b. agyon-szúr valaki-t
     to death-stab somebody-ACC
     ‘(s)he stabs somebody to death’

(17) a. a fej-é-be lő valaki-nek
     det.head-POSS3SG-into shoot somebody-DAT
     ‘(s)he shoots into somebody’s head’ →
     b. agyon-lő valaki-t
     to death-shoot somebody-ACC
     ‘(s)he shoots somebody down’

Most verbs of this semantic group do not have complex morphological structures so it is questionable whether this group is open (i.e. whether it can increase the number of its members) or not — to put it differently: whether agyon is productive in its first meaning or not. One argument in favor of its (though slight) productivity can be the fact that in this group there exists one subgroup of denominal verbs formed from nouns indicating the tool of killing, e.g.:

(18) a. (meg-)kőv-ez valaki-t
     (PERF PREF)-stone-SUFFN somebody-ACC
     ‘(s)he throws stones at somebody’

9 SUFF indicates the two Hungarian N → V type category-changing derivational affixes, -z and -i here.
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b. agyon-kőv-ez valaki-t
to death-stone-SUFF\textsubscript{N-*}\ somebody-ACC
’she stones somebody to death ’

(19) a. (meg-)bot-oz valaki-t
(PERF PREF-)stick-SUFF\textsubscript{N-*}, somebody-ACC
’she beats somebody with a stick’
b. agyon-bot-oz valaki-t
to death-stick-SUFF\textsubscript{N-*}, somebody-ACC
’she beats somebody to death with a stick’

(20) a. (meg-)kés-el valaki-t
(PERF PREF-)knife-SUFF\textsubscript{N-*}, somebody-ACC
’she stabs somebody’
b. agyon-kés-el valaki-t
to death-knife-SUFF\textsubscript{N-*}, somebody-ACC
’she kills somebody using a knife’

The number of such tools (accepted by the speakers as suitable means for killing) is very small and restricted, and the derived verbs are usually lexicalized. However, new potential verbs can still be formed from special or even extreme tool names, e.g. in (21) and (22):

(21) ?agyon-puskatus-oz valaki-t
to death-gun stock-SUFF\textsubscript{N-*}, somebody-ACC
’she kills somebody using a (gun)stock’,

(22) ?agyon-lézer-ez valaki-t
to death-laser-SUFF\textsubscript{N-*}, somebody-ACC
’she kills somebody using a laser gun’

So the subgroup is, in principle, open — though this morphological pattern shows only very slight productivity. The whole verb group cannot be said to be closed, anyway, because it can obtain new members not only by morphological means (i.e. by noun \textarrow{\rightarrow} verb derivation), but also via semantic and pragmatic processes: verbs with other meanings can fit into this group in their metaphorical senses or due to inferences following from the context.

Semantically the most unified and at the same time the most restricted subgroup of physical force type verbs consists of verbs of hitting. agyon\textsubscript{Vx} formed from these verbs means ‘to kill something/somebody by hitting’, as e.g. in (15) rewritten here as (23):

(23) a. ver valaki-t
beat somebody-ACC
’she beats somebody’

→
b. agyon-ver valaki-t
   's/he beats somebody to death'

(Verbs with similar meanings are üt 'to beat', csap 'to strike', sújt 'to hit' etc.)

The meaning of agyon 'to death' with verbs of hitting is not different from that of the other members of the group, because the place of hitting is not necessarily the victim's head as it historically was.

In its second meaning agyon can be attached to verbs indicating several types of activities where agyonVx means 'to do something to excess, beyond measure', e.g.:

(24) agyon-dolgoz-tat valaki-t
    to excess-work-causative somebody-ACC
    's/he overworks somebody'

(25) agyon-gyógyszer-ez valaki-t
    to excess-medicine-SUFFN 3SG(tr.) somebody-ACC
    's/he gives somebody too much medicine'

(26) agyon-gyógyszer-ez-i magá-t
    to excess-medicine-SUFFN 3SG(tr.) oneself-ACC
    's/he takes too much medicine'

(27) agyon-csók-ol valaki-t
    to excess-kiss-SUFFN 3SG(tr.) somebody-ACC
    's/he smothers somebody with kisses'

These verbs (discussed as types 1–4 later on) are transitive and — in case the verbal meaning makes it possible (i.e. does not exclude the agent from being the direct object of the verb) — can also be used with a reflexive pronoun as an object, as in (26). (Type 5 has special characteristics which will be discussed separately.)

In its second meaning ('to excess') agyon can only be attached to verbs whose semantic or pragmatic contents are connected with some (not necessarily immediate or physical) effects on the state of the non-resultative object (i.e. causing some change in the state of an already existing object), e.g. in (28) and (29) vs. (30) and (31):

(28) a. szín-ez-i a rajz-ot
colour-SUFFN 3SG(tr.) determiner drawing-ACC
's/he colours the drawing'

b. agyon-szín-ez-i a rajz-ot
to excess-colour-SUFFN 3SG(tr.) determiner drawing-ACC
's/he colours the drawing to excess'
Productivity as a sign of category change

(29) a. parfüm-öz-i magá-t
   perfume-SUFFₗₘₘₚₗₐ₂ₗₐ₂ₗₐ₂ₐₖₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ₂ₐₖₐ-chief of the verbal group. Agyon can be attached productively to the following morphologically complex verb types in its second meaning:

**Type 1**: deadjectival verbs with morphological structure in (32):

(32) \([\text{Stem}_{\text{Adj}} + \text{Suff}_{\text{Adj}} \rightarrow \text{V}]\)

with meaning ‘to make/cause something Adj’, as e.g.:

(33) a. puh-it (Adj: puha ‘soft’) valami-t
   soft-cause something-ACC
   ‘(s)he softens something’
   → b. agyon-puh-it valami-t
      to excess-soft-cause something-ACC
      ‘(s)he softens something to excess’

(34) a. görb-it (Adj: görbe ‘curved’) valami-t
   curved-cause something-ACC
   ‘(s)he curves something’
   → b. agyon-görb-it valami-t
      to excess-curved-cause something-ACC
      ‘(s)he curves something to excess’

**Type 2**: denominal verbs with morphological structure in (35):

(35) \([\text{N} + \text{Suff}_{\text{Adj}} \rightarrow \text{V}]\)
with the general meaning ‘to supply with N’, as e.g.:

(36) a. (meg-)csők-ol valaki-t
    (perf. pref.-)kiss-SUFF\_N\_V somebody-ACC
    ‘(s)he kisses somebody’ →
    b. agyon-csők-ol to excess-kiss-SUFF\_N\_V somebody-ACC
    ‘(s)he smothers somebody with kisses’

(37) a. gőz-ől valami-t
    steam-SUFF\_N\_V something-ACC
    ‘(s)he steams something’ →
    b. agyon-gőz-ől to excess-steam-SUFF\_N\_V something-ACC
    ‘(s)he steams something excessively’

(38) a. (meg)bors-oz valami-t
    (perf. pref)-pepper-SUFF\_N\_V something-ACC
    ‘(s)he puts pepper into something’ →
    b. agyon-bors-oz to excess-pepper- SUFF\_N\_V something-ACC
    ‘(s)he puts too much pepper into something’

(39) a. gyógyszer-ez valaki-t
    medicine-SUFF\_N\_V somebody-ACC
    ‘(s)he gives somebody medicine’ →
    b. agyon-gyógyszer-ez to excess-medicine-SUFF\_N\_V somebody-ACC
    ‘(s)he gives somebody too much medicine’

(40) a. krém-ez-i az arc-á-t
    cream-suff-3SG(tr.) determiner face-POSS3SG-ACC
    ‘(s)he smears (her) his face with cream’ →
    b. agyon-krém-ez-i az arc-á-t
    to excess-cream-SUFF\_N\_V 3SG(tr.) determiner face-POSS3SG-ACC
    ‘(s)he puts too much cream on (her) his face’

It is not a chance phenomenon that the verbal prefix agyon can be attached to verbs of these morphological structure to the highest degree. As mentioned before, in its second meaning (‘to excess’) agyon mainly goes with transitive verbs signalling activities changing the state of an already existing object. The deadjectival suffix -í has the word-formation meaning ‘making something Adj’ and the denominal suffixes -z and -l have the word-formation meaning ‘supplying with N’ — so they enlarge exactly the
lexical group of verbs (with meaning ‘changing the state of an object’) which constitutes the basis of the agyon prefixation.

Deverbal frequentative/durative and causative verbs also often serve as bases for agyon prefixation. However, not all verbs of these classes can automatically take the prefix, see (42) and (43) vs. (44) and (45) concerning frequentative/durative verbs and (49) and (50) vs. (52) and (54) concerning causative verbs.

**Type 3:** deverbal frequentative/durative verbs with morphological structure in (41):

(41) \[ V + {-\text{gAt}_{SUFF,V}} ] V

meaning ‘to do something repeatedly or long’, e.g.:

(42) a. öel-get valaki-t
    embrace-freq. somebody-ACC
    ‘(s)he embraces somebody repeatedly’ \(\rightarrow\)

b. agyon-öel-get valaki-t
    to excess-embrace-freq. somebody-ACC
    ‘(s)he embraces somebody too much times’

(43) a. csók-ol-gat valaki-t
    kiss-SUFFN-freq. somebody-ACC
    ‘(s)he kisses somebody repeatedly’ \(\rightarrow\)

b. agyon-csók-ol-gat valaki-t
    to excess-kiss-SUFFN-freq. somebody-ACC
    ‘(s)he kisses somebody too many times’

(44) *agyont-ir-gat-ta a lecké-t

(45) *agyont–tanul-gat-ta a vers–et

The constraints are exactly the same as mentioned above. However, in some cases, when (owing to some constraints) the base verb cannot take part in agyon prefixation, the derived form (not being concerned by the limitations) can serve as a basis for derivation, see (46) vs. (47):

(46) a. (meg)fog valami-t
    touch/catch something-ACC
    ‘(s)he touches/catches something’ \(\rightarrow\)

b. *agyont-fog valamit

(47) a. fog-dos valami-t, valaki-t
    touch-freq. something-ACC, somebody-ACC
    ‘(s)he paws something, somebody’ \(\rightarrow\)
Here the activity verb *(me)g fogs* ‘to touch/catch’ does not have an effect on the object whereas *fog-dos* ‘to paw’, in a sense, does.

**Type 4:** deverbal causative verbs with morphological structure in (48):

(48) \[ V + \text{-tAt/-At}_{\text{SUFF,V}} \rightarrow V \]  
as e.g.:

(49) a. dolgoz-tat valaki-t \[ \text{work-cause somebody-ACC} \]  
\( \rightarrow \)  
\( \text{‘s} \text{he works somebody’} \)

b. agyon-dolgoz-tat valaki-t  
\( \text{to excess-work-cause somebody-ACC} \)  
\( \text{‘s} \text{he overworks somebody’} \)

(50) a. áz-tat valami-t  
\( \text{soak-cause something-ACC} \)  
\( \rightarrow \)  
\( \text{‘s} \text{he steeps something’} \)

b. agyon-áz-tat valami-t  
\( \text{to excess-soak-cause something-ACC} \)  
\( \text{‘s} \text{he oversteeps something’} \)

The constraints here are exactly the same as the ones on the base verbs (see (12) rewritten here as (51), and (29) rewritten here as (53)):

(51) a. kezd valami-t  
\( \text{start something-ACC} \)  
\( \rightarrow \)  
\( \text{‘s} \text{he starts something’} \)

b. *agyon-kezd valami-t

(52) a. kezd-et valaki-vel valami-t  
\( \text{start-cause somebody-by something-ACC} \)  
\( \rightarrow \)  
\( \text{‘s} \text{he make somebody start something’} \)

b. *agyon-kezd-et valaki-vel valami-t

(53) a. ír-ja a lecké-t  
\( \text{write determiner homework-ACC} \)  
\( \rightarrow \)  
\( \text{‘s} \text{he writes the homework’} \)

b. *agyon-ír-ja a lecké-t
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(54) a. ír-at-ja valaki-vel a lecké-t
    write-cause-3SG somebody-by det. homework-ACC
    '(s)he makes somebody write the homework' →
b. *agyon-ír-at-ja a lecké-t

Generally, it can be claimed that if the prefix agyon can be attached to a non-causative verb, it also goes with its causative form derived from it. It does not even depend on whether the verb concerned is morphologically simple or complex:

(55) a. ver valaki-t
    beat somebody-ACC
    '(s)he beats somebody'
b. agyon-ver valaki-t
    to death-beat somebody-ACC
    '(s)he beats somebody to death'
c. agyon-ver-ét valaki-t
    to death-beat-cause somebody-ACC
    '(s)he has somebody beaten to death'

(56) a. szőkít-i a haj-á-t
    blond-SUFFAdj det. hair-POSS3SG-ACC
    '(s)he bleaches (her) his hair'
b. agyon-szőkít-i a haj-á-t
    to excess-blond-SUFFAdj-3SG det. hair-POSS3SG-ACC
    '(s)he bleaches (her) his hair to excess'
c. agyon-szőkít-tét-i a haj-á-t
    to excess-blond-SUFFAdj-cause-3SG det. hair-POSS3SG-ACC
    '(s)he has (her) his hair bleached to excess'

This statement cannot be inverted. However, due to the fact that the causative suffix makes verbs transitive, this suffix may also increase the chances of the prefix agyon for its attachment to verbs. We do not have non-causative prefixed verbs formed from verbs, e.g. in (57–59):

(57) a. esz-ik [valami-t]
    eat-3SG(intr.) [something-ACC]
    '(s)he eats [something]' →
b. *agyon-esz-ik [valami-t]

(58) a. isz-ik [valami-t]
    drink-3SG(intr.) [something-ACC]
    '(s)he drinks [something]' →
b. *agyon-isz-ik [valami-t]
(59) a. dolgoz-ik
   work-3SG(intr.)
   ‘(s)he works’
   \[\rightarrow\]
   b. *agyom-dolgoz-ik

while their causative versions derived from them can be prefixed:

(60) a. esz-ik \[valami-t\]
   eat-3SG(intr.) \[something-ACC\]
   ‘(s)he eats [something]’
   \[\rightarrow\]
   b. e-tet valaki-t \[valami-vel\]
   eat-cause somebody-ACC \[something-with\]
   ‘(s)he feeds somebody (on) something’
   \[\rightarrow\]
   c. agyom-et-et valaki-t \[valami-vel\]
   to excess-eat-cause somebody-ACC \[something-with\]
   ‘(s)he gives somebody too much food’

(61) a. isz-ik \[valami-t\]
   drink-3SG \[something-ACC\]
   ‘(s)he drinks [something]’
   \[\rightarrow\]
   b. i-tat valaki-t \[valami-vel\]
   drink-cause somebody-ACC \[something-with\]
   ‘(s)he gives somebody something to drink’
   \[\rightarrow\]
   c. agyom-i-tat valaki-t \[valami-vel\]
   to excess-drink-cause somebody-ACC \[something-with\]
   ‘(s)he gives somebody too much drink’

(62) a. dolgoz-ik
   work-3SG(intr.)
   ‘(s)he works’
   \[\rightarrow\]
   b. dolgoz-tat valaki-t
   work-cause somebody-ACC
   ‘(s)he works somebody’
   \[\rightarrow\]
   c. agyom-dolgoz-tat valaki-t
   to excess-work-cause somebody-ACC
   ‘(s)he overworks somebody’

**Type 5:** A special kind of *agyom* prefixation is when the prefix is attached to intransitive, atelic verbs. It can only happen if the prefixed verb is used together with the reflexive pronoun as a “fake object” (i.e. the verb formally becomes transitive). Originally not being transitive, these verbs cannot take the verbal prefix without the appropriate form of the reflexive pronoun. It also means that intransitive base verbs, on the contrary, cannot be used with it.
The base verbs are not constrained semantically here, because the reflexive pronoun expresses that — in a sense and in some degree — every activity can have some effect on the agent, whereas the verbal prefix agyon also indicates that the effects follow from excessively performed activities (too long, too frequently, too intensively). This is the reason why the type agyon-sétál-ja, etc. magá-t ‘(s)he walks, etc. too much’ has also the pragmatic meaning ‘(s)he exhausts (herself) himself by walking, etc. too much’. So while we do not have prefixed verbs derived from transitive verbs in (65) and (66) (owing to some constraints discussed earlier), we have prefixed verbs in (67) and (68) derived from intransitive bases:

(63)  a. sétál
       walk  
       ‘(s)he walks’  →

 b. *sétál-ja magá-t  →

c. agyon-sétál-ja magá-t  
to excess-walk-3SG(tr.) oneself-ACC  
‘(s)he walks too much’

(64)  a. kártyá-z-ik  
card-SUFF$_{w-v}$-3SG(intr.)  
‘(s)he plays cards’  →

 b. *kártyá-z-za magá-t  →

c. agyon-kártyá-z-za magá-t  
to excess-card-SUFF$_{w-v}$-3SG(tr.) oneself-ACC  
‘(s)he plays cards too long’
(68) a. tanul
learn
’she learns’ →
b. agyon-tanul-ta magá-t
to excess-learn-3SG(tr.) oneself-ACC
’she learns too much’

Semantically the group of verbs with *agyoni* in its second meaning contains a subgroup indicating negative (but not necessarily physical) effects; *agyoniX* means ‘almost kill or ruin somebody by an excessive activity’ here, as in (69):

(69) a. kin-oz valaki-t
torture somebody-ACC
’she tortures somebody excessively, almost to death’
b. agyon-kin-oz valaki-t
to death-torture somebody-ACC

(Similar verbs are *gyötor* ‘to torture’, *hajszol* ‘to work’, *terhel* ‘to burden’, etc.). The meaning of *agyoni* with the members of this verbal subgroup is in between *agyoni1* and *agyoni2*: ‘excessively, almost to death’.

In connection with type 5 verbs we have mentioned that there is a pragmatic meaning involved in prefixed verbs formed from them: ‘to exhaust oneself by doing something excessively’. The same is true of transitive verbs other than verbs indicating negative effects. Here the involved (pragmatic) meaning is that the action carried out excessively can ruin, damage or spoil somebody or something, or just can be unpleasant, annoying or tiring, etc. to somebody, as e.g. in (70) and in (39) b. rewritten here as (71):

(70) agyon-hord-ja a ruhá-t
to excess-wear-3SG(tr.) determiner dress-ACC
’she wears a dress too often’ (pragmatic meaning: she damages the dress by it)

(71) agyon-gyógyszer-ez valaki-t
to excess-medicine-SUFFN somebody-ACC
’she gives somebody too much medicine’ (pragmatic meaning: possible negative effects)

It means that in addition to the two characteristically different meanings of *agyoni* given in (9) rewritten here as (72):

(72) agyon1 = ‘to death’
agyoni2 = ‘to excess’
there are other slightly different uses and meanings of agyon which form a continuum:

(73) agyon1a = 'to death, by hitting'
     agyon1b = 'to death, by Vxing'
     agyon2a = 'excessively, almost to death'
     agyon2b = 'excessively'
             (possible consequences for somebody or something: damage, unpleasantness, etc.)
     agyon2c = 'excessively'
             (possible consequences for oneself: tiredness, unpleasantness, etc.)

This graduality in the meanings of agyon is also reflected in its attachment to verbs, especially concerning the lexical meanings of verb groups, i.e. verbs that agyon goes with can be scaled as follows: verbs of hitting with agyon1a; verbs of physical force (other than hitting) with agyon1b; transitive verbs with negative effects with agyon2a; transitive verbs in general with agyon2b; intransitively used or intransitive verbs with agyon2c. That means that a verb agyon can be attached to has to indicate an action which (if carried out excessively) (a) can cause somebody’s death, (b) can cause harm to somebody or something, or (c) can be unpleasant, annoying or tiring, etc. to somebody or to the agent.10

In type 5 the extremely high productivity of the prefix agyon can be explained in two ways. The first explanation is that the use of verbs with the reflexive pronoun can change all kinds of atelic situations to telic ones — and due to this, the domain of the prefix agyon enormously increases. The other explanation is connected with the meaning change and the grammaticalization process of agyon, a topic we are going to deal with in the next Section.

3. Changes in meaning, category and productivity: the hypothetical grammaticalization process of agyon

While in grammaticalization research there are discussions about the nature of semantic changes (semantic bleaching vs. semantic enrichment, the role of

10 We cannot stipulate that a given base verb should always indicate an action which causes death, harm or inconvenience to somebody or to the agent in itself. It is very important that the given action must be carried out excessively and death, harm or inconvenience is just the final result of the action.
metaphor and metonymy vs. inference and context in the process of grammaticalization, see e.g. Bybee, Perkins & Pagliuca 1994 vs. Heine, Claudi & Hünemeyer 1991 or Rubba 1994), there is full agreement that grammaticalization forms a continuum in which polysemy and the layering of (grammatical) meanings are of great importance (see Hopper 1991; Heine, Claudi & Hünemeyer 1991: 20, 107–108; Bybee, Perkins & Pagliuca 1994: 21–22). According to Bybee, Perkins & Pagliuca (1994: 18), on the basis of the synchronic chain of different uses (connected meanings) of a grammaticalized element — that reflects the stages of grammaticalization — the whole process of grammaticalization can be reconstructed along the so called "possible grammaticization path".

Supposing that synchronic facts and relations are reflections of diachronic changes, and putting our synchronic knowledge of agyon into a historical perspective, we can outline a hypothetical process of its becoming a verbal prefix. My suggestion is that on these theoretical grounds a method can be elaborated for deciding on the category membership of the debatable elements. First I will deal with the connections of changes in meaning, category and productivity concerning agyon, and then with the evaluation of some preverbal elements.

3.1. Agyon in a historical perspective

Our knowledge about the different uses of agyon and the detailed picture of its meanings in 2.2. can serve as a basis for understanding its (hypothetical) grammaticalization process we are trying to outline now.

Stage (1): As seen before, in its original meaning ('on the head') agyon could express the place or direction of the action. With the verbs of hitting it indicated the concrete place of the action, and was part of a syntactic construction as an adverbial element.

(74) *agy-on út valaki-t
     brain/head-on hit somebody-ACC
     '(s)he hits somebody on the head'


12 Cf. agyba-fõbe ver 'beat up totally', where both agy and fõ mean 'head', while -b-/vé 'into' is a directional inflectional ending.
At this stage, the use of *agyon* must have been quite restricted; due to its concrete meaning its combinatorial possibilities in syntax were quite small: from the syntactical point of view *agyon* was not productive at all.

**Stage (2):** In the synchronic system of Hungarian, the first meaning of *agyon* ‘to death’ is a reflection of the next stage which is the result of a change in meaning of the construction as a whole. It is a pragmatic change (inference) following from the context: the consequence of the action (hit → kill) becomes part of the meaning of the construction:

\[(75) \quad *agyon \text{ vág} \]
\[\text{‘hit on the head and kill somebody/something by it’} \quad \rightarrow \quad \text{agyon-vág ‘kill by hitting’}\]

As a consequence of the change in meaning of the construction as a whole, the meaning of *agyon* changes likewise:

\[(76) \quad *\text{agyon ‘on the head’} \quad \rightarrow \quad \text{agyon ‘to death’}\]

**Stage (3):** The change in meaning of *agyon* gives some new co-occurrence possibilities to the element. The restriction that it should only be attached to verbs of hitting does not apply any more, because *agyon* in its new, more generalized meaning does not give the concrete place or direction of the action (‘on the head’), but rather the result of it (‘to death’). At this stage, *agyon* may co-occur with verbs indicating physical force which can cause death: but not necessarily by hitting or by inflicting a wound on somebody’s head. Consequently, the meaning of the construction as a whole changes, or more exactly, becomes more general again:

\[(77) \quad \text{agyonVx = ‘kill somebody/something by hitting’} \quad \rightarrow \quad \text{agyonVx = ‘kill by Vxing’}\]

The generalization of the meaning and the increase in the co-occurrence possibilities advances in parallel with the isolation of *agyon*.\(^\text{13}\)

\[(78) \quad \text{agy-on (brain/head-on) ‘on the head’} \quad \rightarrow \quad \text{agyon ‘to death’}\]

At the same time, *agyonVx* type verbs — in connection with the new expanded meaning including ‘kill’ — also gain perfective meanings. This is the stage for *agyon* when the process of becoming a grammatical element (a verbal prefix) and part of a morphological construction really starts.

**Stage (4):** Presumably the exaggerated use of some $agyonyVx$ type verbs enables a further change in the meaning of the construction:

(79) $agyonyVx$ = 'kill by Vx-ing' $\rightarrow$
$agyonyVx$ = 'almost kill by excessive Vx-ing'

In this special use, $agyony$ can receive another new meaning:

(80) $agyony$ 'to death' $\rightarrow$ $agyony$ 'excessively, almost to death'

As a consequence of this change, the co-occurrence possibilities of $agyony$ can increase once again. Now the verbs it can be attached to go far beyond the verbs of hitting and indicating physical force. At this stage $agyony$ can be attached to verbs indicating negative effects.

**Stage (5):** While with verbs indicating 'physical force' the result of the action ('to death') was predominantly stressed, with verbs indicating negative effects — presumably as a consequence of an exaggerated use — the way the action is carried out begins to be more emphasized ('excessively'). This stress shifting results in the change of meaning of the verbal prefix and its co-occurrence possibilities once again:

(81) $agyony$ 'excessively, almost to death' $\rightarrow$ $agyony$ 'excessively'

At this stage, having lost the meaning element 'to death', $agyony$ can also be attached to transitive verbs with inanimate objects. At the same time, it keeps some traces of its earlier meaning as a pragmatic meaning ('negative effects: harm, damage, etc.').

At stage (5) $agyony$ gains not only a new lexical, but also a new grammatical meaning: 'excessively' is a type of aktionsart which gives the element maximal co-occurrence possibilities: at the next stage, Stage (6) $agyony$ can also go with intransitively used or intransitive verbs. This is the point when the process of becoming a verbal prefix and part of a morphological construction has been completed.

The maximal generalization of the meaning of $agyony$ makes its co-occurrence possibilities almost unlimited: it can be attached to every verb indicating an action that — carried out excessively — can be unpleasant, annoying or tiring, etc. to the patient or to the agent. At stages (5–6) the meanings of $agyonyVx$ type verbs still are connected — at least pragmatically — with the

14 At this stage, the pragmatic factor plays an important role: it depends on which actions are unpleasant, disgusting, etc. for the speaker. Somebody can say about a woman concerning her make-up, e.g. $agyonyzisa ma$az $agyony$ 'she rouges herself too much', even if her make up is not really excessive, however, the speaker thinks it is.
meaning of the first group ‘kill’. The connection is a bit indirect (in an exaggerated and metaphorical sense you can ‘kill’ or at least ‘bring somebody to ruin’ by carrying out an action which can be unpleasant, annoying, tiring, etc. to him). 15

In (82) there is a summary of the semantic changes in the grammaticalization process of agyon:

(82) agyon
Stage (1) ‘to hit on the head’
Stage (2) ‘to kill something/somebody by hitting’
Stage (3) ‘to kill something/somebody by hitting’
Stage (4) ‘to Vx almost to death’
Stage (5) ‘to Vx excessively’ → ‘excessively, almost to death’
Stage (6) ‘to Vx excessively’ → ‘excessively’

Meanings ‘to death’ and ‘excessively’ (with some variations) belong to the synchronic language system, whereas the original meaning of agyon (‘on the head’ — stage (1)) does not constitute its part any more.

3.2. General discussion

We tried to show that the grammaticalization process is complex; the changes are simultaneous and interdependent in meaning (changes in lexical meaning; lexical → grammatical meaning), in construction (syntactic construction → morphological construction), in category (adverbial → verbal prefix), and in productivity (narrow → broader → maximal co-occurrence possibilities). The most important factors in the above-mentioned process are the change in meaning of the construction as a whole, and that of the preverbal element as part of it. That is why I cannot accept Jakab’s (1982) conception that changes

15 In Lieber & Baayen (1993: 57) the authors point out a similar fact about Dutch verbs in verbal prefix ver- that ‘often carry with them a markedly pejorative or negative component of meaning’. They interpret this ‘as the possibility of filling in one of the argument positions in the LCS (Lexical Conceptual Structure) of ver-, specifically the goal argument, with a metaphorical negative Thing or Place argument.’
in meaning of the given formations do not play any role in the status of the preverbal element. Semantic changes are the basis of the entire grammaticalization process, but they are connected very intimately with category change and changes in the productivity of the preverbal element.

