Grammatical vs. Lexical Formatives

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1 Introduction

For a generative linguist, (re)reading *Syntactic Structures* is to be presented with a disorienting combination of ideas so clear and completely obvious as to be scarcely worth expending rhetorical energy on, together with others that seem bizarre, unintuitive or unwieldy to those who are not old enough to have read it in its time. The dissonance is unsurprising. *Syntactic Structures* inaugurated a field of inquiry that has progressed through many changes in its formal devices and theoretical constructs since 1957. But at the same time, it is impressive how much the enterprise has remained true to its origins in terms of methodological principles and the very nature of the questions being asked.

The modern stage-level generative linguist inhabiting her own moment in space and time, with her own articles of faith, and collections of open questions, might be surprised at how many of the most commonly accepted results of generative grammar were not at all obvious or conceived of in the same way at the very start of the enterprise.

As a case in point, the issue of the difference between lexical and grammatical formatives is a pervasive feature of much modern theorizing about syntax and its relation to the lexicon, and syntax in its relation to semantics. The distinction between the functional and the lexical is ingrained in the modern syntactic theoretical assumptions, and is almost never questioned, even across different architectures within the generative tradition. It is therefore surprising to (re)discover that these ideas are entirely absent from *Syntactic Structures*.

Chomsky's position on the inexistence of a distinguished class of 'grammatical formatives' is expressed directly and clearly in only one passage of the book, which I repeat here in full.

> Another common but dubious use of the notion 'structural meaning' is with reference to the meanings of so-called 'grammatically functioning' morphemes such as *-ing*, *-ly*, prepositions

> etc. The contention that the meanings of these morphemes are fundamentally different from the meanings of nouns, verbs, adjectives, and perhaps other large classes, is often supported by appeal to the fact that these morphemes can be distributed in a series of blanks or nonsense syllables so as to give the whole the appearance of a sentence, and in fact, so as to determine the grammatical category of the nonsense elements. For example, in the sequence "Pirots karulize elatically." we know that the three words are noun, verb and adverb by virtue of the *s*, *ize* and *ly*, respectively. But this property does not sharply distinguish 'grammatical' morphemes from others, since in such sequences as "the Pirots karul – yesterday" or "give him — water", the blanks are also determined as a variant of the past tense, in the first case, and as "the", "some" etc. but not "a" in the second. The fact that in these cases we were forced to give blanks rather than nonsense words is explained by the productivity or 'open-endedness' of the categories Noun, Verb, Adjective, etc., as opposed to the categories Article, Verbal Affix, etc. In general, when we distribute a sequence of morphemes in a sequence of blanks, we limit the choice of elements that can be placed in unfilled positions to form a grammatical sentence. Whatever differences there are among morphemes with respect to this property are apparently better explained in terms of such grammatical notions as productivity, freedom of combination, and size of substitution class, than in terms of any presumed feature of meaning.
> pg 104-105

To understand this position, it is necessary to understand Chomsky's position on the autonomy of syntax and on the relationship between syntax and semantics, both of which I would claim have been misunderstood in various ways, both by adherents and detractors (see also Adger, this volume, for a discussion). My purpose in this short article is to deconstruct the motivations behind the division largely assumed today between grammatical and lexical formatives, and explore the intuition about how they contribute differently to meaning. A clearer picture of what is at stake will lead to the conclusion that Chomsky's position in *Syntactic Structures*, far from being a temporary aberration on the road to the by now established position, is a serious candidate for actually being right.

