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Title	Conditions On Empty (Allo-)Morphs : Two Types Of Lexical Access
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<i>Citation</i>	Theoretical and applied linguistics at Kobe Shoin, No.6 : 1-23
Issue Date	2003
Resource Type	Bulletin Paper / 紀要論文
Resource Version	
URL	
Right	
Additional Information	

# Conditions On Empty (Allo-)Morphs: Two Types Of Lexical Access

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## Abstract

Phonologically null morphemes, i.e. empty  $X^0$  arising neither from movement or copying, are an interesting issue in the study of possible lexical entries. First, despite claims to the contrary, they seem limited to the purely grammatical part of the lexicon, the “Syntacticon.” Second, they are among the items that show that this Syntacticon is not organized or accessed by phonology, in contrast to the open class Dictionary. In particular, this essay shows that both types of access involve testable, differing claims as to the expected ranges of lexical properties. Third, empty grammatical items strictly conform to a “Generalized Invisible Category Principle,” which requires interpretable features of non-anaphoric empty categories to be present in their immediate context. These results suggest a model of a syntactic derivation that consists of a local algorithm for filling in syntactic “slots” with appropriate grammatical items, with phonology in this phase of computation being entirely secondary.

This essay discusses whether and to what extent Universal Grammar and/or lexicons of individual grammars include optional and/or obligatory null morphemes. Although this issue intrigued structuralist linguists from de Saussure to Z. Harris, only recently has it attracted attention in generative syntax. By null morpheme is meant an empty category that arises neither from principles of ellipsis nor (as a trace or copy of) movement. In bar notation terms the question might be put, under what conditions can such phonetically unrealized or “empty” morphemes appear as  $X^0$  projections in surface structure or PF?

One rather obvious restriction on empty  $X^0$  is that while there may exist some unpronounced grammatical elements (one can think of arbitrary PRO, empty complementizers, null suffixes in agreement paradigms, understood copulas, etc.), a fully empty open class item is unconceivable. We begin by trying to understand this difference.

## 1. A Lexical Framework for Grammatical Items

A revealing account of this restriction on empty open class items is available in terms of the lexical framework in Emonds (2000, Ch. 3). Developing ideas of Tsimpli and Ouhalla (1990)

and Ouhalla (1991), that work claims that a natural language “Lexicon” is composed of two quite different mental components, a mental “Dictionary” of open class items (*table, disperse, clever, aboard*, etc.) and a separate “Syntacticon” of closed class items (the store of a language’s bound morphemes and e.g., *self, get, other, of, every, could, very, not, if*, etc.). The fundamental distinction between these two classes of items is due to the kinds of categories and features that appear in the two components.

Open classes of lexical items are limited to *proper subsets* of N, V, A and perhaps P; their members are differentiated from each other by purely semantic features *f* that lack any role in syntactic derivations. In contrast, closed class items (of all syntactic classes) have only features *F* that *are* used in derivations (ANIMATE, COMPARATIVE, MODAL, NEG, PAST, PATH, etc.). Thus, besides the familiar closed classes of Complementizers, Determiners, Modals, Quantifiers, etc., the Syntacticon also contains closed subclasses of N, V, A and P that lack *f* and are therefore fully characterized by *F*. I call such classes “grammatical” nouns, verbs, adjectives, and prepositions.

The syntactic categories and features *F* are undeniably semantic as well as syntactic; in fact, they reflect the most basic cognitive categories. Moreover, the distinction here between

LF-interpreted features that play a role in syntax (*F*) and those that do not (*f*) makes no provision for a separate class of purely diacritic or uniformly uninterpretable formal features. Although there are conditions under which various *F* such as PAST, PLURAL, WH, etc. do not contribute to LF (partly having to do with agreements), I hold that all *F* contribute to interpretation in *some* contexts.

In these terms, table (1) on p. 3 (from Emonds (2000, Ch. 3)) summarizes properties that distinguish the two lexical components. So as to better situate the differences between *f* and *F*, the table begins with three properties (a)–(c) members in both components have in common. Points (d) through (k), which can be understood with little technical discussion, serve to introduce and illustrate the often overlooked striking clustering of properties that characterize these very different collections of lexical items.

Point (j) is the restriction on empty  $X^0$  of interest here; phonetically empty *V* are restricted to the set of “grammatical *V*.” This discussion will treat points (l) and (m) only in passing, since this essay doesn’t focus on the derivational levels of lexical insertion.<sup>1</sup>

If languages do not tolerate null morphemes as realizations of open class items (point j), then any empty *V* or *P* must be one fully characterizable by features that are used in syntactic derivations; that is, they must be in the closed classes of grammatical N, V, A and P. Thus, we might expect that a language can allow a null grammatical *V* akin to *go* (Riemsdijk, 2002) but not one meaning, e.g. *swim* or *fly*.

- (2) A lexical phonological representation  $\pi$  can be  $\emptyset$  only if an item has no purely semantic *f*.

Nonetheless, an extensive study of the verbal morphology of the Papuan language Nimboran, (Inkelas, 1993) reports null verbs with meanings such as ‘kiss’, ‘laugh’ and ‘dream.’ Items with such meanings are needless to say of Dictionary rather than Syntacticon provenance. As

<sup>1</sup>The Dictionary/Syntacticon distinction seems to correlate with an important physiological factor. My limited reading on aphasia suggests a claim that the linguistic role of the brain’s famous “Broca’s area” is mainly to house the Syntacticon. The many debates about how Broca’s area relates to processing can be interpreted in terms of difficulties relating to accessing closed class storage.

(1)		DICTIONARY	SYNTACTICON
a.	Items with both cognitive and purely syntactic features F:	yes	yes
b.	Cognitive features F realized in canonical syntactic positions:	yes	yes
c.	Insertion possible at the beginning of a derivation:	yes	yes
d.	Items with purely semantic features ?:	YES	NO
e.	Grammatical categories in the inventory:	N, V, A, P	ALL
f.	Open classes; coining and neologisms for adult speakers:	YES	NO
g.	Bound morphemes have inherent stress and head compounds:	YES	NO
h.	Interface with non-linguistic memory and culture:	YES	NO
i.	Full phonological suppletion inside paradigms:	NO	YES
j.	Phonetically zero morphemes possible:	NO	YES
k.	Items conform phonologically to core vocabulary:	NO	YES
l.	Items with alternatively realized features:	NO	YES
m.	Insertion also possible during syntax and at PF:	NO	YES

we might expect, however, the hypothesized null V are non-trivial theoretical constructs; these null open class V are indeed part of larger pronounced locutions: “Verbs formed from these [zero] roots consist, on the surface, only of modifier morphemes.” More precisely, Inkelas (1993, section 8) argues convincingly that Nimboran V-PRT combinations have two accented parts like compounds, so that the open class items ‘kiss’, ‘laugh’, etc. consist of verbal compounds of the form [<sub>V</sub> [<sub>V</sub>∅] – PRT (LOC) ], where PRT is always overt.

This structure becomes less exotic once we discover the category of the mysteriously labeled “modifier” PRT. In this quest, we are aided by several facts and generalizations about Nimboran scattered throughout Inkelas’s study: (i) The category PRT takes obligatory TENSE and (Subject) PERSON AGREEMENT suffixes. (ii) The category PRT with its LOC, TENSE, and AGR suffixes receives a single and *separate* word accent, just as do verbs. (iii) The LOC suffixes on PRT are a set of grammatical markers with content reminiscent of the locative particle prefixes on V in Czech, German, Hungarian, etc. (iv) PRT optionally takes a progressive-like suffix/infix ITERATIVE. (v) It appears that the PRT category derives diachronically from V.<sup>2</sup> Unless one has some kind of predilection for ad hoc category names, Nimboran PRT must

<sup>2</sup>Crediting Foley (1986) in her note 17, Inkelas observes that “many Papuan languages employ complex verbal constructions in which a ‘generic’, semantically bleached verb combines with a specific noun or verb to produce a semantically contentful complex verb construction. It seems plausible to assume that Nimboran ‘particles’ derive historically from such a source”

then *be* a V: it inflects like a V, it accents like a V, it has locative and progressive affixes like a V, and its historical source is V. And if the verbal compound structures argued for by Inkelas are typical, their overt right hand members should also be endocentric heads, i.e. again V (cf. Lieber (1980)).

In these terms, Nimboran verbs with left hand “zero Vs” and obligatorily overt right hand members exemplify the following compound structures: [<sub>V</sub> [<sub>V</sub>  $\emptyset$ ] - [<sub>V</sub> *rár* - [<sub>ITER</sub> *ŋkát* ]]] ‘laugh’ and [<sub>V</sub> [<sub>V</sub>  $\emptyset$ ] - [<sub>V</sub> *rar* - [<sub>LOC</sub> *be* ]]] ‘bring’.<sup>3</sup> We will see in the next section that the Dictionary often associates semantic *f* with complex structures where  $\pi$  is  $\emptyset$  for part of the structure and for another part it is not. Thus, (2) applies only when a phonological representation is  $\emptyset$  for a lexical item *taken as a whole*. Despite initial appearances then, the Nimboran lexical entries conform to the theory of the open class Dictionary developed here.