In Hungarian an element can be categorized as a verbal prefix (and at the same time productively be attached to several types of verbs) only if the change in the meaning of the construction as a whole and that of the preverbal element as part of it have taken place. The meaning of the element has to change so that there is also a conceptual shift from lexical to grammatical meaning. The whole process is accompanied by a substantial increase in the productivity of the element. That is why productivity in this case can be an important sign of category change.

4. Status of some (debatable) preverbal elements

In Hungarian there are several morphologically complex preverbal elements which may have a claim to be listed as verbal prefixes. To decide on their status, first of all, we have to take into consideration the formal/constructional characteristics of verbal prefixes in language, namely that (a) they can occur in a preverbal position without a determiner, whereas occupying the immediately preverbal focus slot (for details see Kálmán 1985a, 1985b), and that (b) they do not include determiners even in their postverbal positions.16

Morphologically complex formations not meeting these criteria, cannot even be considered as debatable elements. For example, if an element in a preverbal position can contain a determiner, as in (83) b., or if a determiner emerges with it in a postverbal position as in (84) b., the element cannot be called a verbal prefix.

(83)  a. föld-ön csúszik
     ground-on slide
     ‘(s)he slides on the ground’

                   b. a föld-ön csúszik
     determiner ground-on slide
     ‘(s)he slides on the ground’

16 When Beóthy & Altmann (1985) define the number of Hungarian verbal prefixes as about 100, they may think about preverbal elements fulfilling the above-mentioned two conditions. However, the existence of these two conditions is not enough to define an element as a member of the verbal prefix category.
Productivity as a sign of category change

(84) a. föld-re hajlik
    ground-onto trail
    ‘(s)he trails along the ground’

b. nem hajlik a földre
    not trail det trail ground-onto
    ‘(s)he does not trail along the ground’

There are morphologically complex formations which meet these criteria but are not included in any lists of Hungarian verbal prefixes. Three of them are: ég-nek (sky-DAT) ’up to the sky’, fej-be (head-into) ’on the head’ and ész-re (mind-onto) ’into the mind’.

Preverbal elements that are used only in constructions with concrete meanings such as égnek ’up to the sky’, e.g.:

(85) ég-nek áll
    sky-DAT stand
    ‘it stands up [to the sky]’

cannot be ’real’ verbal prefixes because they either lack changes in the meaning of the construction, or do not have any grammatical meanings. They can only be attached to a very restricted number of verbs (in the case of égnek 2 altogether!), and cannot become productive.

As to fejbe ’on the head’ in (86):

(86) fej-be ver valaki-t
    head-into beat somebody-ACC
    ‘(s)he hits somebody on the head’

There is a small group of verbs — generally in the sense of hitting — which can co-occur with this element:

(87) csap, út, ver, sújt, etc.
    ‘strike’, ’hit’, ’beat’, ’hit’
    fej-be csap/út/ver/sújt etc. valaki-t
    head-into strike/hit/beat/hit somebody-ACC
    ‘(s)he hits somebody on the head’

And some other verbs indicating actions causing wounds to somebody’s head, such as

(88) fej-be lö valaki-t
    head-into shoot somebody-ACC
    ‘(s)he put a bullet through somebody’s head’
The meaning of the whole construction as the sum of its parts and the meaning of the preverbal element is very concrete again: it indicates the direction/place of the hitting or wounding. *fej-be (head-into)* ‘on the head’. In some cases, the whole construction is used in a metaphorical sense, e.g.:

(89) fej-be vág-ja a hír
head-into strike-3SG(tr.) determiner news
‘(s)he is staggered by the news’.

For *fejbe*, this type of construction might be in the process of becoming a verbal prefix, but we do not have any other conditions fulfilled yet — neither the isolation of the preverbal element, nor the change in its meaning, not to mention the increase in productive co-occurrence patterns.

For similar reasons, we cannot categorize *észre* ‘into the mind’ as a verbal prefix. There is only one dictionary entry for *észre*:

(90) ész-re vesz valami-t
mind-onto take something-ACC
‘(s)he perceives, becomes aware of something’

(but there are other examples in everyday use as *észre-tér* ‘to come to oneself’). The construction has its meaning as an integral whole, where *észre* has no separate meaning different from its concrete one. Even if the change of the meaning of the construction and the isolation of *észre* have already more or less taken place, the preverbal element has not yet obtained a special meaning which could enable its attachment to some new group(s) of verbs.

*Töntre* (getting) totally ruined’ is also a debatable element: from eight lists of Hungarian verbal prefixes only two include it as a verbal prefix (one of them is the Hungarian Concise Dictionary). The reason for this could be that *töntre* – at least historically — is a morphologically complex formation:

(91) tönk-re
tree stump-onto
‘into a tree stump’

and it might seem to be questionable whether the isolation process (*töntre ≠ tönk + -re*) has already finished or not.

*Töntre* in its original directional meaning (*tönk-re* ‘onto a tree stump’) was a part of a syntactic construction with verbs such as *jut* ‘to get’ and *megy* ‘to go’, e.g.

(92) *tönk-re meg y
tree stump-onto go
‘it runs into a tree stump’
In the synchronic system of Hungarian we can find the reflection of the next stage, which is the result of a change in the meaning of the construction as a whole: the consequence of the action becomes the part of the meaning of the construction (pragmatic inference).

(93) “tönk-re megy ’to run into a tree stump’ and get totally damaged → tönkre-megy ’to get totally damaged’”

Parallel with the meaning change of the construction as a whole, tönkre gains a new meaning, too.

(94) tönkre ’(getting) totally ruined’

It looses its directional meaning and morphological complexity, and, being isolated (tönkre ≠ tönk + -re) becomes a verbal prefix with many more co-occurrence possibilities than ever before, while the original syntactic construction changes into morphological. The whole process is quite similar to the one we have seen in connection with agyon.

In spite of the fact that tönkre is listed as a verbal prefix in the Hungarian Concise Dictionary, it contains very few prefixed verbs (six altogether, namely: tönkre-jut ’to fail/be ruined’, tönkre-megy ’to get spoiled/ruined/damaged’, tönkre-tessz ’to ruin’, tönkre-silányít ’to ruin/spoil/cripple’, tönkre-ver ’to destroy/defeat (totally)’, and tönkre-zúz ’to crush/shatter’). At the same time, tönkre seems to be very productive in several different uses in the spoken language (also with the reflexive pronoun magát):

(95) tönkre-fagy, tönkre-ázik, tönkre-kopik, etc.
pref.-freeze, pref.-get wet pref.-get worn out
‘it gets damaged or totally ruined by freezing, getting wet, getting worn out’

(96) tönkre-rág, tönkre-hord, tönkre-farag, etc. valami-t
pref.-gnaw pref.-wear pref.-carve something-ACC
‘(s)he gnaws, wears, carves something too long or too frequently, causing (total) damage’

(97) tönkre-dolgoz-za, tönkre-tanul-ja, etc. magát
pref.-work-3SG(tr.) pref.-learn-3SG(tr.) oneself-ACC
‘(s)he works, learns too much — and undermining (his) his health or tiring himself (herself) by doing that’

This is the reason why we can consider it to be a verbal prefix.17

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5. Conclusions

Through the analysis of a relatively young Hungarian verbal prefix, I have concluded that one can determine the status of the debatable part of the 'preverb + verb' formations by their productivity. The idea is based on the presupposition that some characteristic changes take place when an adverbial element with an original lexical meaning becomes a verbal prefix.

This is a complex process affecting the semantic properties, the grammatical status, and the co-occurrence possibilities of the given element. The final point is that the element becomes a morphological formation with a new (lexical and/or grammatical) meaning. As a consequence, its co-occurrence possibilities with verbs dramatically change: the rules for forming verbs with the given element become productive. Productivity is a very characteristic feature not only of the process of an element becoming a verbal prefix, but also of the grammaticalization (or morphologization) process in general. (However, the process of grammaticalization cannot be called morphologization in this case because the grammaticalization process does not result in a real affix. Morphologization at its final stage (referred to as 'univerbation') involves the creation of a bound morpheme — see Hopper & Traugott 1993.)

On the basis of the study of the 'preverb + verb' constructions in this paper, it seems to me that in Hungarian beyond the formal criteria mentioned earlier (the possibility of occurring in a preverbal position without a determiner, the lack of determiner even in a postverbal position) for the categorization of the debatable elements as verbal prefixes the following criteria can be used: (a) they have to be polysemous; (b) they have to have a grammatical meaning, too (aktionsart and/or aspect); (c) they have to have several (or at least more than one) co-occurrence patterns; (d) in their more abstract and/or grammatical meanings they have to be productive.18

In the debatable cases productivity is a characteristic mark of the fact that the process of becoming a verbal prefix has already taken place. It also indicates the existence of all the other conditions (a-c), and therefore it can really be a substantial sign of the category change.

18 It goes without saying that my criteria are still hypothetical and have to be tested on a wider range of material.
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References


Are Affixes Signs?
The semantic relationships of English derivational affixes

Adrienne Lehrer

Lieber argues that affixes are no different from ordinary lexemes — they are just bound. Therefore, they are signs. Beard, taking the opposite position, says that affixes (and function words) are completely different. If affixes are just like lexemes, they should exhibit the syntactic and semantic properties of lexemes. Lieber has explored the syntactic similarities, and in this paper, I explore semantic similarities, using English derivational affixes as a data source.

Lexemes typically are polysemous, and they enter into a number of lexical-semantic relationship, such as synonymy, antonymy, and hyponymy. I show that we find in English some of the semantic properties typical of lexemes, namely polysemy, synonymy, and antonymy. The absence of other semantic properties follows from the fact (as Beard has shown) that affixes encode a limited set of meanings.

1. Introduction

One controversy in morphological theory involves the extent to which affixes exhibit sign-like behavior. Although this issue has been discussed in linguistic theory at least since Saussure (1965) and was a problem for structuralists in their definition of the morpheme, it has been revived in recent morphological theory. Lieber (1992) and others view affixes as ordinary signs, just like lexemes, whereas Beard (1988, 1990, 1995) sees them as non-sign-like, even semantically empty. The most typical linguistic signs — lexemes — have one or more meanings and a syntax. This raises the question of whether elements smaller than words, namely bound morphemes, have the same properties. Lieber has explored the syntax of bound morphemes, and in this paper I wish to explore the meanings of one subclass of bound morphemes — derivational affixes. If affixes are lexeme-like, we would expect them to exhibit certain salient properties, such as entering into lexical-semantic relationships like synonymy, antonymy, hyponymy, etc.

2. Comparing derivational affixes and lexemes

The semantic relations that will be examined will be the following: first polysemy, then the most important paradigmatic relations (synonymy, antonymy, hyponymy, and meronymy) and finally some syntagmatic relations.
2.1. Polysemy

Like most lexemes, derivational affixes are polysemous, and the study of their development over time mirrors the semantic shifts found in lexemes. For example, the prefix meta- has two related currently productive senses: The first sense is ‘(an) X about (an) X’ as in metalanguage, metarule, metaquotation, and metastatement. Thus a metarule is ‘a rule about a rule or rules’ and a metalanguage is ‘a language about a language or about languages’. The second sense is ‘a foundational study of X’ as in metapsychology or metahistory. In this case, metapsychology is the foundational study of psychology. Historically, the first sense developed from the second, and we can see the beginning of a semantic shift from the first sense ‘about’ to ‘of’ in words like metapopulation, glossed as ‘a population of populations’, not ‘a population about populations’ (Lehrer 1995).

Another example of polysemy involves the suffix -ist, which has a very general meaning — ‘one who is or does X’, but there are three related clusters: (1) ‘one who performs an action involving X’ e.g. violinist, harpist; (2) ‘one who holds an ideology’, e.g. socialist, capitalist; (3) ‘one who is prejudiced against some group’, e.g. racist, sexist. These last two senses are paired with -ism, and the third sense developed out of the second. Racism, (racialism) was the ideology that there are differences among races, and since this ideology was used to justify discrimination, it acquired a negative connotation in recent social and political climates. This last sense is found in neologisms like ageist and classist ‘one who discriminates against people because of their age or class’ respectively, and speciesist ‘one who unjustifiably discriminates in favor of humans over other animals’. The range of related senses and the semantic shifts of meta- and -ist are just what we find in the polysemy and semantic shifts of lexemes (Lehrer 1998).

A third example of polysemy is seen in the English suffix -er, denoting an agent (baker, driver, dancer) or an instrument (vacuum-cleaner, toaster, opener), and -er can be glossed as ‘one who or that which does X’ where X replaces the verb to which this suffix is added.

A study of derivational affixes in English will show that polysemy is the norm and that few affixes have only one sense.1

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1 Homonymy is found among words and affixes, but since homonymy is not a semantic relation — it is a case of accidental phonological and orthographic identity — it will not be discussed here.
3. Paradigmatic relations

The most important paradigmatic relationships found among lexemes are antonymy (of various types), synonymy, hyponymy, and meronymy.

3.1. Antonymy

Antonymy is widely found in English prefixes from both Latinate and Germanic origins. Prefixes attach to free words and bound roots. The Germanic items also function as adverbs. Below are some examples.

<table>
<thead>
<tr>
<th>super — sub</th>
<th>superordinate</th>
<th>subordinate</th>
</tr>
</thead>
<tbody>
<tr>
<td>superset</td>
<td></td>
<td>subset</td>
</tr>
<tr>
<td>hyper — hypo</td>
<td>hyperactive</td>
<td>hypoactive</td>
</tr>
<tr>
<td>hypernym</td>
<td></td>
<td>hyponym</td>
</tr>
<tr>
<td>pre — post</td>
<td>prewar</td>
<td>postwar</td>
</tr>
<tr>
<td>prenatal</td>
<td></td>
<td>postnatal</td>
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<tr>
<td>pro — anti</td>
<td>pro-choice</td>
<td>anti-choice</td>
</tr>
<tr>
<td>pro-education</td>
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<td>anti-education</td>
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<tr>
<td>micro — macro</td>
<td>micro-economics</td>
<td>macro-economics</td>
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<td>mini — maxi</td>
<td>miniskirt</td>
<td>maxiskirt</td>
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<td>overworked</td>
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<td>downgrade</td>
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<tr>
<td>in — ex</td>
<td>inhale</td>
<td>exhale</td>
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<tr>
<td>introvert</td>
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<td>extrovert</td>
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</tbody>
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There is also one antonymous pair of suffixes: -less and -ful.

- less — ful  careless  careful
<table>
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<th></th>
<th>harmless</th>
<th>harmful</th>
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Several of the morphemes among the prefixes are identical to free morphemes, either prepositions or adverbs, and in many cases they are the result of grammaticalization, that is, the evolution of free morphemes to bound ones. The meanings of most affixes are largely limited to concepts involving space, time, and quantity, that is, to concepts that are frequently expressed by grammatical means in languages (Beard 1995). There are also many instances where affixes have no antonym formed from the morpheme paired...
above (*expert, *beautiful, but no *inpert, *beautiless); in other cases the pairs of words are not antonymous, e.g. *inlaw–outlaw. Part of the explanation lies with the fact that derivational morphemes, including the most productive ones, are not as productive in word formation as full lexemes are in phrase and sentence production. But in general, we see that antonymy is well represented as a semantic relation among affixes.

3.2. Synonymy

As often noted, synonymy is rarely absolute in that one usually does not find complete interchangeability. Rather we must think of synonyms as words whose meaning and distribution are very similar, there may be subtle connotative differences but substitution can occur in a wide range of cases. Beard (1990, 1995) uses this fact to dispute the sign-like behavior of affixes. He says that we do not find the subtle differences of meaning in affixes that we find in lexical synonymy, citing nominalizing suffixes (*-ation, -ity, -ness, etc.) However, choosing other affixes will show that parallels can be found among some derivational affixes. Consider a subset of agentive suffixes: -er, -ist, -ster, -eur, -eer, and -ian. The first two are highly productive, and their difference in distribution can be accounted for in terms of the different bases they attach to: -er attaches to verbs and -ist to nouns.

The other four are not highly productive, but they do occur in neologisms, and when they are so used, they exhibit subtle differences of connotation. -ster has a negative connotation that ranges from naughtly to very bad, found in words like trickster, huckster, gangster, and mobster. This point was brought home to me during the attempted coup in the Soviet Union in 1991, when a television news commentator referred to the anti-Gorbachev agents as coupsters. (This word was created during a discussion, not read from a prepared script.) More recently fraudster was used to describe a scientist who had published research based on lies.

-eur, because it is found in French loan words, carries a cluster of connotations of something exotic and foreign, but also with an association of skillfulness, as found in words like raconteur, masseur, restauranteur, and provocateur. Although it is not productive, it occurs in neologisms, like scripteur ‘a scriptwriter’ (Algeo 1991: 97) or ecopreneur, a blend of ecology and entrepreneur.

-eer also has a very slight negative connotation, and it refers to agents who

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2 There are a few other suffixes, such as -ee, which is mostly a patient-marking suffix but occurs as an agent with unaccusative verbs (see Bauer 1989). There are also some agents with -ant/-ant (see Szymanek 1989: 181).
are enthusiastic about banal activities, or perhaps activities which are shady or undesirable, e.g. mutineer. Neologisms listed in Algeo (1991: 94) include the following:

- aeroneer: ‘enthusiast of model airplanes’
- blacketeer: ‘black market operator’
- conventeering: ‘a concert goer’
- conventioneer: ‘one who attends a convention’
- dandelioneer: ‘a state employee designated to dig dandelions’
- pigeoneer: ‘keeper or trainer of homing pigeons’
- privateer: ‘an operator or advocate of private ownership of a public utility’
- pulpateer: ‘one who writes for pulp magazines’
- sloganeer: ‘one who attempts to influence by the use of slogans’

A dean in charge of promoting a new program described himself as a marketeer.

The agentive use of the suffix -iër that is of interest here is that attached to nouns and adjectives ending in -ic or nouns ending in -ics, where the -s is dropped before -ian. Examples are phonetician, mathematician, electrician, magician, mathematician, electrician, magician, statistician, statistician, optician, and academician. The suffix here refers to a skilled or professional practitioner of the occupation or specialty named in the base.

Even though there are words that do not carry these connotations for each of these suffixes, e.g. engineer, youngster, chauffeur, the existence of numerous words that do outweighs any exceptions, providing a general meaning that is found when neologisms are created.

Most morphologists would attribute neologisms constructed from non-productive affixes to the mechanism of analogy, but another possibility is Bybee’s model of lexical connection (1988, 1995), where associative strength among the representation of lexical items plays a major role in productive processing. This model is promising in dealing with these phenomena, since it would account for creative uses of non-productive processing.

Another area where we find affixal synonymy is in the suffixes -ship, -dom, and -hood. Each of these has a range of senses, and the synonymy is only partial, but it is similar to that found in lexical items. The sense that they share is ‘state or quality of being’, as in friendship, serfdom, and motherhood. A consequence is that in the creation of neologisms, there is more than one possibility: e.g. kinglydom (in the sense of the state of being a king vs. kinghood; catdom vs. cathood (cited in Walker 1936); dogdom (cited in Wentworth 1941) vs. doghood.
Other examples with three possibilities include *thiefdom* vs. *thiefship* vs. *thiefhood*; and *cronydom* vs. *cronyship* vs. *cronyhood*. (See Wentworth 1941 on -dom.)

Subtle semantic differences have been observed for different negative prefixes, for example *un-*/in- versus *non-*/a-, as in pairs such as *immoral* vs. *amoral* and *nonchristian* vs. *unchristian*. Semantic differences can also be found in the reversives *un*- vs. *de-* (*unfrock* vs. *defrock*, *uncode* vs. *decode*). (See Algeo 1971; Andrews 1986; Funk 1986; Horn 1989; Zimmer 1964; and the many references therein.)

Finally, in examining the list of antonyms above, we find synonyms among them, for example, *hyper-* and *super-*, *hypo-* and *sub-*, *pre-* and *ante-*, *mini-* and *micro-*, *maxi-* and *macro-*. When we look at the distribution of roughly synonymous, but rival affixes and compare them to the distribution of lexical synonyms, we see a great difference, however. On the whole, affixes tend to be in complementary distribution (van Marle 1985), whereas in the case of lexical synonyms we find tolerance for most combinations. To be sure, we do find doublets, as illustrated below (with examples from Szymenek 1989: 156 and Bauer 1983: 290).

<table>
<thead>
<tr>
<th>falseness</th>
<th>falsity</th>
</tr>
</thead>
<tbody>
<tr>
<td>morbidity</td>
<td>morbidity</td>
</tr>
<tr>
<td>impecuniousness</td>
<td>impecuniosity</td>
</tr>
<tr>
<td>inextricableness</td>
<td>inextricability</td>
</tr>
<tr>
<td>flippantness</td>
<td>flippancy</td>
</tr>
<tr>
<td>recentness</td>
<td>recency</td>
</tr>
<tr>
<td>zest</td>
<td>zestful</td>
</tr>
<tr>
<td>grammaticalize</td>
<td>grammaticize</td>
</tr>
<tr>
<td>minimalize</td>
<td>minimize</td>
</tr>
<tr>
<td>lech</td>
<td>lecher</td>
</tr>
<tr>
<td>normality</td>
<td>normalcy</td>
</tr>
<tr>
<td>complacence</td>
<td>complacency</td>
</tr>
<tr>
<td>defectiveness</td>
<td>defectivity</td>
</tr>
</tbody>
</table>

Doublets for agent suffixes, with differences of meaning, include the items below

<table>
<thead>
<tr>
<th>jokester</th>
<th>joker</th>
</tr>
</thead>
<tbody>
<tr>
<td>spinster</td>
<td>spinner</td>
</tr>
<tr>
<td>copiest</td>
<td>copier</td>
</tr>
<tr>
<td>informant</td>
<td>informer</td>
</tr>
</tbody>
</table>

Most often we find doublets for a short time, while rival affixes compete for acceptance, and a choice is made. This reflects an indeterminacy about the
most appropriate new word for a new concept (or new to the lay public). For example, when many new linguistics departments were established in the United States in the 1960s, a member of such a department was often called a linguist by nonlinguists, analogous to mathematician and phonetician, since the word linguist had the meaning to many nonlinguists of ‘a person who speaks many languages’, a concept that linguists have lexicalized as polyglot. In time, however, linguist ceased to be used.

A possible counterpart to the complementary distribution of rival affixes might be found in conventional compounds and fixed phrases: handcuff, not *wristcuff, distant future, not *far future. Another parallel can be found in collocations. Examples from Cruse (1986: 281) are the following:

<table>
<thead>
<tr>
<th>acceptable</th>
<th>unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>spotless kitchen</td>
<td>flawless, unblemished kitchen</td>
</tr>
<tr>
<td>flawless performance</td>
<td>spotless, unblemished performance</td>
</tr>
<tr>
<td>unblemished record</td>
<td>flawless record</td>
</tr>
</tbody>
</table>

To sum up, synonymy is a common relationship among affixes, and we find parallels to lexical synonymy.

### 3.3. Hyponymy and meronymy

One of the commonest and most important lexical relationships is that of hyponymy. In most semantic fields there is a superordinate term with several incompatible co-hyponyms. However, among the English affixes, the only example I could find, and a marginal one at that, is multi- which serves as a superordinate for bi-, tri-, etc.

Another common lexical relationship is the part-of relationship, and this one, like hyponymy, is missing from the inventory of affixes.

Beard (1995) explains the restricted types of lexical semantic properties found in English affixes and the affixes of most other languages by pointing out that the meanings expressed by affixes (derivational and inflexional) are the same as those found in function words. For example, in English meanings of affixes can also be expressed by prepositions or by logical words, like not; or else they are affixes that can be paraphrased by very general words (ACTION, AGENT, EVENT, STATE, QUALITY), or they can be paraphrased by highly restricted modifiers, like former. Below are some examples of affixes with their nearest free-word paraphrase.

<table>
<thead>
<tr>
<th>Affix</th>
<th>Free word</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-</td>
<td>before</td>
</tr>
<tr>
<td>meta-</td>
<td>about</td>
</tr>
</tbody>
</table>
Beard observes that in most languages affixes and function words are alike in that the meanings they express are limited and are similar to each other.

A related explanation is suggested by the work of Miller & Fellbaum (1991), who have looked at the linguistic networks of words in English and the kinds of lexical semantic relationships that are found among the different parts of speech. Whereas taxonomy, hyponymy, and meronymy are the commonest kinds of relationships found in nouns, scales and antonyms are the commonest found in adjectives. Verbs are in between, and among the verbs one can find some examples of hyponymy and some of antonymy.

Almost all nouns in languages are rich in lexical content, denoting many specific things (concrete and abstract), persons, and places, and through nominalization, states, events, and properties. Although there are a variety of nominalizing suffixes (-tion, -ness, -ity, etc.), their meaning is so general that it is not possible to identify them with specific enough categories. This fact may provide a partial explanation for why hyponymy and meronymy are missing from affixes.

4. Syntagmatic relations

Derivational affixes (and some inflexional affixes) are intimately connected with syntactic relationships in that they may change the part of speech or the subcategorization frame and they may add or delete arguments of a verb. However, in addition to these phenomena, lexemes are often related by specific collocations and semantic field associations, such as the relationship

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3 Mithun’s contribution at this conference (1996) has provided several case studies which seriously challenge the view that affixes express only the limited meanings found in grammatical or functional morphemes. In particular, in many languages of North America, affixes express meanings typically found among nouns and verbs of Indo-European languages.
between *eat* and *food*, *drink* and *beverage*, *read* and *book*, *cook* and *chef*, *play* and *game*, etc. There are also syntagmatic relationships of the sort described as semantic incorporation, such as *kick* and *foot*, *punch* and *fist*, and *hurry* and *fast* where an instrument or manner is part of the meaning of the verb. This type of syntagmatic relationship does not appear among English affixes, nor presumably that of most languages, but this fact also follows from the nature of the meanings of affixes, as discussed above, because affixes do not encode the highly specific types of meanings found in lexemes. (But see footnote 3.) The verb meanings we find are very general, such as CAUSE, BEGIN, DO, etc. and the nominal meanings are THING, PERSON, PLACE, etc. Although we can see an analogy between the agent-action relation in lexemes like *A chef cooks* and *An X-er X-izes*, such associations are forced.

5. **Global properties of lexemes and affixes**

The lexicon is often divided into two sets of partially overlapping contrasts: (1) open classes vs. closed classes and (2) content words vs. function words. Content words typically belong to open classes and function words to closed classes. The distinction is clear in most cases, but there are disagreements on categories such as prepositions, which have been considered function words by many structuralists but are grouped with nouns, verbs, and adjectives (as lexical classes) in generative and post-generative theories. Prepositions constitute a (mostly) closed but rather large class, at least larger than other closed classes, like modals, determiners, pronouns, quantifiers, and conjunctions. Manner adverbs also constitute an open class.

A similar distinction between content and function items can be made in the affixes. Some affixes, such as nominalizing suffixes (*-ation*, *-ness*, etc.), exist for grammatical purposes. In contrast, most English prefixes and some suffixes (e.g. *-able*, *-ful*, *-less*, *-free*, *-ess*, *-ly*) have more specific meanings, and it is these that exhibit the relationships of synonymy and antonymy.

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4 Whether they have any meaning has been debated. Many linguists deny that they have any meaning; others (e.g. Langacker 1987; Wierzbicka 1988) argue that nominalization itself produces a conceptual change because each part of speech carries a meaning, and nominalizing a verb or adjective adds this meaning.
6. Affixes and combining forms

I have assumed, without comment, that there is general agreement on what items are included in affixes and what are not. One class of items that may be controversial is bound morphemes that have described as neo-classical compounds and combining forms. Combining forms include the parts of neo-classical compounds and other formatives that are the results of splinters from blends that have become productive, such as -gate, meaning ‘political scandal’ from Watergate. Algeo (1991) treats these as affixes. For example bio-, Euro- and eco- are listed as prefixes, while -gate and -naut are listed as suffixes. Bauer (1983), Warren (1990), Lehrer (1998) and others present strong arguments for treating these as bound stems, not as affixes, and Beard concurs (1995). So far I have not found any fully convincing tests that would allow us to draw the distinction in borderline cases. And it may be that the only importance in drawing the distinction lies in evaluating Beard’s claim that the meanings encoded in affixes is limited. If Euro-, bio- etc. are prefixes, then the kinds of affixal meanings will be not be limited, and consequently the semantic relationships will include hyponymy, meronymy, and other relationship.