2 Signs and Symbols

Ferdinand de Saussure in his seminal work on semiotics spent a good deal of time thinking about the phenomenon of the sign, and how an arbitrary,

conventionally agreed external form comes to be associated with a conventionally agreed concept. In his discussion, he conceives of the 'signified' as some essentially arbitrary (though probably culturally motivated) partition of the flow of reality, or space of possible things that can be 'meant'. The 'signifier' is the arbitrary conventionalized sequence of sounds it is paired with (or indeed in principle any systematically externalizable form perceptible to others). In the *Cours* (de Saussure 1959), the sign is given a kind of primitive, mystical status, but for one often touted as the father of synchronic linguistics, Saussure is dramatically silent on the subject of syntax as we know it. Moreover, the sign, while interesting in its own right, is in no way unique to humans, even if we confine our attention to cases of conscious deployment. Many other species consciously deploy conventionalized signs to convey highly specific meanings (Pearce 2008), and pass them on to their offspring. Vervet monkey calls are the most famous primate examples (Demers 1988, but all see recent work by Philippe Schlenker and his Paris lab on monkey semantics Philippe Schlenker and Zuberbühler 2016).

But the syntax of human languages goes way beyond this, as *Syntactic Structures* is at pains to point out. The grammar of a language is a complex symbolic system, generating infinite forms from finite means, in a way that is not reducible to transitional probabilities between linearly adjacent 'signifiers', or to the nature of the 'signified' (again see Adger, this volume). Language is not just a bag of 'signifiers' (something the vervet monkeys have, albeit in reduced form), but a system of structurally combining 'signifiers' to make complex 'signifiers'. As Terence Deacon put it in his book, *The Symbolic Species* (Deacon 1997), the defining property of this kind of system is that in addition to the signifier-signified nexus explored by Saussure, human linguistic systems crucially employ *sign-to-sign relationships*.

2.1 Two kinds of Meaning?

So doesn't this mean that there are two kinds of 'meaning', then? I think so. There is one kind of meaning that involves a conventional association to some aspect of the world, or our cognitive reality, and there's another kind of meaning that is essentially relational that provides the interpretational glue between signs. Avoiding the contentious terms 'meaning' and 'semantics', and in keeping with the saussurean theme, we could call the former 'external significance'[1], and the latter 'relational significance'. In other words, one needs to know of English that when one puts the word *red* together with *car* to form *red car*, the result is something that you could also describe

[1]I am intentionally staying away from words like reference, and truth conditions, since it is not clear to me that the external significance of signs needs to be explicated in terms of material conditions in the real world, but they do clearly need to reach out of the language module itself and signify independently studiable cognitive products of the mind/brain. It is for this reason I use the term 'external'.

as a kind of 'car' but with the additional property of being 'red'. It does not describe a particular shade of red, or refer to a person who 'owns a red car', it means 'a car that is red', and this knowledge does not need to be acquired on a collocation by collocation basis, but is part of the productivity of the system as understood by the native speaker. Illustrations of this sort could be multiplied, and underlie the creative semantic competence of human language users. I think therefore that there are two kinds of meaning in the most informal sense, that need to be importantly distinguished in understanding the functioning of human languages. This very distinction lies at the heart of what distinguishes the linguistic symbolic system from collections of signs.

Another way to think of it is the following. Consider a language for describing big integers in terms of smaller integers. Both big integers and small integers have themselves external significance, in terms of the quantity of things they correspond to when counting. But we can build the number 101 from a system that adds 1 + 1+ 1 + ... one hundred and one times. Or from a system that builds it up as (5 x 20) + 1. In these latter case, we also have the elements + and x which have 'relational significance' and the round brackets which establish locality domains. Understanding the grammar of language is equivalent to knowing what the external significance of the primary formatives are, *and* what the relational signifiers are that compose them into larger units which also have external significance. But this analogy to the mathematical symbolic system is only suggestive because it already reifies an absolute difference between the elements with external significance and those with purely relational significance. The question is whether language is indeed like that, with a categorical distinction between formatives that have external significance ('lexical' under this conception) and those that are only functional.

2.2 Meaning and Autonomy of Syntax

I read Chomsky's position on 'meaning' in *Syntactic Structures* as a claim about external signification. External signification simply does not bear on the functioning of the grammar *qua* system. The system of grammar is remarkably independent from its external products (both in terms of the externally signified, and the external manifestations of signifying). Chomsky's position is that we can and must study these abstract properties if we want to understand nature of human language.