Returning to more familiar matters, I show in (3) two examples of null grammatical V in the English Syntacticon; one is a bound morpheme and one is free. (3a) is the present tense number agreement verbal suffix in marked persons and number, where marked feature values are notated by  $\mu$ . It is the null “right hand head” of a morphological formation, which alternates with the phonetically realized verbal suffixes *-s* and *-ed*.<sup>4</sup>

- (3) a. V, -PAST,  $\mu$  PER,  $\mu$  NUM, +(<V\_\_\_>);  $\pi = \emptyset$   
 Structure: [<sub>V</sub> lexical verb [<sub>V, -PAST</sub>  $\emptyset$  ] ]
- b. V, +DAF, “licensing by I”;  $\pi = \emptyset$   
 (DAF stands for “Discourse Anaphor” feature)

As is well-known, English permits null VPs in the presence of an overt I.<sup>5</sup> Zagana (1982) attributes this possibility to a parameter that sets English apart from Romance languages, whose anaphoric VPs (like those of many languages in fact) must contain a phonetic V. Since this study adheres to the claim that the parameters of particular grammars are nothing other than members of closed lexical classes, we are forced to recast Zagana’s parameter (as well as many others) as a property of a lexical item, which is expressed in (3b). The DAF feature can be thought of as a kind of unspecified address for an identity of sense index whose content is provided by Universal Grammar’s principles of ellipsis.

The role of an explicit Syntacticon entry like (3b) is then to express the brute and simple fact (which a child must easily learn) that an empty V can express such VP anaphora in English, which in many other languages is not a possibility.

<sup>3</sup>Inkelas is aware that Dictionary items might simply ascribe appropriate open class meanings to certain combinations of grammatical “PRT” (i.e. V) and certain suffixes, thereby avoiding initial empty Vs. She resists this, possibly correctly, on the basis of intricate morphological restrictions on especially number morphemes in the verbal complex, which she observes “are exactly the same type that characterize overt roots” in pre-PRT position.

If her compound structures are correct, we may nonetheless consider their empty initial V as grammatical rather than open class. Hundreds of English Dictionary items of open class semantic specificity are made up solely of Syntacticon items: *be up for NP*, *come to*, *do NP in*, *have at NP*, *get up*, *go off*, *let go of NP*, the verbs *out* and *up*, a *go-getter*, the *get-go*, a *have not*, *income*, *input*, *off-putting*, *one-upmanship*, etc.

<sup>4</sup>As argued in Emonds (2000, Ch. 4), features of inflectional (as opposed to derivational) morphemes don’t contribute to LF in their surface positions. They rather “alternatively realize” features on (often empty) categories that do so contribute. For example in (3a), the feature -PAST on V alternatively realizes an empty [I, -PAST]. Since the inflections themselves thus don’t contribute to LF, they must be inserted in the PF part of derivations. This example serves to sketchily illustrate the terminology in lines (l) and (m) of table (1).

<sup>5</sup>See section 5.3.3 below for how the condition of “licensing by I” might be expressed formally. The determination by UG of the actual structural position of the antecedent VP is addressed in the huge literature on VP ellipsis. Cf. Lobeck (1995) for relevant analyses and references.

## 2. Why only Syntacticon Items can be Null

We certainly do not expect the many distinctions expressed in table (1) on p. 3 to all be primitive, underived concepts. For example, full suppletion as in (4) is almost certainly a consequence of point (m) in the table, possible late insertion of grammatical items (Emonds, 1985, Ch. 4).

- (4) go/went, good/better, bad/worse, French *vais/allons* 'go', Japanese *da/na* 'be', Latin *ferre/tuli/latus* 'take', Spanish *ser/fui* 'be'

Further examination of the differing phonologies of the two lexical components can in fact provided a predictive account of the restriction (2). Consider first some morphologically irregular Dictionary (open class) verbs from English as in (5).

- (5) blow/blew, buy/bought, catch/caught, fly/flew, grow/grew, hold/ held, see/saw, seek/sought, stand/stood, steal/stole, stink/stunk, teach/taught, tell/told, think/thought

It does not seem accidental that such irregularities can affect the entire rhyme but *never affect initial consonant clusters*, which are uniform—in contrast to the suppletions (4) found in the Syntacticon. Within a single entry, different rhymes or vocalic nuclei can be paired with different syntactic features (thus for *steal*  $\bar{i} \sim -\text{PAST}$  and  $\bar{o} \sim +\text{PAST}$ ), but the lexical address of each non-homonymous item appears based on the invariant phonology of its initial consonant cluster  $C^*$ . This “regularity among irregularities” in fact suggests that an open class item in the mental Dictionary always associates an item of meaning with a unique phonological address. Moreover, that address is located by means of a system of initial consonant (clusters), precisely as in written dictionaries. This type of mental organization is probably at the basis of this printer’s convention; its almost universal prevalence in dictionary publishing can be taken as evidence of a deep mental reality.

- (6) *Dictionary Storage. Dictionary items link constellations of semantic features  $f$  with phonological forms  $\pi$ . They are organized by virtue of  $\pi$ 's initial consonant clusters  $C^*$ .*

Some details of this addressing system based on  $C^*$  can be gleaned from the well studied pervasive alliteration patterns of Old English oral poetry, which plausibly reflect the same system. For example,  $st- \neq sp- \neq sk- \neq sV-$  in these patterns, although all other initial  $s-$  alliterate like  $sV-$ . Most interesting for our purposes here is that all vowel-initial words alliterate with each other, which follows if the  $C^*$  of such items have the single value  $\emptyset$ .<sup>6</sup>

Taking the reasoning a step further, the very notion of lexical entry having an initial consonant cluster, even one specified as  $\emptyset$ , implies the existence of an *overt* phonological rhyme. Bare consonant sounds lacking a rhyme, such as *shhh!* or *ssss!* (hissing) or a kind of voiceless aspirated  $p$  of disdain (a spitting gesture without spit), are never integrated into well-formed syntactic strings. Therefore the requirement that a Dictionary entry, i.e., one containing some open class semantic feature  $f$ , be specified for an initial consonant cluster implies the presence of an overt rhyme; this in turn makes possible (2), as desired.<sup>7</sup>

<sup>6</sup>The claim that Dictionary entries are organized by initial consonant clusters does not entail any further claim about what this organization is, i.e. about what might be a mental equivalent to an “alphabet.”

<sup>7</sup>Turning the logic around, the existence of phonologically null Syntacticon entries implies that these items are *not* organized by their initial clusters. In fact, section 4 will argue that storage in the Syntacticon is organized according to entirely different principles.

Independent support for a phonological system of Dictionary storage comes from the form of idioms. If they are Dictionary entries, (6) actually implies only that an idiom's address must be phonological (possibly always or at least in most cases, its initial word). It doesn't prevent one from containing internal null items. And in fact, there are abundant examples of idioms that must contain empty categories in order to satisfy subcategorization requirements or syntax (e.g. English count nouns must have determiners).

- (7) come to [<sub>D</sub>∅] 'regain consciousness'; put [<sub>D</sub>∅] out 'provide sex'; take [<sub>D</sub>∅] to something 'start liking something'; go to [<sub>D</sub>∅][<sub>N</sub> jail ]; hold [<sub>D</sub>∅][<sub>N</sub> office ]; keep [<sub>D</sub>∅][<sub>N</sub> track ](of); talk [<sub>P</sub>∅][<sub>D</sub>∅ ][<sub>N</sub> shop ]<sup>8</sup>

At the same time, the phonological content of the V in these examples, or perhaps of the N in some cases, satisfies the condition (6) on non-null Dictionary Storage.

The same reasoning allows us to construct Dictionary entries that account for the infamous "zero derivation" of English morphology, which is not-and we will see in section 4 could not become-a productive process typical of Syntacticon entries.

- (8) a. [<sub>V</sub> [<sub>N</sub> air ] [<sub>V</sub>∅]] the clothes; [<sub>V</sub> [<sub>N</sub> bicycle ] [<sub>V</sub>∅]] to the store; [<sub>V</sub> [<sub>A</sub> brown ] [<sub>V</sub>∅]] the meat; [<sub>V</sub> [<sub>N</sub> tunnel ] [<sub>V</sub>∅]] to the riverbank  
 b. \*Let's { turpentine the brush / streetcar to the store / pink the walls / ditch to the riverbank }.