7. Conclusion

To return to the original question: Are affixes signs? Beard selected as his primary examples morphemes with relatively little meaning, and I selected those with the most meaning. In looking at all the cases we see a cline rather than a clear-cut division. Beard’s criticisms against the sign-view of affixes is especially convincing in the case of zero-morphemes (which some linguists have posited) and somewhat convincing in the case of purely grammatical affixes. Although affixes may encode only a limited set of meanings, and although there are many that are semantically general, there are still many that have rather specific and stable meanings. The affixes with such meanings as well as the semantic relationships that exist, in particular, antonymy and synonymy, are just what we find in free, open class lexemes. Therefore, I conclude that affixes and function words are signs.

Acknowledgments

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Are Affixes Signs?

References


**Athabaskan redux**  
Against the position class as a morphological category

**Joyce McDonough**

A difficult area in morphological productivity is the relationship between morphophonemic and morphosyntactic processes. This relationship is particularly problematic in cases when the morphemes themselves are abstractions, a situation that arises when the relationship between morphemes loses its transparency, the classic case is the synthesis that underlies the root-stem relationship. There are two other cases where this kind of loss of transparency can arise: in prosodic morphology, where morphemes can be prosodic entities like ‘foot’ and word formation is governed by phonological or metrical principles, and in position-class morphologies. A major problem with the later type is that its primes, the position-classes, unlike prosodic entities, are unprincipled. There is no internal integrity to position classes other than their use as a device in describing complex morphologies. A classic example of the extensive use of position classes is found in Athabaskan. Concomitantly, word formation in Athabaskan is considered unique and typologically odd. This fact is underscored by the general lack of consensus among Athabaskanists concerning the number and kind of position classes available, by the lack of external motivation for a position class and by the highly conditioned phonological and concatenative processes needed to produce the surface forms from the structures imposed by the position classes. This paper reviews an analysis of Athabaskan verb that eschews the position class model using instead a standard affix-to-base morphology called the bipartite analysis. This analysis argues that position classes are essentially prosthetic extensions to affix-to-base morphology. We must prove that these extensions are necessary and principled before we assume them. In this paper, the position class and the bipartite analyses of Athabaskan are compared using a morphosyntactic model developed for position classes. Insofar as the bipartite analysis serves this type morphosyntactic model, then evidence for position classes as independent lexical categories is considerably weakened and the burden of proof for their existence falls to those who assume them.

1. **Introduction**

A difficult area in morphological productivity is the relationship between morphophonemic and morphosyntactic processes. This relationship is particularly problematic in cases when the morphemes themselves are abstractions, a situation that arises when the morphological relationship loses its transparency, the classic case is the synthesis that underlies the root-stem relationship. There are (at least) two other cases where this kind of loss of transparency can arise, both yield non-linear concatenations: in prosodic morphology, where morphemes can be prosodic entities like ‘foot’ and word formation is governed by phonological principles, and in position-class morphologies. A major problem with the later morphological type is...
that its primes, the position-classes, unlike prosodic entities, are unprincipled. There is no internal integrity to position classes other than their use as a device in describing complex morphologies. A classic example of the extensive use of position classes is found in Athabaskan. Concomitantly, word formation in Athabaskan is considered unique and typologically odd (Simpson & Withgott 1986). This fact is underscored by the general lack of consensus among Athabaskanists concerning the number and kind of position classes available, by the lack of external motivation for a position class and by the highly conditioned and often unique phonological processes needed to produce the surface forms from the concatenations imposed by the position classes (Morice 1932; Reichard 1932; Li 1930; Sapir-Holzer 1967; Hale 1972; Young & Morgan 1980, 1987; Kari 1976, 1989; Cook 1984; Rice 1986; Hargus 1985; Randoja 1989). This paper reviews an analysis of Athabaskan verb that eschews the position class model using a standard affix-to-base morphology, called the bipartite analysis (McDonough 1990, 1996, 1998). This analysis argues that position classes are essentially prosthetic extensions to affix-to-base morphology. We must prove that these extensions are necessary and principled before we assume them. In this paper, the position class and the bipartite analyses of Athabaskan are compared using a morphosyntactic model developed by Stump (1991, 1992) for position classes. Insofar as the bipartite analysis, without templatic position-classes, serves as a morpheme base for this type morphosyntactic model, then evidence for position classes as lexical categories is considerably weakened and the burden of proof for their existence falls to those who assume them.

2. Af-to-base morphology

By af-to-base, I mean the common process of morpheme concatenation that we are familiar with from English and many other languages (Jespersen 1933; Marchand 1969). This process is the basis of phonological theories like lexical phonology where a morpheme is concatenated to a base, presented to the phonology and the output is a lexical item (Kiparsky 1982; Mohanan 1986). In these views, a morpheme is assigned in the lexicon to a category of affix (pre-or suf-)1 or one of the base categories (root, stem or word).2 No counting or

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1 I assume a view in which infixation is prosodically governed concatenation. See McCarthy & Prince (1995) and the work that has come out of the research strategy investigating prosodic word formation processes.
ordering template is needed because concatenation is always done to a base, and the resulting structures have been argued to be binary branching (Selkirk 1984; DiSciullo & Williams 1987). Af-to-base morphology also allows for compounding, which conjoins two like lexical items and is also binary branching. Compounding can be done at the word level, as in English, or below word level (the pseudo-Chinese compounds of Japanese). Af-to-base morphology contrasts with prosodic morphology where the units are phonological and word formation processes are governed by phonological principles (McCarthy 1981; McCarthy & Prince 1993). A couple of examples of prosodic morphology are reduplication where the reduplicative morpheme may be defined as a prosodic foot (characteristically empty of segmental content), or minimal word requirements that impose prosodic constraints on word size. In many (perhaps most) languages both kinds of morphological processes are present. For instance the well-known non-concatenative morphology of Arabic also has affixation; many af-to-base languages have prosodic minimal word requirements.

3. Position classes

By definition, a position class is a holding device in a template for a group of morphemes that have a similar distribution in a word. It is needed in exactly the case that neither af-to-base nor prosodic processes are adequate to handle the concatenation of morphemes, a failure primarily due to ordering and co-occurrence problems between multiple affixes in complex morphologies. I am placing clitics outside the domain of our discussion (see Halpern 1992). Position classes basically provide ancillary support to af-to-base concatenation through the device of a prosthesis that maintains order among morphemes. A brief discussion follows.

By definition a position class is a morphological category and also a position or a ‘slot’ in a template. The template represents the linear order of the position classes with respect to each other. The following represents a position class template or ‘slot-and-filler’ template of \( n \) positions:

\[
\text{Position class (slot-and-filler) template:} \quad _1 + _2 + _3 + \ldots + _n
\]

\[ ^2 \text{I take the view that the category ‘root’ is an abstraction over stems and the category change ‘root’ to ‘stem’ is not transparent nor done via affixation.} \]
The morphemes of a position class may or may not be defined by a set of feature specifications, though the case that they do not share a common set is much less preferred (because the group is then ill-defined), but there is nothing inherent in a position class that requires this. In effect, a position class template is a prosthetic device for an array of morphemes. Because individual morphemes are assigned (either lexically or by rule (cf. Stump 1991)) to the position classes, a position class’s primary (and perhaps exclusive) purpose is to maintain order among sequences of morphemes. A morpheme from position 2 will always appear to the left of a morpheme from position n, by virtue of its being assigned to a position which precedes n, whether intervening morphemes appear or not. The following are possible morpheme sequences:

(2) a. __ + __ + __ + ... + __
   1  3  6  n
b. __ + __ + ... + __
   1  2  n
c. __ + __
   3  n

One of the principal things this allows is a sort of virtual concatenative non-linearity. The distribution of a morpheme in a word is crucially dependent on the position of its assigned class in the template and not the thing it is attached to, which makes it unlike the other morphologies. So it is possible in a position class morphology to have the kind of affixation that the derivation below represents. The morpheme from position class 3 is introduced later than those that may appear to its left.³

(3) a. add morphemes from 1 and 6 to n:
   __ + __ + ... + __
   1  6  n
b. add a morpheme from 3 to the preceding:
   __ + __ + __ + ... + __
   1  3  6  n

Position classes are mediators in the morphology between morphemes and structure. Inherent to this system are the assumptions of lexical phonology: the output of any given affixation is submitted to the phonology, which is

³ This sort of concatenation underlies the Athabaskan notions of ‘verb theme’ and ‘verb base’. See discussion of these notions in Young & Morgan (1987).
called upon to produce the surface forms (Hargus 1986; Rice 1990). In the above, (a) is submitted at one level, (b) at another. Accordingly, templates give rise to multiple levels in the phonology (Inkelas 1993; Inkelas & Orgun 1995).

As with use of the classes themselves, without a principled base to position classes, this is a somewhat opportunistic use of phonological leveling. It is in this sense that position classes are different kinds of things than morphological categories like stems, words and affixes, or prosodic entities like feet.

What principles (syntactic, morphological or phonological) underlie or govern this kind of affixation, or of position classes in general, is an unaddressed and not wholly straightforward question. Position classes as a whole are typically used in languages with rich inflectional domains in the word. They are used when the usual means of affixation fails; the concatenation of the proposed morphemes in a word cannot be supported without the array prosthesis the template provides. The ‘usual means’ here refers to the other two known and well established types of morphologies: base-and-affix and prosodic morphologies.

One important consideration that arises in any attempt to address this problem is the question of morphological objects. What kinds of morphological objects are position classes, are they real or formal or virtual entities? What kind of evidence can be brought to bear on this question?

One way of approaching the question is to address the puzzle the prosthesis presents. Can the position class affixation be accounted for through more conventional methods? Another way of asking the same question: what kind of knowledge of structure does a native speaker of the language utilize?

In this paper I take the point of view that position classes are exclusively formal or virtual entities: they are artifacts of a particular kind of analysis, one that assumes prior, even diachronic, knowledge of morphophonemic structure. Albeit useful for pedagogic purposes, position classes do not exist as morphological objects in real-time grammar and they do not reflect speakers’ knowledge of structure. I add a further challenge to position class analyses by comparing a canonical example of a slot-and-filler or position class template, the Athabaskan template as it is formalized for the Navajo verb, to a bipartite constituent analysis which characterizes the verbal complex in the more familiar stem-and-affix terms. I will apply an articulated formal model of position class morphology developed by Stump (1991, 1992) to both models. The point is that because this formalization, developed to characterize a position class morphology, handles both models equally well, it cannot

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4 The interaction between the phonology and the position classes gives rise to unusual and/or highly conditioned rules and constraints in Athabaskan.
provide appropriate evidence for the existence of position classes as a morphological type in a working grammar.

4. The two analyses of the Navajo verb

The two analyses of the Navajo verbal complex under discussion are the standard position class template model as it appears in Young & Morgan (1980, 1987), and a revision of the model which uses a conventional base-and-affix type morphology, without the prosthesis of position classes, nor of any morpheme ordering device independent of base-and-affix, called the ‘bipartite constituent analysis’, as argued for in McDonough (1990, 1995, 1998).

A description of uncontroversial aspects of the Navajo verbal complex follows, after which an overview of the salient properties of the two opposing models, the position class and the bipartite analyses, will be given. After that, a explicit formal model of a position class morphology as articulated in Stump (1991, 1992) will be used to generate some Navajo verbal forms. It will be seen that the model generates both the position class and the bipartite forms without discrimination.

5. Three domains of the Athabaskan verb

The minimal verb in Navajo (and in Athabaskan in general) is marked for tense/mode, subject, person and number (Sapir-Hoijer 1967; Kari 1975, 1976; Jelinek 1984; Young & Morgan 1987) and can stand alone as a proposition. The following is an example of a basic Navajo verbal form.\(^6\)

\(^5\) There is no tense marking per se in Navajo as defined by Comrie (1987). Mode refers to the conjugations, perfective, imperfective optative, future etc., as listed in Young & Morgan (1987: 200ff). I use the term ‘tense/mode’ here to distinguish this morpheme from another class of morphemes in the conjunct domain that are referred to as ‘aspectual’ (position 6) in Young & Morgan’s grammars, and other works. In this paper, I have referred to these aspectual morphemes as ‘qualifiers’ after Kari (1989), to further disambiguate the terminology. See also Smith (1995).

\(^6\) I assume the orthography used in Young & Morgan (1987), the standard orthography in use by the Navajo Nation. Words written in the Navajo orthography are in < > ("hasēbą́ą́s") in the text. The terms for the mode conjugations (s-perfective, n-perfective, ø-imperfective, yi-perfective) are taken from Young & Morgan’s grammars and from Kari (1976) and others. Terms for the aspect (inceptive, terminative, seriative) are taken from Young & Morgan 1987. Subject agreement is ‘Su’, object is ‘Ob’. All morpheme glosses unless otherwise stated are derived from the morpheme glosses given in Young & Morgan (1987); page numbers are
The basic verb divides into three well-established domains: the proclitic ‘disjunct’ (‘D’) and inflectional ‘conjunct’ (‘I’) domains and the verb stem (‘V’):

The disjunct domain (‘D’) contains a group of morphemes with clitic-like properties. The domain is optional in the sense that the morphemes in this domain are optional, though there are subcategorization constraints that may require certain proclitics (such as categorization restrictions between the dual marker <na-> and certain stems). The boundary between the disjunct and conjunct domains, marked above with a ‘#’, is well established in the literature. It is marked as a domain edge in the phonology and as a boundary marker for morphophonemic rules (Sapir-Hoijer 1967, Kari 1976, Young & Morgan 1980, 1987). I refer the reader to the literature on the subject. We will adopt this ‘#’ notation as marking the (D/I) boundary between ‘disjunct’ and ‘conjunct’ domains in the paper. The boundary between the I and V domains is marked by a double slash ‘//’.

The ‘conjunct’ domain (I) contains a set of basically inflectional morphemes, some of which are obligatory in the verb. This domain contains five position classes in Young & Morgan’s template (from iv to ix) and three subclasses (via, vib, vic). Two or three of these positions are obligatory: the tense/mode (vii) and subject (viii) (and, in some views, the classifier (ix)) morphemes. In the usual view, the third domain (V) is the verb stem domain. In Navajo, this is always the final syllable in the verb word. The mode and subject and classifiers, when they surface, always comprise the penult syllable.

Every verb in Athabaskan has morphemes from at least two domains:

noted for the forms. The main difference between the bipartite glosses and the glosses of Young & Morgan are in the tense/mode and Subject agreement. Young & Morgan report these as two separate morphemes, I report them as a single synthetic stem morpheme. The term ‘øimper/1SGu’ reads the ø-imperfective, 1st person subject agreement. The names for the classes of morphemes are: ‘cl’ classifiers, ‘qu’ qualifiers, ‘Istem’ and ‘Vstem’ the bases of the infl and verb domains respectively, ‘agr’ agreement markers (position ‘vi’ and ‘V’ in Young & Morgan), ‘tns/Su’ the tense/mode and subject portmanteau (Istem) that is the base of the infl constituent. The term ‘Wd verb’ is refers to the morphological entity ‘Word’, and the fact that this form is a verb in Navajo.
conjunct (I) and the verb (V). These two domains, I and V, constitute the two basic units of the verb and underlie the minimally bisyllabicity of the verb. Some examples and glosses of verbal constructions are provided below.

In the following, the two obligatory morphemes (mode/subject and verb stem) are underlined. The disjunct (D), conjunct (I) and verb stem (V) domains are marked:

(6)  

a. yishcha  

(y)ish // cha  

øimp/1sg // cry.imp  

I   V

b. honiljid  

’I/He appeared/came.’ (Young & Morgan 1987)  

ho + ni // liid  

3sg + nper/1/3/s // ‘appeared, came’ perf  

I   V

c. hasélbàs  

’I drove it up.’  

ha # sè // l - bàs  

‘up’ # sperf/1sg // cl - ‘move hooplike object’: perf  

D   I   V

The form in (6c) has morphemes from all three domains, (6b) contains two conjunct morphemes and the verb stem and no disjunct morphemes. (6a) is an example of the minimal verb, with the two obligatory morphemes, the tense/subject portmanteau <ish> (1st person singular ø-imperfective) and the verb stem <cha>, both underlined.

6. The Young & Morgan position class template

In the Young & Morgan template, the standard conception of the template, there are nine position classes, and several subpositions. The position classes are divided into the two domains, the ‘D’ and ‘I’ domains, as follows. The third domain, the ‘V’, is the verb stem. (Young & Morgan use roman numerals to mark the classes, a convention we will follow. For description of the content of these classes see Young & Morgan 1987: 37ff, 200ff):

(7)  

0 ia ib ic id ie ii iii # iv v via vib vic vii viii ix //  

[ D ] [ I ]  

’disjunct’ ‘conjunct’

Some versions of the template (such as Young & Morgan 1980) have several additional postpositions (‘0’, ‘00’, ‘000’), which were dropped in the 1987
version. Kari’s (1976) version of the Navajo template, based on Hale’s 1972 template, has an additional position for the perfective markers, which is before the subject markers (position ‘viii’ in the above), making ten position classes in all. Rice’s (1989: 425) template for Slave has 16 position classes (13 positions and three postpositions). However in all of these models, the partitioning of the position classes into the three domains is the same. Across Athabaskan, whatever the number of the position class, the direct object/deictic subject agreement markers (‘v’ and ‘iv’ above) sit at the left edge of domain ‘I’ (the ‘conjunct’) at the conjunct/disjunct ‘#’ boundary as in (5). The verb stem is domain ‘V’. In all the Athabaskan templates, the disjunct morphemes are proclitics to the conjunct domain, and the verb stem is the final element in the verbal complex (barring enclitics). The differences between templates across Athabaskan are found in three areas: 1) the make-up of the aspectual, mode or conjugation positions (‘vi’, ‘vii’ above), 2) the existence of incorporated elements in some Athabaskan languages (such as Slave (Rice 1987)), and 3) in the number and kind of proclitic ‘disjunct’ positions. The obligatory morphemes in the template analysis of Athabaskan are the ‘mode’, subject agreement and ‘classifier’ morphemes from position classes vii, viii and x in Navajo, found in the ‘conjunct’ inflectional domain ‘I’, and throughout Athabaskan, the verb stem, domain ‘V’.

7. The bipartite analysis

The second model does not use position classes as a structural base for word formation. Developed in McDonough (1990, 1998) this model, called the bipartite constituent structure, characterizes the basic Athabaskan verb as a compound consisting of two morphosyntactic constituents, a verb constituent and an auxiliary or ‘infl’ constituent (Akmajian et al. 1979; Bach 1983, 1995). Development of this model draws on several sources, both early work on the Athabaskan verb (Sapir 1915; Morice 1932), as well as the work of Kari and others who have attempted to come to terms with the position classes as a model of the Athabaskan verb. The bipartite model is intended to represent a native speaker’s working knowledge of the structure of the verbal complex. The analysis is built from a consilience of arguments drawn from the phonology.

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7 This issue is related to the definition of the left edge of the word. I believe that many of the postposition differences between templates across Athabaskan indicate that the left edge boundary is a possible site of conflict between grammatical components (i.e. prosodic versus syntactic word). See McDonough (in press).
prosody and morphosyntax; they basically fall into three groups. 1) The existence of an internal word boundary between the ultimate and penult syllable (the only place in the word where consonant clusters appear, a result of an edge effect allowing codas at the edge of a domain), 2) the re-categorization of two obligatory position classes, for reasons of morphological fusion, into a single portmanteau of mode conjugations inflected for person and number (assigned the base of the ‘I’ domain), and 3) the assignment of the classifiers, actually a type of valence marker, to the verbal constituent rather than the conjunct domain. These observations expose a verbal structure that does not mirror the template. Each constituent consists of a morph that is the base (stem) of that constituent and a single set of prefixes. The bases of the two constituents, the infl base and the verb base, represent the obligatory parts of the word. These morphs mutually agree in aspect. The prosthetic template is no longer necessary. For the full set of arguments see McDonough (1990, 1998). For the purposes of this paper, a comparison of the two analyses in light of a model built to handle position classes, an outline of the general points of the structure is given below.

Like the template the bipartite constituent analysis has three domains, ‘D’, ‘I’ and ‘V’. The ‘D’ domain is the same in both. In the bipartite analysis, the ‘V’ domain is the ‘verb’ constituent { (af) — base }. It consists of a type of valence marker (the classifiers) as prefix, and the verb stem. In the bipartite analysis, the rightmost morph in the verb is the verb stem which forms a constituent with the classifier (‘cl’) prefixes (position ‘ix’ from domain ‘I’ in the Young & Morgan template). The classifiers are valence markers (as above, the roman numerals represent the position class in the Young & Morgan template):

\[
\begin{align*}
\text{ix} & \quad \text{Vstem} \\
\text{Cl} & \quad \text{stem}
\end{align*}
\]

The constituent they form is the ‘verb’ constituent and contains the argument matrix for the verb. The second domain, in marked contrast to the template view above, also contains a base and a set of prefixes; it is not a domain of position classes. ‘I’ domain of the bipartite analysis differs from the template analyses in two important ways: it is one of two syntactic constituents in the verb, namely the ‘infl’ constituent, and it has a morphological entity, ‘stem’, as a base of affixation within it. The base of domain ‘I’ is a portmanteau of two position classes (vii and viii) (cf. Rice & Hargus 1992). The prefixes to this base are the qualifier prefixes (‘Qu’ positions vi (a,b,c)). These two morphemes, the portmanteau base and the prefix group, form a constituent, ‘infl’. The base of the infl constituent is called ‘Istem’ for expository reasons, and corresponds to the base of the verb constituent, the ‘Vstem’.
A third set of prefixes, the agreement markers (positions iv/v), are attached to the Istem, but are outside that constituent. For the present purposes, we will consider these prefixes part of the second domain, but outside the immediate constituency of the |Qu-stem| group, though presently nothing depends on this assumption. The proclitic group (domain ’D’) is attached to the dual constituency of ‘infl’ and ‘verb’. In the following diagram, the first two rows denote the accepted division of the Athabaskan verb into the three established domains, disjunct, conjunct and verb, the third row denotes the partitioning of the bipartite analysis into the syntactic constituents ‘infl’ and ‘verb’ and the make up of these two constituents, the fourth rows denotes the template and its mapping onto the bipartite analysis.

Thus each of the two constituents, infl and verb, has a morphological base, termed ‘Istem’ and ‘Vstem’ for convenience, and a single set of prefixes, respectively ‘Qu’ and ‘Cl’. The stems are essential; they contain all the obligatory morphosyntactic features in the verb word. Every verb then has morphemes from the two constituents, ‘infl’ and ‘verb’. This morphological imperative underlies the minimum word constraints in Athabaskan (Wright 1983; McDonough 1990, Tuttle 1991, 1994, Hargus & Tuttle 1995; cf. Rice 1990).

In this way, the prosthetic position class template for this domain is redundant. The stipulated ordering is done by conventional means; it is determined by affixation to a morphological category. The affix-type morphemes are either prefixes to the base or ‘stem’, either the Istem or the Vstem, or they are the agreement markers which take the co-joined constituents (stem’1) as a base. The order of the constituents with respect to each other is infl-verb. In answer to the question ‘What does affix A attach to?’, in the bipartite model the answer, as with the traditional models, is a morphological category, here ‘stem’ or stem’1.
8. The two analyses

The two analyses represent opposing views of the structure of the verbal complex. The crucial difference between the two is the concatenation they assume: the bipartite does not use a position class prosthesis, all concatenation is at-to-base.

In the template model, morphemes are assigned to position classes and have the morphological status ‘prefix’ in the grammar. The template mediates their position in the word.

One of the two main differences between the analyses is the way the tense/mode and subject morphemes are treated. In the bipartite model, these two morphemes comprise a single polysynthetic unit which is assigned the morphological status ‘stem’ in the grammar and sits at the right edge of the word. In the template analysis, these belong to two separate positions (vii and viii). The argument for this revision of their morphological status lies in the nature of the morpheme combinations from these two classes and the concomitant morpho-syntactic subcategorization constraints on the combinations. The claim of the bipartite analysis is that the morphemic combination represents a reanalysis of these morphemes into the category ‘stem’. The position class analysis imposes a unwieldy, highly abstract and inherently non-phonological relationship between the underlying and the occurring surface forms of these two classes. These alternations, imposed by this view of the morphological structure, are the basis of the claim that there is a mismatch between the phonology and morphology in Athabaskan (Hargus 1995). A brief discussion follows.

The perfective modes provide good examples of the kind of allomorphy found among the two positions. The surface forms of many of the forms in the paradigms are derived via phonological rewrite rules and not from morpheme concatenations. This is demonstrated below with the s-perfective 1st singular forms used with the null and the <l> classifiers (sperf1). The combination <si> ‘perfective’ from ‘mode’ class (vii) and 1st person singular <ish> from subject class (viii) produces the s-perfective 1st person tense/subject form <sé>.

(11) sēcha
    si -ish- l- cha
    sperf- 1SGu-Cl-stem
    vii -viii -ix-stem
    I V

The rules or constraints for producing the surface form <sé> from the proposed underlying morphemes <si-ish> are opaque. In the bipartite view, these
are stem alternations. These alternations form conjugations of inflected forms (cf. Halle & Marantz 1989). In this way they differ from the phonologically governed alternations with in the complex, such as the epenthetic alternations that occur when prefixes are attached to this base (McDonough 1996). The bipartite view assigns elements from the conjugational sets to the morphological category ‘stem’ in the grammar and crucially not ‘prefix’. In the bipartite view, the mode paradigms are portmanteaus of tense/mode and person and number. These forms are bases for prefixation. The following has the same structure as the preceding, with the same Istem, the Vstem is different, <diz> ‘spin’ (perfective form).

(12) sédiz ‘I twisted it’
    [sé]₁ // [Ø- diz]₁₉
    [sperf/1SG]₁ // [clf stem(perf)]₁₉
    I V

In the bipartite view no position classes are needed to regulate distribution among the conjunct morpheme group.

9. Position classes: the “‘A’ doesn’t know” problem

The principle problem with the position class analysis of Navajo morphology arises when the disposition of individual position classes is examined. The template encodes at least two different kinds of place holding. The first kind is typified by “A is attached to B”. We can consider this a problem of morpheme concatenation. The position class mediates and tells the morpheme where it belongs with respect to the other morphemes in the word ((3) above). In the conventional stem and affix morphology, the answer to the question is a morphological or a prosodic category such as ‘stem’: “A attaches to a stem”, “A attaches to a word” or (in a prosodic system) “A builds a foot”. In a position class view, the answer to ‘what does A attach to?’ is ‘A doesn’t know’. In this way, the position classes are used when these more traditional methods of order keeping (‘attach to a morphological category’) fail. This is the prosthetic aspect of the template. Position classes are morpho-phoneme place holders.

There is a second kind of place holding in position classes. We can see this in the following example.

Many interdependencies exist among the morphemes in the complex. For instance, morphemes from position v and viii do not co-occur, here because both carry ‘subject’ marking, though the syntax of this marking is not generally discussed in the use of position classes. In the following are words with
agreement marking from position v (<ho>) the indefinite 3rd person (Thompson 1993) and 3rd person subject agreement marking form position viii (<ish>):

(13) <ho> as object marker

a. baa nahashne’ ‘I tell a story about it’
    baa na # h(o) -ish- l- ne’
    (around it) # ‘area’ (Ob) -1sgu – cl- ‘say’
    D I V
    honishchin ‘I smell like it’
    ho-ni- ish-l chin
    ‘person/area’(Ob) n – 1sgu – cl- ‘smell’
    I V
    hashne’ ‘I tell (something)’
    ha – ish – l- ne’
    ‘person/area’ – 1sgu – cl- ‘say’
    I V

b. <ho> as subject marker

hane’ story (‘something’ told)
    h(o) – ne’
    ‘person/area’(Su) – ‘say’
    I V

The 3rd person agreement marker <ho> never co-occurs, as a subject marker, with any subject from position ‘viii’. There is a single subject marking in the Navajo verb, and morphemes from position ‘viii’ have precedence. This is a syntactic fact. Subject marking from ‘v’ occurs under certain conditions and is referred to as ‘deictic subject’ (see, Young & Morgan 1987: 200ff, Willie & Jelinek 1996). However, with the exception of <ji->, the 4th person marker (Akmajian et al. 1970), the deictic subject markers are a subset of the object agreement markers of position iv.