Chomsky is also sceptical about the extent to which external significance, in the sense of reference, is achieved purely by any lexical formative at all. Reference is achieved as a joint outcome of the grammatical deployment of linguistic formatives in an utterance context, with an attendant interpretational judgement. I quote here from Chomsky (1995), and there is every reason to believe that this has been his consistent position (my italics).

> Neurologist Rodolfo Llinás (1987) puts the matter well when he describes perception as "a dream modulated by sensory input", the mind being a "computational state of the brain generated by the interaction between the external world and an internal set of reference frames" . But the internal frames that shape the dreams are far more intricate and intriguing than often assumed, *even at the level of the lexicon*, still more so when we turn to expressions formed by the computational processes." Chomsky (1995), pg 23

So even though sensory input from the world is crucial to how we interpret it, language combines this with an internal set of reference frames and organizational principles which *impose* their own logic and interpretation on the world. These internal frames are 'intricate', 'even at the level of the lexicon', and the relational signification that comes along with being a symbolic system instead of a finite collection of signs, pervades the entire system.

From this point of view, we could conclude that even a 'lexical' item like *dog* carries relational significance in addition to its contribution to external signification, by virtue of the fact that it bears the syntactic feature N, which determines how it slots in to the grammatical system and combines with other formatives around it.

Thus, we come to the entirely coherent position expressed in *Syntactic Structures* that *... Whatever differences there are among morphemes with respect to this property* (i.e. 'structural meaning', GR) *are apparently better explained in terms of such grammatical notions as productivity, freedom of combination, and size of substitution class, than in terms of any presumed feature of meaning.*

Having laid out what I take to be the position taken in *Syntactic Structures*, I turn next to a brief description of how the notion of lexical vs. grammatical (or functional) formatives is employed in current syntactic theory, with some discussion of the reasons that have led to the partition of the lexicon in this way.

3 Lexical vs. Functional Categories Today

3.1 Early Classical Period

The tendency to divide language formatives into two main classes can be found consistently in the modern GB era of transformational grammar as the distinction between 'functional' and 'lexical' categories (Stowell 1981, Abney 1987, Ouhalla 1991, Kayne 1994), roughly corresponding to the rise and increase of the former in phrase structural representations. It applies

to bound morphemes as well as independent words and corresponds basically to a difference between formatives that are essentially contentive, or theta-assigning ('lexical'), versus those that are not ('functional'). In addition, functional elements are conceived of as the abstract, grammatical outer scaffolding of lexical elements, forming 'extended projections' of the latter (Grimshaw 1991). An early list of commonly assumed functional categories includes at least C(omplementizer), INFL (T and Agr) (Pollock 1989), Asp(ect) (Tenny 1987), Neg(ation) (Ouhalla 1991), Det(erminer) (Abney 1987), and K(ase) (Bittner and Hale 1996). Abney (1987) provides an important early discussion of the criteria by which one distinguishes the two classes of formative, as part of his argument in favour of Det as heading its own functional projection. These criteria include:

- Lexical formatives belong to 'open' classes of expressions, while functional or grammatical formatives are drawn from 'closed' classes.
- Functional formatives tend to be phonologically reduced compared to lexical formatives
- Functional formatives do not undergo derivational processes
- Functional formatives appear in more restricted syntactic contexts than lexical formatives
- Functional formatives have a 'grammatical' meaning, while lexical formatives have a substantive or 'contentful' meaning.

All of these criteria have problems and exceptions (see section 4 for discussion), but they seem to converge roughly on their target. Moreover, a pleasing system seems to emerge from such a classification, whereby functional sequences are rooted in contentful lexical items in a low, theta-zone and are successively modulated by functional material in a hierarchical expansion. This further enforces the sense of a cutoff between the lexical and the functional. The only source of substantial disagreement appears to be with regard to the number and fine-grainedness of such functional projections in the functional sequences rooted in the lexical categories (assumed to be, at least, V, N and A).