The internally structured verbal complexes in (8a) thus have the status of minimal Dictionary "idioms." Their initial items provide phonological addresses required by (6), but the full entries nonetheless contain zero morphemes.

Similarly, the Nimboran verbal compounds with zero left hand elements discussed briefly in section 1 have overt right hand members, presumably their heads if my earlier comments are correct. These latter provide the Dictionary's phonological addresses.

### 3. Processing Asymmetries

There seem to be few serious proposals about how the realities of language use actually affect the form of the grammar or of the lexicon. However, minimal reflection on some asymmetries between production and perception of spoken language can reveal another source of support for the formulation in (6).

It is clear that a phonologically organized Dictionary is advantageous principally for comprehending spoken language. Informal extrapolations on the size of ordinary language users' vocabularies, some going back to work around 1900 (Jespersen, 1905), suggest that a mental Dictionary can easily contain some 20,000 entries; in contrast, the Syntacticon is unlikely to contain 500. Thus, comprehending language must involve very quick searches among large numbers of Dictionary entries.<sup>9</sup> It is clear how the design feature (6) reduces the search space for the hearer—as soon as a candidate for an open class item begins to be pronounced, say the word *steal*, the search space is drastically narrowed to just those Dictionary entries beginning with *st-*.

<sup>8</sup>The lexical X (D, N and P) in (7) necessarily project to XPs in syntax.

<sup>9</sup>Since the Syntacticon is much smaller and its content more familiar, due to the frequency with which its members are used, a comprehension model need not incorporate a highly efficient search tool for it.

Can such a design feature, which privileges comprehension over production, actually count as a way of optimizing language design in general? The answer is affirmative for a number of reasons.

(i) Any imperfection or difficulty in a speaker's sentence—a false start, a grammar mistake, a mispronunciation, an interruption, saying something not really meant, etc.—is necessarily also a problem for the hearer. On the other hand, there can be many problems for the hearer that are not problems for the speaker—background noise, an interruption not heard by the speaker, distance from the speaker, poor hearing, etc.

(ii) In any normal conversation, the speaker “knows what (s)he is talking about.” (S)he proceeds from knowledge of both the topic and the situation, uses vocabulary (s)he is familiar with, generally knows at least vaguely what is coming next, etc. The hearer on the other hand is constantly presented with unexpected turns of (il)logic, changes of topic, unfamiliar subject matter and/or unexpected or poorly mastered vocabulary.

Summarizing (i) and (ii), a hearer encounters many more problems than a speaker from a wide variety of sources, so a design feature such as (6), which privileges comprehension, can compensate for this “hearer's handicap.”

(iii) While much speech passes between just two people, a tremendous number of speech acts involve a single speaker and multiple hearers. In a family or peer group conversation among say five people, it is an anomaly for two different speakers to be understood simultaneously; generally, only one speaker is attended to at a time. Consequently, if such a conversation contains say 10 produced sentences, even with only 50% attention and comprehension, it involves 20 perceived sentences. Of course, speakers often address large numbers, and the same effect is then many times multiplied. Hence, on an average, a significantly greater number of speech acts are perceived than produced. The greater percentage of language use is thus comprehension rather than production.

Because of these asymmetries, language and in particular that part of the lexicon with a large search space and containing the less used vocabulary (the Dictionary) is better designed if it favors the hearer. The organization in (6) provides the needed advantage.

#### 4. The Form of Syntacticon Entries for Grammatical Morphemes

It is a commonplace that native speakers can understand language even when many grammatical morphemes (Syntacticon entries) are mis-used, indistinctly pronounced, or absent. Japanese speakers often encourage foreigners to just “forget about” the particles and such, saying that they can understand sequences of just the content words. Similarly, little children and foreign speakers and those handicapped by age or infirmity are typically understood well, unless the lack of competence extends into the open class vocabulary.

Along the same lines, the phonologies of many languages including English permit less clear enunciation of and assign less stress to grammatical words. For instance, native speakers can easily understand sentence (9a) pronounced as (9b), where the symbol <sup>a</sup> stands for a fully reduced schwa:

(9) a. Did you visit some of his relatives on the trip to help them?

b. J<sup>a</sup> viz<sup>a</sup>t sm <sup>a</sup>iz rel<sup>a</sup>tivz nd<sup>a</sup> trip t<sup>a</sup> heupm?

Clearly, the only syllables with any phonological prominence at all are in the open class items *visit*, *relatives*, *trip* and *help*. It seems then that the phonological representations of Syntacticon



entries do nothing to compensate for the hearer's handicap. If anything, they exacerbate it, contrary to those in the Dictionary.

In fact, a bit of reflection about some rather typical Syntacticon patterns reveals that they must be stored quite differently than Dictionary items. In the first place, it is well established that null morphemes are essential to many adequate linguistic descriptions: at the outset I mentioned arbitrary PRO, empty complementizers, null suffixes in agreement paradigms, and understood copulas as obvious cases, and to these the null morphemes in (3) can be added. Since all these items are typical of closed class elements, i.e. they lack the semantic specificity of open class features  $f$ , it is clear that a Syntacticon can contain entries whose phonological specification  $\pi$  is  $\emptyset$ . This in itself establishes that Syntacticon entries are at least not uniformly accessed by phonological criteria.

#### 4.1 An Entry for some Free Morphemes

Consider the 5 so-called "irregular finite forms" of an otherwise morphologically unexceptional verb *be*, being, been. No other English verb has a suppletive present tense (*is* and *are* are unrelated to the stem *be*), a special first singular form (*am*) or number agreement in the past (*was/were*). It is highly unlikely that 5 such special forms are just scattered about in the lexicon, "accidentally" sharing feature content, as would be the case if they were stored by the Dictionary's phonological principle, i.e. according to initial consonant clusters. Rather, their shared syntactic content should be expressed but once in an English speaker's competence, with the differences among the forms expressed by disjunctive braces:

$$(10) \text{ English finite copulas: } I, -\text{MODAL}, +\text{STATIVE}, \left\{ \begin{array}{l} \text{were, PAST, PLUR} \\ \text{was, PAST} \\ \text{am, -PLUR, Ist} \\ \text{is, -PLUR, IIIrd} \\ \text{are} \end{array} \right\}$$

This theory behind this entry treats the feature +STATIVE on I as necessary and sufficient for ensuring that I must govern a phonologically null and otherwise unmarked stative grammatical V.<sup>10</sup> Emonds (2000, section 4.5) provides motivation and technical implementation for such an analysis, involving in particular the concept of "alternative realization" of this feature; cf. table (1), point (1). Nonetheless, even if some other feature for copulas replaced STATICE, it would not affect the argument here that the storage address of a lexical entry of the form (10) is not phonological.

Given this single entry for copular I, in which all information is minimally represented, we can maintain an exceptionless generalization: no English verb has more than four idiosyncratic forms, e.g., *do*, *does*, *did*, *done*. The finite copulas above are not verbs at all.

The very form of (10) shows that it cannot be lexically stored or accessed via its phonology. Its address must rather be associated with I. That is, from the existence of null grammatical elements and from entries such as (10), we can provisionally conclude (11):

<sup>10</sup>In other words, the entry (10) embedded in such a theory obviates the ad hoc rule of "*be*-raising" in earlier accounts of English. The inadequacy of this highly stipulative process receives a detailed critique in Emonds (1994). One obvious point is that even with such a rule, the statements of (10) must be separately retained as conditions on its output.

- (11) *Syntacticon Storage*. *Syntacticon items are organized by virtue of their syntactic categories F.*

This adds another line to table (1) on p. 3, or rather the difference between (6) and (11) reduces lines (i) and (j) to a more general design contrast between the two lexical components. The storage principles of the Dictionary and the Syntacticon are entirely different. We of course then expect that brain malfunction will bring this out, and broadly speaking, research on distinct types of aphasia has confirmed a difference of this sort.

## 4.2 An Entry for some Bound Clitics

The above foray into the lexical form of English copulas has dealt with Syntacticon entries for free morphemes. We can construct the same kinds of arguments for (11) on the basis of clitics and inflections as well. Consider French definite (“personal”) pronouns, which fall into three classes: unstressed nominative pre-verbal clitics for subjects, unstressed non-nominative pre-verbal clitics for direct and indirect objects, and a set of so-called strong or “elsewhere” forms which exhibit no case and occur in all other positions.

Interestingly, these paradigms are by no means disjoint; they rather exhibit a number of overlapping forms. For example, a very simple regularity can be factored out of all three classes:

- (12) Invariant French pronouns:    nous, +PLUR, +Ist        vous, +PLUR, +IInd

In contrast, singular and third person personal pronouns have special nominative clitic forms, except for the third person feminine, which uses the strong forms as nominative clitics. The lexical entries for nominative clitics must therefore specify at least the following information, where the frame +\_\_I indicates placement as the initial clitic in the verbal cluster raised to I in finite clauses.