**Table 1:** The position class vi and v morphemes from Young & Morgan 1987 (partial listing for position iv)

<table>
<thead>
<tr>
<th>iv Direct object</th>
<th>v Deictic subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘area, space, impersonal’</td>
<td>ha/ho/hwo</td>
</tr>
<tr>
<td>‘indefinite something’</td>
<td>‘a’/e/’o</td>
</tr>
<tr>
<td>‘reflexive’</td>
<td>‘adi’</td>
</tr>
<tr>
<td>‘space, area, impersonal’</td>
<td>ha/ho/hwo</td>
</tr>
<tr>
<td>‘indefinite something’</td>
<td>‘a’</td>
</tr>
<tr>
<td>‘unspecified agent’</td>
<td>(a)di</td>
</tr>
<tr>
<td>‘s/he, one, people’</td>
<td>ji</td>
</tr>
</tbody>
</table>

Basically <h(o)> is an existential quantifier over either persons (the impersonal or ‘4rth’ person), or space/area (Young & Morgan 1987: 38, Willie & Jelinek 1995).
This morpho-syntactic co-occurrence problem is encoded in the position classes by having two positions for subject, ‘v’ (deictic subject) and ‘viii’, or alternately two positions for agreement markers which are used syntactically in distinct ways (object agreement ‘iv’ and ‘deictic subject’ ‘v’). Thus the morphosyntactic co-occurrence problem encoded as a morpheme cooccurrence problem. The position class is the means in the grammar for stipulating where these agreement markers occur in certain constructions. But the way this syntactic common sense is encoded in a position class is a distinct structural problem from the structural problem of morpheme concatenation (‘A is attached to B’). The mixing of these two kinds of functions is a near fatal problem in finding a formal base for position classes. Since the position classes are neither purely morphosyntactic nor morphophonemic entities, this violates the basic autonomy inherent in both syntactic and phonological reasoning.

In the following section, the effects that this confound produces is demonstrated by using a well articulated morpho-syntactic model of position classes (Stump 1991, 1992). As a morpheme concatenation device this type model is inherently overly powerful; it cannot distinguish between two analyses that hold conflicting views of morpho-phonemic structure, one of which is not a position class morphology. As such it is dependent on analyses of morphophonemes, presumably by a speaker’s (or linguist’s) knowledge of structure and morphemes. As such, it does not provide evidence for position class morpho-phoneme concatenation, or for the existence of position classes as a morphological type. Unless principles that motivate position classes are found, position classes remain virtual entities, useful in delineating morphosyntactic relationship, or diachronic processes, less useful as a model of morphological design.

10. Stump position class model

The formalism in this section is adapted from Stump’s (1991, 1992) discussion of position class morphologies. Stump’s model builds word forms from position classes. In this model there are three kinds of devices, Morpho-Lexical Rules (MLRs), Morpho-Lexical functions (MLFs) and Paradigm Functions (PFs). For each position class, there is a set of MLRs that assigns the

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9 In this sense these morphosyntactic co-occurrence restrictions operate very much like morpheme structure constraints in phonology. They cannot be a formal property of the position class, but they need to be in place before any morpheme concatenation can occur.
morphosyntactic features \[r\] to the morpho-phonemes of that position. The MLRs also specify that the attachment morpheme (x) and the result of the application is \(y\). Affixes that belong to the same position class are always introduced by the same MLRs.\(^{10}\) The following is a format for a MLR for a morpheme from a given position \(vii\). \([r]\) is the set of features and \(x\) the form it applies to. The output \(y\) is a form specified for the features \([r]\)

\[(14) \quad \text{Position class } vii \text{ (mode/tns): } \text{MLR}_{vii}[r](x) = y\]

The position classes for Navajo are as follows from Young & Morgan (1980: 200). Note that the subject agreement position (viii) is actually person and number (singular and dual) subject agreement:

**Table 2:** The morphemes for position classes vii, viii and ix (from Young & Morgan 1980: 38)

<table>
<thead>
<tr>
<th></th>
<th>vii</th>
<th>viii</th>
<th>ix</th>
</tr>
</thead>
<tbody>
<tr>
<td>conjunct</td>
<td>stem</td>
<td>conjunct</td>
<td>stem</td>
</tr>
<tr>
<td>vii</td>
<td>1SG. sh / (\emptyset)</td>
<td>2SG. ni / H</td>
<td>3SG. (\emptyset)</td>
</tr>
<tr>
<td>ni</td>
<td>3SG. (\emptyset)</td>
<td>2D. ii(d)</td>
<td>2D. o(h) / oo</td>
</tr>
<tr>
<td>yi</td>
<td>1D. ii(d)</td>
<td>d</td>
<td>l</td>
</tr>
<tr>
<td>si</td>
<td>2D. o(h) / oo</td>
<td>l</td>
<td>d</td>
</tr>
<tr>
<td>ó</td>
<td>mode/tns</td>
<td>subject</td>
<td>classifiers</td>
</tr>
</tbody>
</table>

A set of morpho-lexical rules which compete for a given slot determine the MLF for that slot. So a MLF for position vii from Table 2 would arguably contain at least the following MLRs. Note that the MLR\(_{vii}\) for the null \(\emptyset\)-imperfective returns itself ((15a) below) (see Stump 1991: 214).

\[(15) \quad \text{Navajo: MLRs for position class } vii \text{ (mode/tense)}\]

\[a. \quad \text{MLR}_{vii(mode)}(\text{imperfective})(x) = \text{def}[x]\]

\[b. \quad \text{MLR}_{vii(mode)}(\text{perfective})(x) = \text{def}[\text{stf} x]\]

\[c. \quad \text{MLR}_{vii(mode)}(\text{optative})(x) = \text{def}[\text{opt} x]\]

The following are some MLRs for the subject position (viii) in the preceding table. The form (17a) returns an imperfective 1st person singular marker <\text{iši}> to the stem 'x', the form in (b) returns the second singular subject etc.

\(^{10}\) See Stump (1991) for arguments against the adequacy of subcategorization to capture position class affixation.
(16) Navajo: MLRs for position class viii (subject agreement)
   a. $\text{MLR}_{v\text{iii}[\text{AGR(subj):1SG}]} (vx) = \text{def}\{\text{ish-}\{vx\}\}$
   b. $\text{MLR}_{v\text{iii}[\text{AGR(subj):2SG}]} (vx) = \text{def}\{\text{ni-}\{vx\}\}$
   c. $\text{MLR}_{v\text{iii}[\text{AGR(subj):3SG}]} (vx) = \text{def}\{vx\}$

This set-up consigns to the phonology any repairs to the morpho-phonemes caused by the concatenation. In the preceding case, the combination of position vii and viii for the s-perfective from vii does not produce the expected <si-ish->, the 1st person singular form of the s-perfective is <sé->. As Stump notes, portmanteau morphemes of exactly this type are common in paradigms. He defines ‘portmanteau’ as a morpheme that spans two positions and provides a formalism for handling these, adapted to the Navajo case below:

(17) Portmanteau MLR: over slots vii, viii for s-perfective, 1st sing subject
    $\text{MLR}_{v\text{iii-v\text{iii}}} (\text{Tns/mode(s-perf1):AGR(subj):1SG}) (vx) = \text{def}\{sé-\{vx\}\}$

An elsewhere-type condition, Maximal Subset Override, is used to override the application of the less specified subject agreement rule from position viii. This has the effect of incorporating phonological rewrite rules of the type used by Kari (1976) and others (see Hargus 1985; Rice 1989) for Athabaskan into the algorithm.

A paradigm function applies to the ‘root’ of a paradigm and yields a fully inflected word of the paradigm,

(18) $\text{PF}_{\{σ\}}[r] = z$

where $[σ]$ is the set of morphosyntactic features and $[r]$ is the ‘root’ of a paradigm. The output $z$ is a word in $r$’s paradigm. An example would be a PF that applies to a ‘root’ morpheme to yield that root’s ø-imperfective, 1SG subject form. The paradigm functions are defined in terms of (sets of) morpho-lexical functions (MLFs), which refer in this case to the various position classes, and to the existing portmanteaus. The PF$_{\{\}}$ is the full set of well-formed morphosyntactic features, and the paradigm function stipulates the ordering of the MLFs needed to get those features. The PF’s below add the MLFs in this order: $(2 + (1 + \text{stem}))$, a formalism of the flat template. Ordering is trivial for the PFs:

(19) Navajo $\text{PF}_{\{vx\}}[vx] = \text{def}\{\text{MLF}_{2[σ]}(\text{MLF}_{1[σ]}[vx, x])\}$

11 A stratum ordered approach, like the Lexical Phonology model, could be accomplished in this model by adapting MLF into levels.
A PF for Navajo that produces '<sédiz>' 'I twisted it' follows. The form is given in both analyses:

**Table 3.** A template and bipartite analysis of Navajo form '<sédiz>' 'I twisted it'.

<table>
<thead>
<tr>
<th>Template</th>
<th>Bipartite</th>
</tr>
</thead>
<tbody>
<tr>
<td>s — ish — ø // diz</td>
<td>[ sê // diz]</td>
</tr>
<tr>
<td>sperf-1sg-cl-stem:’spin’(perf)</td>
<td>[sperf/1sg]infl [perf:’spin’]v</td>
</tr>
</tbody>
</table>

I twisted it

The '<sê>' is a portmanteau, and by Maximal Subset Override wins out over the form in (16) above:

(20) \[ PF_{\text{few}}(\text{modals-perf})_{\text{AGR(subj):1sg}(\text{v}, \text{diz})}) = \text{def } \text{MLF}_{2}^{} \text{sê}_1(\text{v}, \text{diz}) \]

The powerfulness of this system is reflected in the fact that there is nothing in the system which guarantees predicts or constrains the number or types of slots, or the specification assigned to the slots, or the ordering of the specifications. In addition, portmanteaus such as '<sê>' above are 'given' to the formalism. The formalism itself has no way of evaluating a sequence to determine if the mapping of an MLR to MLFs and PFs produce the correct surface forms. In effect, the system can evaluate neither morphological transparency nor opacity. For example, take a system in which most of the position vii and viii morphemes become portmanteaus by losing their morphological transparency. Since by definition, a portmanteau is a specification over two slots, in a system where enough position vii and viii morphemes are portmanteaued vii(viii), these two positions will necessarily collapse. Because an elsewhere condition assigns MLFs (Stump's Maximal Subset Override), at some point, the lack of a featural specification becomes a countable thing, and the advantage of the portmanteau’s ‘greater’ specification is lost. A process like this, in fact, may be what has occurred in the development of Athabaskan.

12 There is good reason to define portmanteaus as two morphemes that have become a single opaque morpheme with joint specification, mainly because there is no principled way to restrict the kind of specifications a morpheme may carry. French '<au>' 'at the' (masc) is considered a portmanteau by virtue of the existence of two transparent morphemes that carry the same specification '<à la>' 'at the' (fem), and crucially not the specification it carries; the English 3rd person, singular, indicative marker '<s>', although it carries specification for person, number and tense is not considered a portmanteau.

13 This is in effect what is encoded into the position classes as 'null' morphemes, specification that is not attached to a morpho-phoneme, but to the absence of one.
In the bipartite view, vii and viii are collapsed in this way. The morphophonemes do not represent distinct positions, but simply morphemes with featural specifications covering tense/mode and subject agreement. The forms for a fragment of some Navajo tense/mode paradigms (covering positions vii(viii)) follow:

**Table 4:** Fragments of two tense/mode paradigms in Navajo, the ø-imperfective and a si-perfective from Young & Morgan (1987: 200)

<table>
<thead>
<tr>
<th>person/number</th>
<th>ø-imperfective</th>
<th>s-perfective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg</td>
<td>(yi)-ish</td>
<td>sé - ø</td>
</tr>
<tr>
<td>2sg</td>
<td>ni/H</td>
<td>sini</td>
</tr>
<tr>
<td>3sg</td>
<td>(yi)-ø</td>
<td>si-ø</td>
</tr>
</tbody>
</table>

Some MLRs for these positions:

(21) Navajo: MLRs for mode/subject bipartite stems

a. MLR $\lambda_{\text{AGR(mode/person):1SG, ø imperf}}(l, x) = \text{def } l, \text{ish } l, x$  

b. MLR $\lambda_{\text{AGR(mode/person:1SGs-perfective1}]}(l, x) = \text{def } l, \text{se } l, x$  

We can add any featural specification necessary to distinguish the correct forms. The PFs for these rules will attach the mode/subject morphemes <ish> or <sé>, with their respective featural specifications for mode, subject, person and number, to a verb base, such as <diz> ‘spin’ or <t’é>.

(22) PF$\lambda_{\text{Tns/mode(s-perf1):AGR(subj):1SG}]}(l, v, diz) = \text{def } \text{MF } 2\text{sé-l } (l, v, diz)$

The formalism is indifferent to the morphological category ‘stem’ of the morpho-phoneme, its main function is to order the morphemes. But in the two main types of morphological typology, ordering is redundant, it is only position classes that need this type morpheme government. The position class formalism is not a morpheme concatenation device.

The fact that this position class formalism has no way of knowing if <si-ish>$_{\text{perf}}$ or <sé>$_{\text{perf}}$ is the correct form for a given set of featural specifications is crucial in the Athabaskan case. Stump’s model can build Navajo words from both the template and the bipartite structure equally well. But in the bipartite structure, the position class ordering is completely redundant, at least among the prefix groups. The formalism cannot distinguish between the two different structures, the position class structure of (7) with its prosthetic template and the bipartite structure of (10) in which the ordering is redundant, provided by af-to-base concatenation. The confound lies in the fact that the two analyses make conflicting claims about the morphemes in the word, the structure of the complex, and crucially, the kind of morphological
entities there are in the world. In this way the formalism fails to provide insights into any principles that underlie position class typologies.

The algorithm is a model of the assignment of morphosyntactic features in a word. The question remains: what is the structure of the verbal complex, what are the morphemes in the verbal complex. It’s the claim of the paper that answers to these questions lie in an interface of morpho-syntactic specification with the phonological component, and in particular, with the prosody. Finally, in view of this, it is meaningless to argue for the lack of isomorphy between the morphology and phonology in Athabaskan, if the template underlies this analysis. Claims that position classes exist as a morphological type need motivation outside its use in the analyses of languages.

II. Conclusion

I end with a caveat; I have excluded clitics from discussion. Position classes may be operable in clitic groups (Speas 1987; Halpern 1992; Stump 1991, 1993), the organization of those classes informed by syntactic principles. Clitics have a quasi-affix, quasi-word property. But in morpheme concatenation where the problem can be phrased as ‘what does A attach to?’, position classes do not provide formal solutions. The second caveat is related to this, I am ignoring, for the point of argument, the inherent morpho-syntactic bias of position class formalisms. If we claim position classes as a morphological type, this is a reasonable tack, we expect and predict them to have relevance to morpho-phonemic structure. One point of this paper is that they do not; the position class formalism is too powerful and cannot distinguish between two conflicting models of the Navajo verbal complex, only one of which is a position class model. If a speaker relies on the ability to deduce morphophonemes from the speech signal to comprehend and build new verb forms, this power of the model to also produce non-position class morphologies is a serious problem for the proposal that position classes exist as a morphological type in this language family.

Finally, the ability to characterize the conjunct morphemes of the Athabaskan template within a common morphological type means that we have failed to find any motivation for the proposal that position classes are a distinct morphological category in a case that is used as a canonical example of position classes.
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Agentive nouns in Dogon
Neither derivation nor inflection?

Vladimir A. Plungian

The article analyses one ‘strange’ grammatical marker of Dogon (West Africa) which seems to be neither affix nor clitic and neither inflectional nor derivational marker. Such phenomena are argued to be not infrequent in agglutinative languages, and some theoretical consequences concerning current morphological models are briefly discussed.

1. Introduction

The main object of this study will be a puzzling phenomenon in the nominal morphology of Dogon (West Africa), later on it will be referred to as ‘agentive noun’. Accordingly, Section 2 introduces the data about Dogon agentive nouns, while Section 3 discusses whether different current models of morphology can cope with it.

First, however, some preliminary remarks about the Dogon language are in order. The name ‘Dogon’1 is applied to a group of about twenty related (though often not mutually intelligible) dialects spoken in a remote south-west part of Mali, mainly in a highland area known as the Bandiagara plateau and on the adjacent arid plain. The total number of Dogon speakers amounts to some 600,000 people. Our study is based on one of the (geographically) central and (sociolinguistically) most important dialects, the ™mm₃-₃ dialect, though in this paper we shall still use the cover term Dogon. Genetically, the position of Dogon within the Niger-Congo family is not very well defined yet; given the actual state of our knowledge it would be wise, perhaps, to consider it as a Niger-Congo isolate. So far, however, most students of the problem were likely to classify it as a marginal member of the Gur group (cf. Bendor-Samuel 1971; Bendor-Samuel et al. 1989). It should be emphasized that, unlike

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1 Actually, also one of the types of agentive nouns under consideration: cf. the examples under (2a) below. The language name relates to a plural form meaning ‘Dogon people’ (d₂f₂₃ in most dialects), the singular (i.e. ‘Dogon person’) being d₁₃ or d₂₃. For more detail, see Section 2.
most Gur languages, Dogon does not display any developed noun class system. Moreover, its nominal morphology is rather isolating, with (optional) clitical markers of number and case, while, on the other hand, its verbal morphology is clearly agglutinative, with a rich set of tense and aspect oppositions.  

This general typological characteristic indicates that what we can expect to be the main morphological problem for a language like Dogon is the so-called problem of wordhood. It has several dimensions and implies, among others, that there will be large intermediate zones with no clear-cut boundaries both between affixes and clitics (or, more generally, between bound morphemes and autonomous words) and between inflectional and derivational markers. This is indeed the case. The formation of agentive nouns discussed below provides a good illustration of all these difficulties and appeals, perhaps, to a more subtle representation of morphologically relevant facts.

2. Agentive nouns

2.1.

The Dogon agentive nouns are obtained by means of a word-final marker -ne (we call it neither ‘suffix’ nor ‘clitic’, and its precise morphological status is to be specified later). The term ‘agentive’ (somewhat conventional) seems justified because the general meaning of the derived nouns is ‘a person, who...’, but there are some semantic peculiarities depending on the lexical class of the element of departure. The marker -ne is applicable to a limited number of nouns, to a limited number of adjectives and to most — perhaps, all — verbs. By and large, it could be considered the nominalizing deverbal marker ‘par excellence’. Nevertheless, we shall begin our presentation with its more restricted, but very important denominal and deadjectival uses.

Here are some typical examples:  

(1) Denominal ne-nouns
   a. ꟾفنادق ‘power’ — ꟾوو ‘hogen, religious chief, chief, leader’
      ꟾوو ‘wealth’ — ꟾوو ‘rich man’
      ꟾوو ‘enmity’ — ꟾوو ‘enemy’

2 A preliminary analysis of Dogon (tmmnc) morphological system is given in Plungian (1995); the most recent sociolinguistic and dialectal survey of the Dogon area as a whole can be found in Plungian & Tembiné (1994).

3 The abbreviations used throughout the article are as follows: 3—third person, ACC — accusative, ANT — anteriority, DEF — definite article, FUT — future, PL — plural, SG — singular.
b. antolu 'hunting' - antolu.ne 'hunter'  
guy 'theft' - guy.ne 'thief'

(2) Deadjectival ne-nouns
a. dagço 'belonging to the Dogon race' - dagço.ne 'Dogon person'  
pulço 'belonging to the Fulani race' - pulço.ne 'Pullo, Fulani person'

b. degu 'poor' - degu.ne 'poor person'  
pry 'old' - pry.ne 'old person'\(^4\)

It can be seen that the main sources of the ne-derivation are nouns and adjectives which denote properties; accordingly, the derivatives relate to a person who has, or is characterized by, the corresponding property.\(^5\) Nouns under (1b), however, represent another subclass of possible derivational sources. They are names of (dynamic) situations, and their derivatives relate to the agent of these situations (more informally, the meaning of these derivatives can be paraphrased as 'one who [usually] deals with P', where P is the name of the situation in question). The two examples cited here represent slightly different types of nominal derivation. The noun antolu 'hunting' is a simplex, i.e., it is not analyzable (at least, synchronically) as going back to any verbal lexeme; nouns of this type constitute a rather limited source for the ne-derivation. On the other hand, the noun guy 'theft' is an obvious deverbal derivative, namely, a *nomen actionis* from the verb guy-e 'steal';\(^6\) this type of nouns constitutes, on the contrary, a very important source of the ne-derivation. We shall discuss the nouns of the guyne type later, when considering the properties of deverbal ne-derivatives.

The derivation exemplified in (1a–b) and (2b) is non-productive (with an exception of the guyne derivatives just discussed). In addition, a slight idiomatization may result (which is typical for this type of derivation). Thus, \(\frac{\text{y}}{\text{g}}\) 'power' yields \(\frac{\text{y}}{\text{g}}\text{n}e\), with a general meaning 'chief, leader'; but this latter word is found mainly in a more specific sense of 'religious leader, sacred priest' (who had the supreme power in the traditional Dogon society).\(^7\)

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\(^4\) In the last noun, the final -\(\text{y}\)- of the adjectival stem is dropped by an irregular morphophonological process. Diachronically, it is possible to analyze this -\(\text{y}\)- as a fossilized diminutive suffix.

\(^5\) A competing denominal suffix may be in this case (at least no less frequent) -\(\text{g}\)in, cf. \(\text{s}\)mke 'force; power' = \(\text{s}\)mke-\(\text{g}\)in 'strong/influential person'; for more detail, cf. Plungian (1995: 17–18).

\(^6\) Verbs are given in the form of 2 SG imperative coinciding with the 'full', or 'vocalic' variant of the verbal stem (see Plungian 1995: 26ff), the final vowel (which may be truncated in some contexts) is separated by a hyphen.

\(^7\) In Western (mainly, French) anthropological literature, the spelling *hogon* has been used.
Pairs like $d\gamma r$ and $d\gamma r\nu e$ in (2a) deserve a special mention. Their first elements form the most homogeneous group among the adjectival sources of $n\epsilon$-derivatives. They all have a meaning 'belonging to an ethnic group X' and sometimes are referred to as 'ethnic adjectives' (cf., for example, Kervran 1993). Accordingly, the derived nouns denote a representative of the ethnic group X (the sense which, in English, is usually rendered by a conversion, with several noted exceptions like French [adj.] — Frenchman [n.]).

Another peculiar type of denominal $n\epsilon$ can be illustrated by the examples (3a–d):

\begin{align*}
(3) & \quad a. \quad mi \; naa \\
& \quad \quad 1 \; \text{mother} \\
& \quad \quad \text{‘my mother’} \\
& \quad b. \quad *mi \; naa \; n\epsilon \\
& \quad \quad 1 \; \text{mother-n}\epsilon \\
& \quad c. \quad naa \; n\epsilon \; \eta \; bo\; e \\
& \quad \quad \text{mother-n}\epsilon \; \text{child ACC call-PAST(3SG)} \\
& \quad \quad \text{‘the mother called the child’} \\
& \quad d. \quad *\; naa \; \eta \; bo\; e \\
& \quad \quad \text{mother child ACC call-PAST(3SG)}
\end{align*}

Here, the element $n\epsilon$ is applicable to a closed list of kinship nouns (like $b\alpha a$ ‘father’, $naa$ ‘mother’, $i\gamma r$ ‘husband’, etc.) which all share the property of having an obligatory 'possessor' and are, in addition, characterized by several other common syntactic properties (in Plungian 1995, the term 'relational nouns' is used). The final $n\epsilon$ is impossible when the overt possessor is present elsewhere in the same NP (cf. 3a and 3b), on the other hand, the presence of $n\epsilon$ implies the obligatory absence of the possessor. Hence, the meaning of $naa \; n\epsilon$ in (3c) is roughly ‘the person who is a mother (of somebody)’. The exact nature of this ‘motherhood’ may be specified in the context. Thus, the most natural interpretation of (3c) is ‘a woman called her child’, but it is not the only possible interpretation. One can imagine a situation when a woman (who is a mother) called a child which is not her own; this reading might be ascribed to (3c) as well.

2.2. To sum up, the properties displayed by denominal and deadjectival $n\epsilon$-nouns point towards a semi-productive derivation which most theories would classify as ‘lexically listed’ (though at least in the domain of ‘ethnic adjectives’ there seems to be a somewhat greater degree of derivational freedom). Let
us now turn to the cases where the source of *ne*-derivation is verbal.

Here, the picture is different. First, the marker *ne* can combine with virtually any verbal stem (without apparent restrictions), forming thus ordinary agentive nouns with the meaning ‘one who [usually] performs an action V’; several examples are given under (4):

(4)  jənən ‘treat, cure’ – jənun *ne* ‘medicine man, healer’
     wa1-a ‘till, cultivate’ – wa1un *ne* ‘crop-grower, farmer’

This type of derivation is parallel to the (non-productive as well as productive) denominal derivation exemplified by (1b), with (simplex as well as derived) *nomina actionis* as a derivational source. Moreover, in some cases it is not so easy to determine the exact nature of the form of departure, since the deverbal noun may or may not coincide with what is considered to be a verbal stem. Thus, the deverbal noun from wa1-a is wa1u ‘cultivation’; this form uses an irregular vowel alternation, which allows us to treat the form wa1un *ne* as a deverbal one (cf. also the noun guyn *ne* ‘thief’ given in 1b, which is obviously related to the deverbal noun guy ‘theft’ and not to the verb gu-e ‘steal’). However, it is not always possible to distinguish between verbal and nominal stems, and consequently forms like, for example, jynun *ne* may be ambiguous (‘treatment’ being jənə as well; the final -u is both the suffix of *nomina actionis* and the habitual stem marker).

This kind of ambiguity, however, is not very problematic and does not constitute a real difficulty for a linguistic analysis. If the facts just adduced were all the relevant data about the Dogon agentive nouns, we could probably assume that all the agentive derivatives are denominal, even if we treat some derivatives as deverbal, this decision would by no means be typologically unnatural. Recall that even in highly inflectional languages cases are attested where one and the same suffix is applicable both to verbs and nouns; such is, for example, the Latin suffix -(ā)tor (incidentally, also agentive): along with deverbal ārātor ‘ploughman’, we can find also denominal glādiātor ‘gladiator’ (from glādius ‘sword’, no verbs like *glādiāre* being attested).

The problems begin, however, when we look at the other deverbal *ne*-forms. In fact, they are numerous: the real paradox is that, besides agentive nouns with a habitual meaning (like guyn or wa1un), each tense and aspect form appears to have its own ‘agentive’ nominal counterpart. The marker *ne* can be attached not only to a pure verbal stem (as it was the case in 4), but also to past, present or future forms of the verbs, as the examples under (5) clearly show:
Moreover, this mysterious marker is compatible even with the analytical verbal forms (in Dogon, consisting of a converb and an auxiliary). Cf.:

(6) a. wal-a be 'he had cultivated'
    cultivate-ANT be:PAST(3SG)
    b. wala be-n 'one who had cultivated (and does not practice it any
    more); an ex-farmer'

The question arises whether we are facing a phenomenon of nominal derivation or a phenomenon of verbal inflection (something like participle formation). My own answer would rather be that it is a case of nominal derivation, but the obvious fact is that we are dealing here with something clearly intermediate.

2.3.

The denominal agentive nouns, on the one hand, and the deverbal 'participle-like' nouns, on the other hand, form two different classes of nε-derivatives, with habitual denominal/deverbal nouns lying in between. If Dogon had no derivatives of the (5) and (6b) type, we would easily categorize the remaining nε-forms as habitual agentive nouns; on the contrary, if Dogon only had the latter derivatives, they undoubtedly would be called participles by any field linguist. Of course, it is always possible to speak about two different markers, one forming (denominal) agentive nouns and the other — (deverbal) participles; however, this solution, as we shall see later, does not remedy all

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8 Some authors, indeed, suggest the analysis of nε-forms as verbal. In particular, this account is developed in Culy (1990: 132ff) (this study is based on the data from the very close donno-s'o dialect). In our text sample, however, no sure indications of adjectival use of nε-forms (with an overt head noun) are attested. The possibility of such constructions in donno-s'o is open. However, even if they really exist (which may well be the case), the problem of denominal nε-forms remains unexplained; moreover, some clearly nominal properties of all the nε-forms do not agree very well with a 'participle' hypothesis (see below, Section 2.3).
mismatches, and instead creates an unnecessary homonymy.

All _n_ -forms have common properties. Some of these properties can be said to be nominal and thus prevent us from treating these forms as elements of verbal paradigm (which must be the case if we deal with ‘genuine’ participles). Other properties can be said to be verbal and contribute to the participle-like treatment of _n_ -forms. Let us consider these properties in turn.