The lexical-functional division is often invoked in the statement of the Borer-Chomsky conjecture concerning the locus of cross-linguistic variation. The following formulation comes from Baker (2008).

(1) **Borer-Chomsky Conjecture**
All parameters of variation are attributable to differences in features of particular items (e.g. the functional heads) in the lexicon.

In fact, variation of course applies to all aspects of the lexicon, it is just that *syntactic* variation can only arise from variation in a narrower subset of lexical items. The formulation in Chomsky (2001) is given in (2).

(2) Parametric variation is restricted to the lexicon, and insofar as syntactic computation is concerned, to a narrow category of morphological properties,primarily inflectional. (Chomsky, 2001, 2) (Derivation by Phase)

So Chomsky's own formulation does not invoke a distinct class of formatives, just a distinct subset of *properties* of lexical items.

3.2 Distributed Morphology

In Distributed Morphology (henceforth DM), the distinction between two classes of formatives is in some sense taken to its logical conclusion. The functional morphemes, the ones that are part of the generative system are in the syntax, while lexical morphemes, or roots, are syntactically completely inert and have only conceptual content (Halle and Marantz 1993, Harley and Noyer 1999, Harley 1995). For DM, this means that they do not even bear category features, because this is part of the relational significance of grammar and must therefore come from the syntax. Roots bear information of the 'external significance' type described above, and are only categorized once they are in a particular syntactic context.

The different so-called lexical categories are split between a single l-morpheme type, the root, in local syntactic relation with an f-morpheme which categorizes it. A verb is the name for a root in the context of the f-morphemes v, Asp and T, while noun is the name for a root in the context of Det.

The distinction between f-morphemes and l-morphemes (using the terms from Harley and Noyer (1999), also corresponds to a difference in how they interact with spell out processes, which originally in DM was a consistent 'late insertion' model. But there was a difference. F-morphemes had completely deterministic spell-out; they were not part of a paradigmatic family of forms but bore purely syntagmatic information. L-morphemes on the other hand, allowed a choice; they were an open class with a wide variety of paradigmatic options (e.g. *dog* vs. *cat* vs. *triceratops*).

The difference between f-morphemes and l-morphemes was given even more drastic architectural implications when Harley and Noyer (Harley and Noyer 2000, Harley and Noyer 1999) argued that the mutual exclusivity constraint on language acquisition prevents root suppletion. This conjecture was architecturally enforced when Embick (2000) proposed that roots were inserted early, while only functional items were inserted late. This had the consequence that suppletion should only apply to functional items, and there simply could never be such as thing as root suppletion in the system. This is

because late insertion of vocabulary items is the only mechanism by which suppletive items can arise by allomorphic selection. Roots, being inserted early, could be subject to readjustment rules, but not suppletion.

Thus, the past 15 years of DM theorizing have involved a strict separation between conceptual content and functional information, operationalized in distinct zones of the syntactic derivation.

DM is also a theory which denies the existence of the Lexicon as a domain for rules or productive processes, or even implicit patterns and generalizations. The lexicon in DM is an inert repository of formless content, and generalizations across lexical formatives can be expressed only in terms of the functional vocabulary that they combine with.

However, the non-lexical aspect of DM is orthogonal to the decision to separate out structural or grammatical meaning from conceptual content. Within lexical theories like that of Levin and Rappaport-Hovav (Levin and Rappaport Hovav 1995, Levin and Rappaport 1998), lexical representations are structured pieces of information which can be separated into templates that express event structure and grammatically relevant meaning, in addition to loci of syntactically inert conceptual content, which they call 'constants'.