- (13) Nominative French clitics<sup>11</sup>:    je, NOM, +\_\_I, -PLUR, Ist  
     tu, NOM, +\_\_I, -PLUR, IInd  
     il, NOM, +\_\_I, +DEF, -PLUR, IIIrd, -FEM  
     ils, NOM, +\_\_I, +DEF, +PLUR, IIIrd, -FEM  
     on, NOM, +\_\_I, -DEF, IIIrd

These proclitics are the only forms in all of French grammar that are specified as Nominative. It seems therefore there is a descriptive generalization to be expressed in the Syntacticon, as in (14):

- (14) Nominative French clitics (revised): NOM, +\_\_I,  $\left\{ \begin{array}{l} \text{je, -PLUR, Ist} \\ \text{tu, -PLUR, IInd} \\ \text{il, +DEF, -PLUR, IIIrd, -FEM} \\ \text{ils, +DEF, +PLUR, IIIrd, -FEM} \\ \text{on, -DEF, IIIrd} \end{array} \right\}$

<sup>11</sup>I take it that Universal Grammar treats the feature DEF as a (canonical) feature of only the category D; hence when it “underspecifies” a syntactic category in a lexical entry for a DEF, D is implied. There may also be other ways that “markedness” or “underspecification theory” can eliminate some further specifications of person, gender or ±PLUR in these entries, but these issues are not our concern here.

Again, we reach the conclusion that the most general form of Syntacticon entries, ones that actually capture the morphological generalizations of a language (here, that there is a single context in French where nominative case is expressed), necessarily state “paradigms” rather than individual morphemes. Consequently, the arbitrarily divergent phonological forms of the individual members of the paradigms cannot be the unique address of the entry. The entry must rather be accessed by its unique syntactic specifications, in line with (11).

Another advantage to formulating grammatical items with disjunctive braces, as in (10) and (14), is that we can say that languages without subject clitics, e.g. English and standard Italian, differ from French in a single way, by the absence of an entry like (14).<sup>12</sup>

Hopefully, each syntactic feature needs to appear but once or twice in paradigmatic entries such as (10) and (14), the rest of the values being “underspecified.” That is, for a series of one column feature matrices labeled DEF stacked up in front of a French V, entries like (14) would provide instructions as to how to spell them out. An elaboration of such a lexical specification for clitics can not only capture generalizations about distribution; it also looks like a speaker’s algorithm for Spell Out rather than a hearer’s.<sup>13</sup>

### 4.3 Entries for Inflections

Perhaps inflection reveals more than any other area how the phonology of grammatical items is subordinate to their syntax, in the sense that the syntactic specifications determine what counts as a single lexical unit. (Recall that in the open class Dictionary, it is the pairing of a purely semantic features *f* with a phonological spelling that plays this role.)

Conceived as a property specific to morphology, the necessity of grouping of various bound morphemes into single “paradigms” has been convincingly put forward by a number of authors. Anderson (1982) argues for such “disjunctive blocks” of inflectional rules under the rubric of his “Extended Word and Paradigm Model.” I claim that these rule blocks correspond precisely to the entries of the Syntacticon.<sup>14</sup>

Before turning to this matter, however, I should make clear my disagreement with Anderson’s notion that the word is some kind of minimal syntactic unit. The fundamental weakness of word-based conceptions of syntax is I believe the failure to integrate compounding into syntactic theory. Compounding shows that productive syntax can combine its truly minimal units (e.g. its simple stems) into *larger units of the same type*, namely what the bar notation calls  $X^0$ . These  $X^0$  are then in no way syntactically minimal.

In my view, morphology does the very same thing, e.g. suffixes are also simply  $X^0$  that head larger  $X^0$ . Bound morphemes differ from members of compounds only in their lexical

<sup>12</sup>English has special nominative pronouns, but they are not clitics on I.

<sup>13</sup>Under this interpretation, an independent mechanism has to license generating bare D pre-verbally. Thus, some universal aspect of economy might need only a lexical spelling mechanism such as (14) to allow bare D in positions other than those of full DPs. A similar mechanism with a different context, perhaps related to the position of C, might give rise to second position clitics. I thank L. Veselovska for this perspective, though my grasp of a full model for properly relating entries like (12) and (14) is still inadequate.

<sup>14</sup>Although on such a vast topic as “position classes” and “template morphology” I can do no more here than give an opinion, their reality on close inspection always seems to dissolve into statements about either grammatical categories (e.g., I vs. V) or about paradigmatically related groups of morphemes (i.e., individual Syntacticon entries). Beginning with Emonds (1985, Ch. 4) I have argued that grammatical items, each a unique combination of syntactic features *F*, are expected to show “unique syntactic behavior,” just as chemical elements (gold, magnesium, neon, sodium, etc.) each have “unique chemical behavior.” For each grammatical item, children (and linguists) have to learn the syntactic category, the syntactic features, and the syntactic context.

feature composition: entries for the former contain no purely semantic *f*, while those for words that make up compounds do. For example, in *prep-school-child*, both *prep* and *child* have such features, while in *pre-school-er*, the affixes *pre-* and *-er* contain only syntactic *F*. Similarly, the head *free* in the compounds *carefree*, *doubt-free sorrow-free* and *taste-free* has a semantic *f*, while in the morphological formations *careful*, *doubtful*, *sorrowful* and *tasteful* the head *-ful* is characterized by an *F*, probably the same *f* that characterizes *with*. My crucial claim is then that *lack of semantic f on bound morphemes typically triggers loss of inherent stress*, yielding what is indeed a type of minimal phonological domain (a stem with its affixes), but one whose internal syntactic composition is not minimal at all.<sup>15</sup>

From this perspective, the agglutinative patterns of bound morphology—so cross-linguistically prominent—transparently reveal language's basic word-internal syntactic structure. Consequently, I imagine my version of morphology (more generally, of the Syntacticon) should simply be called the "Paradigm Model," as already expressed for example by the central way the brace notation structures the entries (10) and (14). To my mind, a crucial factor in favor of this model of paradigms has been Anderson's convincing arguments for "disjunctive blocks" of morphological rules.<sup>16</sup>

The centerpiece of his reasoning is based on the complex verbal agreement system of Georgian. Anderson observes that the rules spelling out the agreement inflections require syntactic representations that keep the subject and object feature complexes separate *within the V* (Anderson, 1982, 604). These feature complexes are distinct from the features on the corresponding full subject and object phrases, because the left-right order of the complexes in one set of verb tenses is distinct from that in the other tenses, and it is this  $X^0$ -internal left-right ("outer" vs. "inner" complexes) order that determines morphology (Anderson, 1982, 599–600). Thus, his rules capture the regularities of Georgian only by virtue of subject and object feature complexes having syntactically distinct and accessible positions inside  $V^0$ . This supports the general claim that  $X^0$ -internal syntactic structure is the basis of morphology.

The phonological realizations of these  $X^0$ -internal positions, however, are always limited in Georgian verbs to a single prefix and a single suffix, i.e., apparently their Syntacticon entries are unified around the context features +\_\_  $V$  (for prefixes) and + $V$ \_\_ (for suffixes). Anderson

<sup>15</sup>For a fuller perspective on the nature of the word, see Emonds (2000, Chs. 3 and 4); the main arguments are also outlined in Emonds (2002a). The fundamental error of autonomous morphology is equating a unit of phonological performance (on the production side) with a minimal unit of syntactic competence. These confusions result from two empiricist legacies: mixing performance and competence and maintaining a "separation of levels" (all data of phonology must "precede" all data of syntax).

<sup>16</sup>Anderson's brief remarks contesting language's basic agglutinative morphology early in his section 4 leave me unconvinced. So-called true inflections, which realize several features on one morpheme (Humboldt, 1822), are roughly as frequent in any given language as similar free morphemes (e.g. a Latin free form demonstrative pronoun *haec* is simultaneously [ FEM, SING, NOM, PROXIMATE]). Since no one contests situating multi-featured pronouns in a left-right ordered surface syntax, why should inflections somehow shed doubt on the appropriateness of left-right agglutinative representations inside a word?

Many readers may not be aware of Humboldt's claim for the supposed logical superiority of inflecting over agglutinating languages (e.g. of I-E Sanskrit over non-I-E Malay). Remnants of this absurdity, whose core Sapir (1921, Ch. VI) demolished, linger on in linguists' feeling that inflection is somehow the most "interesting" part of morphology. But even in languages said to be inflecting, most word structure is transparently "agglutinating" (one feature per bound morpheme, ordered left to right). For example, a single French phonological word *elle-s-ne-se-re-dé-magnet-is-er-ont* with 9 bound morphemes (only 3 of which realize multiple features) is clearly agglutinative. The syntactic behavior of this typical "long" French word moreover closely conforms to Baker's (1985) Mirror Principle, which is the cement binding the left-right orders of phrasal and word-level syntax.

argues persuasively that the four phonological subparts of the prefix rule [his rule (28)] must be ordered disjunctively, that is, by use of braces exactly as in (10) and (14) above.<sup>17</sup> A similar comment applies to the suffix rule [his rule (29)], of which he explicitly gives four of the subparts.