The two basic nominal properties of the _n_ -forms are the following. First, from the syntactic point of view, they behave like nouns, because they are (or, at least, they can be, see note 8) the syntactic head of the nominal phrases and, consequently, they can be modified by attributes and postpositions, cf.:

(7) jëf₇un₇p₇7yg₇le
    healer old  DEF with
    ‘with the old healer’

Second, all the _n_ -forms can take a suffixal plural marker, which, in Dogon, is a strictly nominal (and not adjectival) property. At this point, some more detailed information about the Dogon plural must be provided.

There are two types of plural markers in Dogon: the one marker (-m) is suffixal, while the other (mbe) is a clitic; this latter always occupies the final position within the NP, after all the other nominal dependents, cf.:

(8) ise pilu gr mbe
    dog white DEF PL
    ‘the white dogs (under consideration)’

As concerns the suffixal plural marker, it occurs only on names of persons: for example, the plural from the noun _nn₇_ ‘human being, person’ will be _nn₇_-m (then, a clitic plural marker may also be added, for further detail, see Plungian 1995: 9–11). The _n_ -derivatives, relating to names of persons only, constitute a natural subclass of nouns taking a suffixal plural. An important additional property of this plural suffix is that it always replaces the marker _n_ (however, we cannot treat -m as a plural allomorph of _n_ just because it can form plurals from words like _nn₇_, i.e., without _n_ in the singular). Thus, forms like those given in (9a–b) and (10c) are widely attested:

(9) a. dëgo₇-n₇ ‘Dogon’ [SG] ~ dëgo₇-m ‘Dogon people’ [PL]
    b. jënu₇-n₇ ‘healer’ [SG] ~ jënu₇-m ‘healers’ [PL]
(10) a. wad-e ‘(s)he remained’
    remain-PAST3SG
    b. wad-e-n₇ ‘one who (has) remained’ [SG]
    c. wad-e-m ‘those who (have) remained, the others’ [PL]


It should be emphasized that the possibility of taking a suffixal plural is a strictly
nominal property in Dogon, not shared by any adjectival modifiers. Thus, in
this respect, ne-forms clearly behave like nouns, and not like adjectives.

Now, as concerns the ‘verbal’ properties of these forms, there are also two
worth considering. First, the agentive derivatives easily maintain verbal argument
structure and government patterns (especially the direct object of the
verb of departure). The second property is the maintenance of verbal (inflec-
tional) morphology, which was already discussed (cf. especially examples
under 5, 6 and 10).

The maintenance of verbal argument structure can be exemplified, among
others, by the expressions like ku poru-ne meaning ‘cutthroat, robber’ (literally,
‘one who cuts head’), with the noun ku ‘head’ in the typical preverbal position
of the direct object. Cf. also a nice pair naa giru-ne and ene giru-ne: both are
obtained from the verb gir-ε ‘lead, herd (cattle)’ and denote a kind of herds-
man, the first dealing with cows, and the second — with goats (literally, ‘cow-
leader’ and ‘goat-leader’). The cases of the so-called ‘internal object’ are also
quite numerous; they are especially characteristic for habitual agentive nouns
such as guy guy-ne ‘thief’ (lit., ‘one who steals theft’) or yu walu-ne ‘farmer,
peasant’ (lit., ‘one who cultivates millet’).9

3. Theoretical problems

What kind of theoretical model should account for a coherent description of
the phenomena just considered?

Recall that ne does not resemble what is usually said to be either a typical
derivational or a typical inflectional marker. More precisely, in some of its
uses (which may be referred to as ‘habitual’ ones) it shows a number of
typically derivational properties (such as numerous lexical restrictions,
frequent idiomatization, and the ‘right’ internal constituency, i.e. the fact that it
cannot occur after clearly inflectional markers). Other uses (which may be
referred to as ‘participle-like’), however, are characterized by the opposite
properties: in participle-like uses, the marker ne is not lexically restricted, does
not undergo idiomatization, and occupies a position after inflectional
markers of verbal tense and aspect.

9 The word for ‘millet’ is to be interpreted here as a generic term for ‘cereals’; the entire
construction is semantically analogous to what is found, for example, in Chinese, where the
VP meaning literally ‘to eat rice’ is interpreted as a generic expression for ‘to eat (something);
to dine’, etc. Millet is a basis of Dogon cuisine.
Perhaps, if *ne* could be considered to be a (postpositive) clitic (like, for example, the plural marker *mbe* or the definite article *ge* in Dogon), some of these problems would be solved (first of all, those of internal syntax). Unfortunately, there is no evidence in favor of this status of *ne* in Dogon (though from a diachronic perspective it may still be true). Indeed, *ne* cannot be separated from the remaining word-form by any other morphologically autonomous element; on the other hand, the agentive meaning can be expressed in cumulation with a typical inflectional meaning such as the plural of personal nouns (or, in an alternative treatment, it has a morphologically conditioned zero allomorph before the plural suffix). This means that *ne* is deeply integrated in the system of Dogon inflectional suffixes.10 Similarly, the analysis of *ne* as a compound element (i.e., as a root and not as an affix, much like the English *-man* in French-*man* or plough-*man*) is not supported by any other independent evidence. Moreover, deadjectival *ne*-derivatives display such an additional ‘affixal’ property as (optional) vowel harmony (which never operates word-externally in Dogon) namely, a variant *-n*, along with *-ne*, can be used after back vowels, so that *nyma* and *nym* ‘hogon’, *purne* and *purn* ‘Pullo’ are possible, and so on.

Thus, *ne* is a suffix; more precisely, it is more suffix than something else.11 What can be said now about its inflectional/derivational status? Could at least its ‘participle-like’ uses be considered as inflectional?

In our opinion, this solution would be incorrect. First, the suffix *ne* changes the syntactic class of the element of departure; second (and more crucial), it cannot be considered obligatory. Admittedly, there are other possible views of the inflection/derivation distinction, but here we are not in a position to discuss different approaches in any detail. We have to restrict ourselves to the bare statement that what we would like to call inflectional is a closed class of mutually exclusive elements, one of which is always present in the word-form (for similar proposals, cf., for example, Mel’čuk 1982 or, in a slightly

10 For some authors (cf., for example, Booij (1995)), this property may serve even as an argument in favor of the inflectional status of the corresponding element. Yet the case of cumulative expression of inflectional and derivational markers within the same morpheme are not infrequent; cf., for example, the description of allomorphy displayed by verbal derivational suffixes of ‘itive’ and ‘ventive’ in Turkana provided by Dimmendaal (1983: 119 et passim).

11 It should be noted that, recognizing the affixal status of *-ne*, we face in this case what is often called the ‘bracketing paradox’: indeed, forms like *wala benvi* ‘ex-farmer’ display a conflict between two levels of representation — just like such well-known English examples as moral philosopher (for more detail, see Spencer 1991: 397–420).
different perspective, Bybee 1985). Yet the suffix \( n \) does not belong to any natural class of such elements, despite the fact that it is fully productive and occupies a post-inflectional position in a word-form. The latter two properties are often ascribed to inflectional markers, but, from a typological point of view, they are obviously not sufficient in the sense that they do not allow to distinguish between inflectional and some highly productive derivational markers. These properties work well only for inflectional languages with a non-productive and highly lexicalized derivation. Data from agglutinative languages do not support such a strict separation of inflectional and derivational markers; neither do they fit into a ‘split morphology’ hypothesis in Anderson’s sense, where the case of post-syntactic derivation is not at all provided by the theory (cf. Anderson 1982 and 1992; for a critical discussion cf., among others, Dressler 1989 and Booij 1995).

To sum up, \( n \) is an affix which behaves like a clitic, and a derivational marker which behaves like an inflectional one. This situation is far from being exceptional. Phenomena like this are reported constantly from languages with weak morpheme boundaries and, consequently, with not always clearly observable differences between affixes and words; such languages are often referred to as agglutinative. It seems that agglutinative morphemes are too independent to be treated as parts of the words: they are too word-like to be true affixes, but, at the same time, they are too affix-like to be true words.

To account for this type of language we obviously need a less rigid model of derivational morphology, which would allow derivational markers to occur ‘before’ as well as ‘after’ inflection. This contradicts the classical view of inflection, captured in a well-known universal 28 of Greenberg (1963) and maintained, in a sense, by Anderson. But, on the other hand, we do not think that languages like Dogon undermine the very idea of cross-linguistically valid difference between inflection and derivation. Of course, many authors use exactly this type of data to prove that inflection and derivation are basically the same phenomenon, since inflected forms may serve as input for derivation, and vice versa (cf., for example, Di Sciullo & Williams 1987: 69–71, and others). But this argumentation is true only concerning the very rigid definition of inflection and derivation, which, in any case, is to be abandoned. On the contrary, the view of inflectional markers as obligatory (with a great variation on their other properties) allows us to preserve the distinction and to give it a really universal character.

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12 When an element changes a lexical class, it can never form a natural set of mutually exclusive markers (which is usually called ‘grammatical category’); the other possible solutions seem to be much more artificial. Cf., however, Haspelmath (1995) for an alternative approach.
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References


Agreement morphology in Chukotkan

Andrew Spencer

I present an analysis of verbal agreement in the ergative languages Chukchee and Koryak (Chukotkan-Kamchatkan paleosiberian) showing that certain aspects of the system pose problems for current versions of Distributed Morphology (Halle & Marantz 1993). First, the agreement prefixes and suffixes exhibit a type of ‘split ergativity’: the suffixes seem to operate on an essentially absolutive patterning, while the prefixes make reference principally to subject functions. This seems to require reference to subject and object (or nominative and accusative case) as well as ergative and absolutive functions. More seriously, the agreement paradigms for 1st person object show syncretisms with the antipassive paradigms. This is an instance of the take-over of a marked category by an unmarked one, and hence cannot be handled in terms of DM’s Impoverishment rules. I conclude that the data support a realizational conception of inflection and sketch an analysis along the lines of Stump (1993b).

Introduction

It is possible to discern two opposing views on the way in which inflectional morphology should be handled. The first regards inflectional formatives (affixes, vowel changes, consonant mutations, reduplications) as morphemes in the structuralist tradition, that is, a pairing of phonological form with meaning or grammatical function. On this view an inflectional formative, or inflectional piece, is a lexical entry, which just happens to have a limited semantic value and heavy constraints on what kinds of morphological objects it can attach to. In other words, there is only a fine dividing line between an inflectional piece and a fully fledged word (in the sense of lexeme).

A clear exposition of this view is provided in Lieber (1980). She provides subcategorization frames for inflectional morphemes so as to ensure that they attach to stems in the right way. In this way a word is assigned a hierarchical, constituent structure, much like the phrase structure marker of a syntactic representation. Lieber also assumes that the meaning of an inflectional morpheme is characterized as a set of morphosyntactic features. In computing the meaning of a complete inflected word these features percolate to the uppermost node of the word tree. An illustration of how this might work is provided in (1).¹

¹ I use the following abbreviations in the linguistic examples: ABS, absolutive; ACC, accusative; AGR, agreement; AP, antipassive; AUX, auxiliary; CL, ‘clitic’ (Halle & Marantz); COND, conditional; ERG, ergative; FUT, future; IMP, imperative; IND, independent (mode); NEG, negation; NOM, nominative; NUM, number; OBJ, object; OBL, oblique; PL, plural; PRET, preterite; PROB, probab-
Here the subcategorization frame for the plural suffix requires a noun to the left and delivers a noun. A feature percolation principle then requires the [+PL] feature to percolate to the topmost N node, thereby marking the entire word form as a plural (of ‘cat’).

This approach raises a number of questions even for a very simple case such as English plurals. For example, how do we handle the case of ‘man/men’, and in particular how do we prevent the generation of ill-formed plurals such as *mans or *mens? In addition, we can ask how the singular is represented. If nothing else is said about the grammar, then we would presumably need a zero morpheme marked [−PL] to account for the singular form (otherwise the grammar would not ‘know’, so to speak, the number of a singular word form.) With more complex systems more serious questions arise concerning the order in which affixes are added and how this can be accommodated by means of subcategorization frames. I shall refer to approaches of this kind as ‘morphemic’ approaches. Models of this sort tend to share two facets, which are, however, independent: first, they assume that words have a hierarchical, constituent structure, much like phrases (indeed, Lieber 1992 argues that, outside inflectional morphology, word structure is just phrase structure); second, they assume that inflections are morphemes with their own properties.

Some of the problems besetting the earlier morphemic models are addressed in Lieber’s later account (1989, 1992). There she assumes that lexical categories are endowed with a ‘categorial signature’, a proforma of all the grammatical features for which an item might be inflectionally marked. Thus, a noun in English will have the categorial signature in (2a), while a noun in Hungarian might have the one shown in (2b), expressing the fact that Hungarian nouns inflect for (at least) number, case and possessor:

(2) a. \[
\begin{array}{l}
\text{[\text{NUM}: \alpha]} \\
\alpha = \{\text{SG, PL}\}
\end{array}
\]
Agreement morphology in Chukotkan

b. $[[\text{NUM}] \ [\text{CASE}] \ [\text{AGR}]]$:

- $\text{NUM}: \alpha = \{\text{SG, PL}\}$
- $\text{CASE}: \alpha = \{\text{nominative, accusative, dative, inessive, ...}\}$
- $\text{AGR}: \alpha = \{1\text{SG}, 2\text{SG}, ..., 1\text{PL}, ... 3\text{PL}\}$

On this view, feature specifications percolate so as to fill in the blanks in the categorial signature. If a feature is left unspecified, say, because there is no affix bearing that feature value, then the unmarked value is provided. Thus, the singular of ‘cat’ would no longer need to be given a singular zero suffix, rather, the value $[\text{NUM: SG}]$ would be filled in by a default rule.

The second view treats inflectional pieces as entirely different in kind from lexical roots (and in some theories, different from derivational morphemes). An inflectional formative is a morphological operation performed on a stem so as to realize a collection of grammatical properties. The operation need not be unitary, but there may be several distinct operations each realizing the same morphosyntactic property but in different environments. Moreover, a particular type of output (say, a particular affix) need not be associated with just one such operation. The result is that the function of an inflectional piece is separated from its form and vice versa. For this reason, such an approach to morphology is often said to respect (after Beard) the Separation Hypothesis.

On Separationist assumptions the plural of ‘cat’ would then be conceived of as an operation, $f_{\text{PL}}$, over the lexeme ‘cat’, which takes the root form associated with the lexeme and performs a morphophonological operation, $f'$, over it. Thus, we would have the derivation in (3):

(3) lexical entry ‘cat’: $<$CAT, /kat/, N, ...$>

plural formation: $f_{\text{PL}}(L) = f'(\text{root}_L) = \text{root}_{L^z}$

On this view the plural of the lexeme is part of a paradigm defined by functions of various kinds. A simple function takes the form of adding a suffix to a root representation, as in (3). For more complex systems we find more complex systems of functions, interacting in various ways. I shall call such approaches ‘realizational rule’ models.

For inflection such systems have been proposed by a variety of authors, all of them owing some debt to the pioneering work of Matthews (1972), for instance, Anderson (1977, 1982, 1992), Aronoff (1994), Beard (1995), Corbett & Fraser (1993), Steele (1995), Zwicky (1985, 1990). In this paper I shall follow the format of Stump (1991, 1992, 1993a,b) particularly closely. One feature of this realizational class of models is the importance accorded to the notion of ‘paradigm’. An important reflex of this is the phenomenon of syncretism.

Zwicky (1985) has pointed out that some types of syncretism can be elegantly handled by relating one part of a paradigm to another part. A simple
example of this is discussed by Carstairs (1987) under the heading of ‘takeover’. In Latin class III verbs the future indicative active is formed by replacing the -i- theme vowel with -e-, except for the 1SG form when the theme is -a. This is readily explained by reference to the present subjunctive of this class, which has the -a theme throughout. The relevant paradigms are shown in (4):

(4) rego: ‘I reign’

<table>
<thead>
<tr>
<th></th>
<th>Present Indicative</th>
<th>Future Indicative</th>
<th>Present Subjunctive</th>
</tr>
</thead>
<tbody>
<tr>
<td>reg-o:</td>
<td>reg-a-m</td>
<td>reg-a-m</td>
<td></td>
</tr>
<tr>
<td>reg-i-s</td>
<td>reg-e-s</td>
<td>reg-a-s</td>
<td></td>
</tr>
<tr>
<td>reg-i-t</td>
<td>reg-e-t</td>
<td>reg-a-t</td>
<td></td>
</tr>
<tr>
<td>reg-i-mus</td>
<td>reg-e-mus</td>
<td>reg-a-mus</td>
<td></td>
</tr>
<tr>
<td>reg-i-tis</td>
<td>reg-e-tis</td>
<td>reg-a-tis</td>
<td></td>
</tr>
<tr>
<td>reg-unt</td>
<td>reg-e-nt</td>
<td>reg-a-nt</td>
<td></td>
</tr>
</tbody>
</table>

In filling the 1SG slot for the Future Indicative, rather than applying the normal rules (which would presumably derive *regem) we override those rules by means of a rule of referral saying “the 1SG form in the Future Indicative is identical to its form in the Present Subjunctive”. There are various ways of formalizing this idea (the DATR implementation of realizational morphology, which is applied in Fraser and Corbett’s Network Morphology can be viewed in some respects as a formalism specifically designed to capture as many referrals as conceivably possible). The important point is that if the paradigmatic organization of inflection is not respected then it becomes difficult or even impossible to find satisfactory, elegant ways of capturing such interparadigmatic dependencies. This point will become particularly clear in Section 4.

Despite the importance of paradigmatic organization in inflection, and despite the differences between inflectional pieces and true lexemes, a number of linguists have pointed to residual morpheme-like properties which are retained by inflections (see, for instance, Carstairs-MacCarthy’s (1993) telling criticisms of the most radical proponent of the anti-morphemic, or ‘amorphous’ view, Anderson 1992). Moreover, Noyer (1992) presents evidence from a variety of sources, including what he calls ‘disjunctive blocking’, for the idea that an inflectional piece in general realizes just one particular morphosyntactic property (what we may call ‘primary exponence’). One conclusion from these observations is that a compromise might be called for, combining the best insights of the morphemic theories with those of the realizational models. Indeed, we have seen that Lieber (1992) has already made significant concessions away from a purely morphemic model.
In Section 1 I introduce an attempted rapprochement between realizational and morpheme-based theories, Halle & Marantz's (1993) model of Distributed Morphology. That model makes some use of Separationism without abandoning the morpheme concept entirely. Section 2 presents a brief survey of the relevant facts of the Chukotkan group of languages (more specifically Chukchee and Koryak). In the following two sections I show how verbal inflection in these languages poses problems for the most straightforward interpretation of Distributed Morphology and its treatment of syncretism in terms of 'rules of Impoverishment'. In particular, in section 4 I show that Chukotkan verb paradigms involve a syncretism that demands a rule of referral of a kind which cannot be stated within Distributed Morphology. In section 5 I introduce Stump's (1993b) treatment of certain syncretisms in terms of 'rules of referral' and apply this approach to the Chukotkan data in section 6. The final section presents a short summary.

1. Distributed Morphology

The theory advance by Halle & Marantz takes as its starting point the morphemic theory of Lieber under which morphemes are lexical entries with their own feature specifications. Thus, they write "...we take the phonological realization of the terminal elements in the syntax to be governed by lexical (Vocabulary) entries that relate bundles of morphosyntactic features to bundles of phonological features." (Halle & Marantz 1993: 111).

However, unlike Lieber, Halle & Marantz assume that the overall structure of the inflected word is derived from a syntactic structure at a special level of organization called Morphological Structure, MS. Moreover, unlike the situation prevailing in models inspired by Pollock (1989), and criticized in Joseph & Smirniotopoulou (1993) and Spencer (1992), in Distributed Morphology it is assumed that syntactic terminal elements are separate from their phonological realizations (cf. the Separation Hypothesis).

The features borne by a given exponent can have two sources. They may be inherent features of the given morpheme, or they may be provided by the syntactic representation itself. This means that the featural content of a morpheme can be underspecified. One of the advantages of this is that it is possible for Halle & Marantz to make use of a variant of the Elsewhere Condition, thus answering one of the criticisms of Stump (1992, 1993a) against subcategorization-based morphemic theories. At the same time the actual placement of morphemes is in part determined by syntax and lexical insertion, rather than by affix-particular subcategorizations statements as in
Lieber’s theory. The first stage in the formation of a complex inflected form is syntactic head-to-head movement (as in Pollock 1989), by which the lowest head raises to adjoin to successively higher heads. This process forms a complex hierarchical structure, from which the subtree containing the lexical projections is taken as input to the morphological component. This syntactic derivation solves some of the problems for morphological subcategorization approaches identified by Stump.

As is evident from criticisms of what I have earlier called Radical Agglutination (Spencer 1992), or idealized Item-and-Arrangement analyses, it is necessary to account for the numerous deviations from a one-one mapping between form and function in morphology. Halle & Marantz argue that it is necessary to assume a number of operations which systematically alter the disposition of inflectional pieces. They therefore postulate the existence of processes capable of changing the ordering, number, feature composition and hierarchical positioning of terminal nodes in the word tree. The processes of importance for present purposes are:

(a) head-to-head movement (in syntax)
(b) morpheme insertion in MS (e.g. Agreement nodes)
(c) fusion of sister nodes into one morpheme, e.g. Number/Case in Indo-European
(d) Impoverishment rules

Agreement morphology is added in the mapping to MS, it is not ‘picked up’ by adjunction to a functional head, as in models based on Pollock (1989). This is also true of case marking. These assumptions solve many of the problems posed for Radical Agglutination by nominal inflection which are detailed in Spencer (1992). Fusion of nodes is a way of formalizing cumulative exponence. Impoverishment rules are an ingenious device for capturing the fact that in many circumstances distinctions which are apparent in some types of word or in some positions in the word are neutralized in other types of word, or in other positions.

Halle & Marantz illustrate their theory with a detailed re-analysis of the data from the Central Algonquian language Potawatomi, discussed by Anderson (1977, 1992) in his development of the Extended Word-and-Paradigm model. They take, for instance, the Independent Order (used in declaratives) illustrated in (5) and argue that this derives from the syntactic structure shown in (6), via the MS representation in (7):
(5) Potawatomi Independent Order (for declaratives)
\[ k-\text{wapm}-a\text{-}i\text{-}m\text{ }\text{wapunin}\text{-}uk \]
Cl V Agr1 Neg Agr2 Tns Agr3
2 see 3ACC 2PL PRET 3PL
’You (PL) didn’t see them’

(6) Syntactic structure

(7) MS Structure

Dependencies often have to be stated between non-adjacent pieces, as is meticulously recorded by Halle & Marantz. These are handled in several ways. For instance, it is assumed that an element in the slot labelled Agr3 can be related to the Agr1 slot by a process of agreement (concord). Halle & Marantz are not explicit about what exactly this entails and how it is formalized, however, so I will not discuss this further.

An important dependency is that between the Agr2 marker for 1PL subjects (-mun) and the Agr3 position. Whenever the -mun morpheme appears it blocks
appearance of Agr3 pieces which might otherwise be expected (for instance certain types of object marker). Unfortunately, Agr2 and Agr3 are not, in the general case, linearly adjacent, because there is a Tense slot which can be filled by the Preterite marker. However, Halle & Marantz argue that the dependency can legitimately be stated in their model, because the Agr2 position c-commands, and hence could be said to govern, the Agr3 position. Given this, it is possible to write a rule of Impoverishment for Agr3 features, triggered by the presence of a 1PL-\textit{mun} suffix in Agr2 position. This Impoverishment simply deletes Agr3 features in the presence of \textit{mun}, thereby preventing the insertion of any agreement formative that would normally appear in Agr3 position. Halle & Marantz argue that Impoverishment is generally the way to handle such forms of neutralization, taking the form of a retreat to the more general or unmarked case.

2. Verbal inflection in Chukotkan

The Chukotkan languages show a very stable form of ergative morphosyntax: all nominals (including pronouns) are marked with ergative case when they function as the subject of a transitive verb and with absolutive case when they function as the direct object or as the subject of an intransitive verb. This is illustrated in (8, 9) for Chukchee and (10, 11) for Koryak:

(8) a. atlagan wetat -g?e
   father.ABS worked-3SG.SUBJ
   The father worked’ [Ch]

b. ekak wetat -g?e
   son.ABS worked-3SG.SUBJ
   ‘The son worked’ [Ch]

(9) a. aitag -e \textit{\textsuperscript{1}un-nin} ekak
   father-ERG saw-3SG.SUBJ:3SG.OBJ son.ABS
   ‘The father saw the son’ [Ch]

(10) a. En’pic vetat -e
    father.ABS worked-3SG.SUBJ
    ‘Father worked’ [Kor]

b. Akak vetat -e
   son.ABS worked-3SG.SUBJ
   ‘The son worked’ [Kor]
As is common when discussing languages with ergative organization, we will find it useful to fractionate the subject/object functions into three types. Comrie (1979) and Dixon (1979) refer to these as the A function (transitive subject), S function (intransitive subject) and P function (direct object). When we group together the S and A functions (i.e. the traditional notion of subject) I shall speak of the SUBJ function, and when we group together S and P function I shall speak of the ABS function. Since we will be discussing ergative languages I shall take the liberty of referring to the Comrie/Dixon P function as the OBJ function and the A function as the ERG function (to avoid unnecessary association with semantic roles such as Agent and Patient).

The verbal morphology of Chukotkan is complex. The verb stem consists of a verb root, possibly compounded with other roots (noun, verb, adjective or adverb) to give incorporative structures (for further details of incorporation in Chukchee see Spencer 1995). To the stem are added prefixes and suffixes realizing agreement (with subject and object), tense, mood, aspect and voice. This is illustrated in (12, 13):2

(12) Koryak verb template
Agreement-Mood/Tense-Voice-Stem-Absolutive Plural-Mood/Tense-Agreemen

(13) Chukchee verb template
Agreement-Mood/Tense-Voice-Stem-Voice-Tense-Aspect-Agreemen

Some examples from Koryak are given in (14–17) and from Chukchee in (18–21) (simplifying some of the glosses in accordance with note 2).

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2 For purposes of exposition I have simplified the analysis for Koryak and Chukchee slightly. Thus, there are probably two Agr prefix positions for Koryak, the leftmost accommodating a prefix which indicates that the subject is lower in a person/number hierarchy than the object, while in both Koryak and Chukchee there is an extra suffix position at the right edge for an absolutive plural marker (Chukchee) or absolutive dual and plural markers (Koryak). Note that many of the schwas at morpheme boundaries are epenthetic (these languages only permit CVC syllables).
Koryak:

(14) na-ja-Ø-laho-la-jkane-mak
na-ja-Ø-laho-la-jkane-mak
3SG.ERG FUT see PLABS PROB 1PLABS
‘He will probably (FUT-II) see us’

(15) j[la]-ena-laho-la-jkane-tak
Ø-[j(a)]-ena-laho-la-jkane-tak
2PL.ERG FUT INE see PLABS PROB 2PL.ERG
‘You (pl.) will probably (FUT-II) see me’

(16) q-ena-laho-la-jkane-tak
q-ena-laho-la-jkane-tak
IMPER INE see PLABS PROG 2PL.ERG
‘(You-PL) be seeing me!’

(17) nan-h-ena-laho-la-mak
nan-h-ena-laho-la-mak
3PL.ERG COND INE see PLABS 1PLABS
‘They would see us’

Chukchee:

(18) ne-re-l?u-rkane-mak
ne-re-l?u-rkane-mak
3SG.ERG FUT see PROG 1PLABS
‘He will be seeing us (FUT-II)’

(19) r(e)-ine-l?u-rkane-tak
Ø-r(e)-ine-l?u-rkane-tak
2PL.ERG FUT INE see PROG 2PL.ERG
‘You (PL.) will be seeing me (FUT-II)’

(20) qa-l?u-tku-rkane-tak
q-l?u-tku-rkane-tak
IMPER see TKU PROG 2PLABS
‘(You-PL) be seeing me! (IMP-II)’

(21) n-?a-l?u-tku-g?en
n-?a-l?u-tku-g?en
2SG.ERG COND see TKU 2SG.ABS
‘You (SG) would see us (COND-I)’

I have labelled one prefix in Koryak/Chukchee as INE (taking vowel harmony variants ine/ena) and for Chukchee I have labelled a suffix TKU (vowel harmony variants tku/tko). The primary functions of these affixes is to mark the anti-
Agreement morphology in Chukotkan

passive. The antipassive is a voice alternation under which a transitive verb form is replaced by an intransitive verb form. The subject is then marked with absolutive case rather than ergative, while the object becomes an optional chômeur, marked with one of the oblique cases (locative, instrumental or dative, depending on the verb and on other as yet poorly understood factors). An example of the alternation from Chukchee is shown in (22):

\[
\begin{align*}
\text{(22) a. } & \text{t}-\text{tejk} -\text{ag?en orwoor} & \text{1SG.SUBJ-make.PAST.I-3SG.OBJ sledge.ABS} \\
& \text{‘I made a sledge’} \\
\text{b. } & \text{t- ine-tejk- ag?ek orw- eta} & \text{1SG.SUBJ-INE-make.PAST.I-1SG.SUBJ sledge-ALL} \\
\text{c. } & \text{ta- tejk- atku-g?ek orw- eta} & \text{1SG.SUBJ-make.PAST.I-TKU-1 SG.SUBJ sledge-ALL} \\
& \text{‘I made a sledge’}
\end{align*}
\]

As should be obvious, these two formatives do not have an antipassive function in the forms illustrated. This will be discussed in Section 4.3.

Verbs also give gerunds formed by adding nominal case endings to the bare verb stem. This is also the way the negative verb stem is formed (which thus functions very much like a kind of Privative case). ‘Verb stem’ in this connection includes the antipassive affixes (in their use as genuine voice markers). The functional features of the clause are then realized on an auxiliary verb, it'ak, ‘be’, for intransitives and rot'ak, ‘have’, for transitives. Examples from Chukchee are given in (23, 24) (constructed after Skorik 1977: 256):

\[
\begin{align*}
\text{(23) a. } & \text{?aacek}\text{t jejkew } -\text{ag?et} & \text{youth.ABS.PL fight.PAST.I-3PL.SUBJ} \\
& \text{‘The youths fought’} \\
\text{b. } & \text{?aacek t e- jejkew-ke it } -\text{?g?et} & \text{youth.ABS.PL NEG-fight } -\text{NEG AUX.PAST.I-3PL.SUBJ} \\
& \text{‘The youths didn’t fight’}
\end{align*}
\]

\[
\begin{align*}
\text{(24) a. } & \text{ñinquej-e ket?o-nenat } \text{pelajotte lili } -\text{t} & \text{boy-ERG remember-PAST.I 3SG.SUBJ left:PASSIVE glove-ABS.PL} \\
& \text{‘The boy remembered the gloves he had left behind’}
\end{align*}
\]

\[3\] The antipassive conjugations for indicative mood, Past I forms are shown in Table 5 below.
b. ɲınqejo e- -ketọ -ka rat -ninet
boy-ERG NEG -remember -NEG AUX-PAST.I -3SG.SUBJ.3PL.OBJ
pelajotte lili -t
left:PASSIVE glove-ABS.PL
'The boy didn’t remember the gloves he had left behind’

I shall not discuss negatives or other non-finite forms of verbs further, since what I shall say about lexical verbs holds of auxiliaries too.

Given reasonable assumptions about the nature of syntax in Chukotkan it is easy to postulate a syntactic representation which can serve as the basis of an MS structure for the two templates. As far as I can tell the clausal syntax of the two languages is essentially the same. Let us assume that the imperative and conditional moods are associated with Comp. I know of no concrete evidence in favour of this but it is the most natural assumption cross-linguistically. This means we can posit representation (25) for the clausal syntax of Chukchee and Koryak:

(25) Syntactic Representation Chukchee/Koryak

```
CompP
  Comp0
    TP
      T0
        AspP
          Asp0
            (NegP)
              (Neg0)
                VoiceP
                  Voice0
                    VP
                      DP
                        V0
                          DP
```

To construct a verb form, we first adjoin the heads in the syntax by head-to-head movement. This then gives a representation which is mapped into the MS representation.

In constructing the MS representation we add nodes for Agreement by adjunction to the leftmost and rightmost nodes, corresponding to prefixal and suffixal agreement markers. The mapping also removes all nodes labelled as maximal projections, as we saw for Potawatomi.

In forming the MS for Koryak, we also have to add the special plural agreement marker -la, adjoined to the verb root itself. This gives (26):
The MS structure for Chukchee has to accommodate two nodes for Voice, one immediately before the verb stem, one immediately after. For convenience of exposition I represent these as daughters of a single Voice node, thereby violating binarity. This is to represent the fact that these markers are in complementary distribution. However, nothing in my discussion hinges on this and the facts could presumably be captured in other ways.

---

4 The node labelled Aspect is genuinely aspectual in Chukchee, but it has acquired modal meaning in Koryak, being glossed ‘problematic’ or ‘probabilitive’ mood in Zhukova’s (1972) grammar. Mood is perhaps better regarded as a property of the Comp system. However, since the Comp node governs everything in the word, we can presumably account for this in terms of a dependency between the Comp node and what I have here called the Aspect node. It is worth noting that agreement pieces associated with the Asp node do indeed bear aspectual information in Koryak.
Given these MS representations, we must now write Vocabulary entries for the various affixes. These might well require fusion of the Comp+Agr1 nodes in those cases where a single piece cumulatively realizes the imperative mood and person/number agreement features. Some way would have to be found to express the fact that the verb takes on the intransitive conjugation when the antipassive markers are present. One simple way of achieving this would be to say that the Agr2 features, which essentially mark direct objects, are Impoverished under the influence of the antipassive affixes. However, this is not open to Distributed Morphology because the Voice node fails to govern the Agr2 node. I leave this question open, and assume that there is a straightforward way of capturing such alternations and that this will not impinge on the future discussion. In addition, we find that the person/number agreement suffixes differ with the tense/aspect and also mood paradigms in both Chukchee and Koryak. This would necessitate some kind of selection between Comp and the lower subtrees as well as selection between Tense/Aspect nodes and the Agrs dependent on them. I shall assume without comment that this is in general going to be possible for Chukotkan within Distributed Morphology, at least for the suffixes, since these will be governed by every other part of the verb tree.

3. A problem for Distributed Morphology: cross-referencing grammatical relations

The first point to note about the templates in (26, 27) is that the person/number marking by the prefixes and suffixes realizes a variety of functions. Some of the prefixal pieces seems to be exponents solely of ergative nominals, while some of the suffixes are used solely to cross-reference direct objects. However, when we examine the patterns of homophony across Chukchee and Koryak as a whole an intriguing pattern emerges. The basic function of the prefixes is to mark subjects, while the basic function of the suffixes is to mark the subject of an intransitive verb or the object of a transitive verb, in other words to cross-reference absolutive nominals (see Comrie 1979 for more detailed discussion of this in Chukchee, and Nedjalkov 1979 for a contrasting view).

This ergativity split is particularly clear in the case of the plural suffix of Koryak, not found in Chukchee. This suffix, -la, cross references the plural absolutive nominal, as can be seen from tables 1, 2. There is a small number of cases in which -la appears to be marking a transitive subject (ERG function) and these will be discussed later.
A number of other suffixes in Koryak and Chukchee can be seen to have an essentially ABS marking function. This becomes clear when we compare transitive verb paradigms with paradigms of intransitive verbs and with the agreement paradigms of adjective and nouns used predicatively. Any noun or adjective used predicatively agrees with the subject in person and number. This is seen in Tables 1,2 (Koryak) and Tables 3, 4 (Chukchee).

**Table 1:** Koryak agreement — intransitive

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>1SG</th>
<th>2SG</th>
<th>3SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intransitive verbs Past I</td>
<td>Predicative nominals/adjectives</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1SG</td>
<td>-k</td>
<td>-g</td>
<td>-i</td>
<td></td>
</tr>
<tr>
<td>1DU</td>
<td>-m-m</td>
<td>-mju</td>
<td>-mju</td>
<td></td>
</tr>
<tr>
<td>1PL</td>
<td>-la-m</td>
<td>-ju</td>
<td>-ju</td>
<td></td>
</tr>
<tr>
<td>2SG</td>
<td>Ø-</td>
<td>-i</td>
<td>-i</td>
<td></td>
</tr>
<tr>
<td>2DU</td>
<td>Ø-tak</td>
<td>-tju</td>
<td>-tju</td>
<td></td>
</tr>
<tr>
<td>2PL</td>
<td>Ø-la-tak</td>
<td>-tuji</td>
<td>-tuji</td>
<td></td>
</tr>
<tr>
<td>3SG</td>
<td>Ø-</td>
<td>-i</td>
<td>-Ø, n/qin</td>
<td></td>
</tr>
<tr>
<td>3DU</td>
<td>Ø-gahi</td>
<td>-t/qine-t</td>
<td>-t/qine-t</td>
<td></td>
</tr>
<tr>
<td>3PL</td>
<td>Ø-la-j</td>
<td>-w/qine-w</td>
<td>-w/qine-w</td>
<td></td>
</tr>
</tbody>
</table>

Note that 3PL -la-j derives from underlying -la-i by a process of gliding (which bleeds vowel harmony).

**Table 2:** Koryak agreement — transitive Past I (Zhukova 1972: 307–308)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Object</th>
<th>1SG</th>
<th>2SG</th>
<th>3SG</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Zhukova 1972: 307–308)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1SG</td>
<td>1SG</td>
<td>————</td>
<td>1PL</td>
<td>1SG</td>
</tr>
<tr>
<td>1DU</td>
<td>————</td>
<td>1DU</td>
<td>————</td>
<td>1DU</td>
</tr>
<tr>
<td>1PL</td>
<td>————</td>
<td>1PL</td>
<td>————</td>
<td>1PL</td>
</tr>
<tr>
<td>2SG</td>
<td>t-gl</td>
<td>2SG</td>
<td>mat-gl</td>
<td>2SG</td>
</tr>
<tr>
<td>2DU</td>
<td>t-tak</td>
<td>2DU</td>
<td>mat-tak</td>
<td>2DU</td>
</tr>
<tr>
<td>2PL</td>
<td>t-la-tak</td>
<td>2PL</td>
<td>mat-la-tak</td>
<td>2PL</td>
</tr>
<tr>
<td>3SG</td>
<td>t-n</td>
<td>3SG</td>
<td>mat-n</td>
<td>3SG</td>
</tr>
<tr>
<td>3DU</td>
<td>t-net</td>
<td>3DU</td>
<td>mat-net</td>
<td>3DU</td>
</tr>
<tr>
<td>3PL</td>
<td>t-new</td>
<td>3PL</td>
<td>mat-new</td>
<td>3PL</td>
</tr>
<tr>
<td>2SG</td>
<td>1SG</td>
<td>Ø-ine-i</td>
<td>2PL</td>
<td>1SG</td>
</tr>
<tr>
<td>1DU</td>
<td>ne-mak</td>
<td>1DU</td>
<td>ne-mak</td>
<td>1DU</td>
</tr>
<tr>
<td>1PL</td>
<td>na-la-mak</td>
<td>1PL</td>
<td>na-la-mak</td>
<td>1PL</td>
</tr>
</tbody>
</table>
Note that -la- induces vowel harmony alternations /e ~ a/.

### Table 3: Chukchee agreement — intransitive

<table>
<thead>
<tr>
<th>SUBJ</th>
<th>OBJ</th>
<th>SUBJ</th>
<th>OBJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>t-</td>
<td>1PL</td>
<td>-g?ek</td>
</tr>
<tr>
<td>1PL</td>
<td>mat-</td>
<td>1PL</td>
<td>-mak</td>
</tr>
<tr>
<td>2SG</td>
<td>Ø-</td>
<td>2SG</td>
<td>-g?i</td>
</tr>
<tr>
<td>2PL</td>
<td>Ø-</td>
<td>2PL</td>
<td>-tak</td>
</tr>
<tr>
<td>3SG</td>
<td>Ø-</td>
<td>3SG</td>
<td>-g?i</td>
</tr>
<tr>
<td>3PL</td>
<td>Ø-</td>
<td>3PL</td>
<td>-g?e-t</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBJ</th>
<th>OBJ</th>
<th>SUBJ</th>
<th>OBJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>-i-gam</td>
<td>1PL</td>
<td>-muri</td>
</tr>
<tr>
<td>2SG</td>
<td>-i-gat</td>
<td>2SG</td>
<td>ne- -gi</td>
</tr>
<tr>
<td>2PL</td>
<td>-turi</td>
<td>2PL</td>
<td>ne- -tak</td>
</tr>
<tr>
<td>3SG</td>
<td>-Ø/qin</td>
<td>3SG</td>
<td>ne- -net</td>
</tr>
<tr>
<td>3PL</td>
<td>-t/qine-t</td>
<td>3PL</td>
<td>ne- -new</td>
</tr>
</tbody>
</table>

### Table 4: Chukchee agreement — transitive Past I (Skorik 1977: 44–45).

<table>
<thead>
<tr>
<th>SUBJ</th>
<th>OBJ</th>
<th>SUBJ</th>
<th>OBJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>1SG</td>
<td>1PL</td>
<td>1PL</td>
</tr>
<tr>
<td>1PL</td>
<td>-gat</td>
<td>1PL</td>
<td>mat-</td>
</tr>
<tr>
<td>2SG</td>
<td>t-</td>
<td>2SG</td>
<td>mat-</td>
</tr>
<tr>
<td>2PL</td>
<td>-gat</td>
<td>2PL</td>
<td>mat-</td>
</tr>
<tr>
<td>3SG</td>
<td>t-</td>
<td>3SG</td>
<td>mat-</td>
</tr>
<tr>
<td>3PL</td>
<td>-net</td>
<td>3PL</td>
<td>mat-</td>
</tr>
<tr>
<td>3SG</td>
<td>t-</td>
<td>3SG</td>
<td>mat-</td>
</tr>
<tr>
<td>3PL</td>
<td>-net</td>
<td>3PL</td>
<td>mat-</td>
</tr>
</tbody>
</table>
Agreement morphology in Chukotkan

We can chart the functions of the suffixes found in Tables 2, 4, the aorist or Past I form of the verb in both languages. Note that Koryak distinguishes dual from plural. As we have seen, plural is marked by a special suffix -la attached directly to the stem. This is added to the dual agreement forms to give plural meaning. By inspection of the three sets of paradigms we note the following correspondences:

(28) -g  
1st person singular: object/predicate nominal

2nd person singular: object/predicate nominal

1st person plural: object/intransitive subject

2nd person plural: object/intransitive subject

For 3rd person marking things are a little more complex. The 3rd person object markers in Koryak are shown in (29):

(29) -nin with 3rd person singular subject

3SG

3DU

3PL

Now, there is a general morphophonemical alternation by which a word final vowel is truncated. Thus, we would probably be justified in setting up the form /ne/ for the 3SG suffix -n. But in this case we would be justified in separating out a number exponent for the object, as in (30):

(30) -nin with 3rd person singular subject

3SG

3DU

3-PL
Then we can observe that -t and -w signal dual and plural respectively in predicate nominal forms.

Likewise, in Chukchee we can see that the -t formative regularly signals plural in the predicate nominals and also (in less easily isolable form) in the intransitive paradigm, where the -t element appears to be fused with a -g?i suffix which does not appear in isolation. Interestingly, the suffix -g?i regularly indicates 3SG OBJ function, so it is not excluded that -g?e and -g?i have some common ancestor. (Note that -g?i sometimes alternates with an allomorph -g?e in certain vowel harmony environments, but this is a different, unrelated matter.) Thus, in both languages we have strong evidence for an overall absolutive patterning for suffixes, especially where 1st and 2nd persons are concerned, and to some extent with the number marking of 3rd person forms. There are apparent counterexamples to this in the 1st person object forms, but we will turn to these cases in due course.

The first problem for Distributed Morphology now turns on this curious type of split ergativity. There is no way to refer directly to grammatical relations in this theory. Instead, however, it is possible to refer to morphological cases. This raises rather intriguing questions about phenomena such as quirky case marking and so on, but let us assume that in general it is possible to identify the kinds of grammatical functions with which verbs normally agree by means of such a device. The problem posed by Chukotkan is now located in the prefixes. These pick out ‘true’ subjects (i.e. the ERG and S functions). However, the basic morphosyntax of the language is rigidly ergative. Thus, it is difficult to see how the SUBJ function can be sensibly picked out. It would be an ad hoc use of morphosyntactic features to label the Agr1 slot as picking up such a function given that it plays no role in the grammar.

4. ‘Inverse’ forms in Chukotkan

In discussing the split ergativity of person/number marking I have systematically ignored such forms in Chukchee and Koryak as those in (31, 32):

(31) ‘Inverse’ forms in Koryak
ine-lahu-i ‘thou saw me’/’he saw me’
ine-lahu-tak ‘you saw me’

(32) ‘Inverse’ forms in Chukchee
ine-lu-g?i ‘thou saw me’/’he saw me’
ine-lu-tak ‘you saw me’
The problem here is that we have slots in the transitive paradigm in which the suffix unambiguously picks out the ERG function. The suffixes -i in Koryak and -q in Chukchee can only refer to 2/3SG, never 1SG, and -tak in both languages refers to 2PL. Compare (31, 32) with (33, 34) in which we see the suffixes picking out the OBJ function, as expected:

(33) Koryak
t-лаhu-gi
1SG-saw-2SG
'I saw thee'
ne-lahu-mak
3-saw-1PL
'He/they saw us'

(34) Chukchee
t-пу-got
1SG-saw-2SG
'I saw thee'
ne-пу-mak
3-saw-1PL
'He/they saw us'

As detailed extensively by Comrie (1980), what we have in (31, 32) is a kind of inverse marking, under which the verb fails to identify the OBJ function as such, and uses the suffixes to signal the SUBJ (more accurately, ERG) function.

An inverse system of a rather different kind is found in Algonquian. In Potawatomi the inversion is explicitly signalled by a special ‘stem’ forming suffix, -UkO. Steele (1995) and Halle & Marantz (1993) analyse this as essentially a 3rd person marker which triggers specific types of agreement or person/number exponence, giving the overall impression of inversion. Anderson (1992), however, takes the bull by the horns and writes a rule of exponence for -UkO which reverses the order of subject and object feature sets, thereby directly capturing the processual intuition of inversion.

This is not the place to discuss the relative merits of these solutions for Algonquian. What should be borne in mind in the case of the Chukotkan system is that there is no inversion morpheme as such (cf. Comrie 1980, who explicitly contrasts the Chukotkan and Algonquian groups in this regard). It might be thought that the ine- prefix fulfilled this function in (31, 32) but this would miss an important generalization. The ine- prefix has already been introduced, as the marker of the antipassive. When we compare the inverse forms with forms for the antipassive, we find they are nearly always homophous in both Chukchee and Koryak in all three moods, indicative,
imperative and conditional and in all tense/aspect forms (compare Table 5 with Tables 3, 4 for Chukchee). This is clearly a syncretism which needs to be incorporated into the grammars of these languages.

Table 5: Chukchee agreement — antipassives

<table>
<thead>
<tr>
<th></th>
<th>Antipassive(1) ine- (Skorik 1977: 115–117)</th>
<th>Antipassive(2) -tku: (Skorik 1977: 118–120)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>t-ine- -g?ek</td>
<td>t- -tku-g?ek</td>
</tr>
<tr>
<td>1PL</td>
<td>mat-ine- -mak</td>
<td>mat- -tku-mak</td>
</tr>
<tr>
<td>2SG</td>
<td>Ø-ine- -g?i</td>
<td>Ø- -tku-g?i</td>
</tr>
<tr>
<td>2PL</td>
<td>Ø-ine- -tak</td>
<td>Ø- -tku-tak</td>
</tr>
<tr>
<td>3SG</td>
<td>Ø-ine- -g?i</td>
<td>Ø- -tku-g?i</td>
</tr>
<tr>
<td>3PL</td>
<td>Ø-ine- -g?e-t</td>
<td>Ø- -tku-g?e-t</td>
</tr>
</tbody>
</table>

When we investigate the Chukchee paradigms more carefully we find that things get worse for morphemic theories lacking appeal to rules of referral.

5 There are a couple of divergences from a perfect syncretism. The imperative perfective 2PL-1SG form is q-ine- -tak while the antipassive 2PL form is q-ine- -g aloud, and the imperative imperfective 2PL-1PL form is q- -tel'k while the antipassive 2PL form is q- -tel'k-tuk. Assuming that these aren’t errors on Skorik’s part, this means that the rules presented later would have to be extended with two special additional rules to account for the slightly different final suffixes. Note that if the syncretism isn’t perfect, this indicates that the ine/tku forms of the transitive paradigms are genuinely transitive verb forms rather than antipassive forms to which speakers have recourse to fill in gaps in the transitive paradigm. In other words, we have a genuine syncretism, rather than just the adventitious use of a different part of the paradigm to make good a gap.

6 I have constructed the antipassive for Koryak on the basis of Zhukova’s (1972) paradigms and the very sparse information she gives about this voice form. She does not regard the antipassive as a voice, but rather as a kind of regular word formation. However, she appears undecided as to whether this is a case of word formation proper or inflection. More or less the sum total of her discussion can be found in Zhukova (1972: 226–227), as follows (I have been unable to find any discussion in her textbook of Koryak, Zhukova 1987):

“...The stems of transitive verbs, including a causative verbs, regularly form an intransitive stem with the prefix ine-/en-, with the general meaning ‘engage in some activity without reference to a particular object’...” (226)

“The regular formation of causative verbs and intransitives from transitives gives a regular series of verbs having the same basic lexical meaning (a common root morpheme) and opposed in transitivity, for instance: umek-et’k ‘to gather together’ — jumek-ew-ek ‘to gather people together, allow or compel people to come together’ — ine-namek-ew-ek ‘to gather together, be engaged in gathering together (without reference to an object);’...” (227) (My translations.)

I take this as evidence for an antipassive voice in Koryak similar to that of Chukchee.
For recall that Chukchee has two antipassive paradigms, the second being formed from the -tku suffix. From inspection of the transitive paradigm it will be seen that 1PL OBJ forms are homophonous with this second antipassive form, as can be seen from Table 5. This pattern, too, is found in all tenses, aspects and moods for 1PL object forms. Thus, in Chukchee it is particularly clear that we are dealing with a species of take-over: one or other antipassive form is employed for certain person/number combinations in the transitive paradigm depending essentially on the ‘distance’ between the participants in the animacy hierarchy (cf. Comrie 1980: 68–70).

5. Stump’s (1993b) theory of rules of referral

Stump assumes that each affix is associated with a morpholexical rule (MLR) which specifies the feature set realized by the affix and the order in which the rule applies with respect to other rules. For a given lexeme or lexeme type the set of slots in the paradigm is given by a Paradigm Function (PF), which specifies which MLRs apply and in which order. In practice, Stump achieves this through a derivative (non-primitive) intermediate representation, the Morpholexical Function (MLF). However, in general we will ignore this refinement. The Paradigm Function is simply a way of stating what kinds of operations apply to the root of a lexeme to provide a given inflected form. A complete paradigm (for a lexeme) will then be a set of such Paradigm Functions.

The operation of the rules is governed by two widely accepted principles, the Elsewhere Condition, and what Stump refers to as the Identify Function Default. Stump formalizes the Elsewhere Condition as the Maximal Subset Override, which states that when two rules may apply to a given form, that rule which has the largest number of feature specifications associated with it will apply preferentially (because the larger the number of feature specifications, the more narrowly is the class of forms defined, and hence the more specific the range of application of the rule).

The Identify Function Default is simply a formal way of recognizing that the form obtained when there is no particular rule applying to that particular feature set at that point in the derivation is simply whatever form has already been derived. For instance, in the set of MLRs for English plurals there need be no mention of the singular form of any noun. If nothing else were said, then any attempt at generating a singular form would crash because the rule system makes no provision for singulars. The Identity Function Default comes into play at this point. By default, the function which applies is the identity function, which delivers the current value of the inflected form, as in (35):
(35)  \[ \text{MLR}_n(\sigma)([x]) = [x] \]

Clearly, whenever there is any rule which realizes a particular set of feature specifications that rule will override the Identity Function Default, because, by definition, the Identity Function Default is more general than any other rule. Hence, (35) has the property of applying to a given feature set if and only if there is no rule specifically written for that set.

Stump (1993b) illustrates the operation of rules of referral by reference to Macedonian conjugation. In Table 6 are three tense/aspect forms for the verb padne ‘to fall’.

**Table 6:** Partial paradigm for Macedonian verb padne ‘to fall’

<table>
<thead>
<tr>
<th></th>
<th>Present</th>
<th>Imperfect</th>
<th>Aorist</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SG</td>
<td>padn</td>
<td>am</td>
<td>padn</td>
</tr>
<tr>
<td>2SG</td>
<td>padn</td>
<td>še</td>
<td>padn</td>
</tr>
<tr>
<td>3SG</td>
<td>padn</td>
<td>şe</td>
<td>padn</td>
</tr>
<tr>
<td>1PL</td>
<td>padn</td>
<td>me</td>
<td>padn</td>
</tr>
<tr>
<td>2PL</td>
<td>padn</td>
<td>te</td>
<td>padn</td>
</tr>
<tr>
<td>3PL</td>
<td>padn</td>
<td>at</td>
<td>padn</td>
</tr>
</tbody>
</table>

Clearly, the 2SG and 3SG in the past forms (imperfect and aorist) are identical. Similar paradigms can be constructed for the other two principal conjugation types. Stump provides examples from the -i class, nosi ‘to carry’ and the -e class ide ‘to go’. As indicated in Table 6.8 of Friedman (1993: 274), the relevant syncretism applies to all the subclasses of these conjugations and even to the irregular verb sum ‘to be’.

To generate these forms we first we assume that we can appeal to a general feature \([\text{PAST}]\). The imperfect and aorist are both \([\text{PAST}:+]\) while the present is \([\text{PAST}:-]\). Direct reference needs to be made to the imperfect tense, which for expositional clarity I shall notate directly by means of a feature specification ‘Impf’. We then assume standard person/number features. To generate the partial paradigm in Table 6 we need the MLRs in (36). \(^7\)

(36) a. i. MLR1([x]) = [x][e]
    ii. \(\text{MLR}1, [\text{PAST}:+]([x]) = [x][a] \quad \text{CLASS A} \)

b. i. MLR2, \([\text{PAST}:+, 3]([x]) = [x] \)
    ii. \(\text{MLR}2, [\text{PAST}:+]([x]) = [x][v] \)

\(^7\) I indicate slot positions by means of Arabic numerals, rather than Roman numerals as in Stump’s formalism, for ease of readability.
c. i. MLR3, [PAST:−, 1SG](x) = [x|am]
ii. MLR3, [PAST:−, 2SG](x) = [x|š]
iii. MLR3, [PAST:−, 3PL](x) = [x|a]
iv. MLR3, [PAST:+, 3PL](x) = [x|at]
v. MLR3, [Impf, 3SG](x) = [x|še]
vi. MLR3, [1PL](x) = [x|me]
vii. MLR3, [2PL](x) = [x|te]

The class feature marking ‘CLASS A’ in MLR (36aii) is needed to distinguish the \textit{padne} class from the other two main classes, not illustrated in Table 6.

To capture the syncretism we need a function which will tell us that whenever we seek the 2SG PAST form we must defer to the 3SG form. The way Stump formalizes this is to write a rule which applies to the input subparadigm and refers it to an output subparadigm. The input subparadigm is defined by the features of the slots which are referred. The rule then states that all of the complete feature set characterizing a given word form is carried over except for specified features, namely the output subparadigm. This is shown in simplified form in (37):

\[(37) \text{RR } [\text{PAST:+, 2SG}](\sigma) = \sigma/[3SG]\]

Here $\sigma$ represents any set of feature specifications. Rule (37) replaces the [2SG] specification in $\sigma$ with the specification [3SG].

There is an important final aspect to (37). In general, it is intended to apply only to specified slots. Stump argues that this characterization is essential for two reasons. First, he argues that rules of referral interact with the Elsewhere Condition in such a way that they pre-empt MLRs if they are more specific, but they themselves are pre-empted by more specific MLRs. Cases of this sort from Sanskrit nominal inflection are discussed. Second, he shows, this time from the Vedic Sanskrit perfect conjugation, that there are cases in which only certain slots are subject to referral, while other slots receive their usual exponents. Thus, we might have a rule of referral which deferred to another subparadigm for slots 1, 3 but which used the usual exponent for slot 2. This would be impossible if the entire word form were referred to another paradigm. For these reasons, Stump specifies the slots to which a rule of referral applies. Whether this is necessary, or whether there are whole word referrals is tangential to my present concerns, so I shall simply follow Stump’s exposition.