Both rules mix together aspects of subject and object agreement, and in both cases, certain agreements take precedence over others. That is, the disjunctions in each Syntacticon entry, represented here by the classical brace notation, are ordered—they must be read “top down,” so that the higher option is always spelled out as soon as its context and feature content are satisfied. In fact, I have written (10) above—but not (14)—this way as well.

It would be rash for me to attempt to exactly re-format Anderson’s rules, as I have no knowledge of Georgian not taken from his article and his cited source, Harris (1977). But I am confident in concluding that the several phonologically distinct Georgian verbal agreement morphemes cannot be represented simply as associations of spellings with feature complexes (an alternative that would allow phonological addressing). His arguments show that these agreements must be interrelated in *amalgamated grammatical statements*, at least one for several prefixes and one for several suffixes.<sup>18</sup> This conclusion confirms that the Syntacticon addresses for inflections, as well as for free morphemes and clitics, must be non-phonological, in conformity with (11).

There is a further interesting consequence of the difference of organization between the Dictionary and the Syntacticon with regard to a little systematized but quite pervasive type of lexical “irregularity” that interacts with bound morphology. Stems taken from open classes not infrequently alternate between a form with final segment and one lacking it. What seems to occur is that the segment in question is pronounced only so as to maintain consonant—vowel alternations (CVCV), perhaps somewhat differently in different languages.

For example, the Latin consonant-final roots *nomin-* ‘name’ and *oration-* ‘prayer’ are declined in oblique cases in the same way, except for predictable differences in nominatives and accusatives due to their differing genders. Thus, the genitive singulars are *nominis*, *orationis*; the dative/ablative plurals are *nominibus*, *orationibus*, etc. Moreover, these nouns are among those Latin consonantal stems whose nominative singular is phonologically null. The resulting form for *nomin-* is *nomen* (with a predictable vowel change), but that for *oration-* is *oratio*, with the *n* disappearing.

A simple way to notate this distinction is to list this word in the lexicon with its final segment parenthesized, e.g. as *oratio(n)*, with a convention (15):

- (15) *Phonological segments parenthesized in the lexicon are pronounced only to maintain CVCV patterns.*

In this vein, when the nominative singular for Latin consonant-final stems is *-s*, some nouns will maintain a stem’s final stop in all cases (e.g. the stem *leg-* ‘law’ predictably yields

<sup>17</sup>Anderson doesn’t actually use the brace notation, and consequently he must repeat the same context in each of the four spellings of the Georgian verbal agreement prefix.

<sup>18</sup>My argument here is that multiple morphemes must appear together in single Syntacticon entries in order to capture descriptive generalizations, which implies that the presumably unique addresses of such entries cannot be phonological. Thus, it doesn’t harm my argument if Georgian has more agreement entries than the two blocks Anderson discusses. Moreover, if these two blocks themselves must be combined into a single entry, the argument becomes all the stronger.

*leg+s = lex* in the nominative, *legis* in the genitive, etc.). Others drop a final stop in the nominative, where it is not needed for consonant-vowel alternation. The latter situation can again be indicated by lexical parentheses; thus, a lexical representation *pe(d)-* ‘foot’ yields the nominative *pes* and genitive *pedis*.<sup>19</sup>

If the Dictionary entries are uniquely addressed according to their initial consonant cluster as in (6), it then follows that open class items will not tolerate the kind of morphological irregularity specified by convention (15) *within this cluster*. And this seems to be true.<sup>20</sup>

Moreover, if Syntacticon entries are addressed rather according to syntactic categories, it will equally well follow that closed class items *can* include a parenthesized initial segment that obeys (15). In fact, cases of this type abound. Both the Spanish plural morpheme *-(e)s* and the Japanese negation *-(a)nai* have such initial vowels, and the Japanese suffixes *-(s)ase* ‘cause, make’ *-(r)are* ‘passive’ contain such initial consonants; these segments are pronounced precisely when needed to maintain CVCV alternations. This difference between the Dictionary and the Syntacticon further confirms (6) and (11).

Summarizing, the phonological specifications of Syntacticon items are not the basis for how this component is organized. It is rather the relation between grammatical category and grammatical context, for example the association between NOM and +\_\_\_I in the entry (14). The phonological specification  $\pi = \emptyset$  is just an extreme case of the phonologically less than salient character typical of many Syntacticon items. The Dictionary is prevented from this specification by virtue of the way its storagae is organized (6), but the Syntacticon is not. Along the same lines, the uniqueness of lexical addresses prevents a open class Dictionary item from having a phonologically suppletive paradigm, while this is possible in the Syntacticon (e.g. *go, went; bad, worse; person, people*).

## 5. Licensing and Identifying Empty (Allo-)morphs

For over 20 years, a general line of inquiry on empty categories  $\alpha$  in a tree  $\tau$  has attempted to state in structural terms where to find in  $\tau$  the interpreted features of these categories  $\alpha$ . A governed category that can be empty under a condition of identity with some other has been called “properly governed” (the “Empty Category Principle” of Chomsky (1981)). Attempts have been made using concepts like c-command to specify possible locations for these identical or “identifying” categories. One can thus pre-theoretically state, as in Emonds (2002b), a principle guiding such research.

(16) *ECP Corollary. Properly governed empty categories cannot retain an unidentified feature in LF.*

<sup>19</sup>This parenthesis convention may allow treating most French verbs of the so-called second and third conjugations simply as stems ending in *-i(s)*, *-e(n)*, *-en(d)*, etc., thus eliminating arbitrary “conjugation class” features. Under this view, *périr* ‘perish’ has a lexical stem *péri(s)-*, giving rise to present singular forms without *s* before zero endings (*périt*, where an orthographical *t* or *s* is silent). In contrast, a stem-final lexical *s* (orthographically *ss*) must be pronounced before overtly vocalic present plural and subjunctive endings (*périssons* ‘we perish’)—though the schwa ending of the present singular subjunctive *périsse* is pronounced only in some regions.

In contrast, in regular verbs whose stems ending in *-is* have no parentheses (*hisser* ‘raise up’, *glisser* ‘slide’), the final consonant is always pronounced; *hisse*, *glisse* are present singulars and *hissons*, *glissons* are first plurals). Other candidates for convention (15) can easily be found; one is the English verb *have* (*has/had*)

<sup>20</sup>An anecdote demonstrates what cannot happen. Two west coast friends were often conversing in the presence of the woman’s perceptive three year old. Unwittingly, each repeatedly referred to their separate, different residences of the previous year in similar contexts. The daughter, puzzled by a seeming violation of the restriction in the text, observed: “Mommy says Austin but [name withheld] says Boston.”

In these terms, (16) encapsulates an intuition behind a long line of proposals for restricting empty categories generated by movement and by ellipsis. At least for movement, less so for ellipsis, the identification required by proper government must be defined as local structural relation; features that identify those on a trace in a tree must be “nearby.”

Having established that null lexical items must be fully characterized by grammatical features  $F$  (semantic  $f$  being disallowed), it is natural to ask what structural conditions along the lines of the ECP corollary might further restrict their distribution. This section will show that in fact null lexical items are subject to a stringent special case of (16).<sup>21</sup>

- (17) *Generalized Invisible Category Principle*. An empty  $\alpha$  or  $SPEC(\alpha)$  is permitted in LF only if: (i)  $\alpha$  is uninterpretable, (ii)  $\alpha$  is an anaphor, or (iii) all interpretable features on  $\alpha$  also appear in  $\beta$ , where some projections of  $\alpha$  and  $\beta$  are sisters.<sup>22</sup>

### 5.1 Empty Bound Morphemes

It is well known that inflectional paradigms often contain zero morphemes. Just three familiar examples are the English present tense allomorph (3a), the French present tense singular (note 19), and the Latin nominative singular allomorph for (some) consonantal roots discussed at the end of section 4. Because inflections do not contribute to LF at all (they are “alternative realizations”; cf. note 4), we can immediately observe that due to its first clause, the GICP in itself places *no restriction on null inflections*. Thus, in inflectional paradigms that spell out features such as case and agreement, we can almost expect some empty allomorphs.