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8 Given the exceptional ‘inverse’ forms mentioned in note 5, a slot-by-slot analysis would be required for those forms.
In the Macedonian case, the rule of referral applies to all slots, so we replace (37) with (38):

\[(38) \quad \text{RRn, [PAST:+, 2SG]}(\sigma) = \sigma/3SG \text{ (where } n = 1, 2, \text{ or } 3)\]

We can now see how (38) interacts with the rules of (36) to generate the required forms. Consider padna ‘you (sg) fell (aorist)’. The feature set for this will be (39):

\[(39) \quad [\text{PAST:+, Aor, 2SG}]\]

For each slot we now have to compute which MLR (if any) applies. For slot 1 there is no MLR more specific than (38) so (38) applies and we compute the MLR for [PAST:+, Aor, 3SG] (i.e. (39) with [2SG] replaced by [3SG]). This gives us (36aii), hence padn-a. For slot 2 we again find that (38) is the most specific rule (there is no other rule), and this sends us to the 3SG form. There is no rule for this so the Identity Function Default delivers padna-. Finally, slot 3 again refers us to the 3SG form, where we again find no MLR and the Identity Function Default gives us the final form padna.

Now consider what happens with the feature set in (40):

\[(40) \quad [\text{PAST:+, Impf, 2SG}]\]

Again, rule (38) tells us to find the slot 1 rule for the 3SG form, in this case giving padn-e. The slot 2 rule is again referred to 3SG, where we find there is no MLR and the Identity Function Default operates. However, for slot 3 we find that there is a MLR for 3SG, namely, (36cv) so we obtain padne-še.

6. A realization rule solution for Chukotkan ‘inverse’ forms

The problems posed for Distributed Morphology by the split ergativity in the agreement markers of Chukotkan are parochial to that model, in that Distributed Morphology presupposes a theory of syntax in which direct reference to grammatical relations in the syntax is impossible and then imports this restriction into the syntax-driven morphology. However, as far as I can tell, there is no particular reason for this restriction in Distributed Morphology. It would probably make no difference at all to the overall architecture of the theory if reference were permitted in the morphology to grammatical functions such as S, ERG, SUBJ, OBJ and ABS. Indeed, this would be a slight extension of the practice of Halle & Marantz with Potawatomi. In that language there is a lexically governed morphosyntactic difference between transitive and intransitive conjugations. This difference is presumably largely deducible
from syntactic structure (since all and only transitive verbs will have an object position in the syntax), at least for the majority of cases in which syntax and lexical category membership coincide. However, Halle & Marantz choose to make reference to a feature [+trans], to pick out the transitive conjugation class. The conclusions from split ergativity, then, are simply that morphology is probably a little more autonomous than Halle & Marantz originally argued. Nonetheless, data such as those provided by Chukotkan offer important insights into the relationship between morphological form and syntax.

The real problem for the Distributed Morphology approach comes from the syncretism between antipassive forms and certain 1st person object agreement forms. If this were captured purely by means the feature characterization of Vocabulary entries (corresponding to rules of exponence in rule-based theories) then we would inevitably fail to capture the fact that this is an instance of a take-over. However, because rules of exponence play no role in Distributed Morphology, it is also not possible for rules of referral to play any role as such. Those syncretisms which are most naturally handled by rules of referral in a realizational rules approach can be captured indirectly, however, by means of Impoverishment rules. In this case what happens is that whole sets of feature values in the MS representation of a word may be deleted, when governed by specific morphemes. Since Distributed Morphology countenances default specification, this means that the deleted values may be reinstated later in the derivation, but with their unmarked values.

It might be possible to incorporate this solution into an analysis of the Macedonian data given in Table 6 above. We could perhaps say that in the past tense forms the feature mark ’2’ is deleted in the context of ‘sg’. On the assumption that the default person is 3rd, the impoverished person/number forms would then revert to 3sg forms as required. A major problem with this is apparent when we inspect the paradigms for the past tenses, however. In the agreement slot (Slot III) we find that there are distinct agreement markers for all person/number combinations, with just the 1sg form remaining unmarked. This would imply that the 2/3sg agreement ending should be zero, which would work for the aorist, but not for the imperfect (where the ending is -še). More seriously, perhaps, there is a past tense formative evident in the imperfect and aorist tenses, which takes the form of -v- for all persons and numbers except 2sg and 3rd persons. From casual inspection, it would thus appear that the default form is with -v- and that the 3rd person form (syncretised with the 2sg form) is the special case. This, indeed, is how Stump (1993b) analyses these forms. But this means that if we impoverish the 2nd person mark for these forms, the default -v suffix will be inserted for 2sg forms, giving us incorrect forms *padn-e-v-še (imperfect, a non-existent form) and padn-
a-v (aorist, grammatical but only in the meaning of 1SG). Thus, a theory such as Distributed Morphology could only provide a satisfactory account of Macedonian if it were somehow able to motivate an analysis under which the v-less form of the past tense were unmarked.9

How might Impoverishment be deployed in the case of Chukotkan inverse forms? First, we would have to give the ine- and -tku affixes dual entries, one as antipassive and the other as special markers effectively signalling agreement with 1st person objects. Then we would have to neutralize the real object agreement suffixes which we would normally expect to appear. This would presumably mean deleting an ACC feature on the object suffix. This would then mean that the conjugation would retreat to the less marked intransitive conjugation and the suffix would agree with the subject rather than the object. This ploy already causes problems because the suffixes follow an ergative/absolutive patterning. Thus, what we would actually be deleting would be a feature signalling agreement with an ABS case-marked nominal. But deleting such a case-marking on the agreement suffix would also prevent it from agreeing with an intransitive subject. Furthermore, our initial assumptions about the morphosyntax of the Chukotkan verb put the voice markers ine- and -tku too low down in the tree to be able to govern anything but the verb. This was motivated by the morpheme order in verb forms, which shows pretty conclusively that the voice markers, whether prefixes or suffixes, are adjacent to the verb stem (in conformity with Bybee’s (1985) findings on cross-linguistic morpheme ordering). But in that case, how could the ine- or -tku affixes induce Impoverishment of the Agr suffixes, for those suffixes must presumably be attached to the Aspect/Mood node which dominates the Voice node (again witness the morpheme order). Thus, the Voice node should be unable to effect such Impoverishment, since it fails to govern the node which it is Impoverishing.

Another alternative might be for the 1st person object features themselves to induce some kind of Impoverishment. I have little idea how this might be achieved (it would seem to require a node to induce self-deletion), but let’s suppose that such an idea could be made to work. This would mean that the slots concerned would be treated as effectively intransitive for the purposes of agreement. This would correctly achieve the goal of detransitivization for 1st person object forms, but this too would be to little avail. For we would simply end up with a word taking the intransitive conjugation form. Thus,

9 The same holds of Wunderlich’s (1996) analysis of these facts. Wunderlich attempts to maintain a morpheme-based analysis by skilful use of underspecification, but he is obliged to resort to disjunctive definitions in order to make the unaffixed forms the default.
instead of the expected *Pur-gam for ‘thou/he saw me’ we would get *Pur-\text{g}^\text{?i} in which the verb agrees just with the 2nd/3rd sg. subject. There would be no way on this story to ensure affixation of \text{ine}- or -\text{uku}.

The problem is caused by the fact that we have here a retreat to a marked form, the antipassive, rather than to the unmarked, default form. It is difficult to see any alternative to an account which simply states this baldly: the inverse forms are homophonous with the corresponding antipassive. This is precisely the kind of situation for which the realizational approach of Stump (1993b) is designed. I shall illustrate the way rules of referral might work, restricting myself for the present to Chukchee (essentially the same considerations will apply to Koryak).

The MLR set in (41) will generate the subject and object agreement forms for the Past I transitive and intransitive conjugations illustrated in Tables 3 and 4. For ease of reading the rules are presented in a rather informal manner, ignoring certain regularities (such as the -t absolutive plural suffix identifiable in suffixes such as -\text{net}, -\text{ninet}, and -\text{g}\text{?et}). MLR-2 indicates agreement prefixes while MLR+2 indicates agreement suffixes. We will need to appeal to five morphosyntactic attributes governing agreement: Erg (transitive subject), S (intransitive subject), Subj (transitive or intransitive subject), Abs (absolutive, i.e. intransitive subject or object), Obj (direct object).

\begin{enumerate}
  \item a. (41) Morpholexical rules for a partial paradigm of transitive and intransitive verbs in Past I form
  \begin{enumerate}
    \item i. MLR-2, [AGR Erg:3SG, Obj:3SG]|(x)| = [x]
    \item ii. MLR-2, [AGR Erg:3]|(x)| = [ne|x|]
    \item iii. MLR-2, [AGR Subj:1SG]|(x)| = [t|x|]
    \item iv. MLR-2, [AGR Subj:1PL]|(x)| = [mat|x|]
  \end{enumerate}
  \begin{enumerate}
    \item b. i. MLR+2, [AGR Erg:3SG, Obj:3SG]|(x)| = [x]|nin|
    \item ii. MLR+2, [AGR Erg:3SG, Obj:3PL]|(x)| = [x]|ninet|
    \item iii. MLR+2, [AGR Erg:2PL, Obj:3]|(x)| = [x]|tka|
    \item iv. MLR+2, [AGR Abs:1SG]|(x)| = [x]|g\text{am}|
    \item v. MLR+2, [AGR Abs:2SG]|(x)| = [x]|g\text{at}|
    \item vi. MLR+2, [AGR Abs:1PL]|(x)| = [x]|mak|
    \item vii. MLR+2, [AGR Abs:2PL]|(x)| = [x]|tak|
    \item viii. MLR+2, [AGR Obj:3PL]|(x)| = [x]|net|
    \item ix. MLR+2, [AGR Obj:3SG]|(x)| = [x]|g\text{?en}|
    \item x. MLR+2, [AGR S:3PL]|(x)| = [x]|g\text{?et}|
    \item xi. MLR+2, [AGR S:1SG]|(x)| = [x]|g\text{?ek}|
    \item xii. MLR+2, [AGR S:SG]|(x)| = [x]|g\text{?i}|
  \end{enumerate}
\end{enumerate}

Note that rule (41bxi) introduces the suffix -\text{g}^\text{?i} to agree with a 2SG or 3SG intransitive subject. The rule is formulated so as to apply to the whole of the
singular intransitive paradigm, but for 1SG forms it is overridden by the more specific (41bxi).

Next we need a set of rules to generate the antipassive forms. I shall assume a special voice feature [VOICE] with two principal values, {active, antipassive}, such that [antipassive] itself has two values, {antipassive(1)}, realized by -ine, and {antipassive(2)}, realized by -tku. Antipassive verb forms take only subject/absolutive agreement affixes (i.e. conjugate as intransitive verbs). How exactly this is achieved is a non-trivial matter (though not, I suspect, one that will serious discriminate in favour of a morphemic theory against a realizational approach). I provide an outline solution below. The MLR’s for introducing the two antipassive affixes are given in (42):

\[(42)\]  
\[\text{a. } \text{MLR-1, } [\text{VOICE:antipassive(1)}](\[x\]) = \[\text{ine}[x]\] \]
\[\text{b. } \text{MLR+1, } [\text{VOICE:antipassive(2)}](\[x\]) = \[\text{xktu}\]\]

We now need to link the antipassive forms to the intransitive conjugation. Let us first note that it is only transitive verbs that can have an antipassive form (the antipassive equivalent of Burzio’s generalization). Therefore, the antipassive value for [VOICE] is, in a sense, only compatible with verb feature sets which include a value [OBJ] for [AGR]. This can be stated as a lexical redundancy by means of (43):

\[(43)\]  
\[*\text{[VOICE:antipassive, AGR[S:} \alpha]\]

Recall that the attribute ‘S’ refers to intransitive subjects.

Rule (43) bans antipassive voice forms of intransitive verbs. Next, we need to be able to say that the antipassive verb form conjugates like an intransitive verb, by agreeing with the subject alone. For this we can posit a rule along the lines of (44):

\[(44)\]  
\[\text{[VOICE:antipassive, AGR[Erg:} \alpha, \text{Obj:} \beta\{[\text{VOICE:antipassive, AGR[S:} \alpha]\]}

A rule such as (44) will ensure that a phrase schematically represented as (45a) will alternate with the schematic antipassive in (45b):

\[(45)\]  
\[\text{a. Man-ERG killed-3SGS.3PLO bears-ABS}\]
\[\text{b. Man-ABS AP-killed-3SGS (bears-OBL)}\]

It should be clear that the rule system given in (41, 42) misgenerates the inverse cases, offering non-existent forms such as *Pu-gam for ‘thou saw me’, *he-Pu-gam for ‘he saw me’, and *he-Pu-mak for ‘you saw us’. We therefore need to pre-empt these forms by means of a rule of referral (46):
(46) For $|\sigma| = (\text{VOICE:active}, \text{AGR[Erg[PERS:} \alpha \text{NUM:} \beta], \text{Obj[PERS:1, NUM:} \gamma\text{]})}$
RRn,$|\sigma| (|\sigma|) = \text{PF[\sigma]/(VOICE:antipassive(\delta))}$ (where $\delta = 1$ if $\alpha = 2$ or ($\alpha = 3$ and $\beta = \text{sg}$) and $\delta = 2$ if $\alpha = 2$ and $\gamma = \text{pl, } n = -2, -1, +1, +2$)

Rule (46) states that the 3SG/1st person object forms and 2nd person subject/1st person object forms are referred to Antipassive(1) for 1SG object forms and Antipassive(2) for 1PL object forms. But now the output of (46) automatically fits the description of rule (46), with the result that the verb appears to show agreement only with the subject and not with the object.

7. Summary

I have shown that the agreement system of Chukotkan poses two types of problems for Distributed Morphology and any other theory which seeks to defend the morpheme as the prototypical inflectional piece. The first problem is that Chukotkan agreement exhibits a kind of ‘split ergativity’ under which some affixes in a word form effectively operate on a nominative/accusative basis while other affixes in the same word form effectively operate on an ergative/absolutive basis. The second problem is that certain person/number forms in transitive paradigms (active voice) are syncretic, taking over one or other of an antipassive paradigm. This is a type of syncretism that cannot be handled by means of a ‘retreat to the unmarked’.

The first problem could perhaps be solved by permitting reference by means of morphological features to syntactic functions. The second is a serious problem for any morpheme-based theory because it demonstrates the need for reference to parts of paradigms in a manner crucially different from the way in which rules of exponence work. Since the syncretism defers part of an active paradigm to part of an antipassive paradigm, we have to concede that this is a case of ‘retreat to the marked case’. This means that the device of Impoverishment cannot come to the rescue. Thus, if take-overs by marked subparadigms of this kind can be shown to be a recurrent phenomenon in paradigmatic systems we will have grounds to call into question any model of paradigmatic organization which does not countenance something like the notion of referral.
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References


Nearly from the beginning, generative grammar has struggled, sometimes silently, to reconcile the various notions of word. An important dimensionality of the theories in syntax concerns the “atomicity” of words. At one pole on this dimension, the “atomic” end, words, complex or not, occupy syntactic positions and have syntactic properties; how the words come to have those properties does not concern the rules of syntax. On the other “interactive” end, the derivation of the properties of words and the derivation of the properties of sentences are intermingled in various ways; in one concrete version, affixes occupy positions in syntax, and affixation is a sentence level process.

What I have called THUD (“The Theory Under Discussion”), beginning with “Remarks” and continuing on until now, has moved between these two poles. Pollock (1989), Chomsky (1957), and others proposed a rather interactive model; in that model, functional elements like Tense occupy syntactic positions; lexical items like verbs move to those positions to get those elements. In a real sense, affixes are associated directly with syntactic positions: the English tense ending -ed is a functional head which acquires its base verb through syntactic derivation.

In examining these models, it is useful to keep three questions in mind: first, how is morphology added to the verb; second, how does morphology determine the positioning of verbs and their arguments; and third, how does morphology determine the positioning of adjuncts relative to verbs and arguments. The questions are a bit arbitrary, but have the virtue that little falls outside of them.

1. The theory under discussion

In a more recent model, Chomsky (1995) has now proposed that affixation is done in the lexicon, and fully formed words are inserted in the syntactic derivation. And the derivation of the sentence is largely governed by the “top level” properties of words. This sounds like a theory at the opposite end of the lexicalist pole, at the atomic end. But in fact, this account is still quite anti-lexicalist, in the sense that affixes are essentially associated with syntactic positions in a way that I will discuss. Let us look at how the theory works.

In (1) is a sketch of the model of the lexicon; morphological derivation is completely separate from syntax.

(1) Lexicon:

X: (like,
af: +F, -ed, +Tense, -past)
Y=[X+af]F, (like+ed, +Tense, +past,)
F: +F (T,-Tense)
If affix $af$ with feature $F_i$ is added to stem $X$, $X+af$ bears that feature. $Y=X+af$ with its properties (the feature $F_i$) is inserted as a unit into the syntactic derivation. In the syntactic derivation, an abstract morpheme, the functional head $F_i$, bearing the same feature "attracts" $X+af$ to it, so in s-structure, $X+af$ appears in the position of the functional head:

\[ (2) \]

```
XP
  ↓
 F_i
  ↓
 YP
  ↓
 ZP
  ↓
 Y
```

The movement is motivated by the need to satisfy the morphologically acquired feature $F_i$. The verb will move extensively through a "spine" of functional projections that define basic clausal structure, as in (3):

\[ (3) \]

```
Agr-SP
  ↓
 AgrS
  ↓
 TenseP
  ↓
 Tense
  ↓
 Agr-OP
  ↓
 Agr-O VP
  ↓
 VP
  ↓
 V
  ↓
 NP
```

\[ (4) \] $[V \ NP]_{VP}$

In this way, the morphology of the verb is connected to its positioning in syntax.

But this theory is only apparently lexicalist. The spine of functional projections "recapitulates" the lexical structure of verbs, and nodes in that spine correspond, roughly, to affixes, just as before. It is my contention that in fact this spine is purely lexical; that is, it represents the structure of lexical items, but is not part of the syntactic derivation. If that is so, then all of the structure in (3) collapses into (4) from the point of view of syntax. The sequence of embeddings AgrS-Tense-AgrO-V for example certainly exists; the question is, is it part of the syntactic structure of sentences, or is it rather the structure of the verb itself. The current version of Minimalism suggest that this aspect of lexical structure is part of syntactic structure.
But while the Minimalism of Chomsky (1995) commits itself to this anti-lexicalist position with one hand, it takes back large chunks of that commitment with the other. A variety of constraints and artifacts conspire to prevent the kind of interaction of this lexical structure with the surrounding syntactic structure. Clearly, (4) will interact with its syntactic environment in more limited ways than (3) — there are fewer elements and fewer places to move them. But in fact, to make (3) viable, a number of constraints must be introduced to reduce the possibilities in (3) to something like those afforded by (4). I will look at 4 such take-backs:

(5) Lexicalisms:
   a. Insertion of whole words.
   b. Holmberg’s generalization.
   c. Mirror principle.
   d. Movement through Larsonian shells

To begin with, there is the insertion of whole words into syntactic structures, the thing which gives the theory the lexicalist look to start with. This position was adopted, relatively recently, for rather theory internal reasons: languages differ in whether a particular movement is “overt” or not; so for example, the V moves to Tense in French, but not in English. Nevertheless, the V in both French and English bears the tense morpheme. How does the V get the tense morpheme in English? By “covert” movement. But if the movement is covert, then why isn’t the morpheme also “covert”? Because all morphemes are attached to words from the beginning, and the movement results not in the morphological marking of the thing moved, but in the licensing of the relevant feature on the thing moved; so, English and French are the same, except French feature checking is done under overt movement, and English feature checking is done under covert movement. Covert movement replaces “affix lowering” in Pollock (1989), and Chomsky’s previous theories.

A second taking back of the antilexicalist stance is connected to Holmberg’s generalization, which says basically that a NP will not cross over a verb to get a morphological feature. The system of triggers for NP movement and V movement are decoupled in Chapter 4, permitting independent movement of each. But in fact, if Holmberg’s generalization is right, then something must be introduced to make it come out looking like there was just the verb and its arguments, with no superstructure of functional projections on which each could move independently. In fact, Holmberg’s generalization is a special case of a general principle dictating that theta role assignment will be uniform in certain ways, a generalization that I called TRAC in Williams’ (1994) book.
And there is not just a Holmberg’s generalization for arguments, but also for
adjuncts, which we will examine shortly.

A third taking back is done in connection with Baker’s Mirror principle
(Baker (1985)). It turns out that the hierarchy of functional projections “mir-
rors”, or, one should say, “duplicates” the morphological structure of the verb.
This is expected under the lexicalist hypothesis: that hierarchy simply IS the
morphological structure; but without the lexicalist hypothesis something else
must be introduced to make it come out right, and that is the Mirror principle.

A fourth taking back concerns movement through Larsonian shells. Larson
(1988) proposed the introduction of sufficient functional projections below
the level of V so that a verb never need take more than a single internal
argument, or adjunct, for that matter, any more than one are introduced as
specifiers of higher functional projections; the take back is, movement
through these functional projections is always obligatory, yielding the result
that conforms with TRAC again: the verb takes its arguments in a uniform way
(all on one side).

Now, there is good motivation for each of these postulates. But at the
same time, it is undeniable that each of them is a step towards lexicalism, in
that each participates in a conspiracy to make language look lexicalist. Under
a strict lexicalist theory, none of them would be necessary, as each prohibits
an interaction between lexical structure and syntactic structure that lexicalism
gives no grounds to expect in the first place.

2. Holmberg’s generalization

Let’s look first at Holmberg’s generalization. In Swedish, Negation can appear
on either side of the verb; when negation appears on the right of the verb, a
pronoun direct object can appear on either side of negation. But when
negation appears on the left of the verb, the pronoun cannot appear on the
left of the verb:

(6) Vafor last studenterna inte alle den?
    why  read students  not all  them

(7) a. Vafor har studenterna inte alla last den
    why  have the students not all  read them
b. *Vafor har studenterna den inte alla last
    why  have the students them not all  read
c. att studenterna inte alla laste den
    that the students not all  read them
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d. *att studenterna den inte alla laste
   that students it not all read them
   (Holmberg 1986)

(8) "AgrO is {strong [D−], strong [V−]}" (Chomsky 1995)

(9) TRAC: Theta role assignment is uniform.

The generalization is that the pronoun cannot cross the verb. In a general theory of the type of the minimalist program, this is unexpected, if the NP can move left, there is no reason for its movement to be connected to the verb’s position. But it is, and to get that correlation, some supplement to the theory must be made; the supplement in Chapter 4 of Chomsky (1995) is given in (8), which stipulates that for this particular projection, the strengths of the N and V features in fact coincide; the stipulation is in fact too weak, yielding movement of V and NP to the head and specifier of the same projection, which would result in crossing over. Presumably some different mechanism can be made to work. But in fact, if there is no movement, there is no need for a supplement. There is a larger generalization at work, namely, theta role assignment is uniform, in a simple sense: a predicate always takes its internal arguments in the same way, in particular, always on the left, or on the right. This was part of what I identified as TRAC in Williams (1994). Another way to think of Holmberg’s generalization is that morphologically motivated movement is “structure preserving” for the “complement of” relation: that is, if X can be the argument of V before movement, then it can be the argument of V after movement. Only “true” movements, such as V to C, which are not morphologically motivated, will give overt evidence of the violation of Holmberg’s generalization.

It seems that the need for the Holmberg supplement to the minimalist theory arises from the introduction of lexical structure, the FP clause spine, into syntactic structure. If that structure is recognized as strictly sublexical, then the problem does not arise in the first place.

3. The Mirror Principle

The Mirror principle is another way that lexicalism is approximated, after first being denied. (10) from Quechua illustrates the paradigm of Muyskens (1981), which originally motivated the principle:

(10) a. Maqu-naku-ya-chi-n
    beat-recip-dur-caus-3sg
    ’He is causing them to beat each other.’
When the reciprocal is inside of the causative, as in (a), the form means the causative of a reciprocal action; but when the reverse, it means to reciprocally cause something, that is, the reciprocal of a causative. At first glance, this would seem to simply illustrate the compositionality of word formation. But in a theory where the causative morpheme and the reciprocal morpheme are located in syntactic structure, and movement operations are needed to unite the parts of the word which is then lexicalized, and the compositionality in question holds among syntax elements, a further principle is needed to insure that the word gets put together in a way that INDEPENDENTLY reflects that compositionality. There are various ways to effect this; the way of Chomsky (1995) is given below:

(11) "the verb \[is\] a sequence \( V = (\alpha, \text{Infl}_1, \text{Infl}_n) \) the PF rules only 'see' \( \alpha \)" (Chomsky 1995, p. 194.)

Affixes add features in a certain order in the lexicon, and then they are checked off IN THAT ORDER in syntax, since the nth is not visible until the n-1th has been checked.

Now, this theory gives rise to a pseudo question: in which component of grammar are the principles determining which possible sequences of embeddings of functional elements is grammatical? For example, if Tense always embeds subject agreement, or vice-versa, or even if this varies from language to language, where is this information located? Is it in the principles of word formation, which then, via the mirror principle establish the ordering of the elements in the functional hierarchy in syntax, or is the syntactic subcategorization of the functional heads fixing the order of syntax, and then the order of morphemes in a word is determined by the mirror principle? I think this is a nonsense question that can be eliminated by eliminating the dual lexical and syntactic structures.

4. Larson Shells

Finally, we turn to the Larson shells. In the context of the Minimalist program, the behavior of verbs in Larson shells is mysterious. The Larson shells, as mentioned above, are functional projections of a special sort: a sufficient number of them is supplied so that no verb need take more than 2 arguments, as in (12):
The lexical verb takes the first two arguments directly as complement and specifier, but any further arguments of the verb must occur as specifiers of higher functional projections with "dummy" heads — the little v’s in (12). Part of the evidence given for this structure is the appearance of strict right-branchingness among arguments in VO languages. I will not review this evidence here, though I do not believe it has been interpreted correctly (as I wrote in (1994)). I do want to point out though that here again, we see lexical structure injected into syntax, in this case, it is thematic structure, specifically, the thematic hierarchy. What is striking about the structure is that the verb always moves all the way to the top of the hierarchy, whereas with other functional projections, the movement is possibly partial, depending on the language. Now, there may be some good reason for this deviation of the Larson shells from the full generality of functional projections; but again, as in the case of Holmberg’s generalization, whatever that reason is, it seems to serve a "higher cause" — namely, preserving the “surface” uniformity of theta role assignment. Hence in our investigation we should not stop with making more precise the reason for obligatory movement through Larson shells, but should go beyond and ask if there is any reason for the surface uniformity that it seems to serve.

I think that again the surface uniformity has to do with the atomicity of lexical structure in syntax. If the hierarchy of Larsonian shells exists, it exists in the lexicon. I would suggest that the correct structure of a verb and its arguments is in (12b), which is a set of projections strictly of the initial lexical verb, with uniformity of theta role assignment preserved throughout.

But is there any reason to believe that the structure looks anything like (12b), as opposed to (12a)?
5. **Compounds**

Observe the ordering of elements in thematically based compounding, as in (13):

(13) a. high school history instructor  
b. *history high school instructor  
c. graduate student course advisor  
d. *course graduate student advisor  
e. advise NP about PP (theme inside goal)  
f. *advice courses to graduate students  
g. razor potato peeler  
h. *potato razor peeler (theme inside goal)  
i. the 4:00 Times Square speech  
j. *The Times Square 4:00 speech (place inside time)

One sees immediately that the ordering of elements in compounds is the reverse of the ordering in VPs: theme comes inside of goal, goal inside of location, location inside of time, etc., clearly we have a case of robust symmetry here. It covers not only what we have traditionally thought of as theta roles, but extends to adjuncts as well.

An interesting deviation from the pattern occurs when the verb deploys its arguments in a nonstandard way: the verb advise, for example, has a theme and a goal, which it uses in the order head+NP-goal+PP-theme. In the compound, we find the elements in the order goal+theme+head, which is not the mirror image of the VP. How can we interpret this deviation from mirror imagery? It shows, I think, that there is a single set of laws governing the deployment of arguments, which says, theme inside of goal, goal inside of location, location inside of time, etc., In the VP system, there is another generalization laid on top of the thematic hierarchy having to do with NPs and PPs: NPs come inside of PPs no matter what. But in the compounding system, we see the theta hierarchy unobscured.

Now, suppose that (12a) were the correct structure. Then, we must assume that the verbal system has a theta hierarchy which is the inverse of the compounding system: theme goes OUTSIDE of goal, etc. Either that, or we must assume that the compounding system involves massive systematic transformation of a right branching structure into a leftbranching structure. Perhaps this is the right analysis of compounding, or for that matter, of words in general, but this then at least shows that the Kaynian program extends fully into the structure of words.