A full theory of Alternative Realization must of course ultimately go beyond (17) and restrict the kinds of features that can be realized by bound null clitics and inflections, but that task is not our purpose here. Emonds (2000, section 9.4.2) approaches this issue along the lines of Benveniste (1966), tentatively concluding that “acquisition of zero morphs should be privileged in unmarked syntactic configurations but not elsewhere.” That is, null inflections will retain an important—albeit constrained—place in the Syntacticon.

On the other hand, a productive pattern of derivational morphology is *not* expected to be based on an empty item, for such morphemes (e.g., *-ize*, *-less*, *-ation*, etc.) are contribute to interpretation and their features do not appear on their sisters; no sister of any projection of *-ize* in the example *modernize the city* has a causative feature.

Another instance of an empty category  $\alpha$  with features that are interpreted in LF is the understood Italian object pronoun  $\alpha$  analyzed in Rizzi (1986).

- (18) a. L'ambizione spesso spinge  $\alpha$  a commettere errori.  
           ‘Ambition often pushes (one) to make mistakes’  
       b. Questa musica rende  $\alpha$  allegri.  
           ‘This music makes one happy’

<sup>21</sup> This formulation slightly revises the GICP in Emonds (2000, 383). Additionally, the GICP seems to allow certain unidentified features in “ungoverned contexts.” In this connection, Emonds (2002b, section 3.1) discusses (i) animate PRO, (ii) a null [C, WH] counterpart to *whether* in direct questions, and (iii) null modals and pronominal subjects in root imperatives and conversational questions. In these contexts that are exempt from (17), the Syntacticon is free to specify a significantly wider range of empty free morphemes.

This study examines only those null morphemes that occur freely in both root and embedded contexts.

<sup>22</sup> Since the English empty morpheme for “VP ellipsis” permitted by (3b) is a discourse anaphor, its feature content need not be identified locally. This content can even be located in a preceding sentence. In fact it often is [<sub>VP</sub>  $\emptyset$ ].

Under Rizzi's analysis, this empty D and the  $[_{DP}\alpha]$  it projects have interpreted features such as +PLUR and +HUMAN. But because these features are found neither on the V sister of the object nor in (18a) on the XP predicated of this DP, the empty direct object phrase  $\alpha$  could be a counterexample to the GICP (17).

However, according to independently justified revisions in this analysis (Emonds, 2000, section 9.4), the Italian lexicon does not directly license the features of the undeniably interpreted empty objects  $\alpha$  in (18). Rather, the Italian lexicon contains a null object *clitic* on the V sister of  $\alpha$ , which is [+HUMAN, +PLURAL, –SPECIFIC]. This clitic, like all Romance pronominal clitics, alternatively realizes in the V all the interpreted features of an argument DP, and hence by the GICP (17iii) is sufficient to license that argument as empty. As summarized briefly in note 4, since alternatively realized features are not themselves interpreted in LF, a null clitic with features does *not* run afoul of (17) either.<sup>23</sup>

Thus, to the extent that my clitic-based revision of Rizzi's analysis is independently justified, it additionally supports the notion that the Generalized Invisible Category Principle makes precisely the right "cut" between allowed and excluded empty lexical categories.

## 5.2 Some Empty Allomorphs in the CP system

A set of free morphemes that conform to (17) are the English pronouns *who*, *which*, *where* and *when*. When these morphemes occur in the SPEC(CP) of direct and indirect questions, their Phi and PLACE features clearly do not occur on any sister of a projection of C, so they must remain overt (Chomsky & Lasnik, 1977). However, when these elements are on DPs in SPEC(CP) of a restrictive relative clause, this CP is a sister of some modified nominal projection with the same features. Hence these pronouns can be replaced by zero allomorphs.<sup>24</sup>

Emonds (2002b) proposes that morphemes that are optionally zero be represented in the lexicon with parenthesized phonological content as in (19).

- (19) a. D, WH, ANIMATE, –\_\_\_ NP;  $\pi$  = (who)
- b. D, WH, PLACE, –\_\_\_ NP;  $\pi$  = (where)
- c. D, DEF, WH;  $\pi$  = (which)

One might object that once a UG principle such as the GICP (17) is in place, it is redundant to account for empty categories by stipulating parentheses like (19) in a language-particular Syntacticon entry. This would be an erroneous conclusion, since a language like French is like English in all relevant respects: it is head-initial, has overt WH-movement, and uses interrogative pronouns to introduce relative clauses. Yet its pronoun counterparts to (19) (*qui*, *où*, *que* and *lequel*) cannot be omitted in restrictive relative clauses.

Let us now turn to whether (17) permits other empty free morphemes besides those in (19). An obvious candidate for another optionally pronounced morpheme is the unmarked English complementizer *that*.

<sup>23</sup>This might seem like a "trick." Rizzi's null object pronoun is disallowed by the GICP unless it is alternatively realized by an object clitic. But the licensing object clitic can be null, so what is the difference?

In fact, my cited full treatment emphasizes at least two differences: (i) Italian independently has a paradigm of verbal object clitics; (ii) we expect some bound morphemes with unmarked features to be null. And precisely, the unmarked value for  $\pm$ SPECIFIC in object position is –SPECIFIC.

<sup>24</sup>The analysis of non-restrictive relative clauses in Emonds (1979) shows that the CPs that constitute non-restrictive relatives are *not* sisters of the nominal projection they modify. Consequently, their relative pronouns fail to satisfy (17) and can't be omitted.



(20) First version:  $C, +\_IP; \pi = (\text{that})$

(21) John persuaded Mary (that) she would easily get the job.  
We explained to her (that) her children should stay outside.

The empty allomorph generable by (20) has no interpretable features besides  $C$ . Therefore, it can conform to the GICP if and only if the category  $C$  itself is not present (i.e. interpreted) in Logical Form. Intuitively of course,  $[C \text{ that}]$  is unmarked and contentless, but some mechanism must formally reflect this semantic “emptiness.” In Emonds (2002b), I suggest that a marked categorial feature labeled  $\emptyset$  in the lexicon has exactly this effect. In these terms, (20) should be recast as (22).

(22) Final version:  $C, \emptyset, +\_IP; \pi = (\text{that})$

An empty allomorph of  $C$  is thus permitted because it is not interpretable in LF due to the convention for the feature  $O$ . Hence an empty  $[C, +\emptyset]$  conforms to the GICP (17i).

There are of course contexts where a phonetic  $C$  *that* is not optional. For example, when a CP clause moves out of a complement configuration (so that its deep governor no longer governs it), its head *that* must again be present:

(23)  $[_{CP} *(\text{That}) \text{ she would easily get the job } ]_i$  John never believed  $t_i$ .  
John persuaded Mary  $t_i$ , they tell me,  $[_{CP} *(\text{that}) \text{ she would easily get the job } ]_i$ .  
What we explained  $t_i$  to her was  $[_{CP} *(\text{that}) \text{ her children should stay outside } ]_i$ .

Such paradigms suggest that empty allomorphs can appear as heads of phrases only in their base positions; cf. Stowell (1985).

### 5.3 Null Grammatical Verbs

This final section will discuss the possibility of empty grammatical V. There are basically four possibilities: anaphoric V like the English discourse anaphor (3b), V with no interpretable features, unmarked but still interpretable verbs, and empty verbs with some marked interpretable feature. Each of the last three possibilities will be discussed in turn.

#### 5.3.1 EMPTY COPULAS WITH NO INTERPRETABLE FEATURES

The GICP (17i) allows a Syntacticon to contain an empty contentless V, with no interpretation at all. To be entirely without interpretation, a verb can have no lexical specifications other than  $[V, \emptyset]$ , where  $+\emptyset$  is a marked syntactic feature on  $X^0$  that cancels the usual interpretation of the category itself at LF (Emonds, 2002b, section 4).<sup>25</sup>

Since the most plausible general interpretation of the category V is “ACTIVITY,” the “defective interpretation” of the syntactic combination  $[V, \emptyset]$  can characterize the entire lexical class of non-activity (or “stative”) verbs, whether they are open class Dictionary items or, like *be*, *have* and *want*, in the Syntacticon. Since stative verbs are a relatively small subclass of the category V and probably acquired later than activity verbs, we are justified in considering the value  $+\emptyset$  as a marked option. A stative verb with no other syntacticity for semantic  $f$  features is

<sup>25</sup>This is similar to the empty allomorphs of the  $C$  *that* discussed in the previous section. Another example of the use of the feature  $\emptyset$  is with P. Since the general interpretation of P is doubtless LOCATION, the combination  $[P, \emptyset]$  plausibly indicates the marked subset of P that fail to specify spatial or temporal location (*of*, *without*, etc).

then clearly what is traditionally known as a copula (e.g. *be* or *have*), and so we derive from (17) that these are candidates for having empty allomorphs.