If the lexicon and syntax are separate in the way that I have claimed, then is it not a coincidence that compound structure and VP structure are mirror
images of each other? No, it is not: we know antecedently that both syntax and
morphology use the same notion of theta role; from this we conclude that they
both interface with theta theory; if it is theta theory that provides the thematic
hierarchy, then it is no accident that these two syntaxes, the syntax of words
and the syntax of phrases, should make use of the same thematic hierarchy.

6. Functional elements in the lexicon

Let’s suppose just for now, that there are no functional projections in syntax;
then, how do we answer the three questions mentioned earlier?

First, there will be functional elements in the lexicon. Tense is such an
element in English. The tense feature is borne by certain verbs, like saw, and
went, it is borne by certain affixes, like -ed. Tense in general is subcategorized
for V, and so, then, are affixes which bear it, hence (14b):

(14) a. T: _V
   b. -ed: +T, _V
   c. V: _NP
   d. V + ed = V-ed: _NP
   e. re: _V
   f. wash: _NP
   g. rewash: _NP
   h. -tai: _V +
   i. V: _NP = V-tai: _NP.

A basic law of the lexicon is that when two forms combine, and the non-head
has subcategorization, then the resulting form has the subcategorization of
the non-head; hence, (c) — the past tense verb form is marked past tense, but
it also has the subcategorization of the base verb.

The same thing happens with derivational morphology, witness (e): rewash
inherits the subcategorization of wash; in this case, since re- is an adjunct, the
subcategorization of the whole is the subcategorization of the head. In
Japanese, the suffix -tai means want; it subcategorizes for V, V-tai has the same
combining potential as the original V. This partially answers the question of
how affixes are added to verbs, and how that relates to verbs and their
arguments; this is of course a sketch, leaving much unsaid.

The simplest assumption is that what is available for derivational morphol-
ogy is also available for inflectional morphology, and so (14) is expected.
More complicated systems will work the same way, they will just be more
complicated; so, for example,
Because lexical derivation works this way, we will get a partial imitation of syntax in the lexicon. The imitation will always be only partial, however, because the elements combining in the lexicon are X's not XPs, and while X's and the XPs they project are identical in many respects, they are crucially different in regard to argument structure: an XP is a saturated X. Hence, we will find pairs like (16), where the WORD want takes a whole VP, whereas the AFFIX -tai will only take the verb, and then the V-tai package will take the NP:

(16) a. want [to V NP]_{VP}
    b. [NP [V-tai] V]_{VP}

But this is all straightforward, if things work as I have said, and we have already seen that this sort of combination is pervasive in the lexicon anyway.

An alternative would be to put all of affixation in syntax; that is, put the affix -tai in a syntactic position parallel to want, and derive the form V-tai by movement. But there are good reasons not to do this. This will lead to exactly the expectation of intricate interactions between syntax and morphology that is not attested. Consider again the prefix re-, which means again.

In combination with a verb and a verb-modifying adverb, it is always the case that the adverb has scope over re-; witness the interpretation in (17a), which does not have the meaning in (b):

(17) a. John [rewashed] the dishes thoroughly
    b. John again [washed the dishes thoroughly]
    c. John re- [the dishes [washed thoroughly]]
    d. John re-washed [the dishes [thoroughly]]

this suggests the structure in (a), where the adverb c-commands the verb and its particle, and in particular, it suggests that the particle’s scope is determined before the re-V combination exits the lexicon. But suppose that re- were a sentence grammar adverb, then it might occupy a position parallel to again, be assigned scope there, and combine with the stem verb only after syntactic movement as in (d); but this would give the wrong meaning. Simply put, we do not want to loosen morphology up enough to embed it in syntax in a general way, but this is what the program of functional projections would suggest, if the logic were pursued rigorously.

The subcategorization schema in (14) is enough to accommodate a variety of different ways that a language can "package" the functional elements. The "packaging" varies according to what I call in the last section of this paper the "lexical style" of the language. The details of this packaging strongly suggests...
that this aspect of lexical structure is not simply a reflection of a universal spine of functional projections composed under the direction of the Mirror principle; see in particular the discussion of Swahili below.

I have deliberately written the subcategorizations as \_V, \_AgrO, etc., instead of \_VP; but in fact, I mean them to be taken ambiguously. When they appear on an affix, then they are to be read \_V, etc., but when they appear on a word, they are to be read as \_VP, etc.; all this in the spirit of there being a common theory of structure for both words and sentences, with phrases at the sentence level playing the role of morphemes at the word level.

So in a fully polysynthetic language each of these features will be realized in a prefix (say), and the subcategorizations will line them up in descending order before the verb stem. Various "packaging" possibilities will interfere with this basic pattern, such as the expression of AgrS and AgrO by a single affix, etc., as is found, for example, in Mohawk:

\[(18)\] T-a-hi-yena-
\[\text{CIS-FACT-1SGA/ZsO-catch-PUNC}\]
'I caught it'
(Baker 1996, p. 193 example (2c))

where the morpheme \textit{hi} represents simultaneously 1st person singular subject and masculine singular object.

A common packaging style is represented by the English Auxiliary system: T takes a verb at the morphological level, as already indicated. But suppose the auxiliary verbs express T without satisfying its subcategorization for a verb; then this subcategorization will be finally played out in syntax, as the auxiliary verbs are words:

\[(19)\] Auxiliary verb:
\[\text{lexicon:}\]
\[T,AgrS + V \rightarrow AuxV \ldots \_V\]
\[\text{past.2sg + be } \rightarrow \text{were } \_V\]

\[\text{Syntax:}\]
\[\text{AuxV + VP } \rightarrow \text{AuxVP}\]
\[\_V\]
\[\text{were + [singing] } \rightarrow \text{were [singing]}\]

A common pattern in language is for AgrS to attach to be expressed on an auxiliary verb, and AgrO to be expressed on the stem verb. This is a slight variation on the Auxiliary system of English:
Note how the subcategorizations are deferred — the verb’s subcategorization for an object is deferred to Syntax when it joins with AgrO, and AgrS’s subcategorization for AgrO is deferred until the Aux it is a part of is combined in syntax with the AgrOP.

Swahili presents a particularly interesting lexical style in this vein. It has AgrS, AgrO, and in fact it has an auxiliary, but in fact the auxiliary is lexical, not syntactic. I believe that Swahili shows that the calculus of functional elements is fully operational within the lexicon, and is not simply the lexical reflection of a syntactic structure under the Mirror Principle, because the particular word-structure that Swahili uses could have no counterpart in syntax.

Keach (1986) presents compelling evidence that the inflected Swahili verb is not unitarily branching, but has two subcomponents, the first of which is “Aux” like, and the second of which contains the stem; these are compounded together, as in (b):

(21)  a. not: [AgrS [TENS [AgrO [V]]]]
     b. but rather: [[AgrS TENS] [AgrO V]]

(22)    Juma a-li-ki-soma kitabu
        Juma SP-Past-OP-read book
        ’Juma read the book’
        (Keach 1986, ex. (1a))

(SP and OP are Keach’s indications of AgrS and AgrO respectively). First, there is a relative clitic which, when it appears elsewhere, is always final in its constituent; when it occurs in the inflected verb, it appears just after Tense:

(23)    kitabu a-li-cho-ki-soma
        book SP-Past-Rel-OP-read
        ’The book which she read’

This would make sense if the structure were the following:

(24)    [SP-Past-Rel]-[OP-read]

Then the Rel particle is final in its constituent, as it morphology dictates.

This solves a problem noted by Stump (1992), which in fact caused him to
reject the "phrase structure plus subcategorization" account of word structure we are building on here:

(25)  
a. a-ki-taka-cho  
     AGR(su)-AGR(obj)-want-rel  
b. a-na-cho-ki-soma  
     AGR(su)-TNS-rel-AGR(obj)-read  
     (Stump 1992, p. 139–140, examples 18 and 20)

In (a), cho is clearly a suffix; in (b) Stump thought it was a prefix (or ambifix to use his term), and the existence of ambifixes suggested to Stump that phrase structure and subcategorization were not the right tools. In fact though cho is a suffix in both of these cases — it is suffixed to the verb in (a), but to the Aux constituent identified by Keach in the second case.

Keach gives a second argument based on stress patterns. Stress is assigned to penultimate syllables, but in the inflected verb, there is a secondary stress on the penultimate syllable of the Aux-like constituent. This is expected if the aux-like constituent really exists, in fact, as Keach demonstrates, the patterning of stress in the inflected verb is identical to what is found in nominal compounds.

This might seem an odd detail in the syntax of inflection. From a semantic point of view, the branching would seem to be that of (13a). But in fact what is found is the (b) structure.

In fact though the calculus presumed here will treat the (a) and (b) structures alike. We need assume simply that the TENS markers are stems, not prefixes, whereas SA and OA (SP and OP in Keach's terminology) are prefixes. This gives the following grammar:

(26)  
TENS: stem, _AgrO  
AgrS: prefix, _T  
AgrO: prefix, _V  
V: stem, _NP

The subcategorization we may assume is universal, or something near it; what is particular to Swahili is the identification of TENS as a stem, rather than a prefix, as it might be in a language which did indeed instantiate the pattern in (21a), as for example in Potawatomi (Anderson (1992)).

Then, AgrS will attach to TENS, yielding a stem, and AgrO will attach to V, yielding a stem. The first, the Aux stem, will inherit the subcategorization of TENS (_AgrO); furthermore, the AgrO-V form will be an AgrO projection; then these two stems are eligible for COMPOUNDING — that is, the putting together of two stems, with one in the head position, and the other in the complement position.
We see from this that the "complement of" relation can be instantiated in three distinct ways: in addition to the "V-XP" juncture in syntax, and the "affix-stem" juncture in morphology, we now have the "stem-stem" juncture of compounding. In fact, then, all junctures that can instantiate the complement of relation are found in the inflected verbal system. This should be no surprise — the verbal system simply exploits every means available, that some means, such as compounding, are instantiated somewhat less frequently than others is a matter of no formal interest.

It is only a surprise if we expect the hierarchical relation that holds among AgrS, AgrO, TENS, and V to be realized in the same strictly right (or left) branching constituent structure in every language. But the calculus of the "complement of" relation does not require this correspondence hold, since satisfaction of subcategorizations can be deferred through the mechanism of inheritance. The semantic structure is in some sense a right branching dependence of T on AgrS, AgrO on T, V on T, etc., but the lexical structure can take any number of different shapes depending on whether the morphemes that realize these elements are affixes, stems, full words, or phrases, choices made at the level of "lexical style"; the systematicities have nothing to do with the Mirror principle, as the Mirror principle cannot acknowledge that the Swahili structure (25b) is a possible expression of this semantic dependence.

7. Adverbs

We will now turn to the third of the three questions, how is morphology related to the distribution of adverbs, and in particular what relation do various theories say hold between an adverb and its surface position of the verb it modifies. We find here a version of Holmberg’s generalization for adverbs: a verb does not move far enough away from an adverb that the adverb could not modify it in its surface position; in other words, morphologically motivated movement is "structure preserving" with respect to adverb modification — if the adverb could have modified the verb before movement, then it can afterwards.

Now this is not true for a class of verb movements — to wit, movement of V to C, as in Subject Aux inversion in English or V2 in German:

(27) \[ V \ldots | \ldots | \text{Adv} \ldots | t | | ]

But this movement is a true movement, one that does not arise from the enterprise of injecting lexical structure into syntax. I think it is no accident that exactly for this class of movements preservation of the modification
Three models of the morphology–syntax interface

relation does not hold, and to boot, it is only for this sort of case that there are known arguments for the physical presence of the trace of movement.

I have dealt elsewhere at length on the French/English parameter responsible for the difference between (28a and b):

(28)  
  a. Jean [frappe souvent] V Pierre  
  b. *Jean [hit often] V Peter  
  c. Jean frappe [souvent [V Pierre]]  
  d. Jean [frappe souvent] chaque garçon  
  e. not: Jean [frappe [souvent [V chaque garçon]]]

Chomsky’s version of Pollock’s and Emonds’ idea is that French verbs move to Tense overtly in French and not in English, giving the structure in (e).

Important evidence comes from adverbs. But in fact, there is no evidence that the adverb is not modifying the verb in its SURFACE position in French; all that needs to be added is a rule permitting the structure in (b) in French, but not in English. Which structure is right, (d) or (e)? The interpretation of scope in (d) indicates in fact that the non-movement structure is probably right: the NP has scope over the adverb, so the structure must be (d), not (e). The difference between English and French is not morphological, then; it is something like (29), part of a family of word order parameters for language in general; it specifies the order of elements in “adjunction to head” structures:

Headedness parameter:

(29) V0 in English is right-headed; French left.

  Compounds:
  a. bateau-mouche
  b. vingt-unième/*vingt-premier (English: *eighty-oneth/eighty-first)

The French choice for this parameter seems connected to the fact that it is head-initial in its compound terms, and even in its number system, as in (29a and b).

How can we tell true movements, like SAI, or V2, from pseudo, morphologically based movements? True movements will give obvious surface violations of TRAC — adverbial modification will be out of kilter, as will theta role assignment. Also, there is “contraction” style evidence of V2 movements. So learning will be easy, at least as easy as if the parameter were morphological.

Now, Cinque (1995) has troubled to give the sort of argument that I think could be decisive on this question; he has sought to show that morphologically motivated movement DOES lead to surface violations of modification relations. I repeat here two of his examples.

In the first one, the position of verb “to be” is varied amongst a set of adverbs with fixed interpretation:
But it is likely that the adverbs in (30) are modifying, ultimately, the participle *invitato*, which is fixed at the end of a huge rightbranching structure. In some cases, the adverbs modify *invitato* by itself, and in other cases, they modify [*sara invitato*], but the negligible semantic content of *sara* probably makes the difference undetectable (shortly I will discuss similar cases in English). So there is no issue about morphology driving movement for this sort of example; in fact, on the face of it, the OPTIONAL positioning of the auxiliary would presents a difficulty for the Minimalist view, whose economy principles dictate that if a movement is not morphologically necessary, then it cannot take place at all.

Example (31) presents a different sort of case; what we might take to be the core of the modified constituent *remisso* (put) is moving with respect to a string of fixed adverbs; if they are all modifying *remisso*, surely some of them are not in canonical modification position in at least some of these structures; hence, the argument goes, *remisso* must have moved from a position in which the modification relation could hold:

(31) a. Da allora non hanno di solito mica piú sempre completamente remisso tutto bene in ordine
   b. Da allora non hanno di solito mica piú sempre remisso completamente tutto bene in ordine
   c. Da allora non hanno di solito mica piú remisso sempre completamente tutto bene in ordine
   d. Da allora non hanno di solito mica remisso piú sempre completamente tutto bene in ordine
e. Da allora non hanno di solito remisso mica più sempre completamente tutto bene in ordine
f. Da allora non hanno remisso di solito mica più sempre completamente tutto bene in ordine
    ‘Since then, they haven’t usually not any longer always put everything well in order’
    (Cinque 1995, ex. 24)

But I suspect that the modifii has been misidentified here; possibly the modifii is in fact the quantifier tutto at the end of the clause. If this is so, then the example is again irrelevant — every adverb is either modifying tutto directly, or indirectly, in a way that I will now illustrate for English.

The following example illustrates an essential truth of adverbs which I think undermines some of the evidence for morphologically driven movement — in general, adverbs are not fixed in regards to their surface position with respect to arguments:

(32) a. Slowly, John left the room
    b. John probably left the room
    c. *Slowly, John probably left the room.
    d. Probably John slowly left the room.
    e. Probably John left the room
    f. John slowly left the room.

(a–f) shows that slowly and probably can each occupy either the presubject or the postsubject position; however, what is not allowed is for slowly to precede probably. That is, adverbs’ relative order is fixed, but their relation to other structure is not (of course this is not really true). This well-known fact should make it seem dangerous to use adverbs to mark fixed positions in sentences.

Now, (33) illustrates a further fact of interest, relevant to Cinque’s last example:

(33) a. John nearly ate all of them
    b. John ate nearly all of them

Nearly can modify the quantifier all in two different ways; either via modifying the VP which contains it, as in (a), or directly, as in (b); in (b), it is in fact attached directly to the quantifier, as the facts in (34) show — it cannot inhabit the space between V and PP, but must be inside PP:

(34) a. I talked to nearly all of them.
    b. I nearly talked to all of them.
    c. *I talked nearly to all of them.
(35)  a. I talked to probably (nearly) all of them  
    b. *I talked to probably them

(36)  a. I probably talked to nearly all of them  
    b. *I nearly talked to probably all of them

This behavior extends to quantifiers in general: *probably too can modify a Q directly, and in fact still has its sentential force (as in (35)). Why is this possible? because the Q itself is assigned sentential scope, and the sentential adverb piggybacks on that interpretation. (36) shows that the same relative ordering facts that we saw before hold for such Q-modifying adverbs. Again, the relation of the adverb to the predicate-argument spine seems irrelevant to this interadverb ordering constraint. I think that it is this Q-modifying capacity of sentential adverbs which is responsible for the second Cinque paradigm.

The following paradigm suggests a further answer to the French/English difference:

(37)  a. *He tried probably to do that  
    b. He tried recently to do that.  
    c. He was probably doing that.  
    d. He was recently doing that.  
    e. He can [probably do that]  
    f. *He must [probably do that]

Note first the difference between *probably and recently in immediate postverbal position: probably is out, and recently is good, this is probably tied to the fact that probably in posthead position must be set off with commas (being nonrestrictive), and recently need not be. Now, what happens when the head verb is an auxiliary? We find the distinction neutralized (c-d). This suggests that probably and recently are unambiguously bound to the following constituent (in English, but of course not in French, which permits posthead modifiers.)

Which means that semantically, probably commutes with the auxiliary — that is, it can be interchanged with it without altering the meaning detectably. That this is the correct view is suggested by the fact that the adverb does not commute easily with all modals, as (f) illustrates. Why should there be a difference between must and can? I suspect it might have to do with the fact that must is a covert universal meaning ("in all possible worlds"), whereas can is a covert existential meaning ("there is a possible world"), and probably, itself being an existential, commutes easily with another existential, but is meaning-changing when commuting with a universal.
Finally, I would like to return to the question of the interaction of lexical scope and syntactic scope. In fact, there seem to be some interactions that the theory I am espousing should not allow. Consider a sentence adverb, which presumably modifies something like Tense, and a manner adverb, which modifies the verb itself. (38a and b) show what happens when tense is separated from the verb, and that is straightforward:

(38) a. John probably was completely cleaning it out.
   b. *John completely was probably cleaning it out.
   c. John completely [clean+ed] it out. (completely|ed|clean])
   d. John probably [clean+ed] it out.
   e. a beautiful [dance -er]
   f. a beautiful [person who dances]
   g. *a [beautiful dance] er
   h. *[case-theor]etic
   i. kitchen [TOWEL rack] $\approx$ [KITCHEN towel] rack

But what happens when the tense and the verb are packaged together? It turns out that either adverb can modify the package. This is easy to swallow for the sentential case, as in (c): the relative scopes are correct. But when completely modifies the package, the Tense morpheme seems to intervene between the adverb and its modifiee.

This brings to mind the cases in morphology called “bracketing paradoxes”. For example, in (e), there is a reading in which beautiful modifies dancer the same way it would modify person, but there is another reading in which beautiful modifies dance, giving the meaning “one who dances beautifully”. Now, why is this reading possible? I think part of the answer is, the right structure for that reading is not available. The right structure would be something like (g), but of course, that is not allowed by the strict separation of syntax and morphology. Observe that a synonym of dancer, namely, “person who dances”, does not admit the syncategorematic interpretation, but this is because there is another structure, “person who dances beautifully”, which has this interpretation; so that is why (f) cannot have this interpretation—there is another structure which has the meaning and is a better structure for that meaning. Similar remarks apply to (h): if affixation precedes compounding, then the semantically correct structure, the one indicated in (h) is not derivable. So incorrect structure is allowed to have the meaning.

Most solutions to bracketing paradoxes run into the following problem. Consider pure compounding. There is a regular law relating compound stress...
to compound structure, Liberman’s law: stress the left branch, unless the right branch branches. This gives us kitchen \([\text{TOWEL rack}]\), when kitchen modifies towel rack, not just towel. But now, why doesn’t this become a bracketing paradox, with kitchen acting as though it modified towel, even though structurally, it is adjoined to towel rack. I think again the answer is the availability of another structure for that meaning, namely, the one that would be pronounced as \([\text{KITCHEN towel rack}]\), and would have the structure shown. So beautiful dancer, and kitchen towel rack behave differently, but they are structurally parallel in every relevant respect, so the solution to the bracketing paradoxes cannot lie in the structures themselves; but these two forms do differ in how they lie amid the space of related structures, and the availability of interpretations responds to this difference. In (39) I give an account of the principle involved, which I have called Transparency, since in relevant cases, \(Y\) becomes transparent to the relation between \(X\) and \(Z\):

(39) Transparency:

\[
X \{Y Z\} \text{r } Z \text{ only if } [Y \{X Z\}] \text{ is not generable.}
\]

i.e., use the most compositional form, but tolerate deviations from perfect compositionality.

‘use the best form for the meaning’

The transparency condition says, “use the best form for the meaning”, but there seems to be room for a converse principle as well, which says, “use the best meaning for the form”; a manner adverb can be displaced to the front of the sentence, removed from its modifier, as in (40a). But when that adverb is ambiguous between manner and sentential uses, the sentential use drowns out the displaced manner use, as in (c):

(40) a. Meticulously, John cleaned the gun.
    b. John frankly spoke to the crowd. (ambiguous)
    c. Frankly, John spoke to the crowd. (not ambiguous)

‘use the best meaning for the form’

Now transparency is what is needed to explain why sentential and manner adverbs can modify the same tensed verb; the manner adverb wants to modify the verb directly, beneath Tense semantically; but since that form is not generable, Tense is transparent to this modification relation.

(41) a. *[completely clean]_v -ed
    b. completely [clean -ed]_v
9. What is Acquired?

According to the view of Chomsky, Borer, and others, the syntactic differences between languages are due to purely lexical differences. By this, I take them to mean, to different properties of mainly abstract lexical items, the functional heads.

Now, I have suggested above that the theory as implemented predicts interactions of lexical structure and syntactic structure that just do not occur. But if the functional projections in syntax are banned, then where do language differences reside?

Even a superficial look at the lexicons themselves of languages shows that they differ in ways that are not reducible to properties of individual lexical items. Languages differ in the systematicities that their lexicons exhibit. To take an uncontroversial example, English has NO verbs that exhibit object agreement. From a syntactic point of view, it is not obvious why this is so. It has nothing to do with there being, or not being, a Spec of Agr O — that has to do with movement. English could have overt movement to Spec of Agr O and STILL lack object agreement. Is the absence of object agreement a parameter? If it is a parameter, it is a parameter of the lexicon. It is the sort of thing that might be treated as a “lexical redundancy rule”; if there was one verb that marked object agreement, the lexicon as a whole would be simpler if every verb marked it. But a redundancy rule is not quite the right concept, because it is not strict enough, and has too broad application. Would English be only slightly more complicated than it is if it had one verb that registered object agreement?

A clear set of examples of the relevant sort is given by Talmy (1985), who uses the term "patterns of lexicalization" to denote the phenomena. He found that languages systematically differed in the kinds of verb meanings they allowed. For example, English allows verbs of motion to indicate a means of motion. Float can be used as a directional verb, but at the same time, it indicates the manner of motion: John floated under the bridge can mean that John moved under the bridge by floating. Spanish and French lack entirely verbs of this kind. Flotter in French and flotar in Spanish (float) can mean only to float stationarily, and the restriction is apparently a hard and fast one. The generalization is deeper still, as Levin & Rappaport (1995) have recently shown that it extends to verbs of sound emission like roar. Similarly, verbs of posture (sit, kneel, lie, etc) differ systematically from language to language, in whether the stative, inchoative, or causative is the basic or underived form; English, Japanese, and Spanish systematically differ in this choice.

We might not have the right way of talking about this sort of thing now.
Maybe this is how parameters of the lexicon are constituted: the language chooses to fill, or not fill, various categories of lexical item, where the categories are universally given. What are the categories? One might be, (underived verb of posture); another might be (object-agreeing predicate).

Given these possibilities, we are now faced with descriptive choices on all sides. The presence or absence of some aspect of syntax in a language might be due to the “strength” of a feature on an abstract functional head, or it might be due to the systematic absence of a category of lexical item. We would make progress here by eliminating the abstract functional heads in favor of the systematic lexical categories, needing the latter in any case.

Consider for example noun incorporation. In general, V subcategorizes for N; in syntax, this means that V subcategorizes for NP. In English, incorporation of the direct object is always impossible, as in (42).

\[(42)\] Noun Incorporation:
John *wine-tasted all night.
*(N-V) (English does not fill the category of N-V compounds).
[[N-V]₀,] Incorporation with satisfaction
[[N-V]₁,] Incorporation without satisfaction

But in noun incorporating languages, N-V compounds are allowed freely. Could this be the NI parameter: the choice to fill, or not, the N-V compound category? In fact there seem to be two kinds of incorporating languages — ones that incorporate without satisfying the targeted theta role, and ones that incorporate with satisfaction; this again corresponds to two different categories of derived verb.

Consider another example — the “polysynthesis” parameter. In some languages, according Baker (1996), all arguments are saturated by verbal morphology, overt expressions of arguments being mere adjuncts. We might think of those languages as lacking the unsaturated lexical categories — that is, they fill the first, but not the second, of the two categories ([unsaturated verbs], [saturated verbs]). Simply then, sentences in those languages do not have arguments because there are no verbs that take arguments.

Or consider a language like Hungarian, where there seems to be no lexical externalization, but purely syntactic externalization through focusing and topic movement. It could be that Hungarian does not lexicalize predicates with external arguments; this is not the property of any single verb, but rather a property about the style of the lexicon made in advance.

\[(43)\] English: \[V_{\text{Ext. Arg}}, \{V_{\text{Ext. Arg}}\}\]
Hungarian: \[*(V_{\text{Ext. Arg}}, \{V_{\text{Ext. Arg}}\}\]

\[\text{Edwin Williams}\]
We might consider recasting the French/English distinction in these terms. Suppose there are different levels of predicate universally available. First, there is a class of predicates with argument structure; second, there is a class of predicates with argument structure but which also incorporate the case-assigning property. Now, suppose that French lexicalizes predicates at the first level, and English at the second; then French, but not English, will allow adjunction below the level of case assignment. Perhaps this could be connected to the fact that English has preposition incorporation, if Ps are always lexicalized at the level of case-assignment:

(44) a. \{V_{\text{internal arg}}\} \Rightarrow \{V_{\text{external arg}}\} \Rightarrow \{V_{\text{case-assigning}}\}
   English lexicalizes \{V_{\text{case-assigning}}\}, so adjacency holds;
   French lexicalizes \{V_{\text{external arg}}\} so adjacency does not hold.
   b. French: \{[V_{\text{ext. arg}} \text{ Adv}] \ V_{\text{ca}} \ NP\}
   c. English: \{V \text{ Prep}\}_{\text{ca}}

Now, I have said nothing about what the universal set of categories is, or how it is organized. In this I am in somewhat the same position as the head theorist who has not specified the set of heads.

But we can set some modest lower limits on the richness of the structure here. One dimension is all the meaning categories in the Talmy examples. In addition, are all the categories just mentioned:

(45) \{V_{\text{internal arg}}\}
   \{V_{\text{case-assigning}}\}
   \{V_{-\text{Ext. Arg}}\}
   \{V_{-\text{Ext. Arg}}\}_{\text{object-agreeing predicate}}
   \{V_{\text{unsaturated}}\}
   \{V_{\text{saturated}}\}

Another dimension is the “simple” versus “derived” distinction — part of the style of a language is whether it has simple, or only derived, members of a given meaning category. It is not enough to provide an affix to produce the derived forms — one must also block simple forms in that category.

Why do languages select a compact systematic subset of the full set of universal morphological categories? We should raise this question routinely: to take another example, why do particular languages not use the full set of available speech sounds? I do not know the answer in either case, but the inventory-taking in various domains seems a part of language acquisition, maybe the bulk of it, and it is how a language comes to have its own style.
The system of abstract heads of the Minimalist Program may be sufficiently rich to describe a range of word-order variability, but cannot encompass the sort of cases I have just discussed. But I wonder if an investigation of lexical style could deliver word order variability along with the rest, and without requiring the injection of word structure into syntax and all the unfulfilled expectations that that gives rise to.

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