If some copula [ $V\alpha$ ] is pronounced optionally, its phonological form is lexically notated ( $\pi$ ); if  $\alpha$  is obligatorily silent, the Syntacticon specifies its phonology as  $\pi = \emptyset$ . An empty verb can be either the *be*-type or the *have*-type, with the essential difference between the two being based on case assignment; *be*-copulas do not assign case while *have*-copulas do.<sup>26</sup>

With regard to *be*-copulas, Russian instantiates the type that, in the present tense, must be a zero morpheme. Such null grammatical copulas are limited to the present tense, more exactly the “non-past” tense, because the GICP would force any  $X^0$  in I that spells out some other *interpreted* feature such as +PAST to be lexically filled. A similar but less familiar example is described in Kader (1981, Ch. 6); the Malay present tense copula is zero in its base position, but surfaces when it precedes the subject in questions (presumably away from its base position). This alternation recalls the restriction (23) on empty C in English, which can also be zero only in a base position.

A contentless copula V can also realize an *uninterpreted* feature. For example a lower V may “alternatively realize” (i.e. copy) the PAST feature on I. Generally, since any feature is interpreted only in its canonical position (for PAST this is I, not V), a complex of the form [V, + $\emptyset$  +PAST] can qualify as lacking interpretable features for purposes of the GICP (17). It is then a candidate for being zeroed. A case of this sort seems to be the empty allomorph of the Norwegian/ Swedish perfect auxiliary *ha* ‘have’ with explicitly past tense modals (Julien, 2002, section 1). Moreover, if we judge by his brief abstract, the complex and variable extension of the *ha*/ $\emptyset$  alternation into Swedish infinitives adheres to at least the same generalization, namely that *ha* alternates with an empty V only if its features play no role in LF.<sup>27</sup>

### 5.3.2 CONDITIONS ON INTERPRETABLE EMPTY V

It seems plausible that unmarked Vs are generally interpreted as +ACTIVITY, with e.g. English *do* being an ultimately unmarked specimen of the transitive subtype. The only way for the present system to countenance an empty allomorph of a prototypical activity verb *do* would be to alternatively realize some feature of the category V as a secondary feature on morphemes in I; then the GICP could license the V position as empty. Although I am not familiar with such a system, the scenario doesn’t strike me as implausible.<sup>28</sup>

Speculating somewhat, the Nimboran verbal complexes discussed earlier might in fact instantiate this type. Recall that Inkelas (1993, section 8) ends by proposing compound structures for verbs made up of V followed by what she terms a class of PRT. Section 1 here argued that these Nimboran PRT must actually be separate finite grammatical (closed class) V, given their rich verbal inflection and independent accent. Consequently I proposed to execute her “compound proposal” with double V structures as in (24). The examples in (24a) are typical verbs

<sup>26</sup>A *have*-type copula or a null counterpart assigns accusative case to a DP sister, and idiosyncratically to special adjectives such as non-agreeing French *chaud* ‘hot’, *froid* ‘cold’, *beau* (*avoir beau* ‘do in vain’) and more importantly, to the perfect participle inflection [<sub>A</sub> -en]. A full analysis of copulas and composed perfect tenses in these terms is elaborated in Emonds (2000, section 5.6).

<sup>27</sup>Regarding clauses which lack modals, Julien’s abstract concludes: “In Swedish, ... *ha* need not be spelled out if *ha* shares its features with some element that is overtly realized....”

<sup>28</sup>For example, a class of modals in some language could have an “inchoative affix” alternatively realizing a V’s inchoative feature on I. This would permit an empty grammatical activity verb in the language with a “change of state” implication. Such an arrangement would exactly parallel the empty D “pro” in Romance languages. The pronominal verbal clitics on the next highest head V alternatively realize features of D and thereby permit empty DPs.

from her text (LOCative and ITERative particles can be suffixed to the second V), while the (24b) examples are locutions built around empty V stems. Both types require obligatory Tense and Person Agreement suffixes.

- (24) a. [v [v rekéi ] [v de ] ]            'turn'  
           [v [v kin] ] [v máN ] ]           'crush'
- b. [v [v∅] [v rár [ITER ṅkát ] ] ]    'laugh'  
           [v [v∅] [v rár [LOC be ] ] ]       'bring'

Although Inkelas provides solid evidence that the finite group built around the second V (PRT) has a lexical category structure separate from the first "stem" V, nothing in her article actually shows that the two Vs together form *a single syntactic unit*. This is because her study treats verbal morphology "autonomously," simply never looking at data that would

bear on syntactic *phrase* structure. So one is left wondering whether the outside "compound" brackets in (24) might not be the boundaries of investigation rather than of syntax.

As my earlier discussion indicated, the lexical theory here is compatible with a rich system for forming Nimboran compound verbs, as illustrated in (24). However, it is also compatible with a more familiar two-part syntactic structure for the same verbs, as in (25):

- (25) a. [VP...[v rekéi ]... ]... [I [v de ] +TENSE +AGR ] <sup>29</sup>  
           [VP ... [v kin]... ]... [I [v máN ] +TENSE +AGR ]
- b. [VP ... [v∅, +F<sub>j</sub> ]... ]...[I [v,+F rár-[ITER ṅkát ] ] +TENSE +AGR ]  
           [VP ... [v∅, +F<sub>k</sub> ]... ]...[I [v,+F rár-[LOC be ] ] +TENSE +AGR ]

In such structures, the diachronic "light verbs," i.e. the Nimboran PRT, would appear in an I position, which would immediately explain their rich verb-like finite inflection. If additionally some of these particles in the I position "alternatively realize" some feature(s) F<sub>j</sub> and F<sub>k</sub> of the lower V, they thereby satisfy the GICP (17) and can license null allomorphs in the lower V, provided that V has no other syntactic or semantic features. Such an empty V would be interpreted as +ACTIVITY and thus exemplify the theoretical configuration of interest in this subsection.

We now turn to a final remaining possibility for empty but interpretable grammatical V that don't require "extra morphemes" with features of V located in I.

### 5.3.3 EMPTY V WITH SOME MARKED INTERPRETABLE FEATURE(S)

A third type of empty V permitted by the Syntacticon is one with a marked interpretable feature it f that satisfies the GICP, i.e., one that also appears on some β that is a sister of V or VP. I will suggest here this type of configuration gives rise to the empty "motion verbs" proposed for continental West Germanic languages in Riemsdijk (2002).

Some of his examples are in (26)–(27); I indicate the position of his proposed empty grammatical verb with [v∅]. Van Riemsdijk observes that, in all the languages he discusses other

<sup>29</sup>The Nimboran final AGR position consists of rather straightforward person agreement with the subject. Number agreements are more scattered and introduce a lot of complexity (e.g., 3 of Inkelas's 8 position classes). The remaining 5 classes appear as represented in (25b).

than Frisian, this empty verb must be licensed by a governing modal verb or its trace  $t_i$ , which are italicized in (26)–(27). Only some of the languages under discussion allow the “right edge directionals” in bold. I return just below to the nature of the feature F.

(26) Dutch: Die doos *kan* naar de zolder *t<sub>i</sub>* [<sub>V,+F</sub>  $\emptyset$ ].

That box can to the attic

‘That box can be put in the attic.’

Deze lampen *moeten* uit *t<sub>i</sub>* [<sub>V,+F</sub>  $\emptyset$ ].

These lights must out

‘These lights must be switched off.’

(27) Swiss German: ... wil mer hettet *söle* [<sub>PP</sub> **hää**] [<sub>V,+F</sub>  $\emptyset$ ].

... because we would’ve had-to home

‘... because we should’ve gone home.’

... **das** si *nöme* **hät** *wele* [<sub>PP</sub> **i d schuel**] [<sub>V,+F</sub>  $\emptyset$ ].

... that she no longer has wanted in the school

‘... that she no longer wanted to go to school.’

Van Riemsdijk has marshaled evidence from a number of sources and constructions that to my mind incontrovertibly establishes the existence of an empty grammatical motion V, across a representative range of documented Continental West Germanic languages and dialects.<sup>30</sup> I therefore concur with most aspects of his analysis. Keeping in mind the language-particular nature of this element (it doesn’t occur in English or French, for example), this empty V with a marked interpretable feature of motion must be a Syntacticon entry.

There are nonetheless two points where his analysis can be better integrated into the theory of the Syntacticon. The first concerns the nature of the “semantic content” of the empty motion verb, which has the label +DIR in the lexical entry of Riemsdijk (2002, 152). This feature should be identified with Jackendoff’s (1983) basic feature PATH for directional PPs. Motion verbs seem to carry the same basic syntactic feature as the so-called English “post-verbal particles” that they often co-occur with, the Ps of PATH such as *in*, *out*, *up*, *down*, *away*, *back*, etc. For example, the subcategories of these particles correspond almost exactly to those of the small class of French Vs of “pure motion” those that require *être* ‘is’ as a perfect auxiliary): *entrer*, *sortir*, *monter*, *descendre*, *partir*, *rentrer*, etc. Emonds (1996) explores parallels between these two restricted classes that testify to shared feature composition or “cross-classification.”

In view of these facts, the feature it fin (26)–(27) is PATH, so I revise van Riemsdijk’s lexical entry for the Syntacticon as in (28). As in Emonds (2000, Ch. 3) the symbol +⟨F⟩ means “selects for a phrasal complement whose lexical head is of feature or category F.”<sup>31</sup>

(28) Continental West Germanic Motion Verb.

V, +PATH, “licensing by M,” +⟨PATH⟩;  $\pi = \emptyset$

<sup>30</sup>Extensive Scandinavian settlement in Britain subsequent to the Viking invasions resulted in Middle English grammar taking on many aspects of a North rather than a West Germanic language. These included many Syntacticon items (*get*, *take*, *them*, *till*, third person verb agreement, etc.), loss of case on nouns, loss of adjectival agreement, preposition stranding, head-initial VPs, etc. Nonetheless many centuries later, as van Riemsdijk’s study notes, Shakespeare still used the null motion verb of West Germanic, suggesting there is no real incompatibility between a null motion verb and a “North Germanic” type system.

<sup>31</sup>In older terminology, the feature ⟨F⟩ would be written +— [<sub>XP</sub> +F ].

If we now inspect again the GICP (recast below in terms of V for ease of reference), we see that the feature PATH of this phonologically null verb respects the requirement (29iii). The PP complement of PATH plays the role of  $\beta$ , and in fact the empty motion verb cannot occur without such a PP. If a modal occurs alone, any following understood predicate has no particular relation to motion; its content would then simply be determined by preceding context as in other cases of VP ellipsis.

- (29) *Generalized Invisible Category Principle for V. An empty V is permitted in LF only if:*  
 (i) *V is uninterpretable, (ii) V is a discourse anaphor, or (iii) all interpretable features on V also appear in  $\beta$ , where some projections of V and  $\beta$  are sisters.*

A second point concerns how to best describe the different distribution of the empty V in e.g. German and West Flemish on the one hand and languages allowing “right edge directionals” on the other (e.g. Swiss German). To account for the contrast, Riemsdijk (2002, section 8) proposes a “Projection Parameter,” which includes language-particular statements for “M licensing” that differ only by virtue of mentioning a phrasal  $X^1$  or non-phrasal  $X^0$  projection.

While I don’t dispute the possibility of some “Pure Parameters” for word order, the Projection Parameter as formulated is incompatible with two restrictions in the Syntacticon framework. First, I follow Ouhalla’s (1991, 7–8) idea that “associates parameters with individual lexical items, as part of the information included in their lexical entries...the nature of the lexical information which determines parametric variation [is] nothing other than the usual type of information relating to selection and grammatical features....” Second, I claim that the lexicon (both Dictionary and Syntacticon) is blind to phrasal structure:

- (30) *Lexical Interface Principle. The lexicon uses only morpheme categories in its statements. It cannot mention phrases, nor distinguish between X and XP (Emonds, 2000, 42).*

These two hypotheses together imply that a language-particular statement cannot crucially mention phrases, whereas van Riemsdijk’s Projection Parameter does this in stipulating distinct conditions on “M licensing” of the empty motion verb.

Empirically, the null motion verb in at least German and West Flemish occurs only if the licensing verb [V, +M] is immediately adjacent on its right. Thus, “licensing by M” for these languages is similar to requiring a right hand, almost “morphological” contextual feature +\_\_M to (28).<sup>32</sup> This additional feature would then account for a more restricted distribution of the empty motion verb in these systems.

The issue that remains is a proper formal expression of the M-licensing condition in (28) in a Syntacticon entry in the other languages under discussion such as Swiss German. (In fact, nothing prevents us from imposing this condition on West Flemish and German as well.) The essence of this feature is that one lexical item, here the empty motion verb, can head a phrase only if the next higher item, the one which selects it, is of a certain type, in this case M.

The fact is, studies treating lexical co-occurrence have just not given serious attention to stating licensing restrictions in terms of a higher (or “governing”) rather than lower (or “governed”) category, whatever their theoretical brief. There are nonetheless some fairly well

<sup>32</sup>Of his only West Flemish example where the empty motion verb unquestionably has a PP complement, van Riemsdijk remarks in his note 48: “What is somewhat mysterious on the other hand is why the c-example...has the German rather than the Dutch/English order [in the sequence of final V, JE]...” That is, empty motion verb would appear to be just to the left of the modal licenser.

known cases of this type of relation: (i) Certain syntactic A such as *soon*, *often*, and *well* must be modifiers in V-projections, not N-projections. (ii) Conversely other A such as *lunar*, *polar*, and *earthly* have the opposite restriction. (iii) Section 1 mentioned the possibility that a null anaphoric V in English (in “VP Deletion” contexts) seems to require a governing I; (iv) Idioms such as *make headway* presumably result from a Dictionary entry for the noun specifying that *headway* must be an object of *make*, at some level: *The headway he claimed she had { made/\*done/\*gotten } didn’t seem sufficient.*

A lexical notation could be proposed for expressing this kind of relation, yielding entries something like: *soon*, A, V  $\leftarrow$ , and *headway*, N, *make*  $\leftarrow$ . Such a notation could be contrasted with one for the more standard co-occurrence restriction that selects a complement type: *seem*, V,  $\rightarrow$  A (for *seem*, V, +\_\_\_ AP) and *talk*, V,  $\rightarrow$  *shop*.<sup>33</sup> Nonetheless, the lack of attention to the kind of relation implied by M-licensing in (28) is in large part due to the fact that it is *not* so widespread, so I hesitate

to attribute it simply to a hitherto unnoticed required type of lexical stipulation.

My tentative suggestion is rather that the M-licensing in (28) is not a required stipulation at all, but simply a consequence of the GICP (29iii). In the Continental West Germanic Languages, Vs are characteristically realized in finite I constituents, in infinitival I with prefixes (Dutch *toe*, German *zu*), or in participial forms. Plausibly, all these forms all include interpretable features of I such as TENSE; a guess as to interpretation of the infinitival prefixes under I may be –REALIS. Since these features do not appear (are not “alternatively realized”) on sisters of any projections of these V, the GICP may simply prohibit the empty motion V in any contexts where a modal isn’t present. The only “feature-free” occurrences of V may be those where a modal selects them.

An interesting point concerning Frisian may support this view. According to Hoekstra (1997) cited in Riemsdijk (2002, note 43), Frisian, in strong contrast to Dutch, allows an empty motion verb in an infinitival clause marked by a bare *ta* ‘to’; no modal is involved:

- (31) Jan is fan doe [om nei Grins ta [<sub>V</sub>Ø] ].  
 John is of plan for to Groningen to  
 ‘John has a plan to go to Groningen.’

Perhaps the Frisian infinitival marker is not a verbal prefix as in Dutch, but rather in I and separate from VP, as in English (Lobeck, 1986). The infinitival V would then have no feature, which removes the blocking effect of the GICP and allows the empty motion verb to have a wider distribution than in Dutch.

A slightly different approach to eliminating an M-licensing feature in the Syntacticon entry (28) would be to say that (i) inflected Continental West Germanic Vs include simply features on V, interpretable or not, and (ii) a revised GICP (17iii) should be generalized by replacing “interpretable features” with “features.” Then the empty motion V would lack “features” only when it is governed by a modal (or infinitival, in Frisian); we would not have to establish that Germanic infinitival prefixes or participial suffixes are “interpreted.” I leave this as a possible avenue for future investigation.

<sup>33</sup>Notice that this type of notation does not violate the Lexical Interface Principle (30). Nor does it seem to be simply camouflaging some kind of “real” lexical reference to phrases; stipulating the category of a higher governor is different from stipulating the “size” of an item in a co-occurrence relation.

In conclusion, we have now seen instances of empty V in the Syntacticon, in particular empty and uninterpreted copulas and empty interpreted motion verbs of Continental West Germanic. In all cases they seem to conform to the possibilities allowed by the GICP (17), which prohibits empty categories with interpretable features that are not present in their immediate context (see note 21 for a relaxation of this requirement in root contexts).

These “phonology-free” entries, as well as the arguments in section 4 for entries which embed phonological content in disjunctive braces, demonstrate that Syntacticon addresses are organized and hence accessed not by phonology, as is the open class Dictionary, but by the categories of syntax. This result is compatible with a model of a syntactic derivation that consists of an algorithm for filling in syntactic “slots” with appropriate grammatical items, an algorithm strongly constrained by locality principles such as the Generalized Invisible Category Principle (17).

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