(3) *splash*: [x Cause [y TO COME TO BE AT z]/ SPLASH
The variables x, y and z get filled in by the the DPs 'the pigs', 'mud' and 'the walls' respectively in the syntax.
"*the pigs splashed mud on the walls*" (after Levin and Rappaport 1998)

So here, SPLASH provides the conceptual content to a structural semantic template consisting of event structure notions such as 'causing', and 'becoming'. These latter are the kinds of notions that are reified as functional heads within the syntax in a framework like DM.

Thus, in lexical theories these two kinds of information coexist in a structured lexical representation, while in DM they are radically separated. But both kinds of theory distinguish sharply between the different *types* of information— the structural vs. the conceptual.

3.3 Psycholinguistic and Neurolinguistic Evidence

The theoretical elegance of the architectures that enforce a radical and categorical distinction between functional and lexical is bolstered by the fact that there is psycholinguistic and neurological evidence for some such distinction as well. The evidence comes from three main sources: (i) processing, (ii) aphasias and language impairment and (iii) acquisition. I briefly summarise the three kinds of evidence in turn.

In production, switching errors occur between elements of like categories. What we find is that contentful categories can switch to create spoonerisms,

but that contenful categories do not switch with functional ones in production disfluencies. This led Garrett (1976) and Garrett (1980) to propose a model in which the combination of lexical items precedes the insertion of functional elements. Lexical decision tasks are subject to frequency effects for contentful items, but this effect seems to be neutralized for functional items (D. Bradley and Zurif 1980). In word priming, contentful lexical items behave differently from functional items in that they prime homophones and semantically related items, while functional elements do not (Shillcock and Bard 1993).

In aphasia, the two classic types of aphasia, Broca's vs. Wernicke's, have been characterized by the fact that the former type of patient struggles with grammatical structure but has fairly intact comprehension of contentful lexical items, while the latter is a fluent producer of grammatical formatives but struggles with the production and understanding of contentful lexical elements (see Goodglass 1976).

In first language acquisition as well, it has been claimed that lexical items are acquired earliest, before functional elements (Bloom 1970, Bowerman 1973).

Despite this seeming consensus, I am going to argue in section 4, that the prevailing view is not correct.

4 Against a Categorical Distinction Among Formatives

Although minimalist approaches to syntax seem to all (at least informally) endorse the distinction between lexical and grammatical formatives, and although the distinction seems to be supported at the cognitive and neurological level, there are serious empirical and technical problems with the idea of a categorical distinction among formatives.

The discussion of the 'sign' in section 1 argued that what is unique about the human language symbolic system is that in addition to signs bearing *external signfication*, they also needed to bear *relational significance*.[2] So there is no doubt in my mind that this distinction between two types of meaning is powerful and important, particularly in comparing human linguistic signs ('formatives in the grammar') with the conscious or unconscious signing of other species, and with general semiotic devices employed by humans in non-linguistic domains.

I also find unassailable the facts and generalizations about linguistic

[2]Once again, I am using this abstract distinction as the proxy for whatever it is that defines the different ways of meaning corresponding to lexical and grammatical morphemes. The distinction has also been described in terms of 'logical' vs 'notional' or 'denotative' but there are problems with applying these terms in any consistent manner (see Cann 2000 for discussion).

patterning across human languages which robustly support certain ordering restrictions in the hierarchical phrase structural sequence corresponding to complex signifiers. To take just one example, tense always occurs outside of causational and participant selectional information in the hierarchical construction of the extended verbal projection (see Julien 2003 for discussion).

The substantive claim of the lexical vs. grammatical formatives idea is that there is some special kind of meaning that is located *all and only* at the bottom of the tree, and a qualitatively different kind of meaning that is located in the hierarchically higher domains. Further, the formatives, the building blocks of a language as stored in declarative memory, are specialized to one or the other of these different types of meaning.

As we have seen, DM, is one of the theories that makes an especially sharp distinction between the lexical and the functional in terms of the specific *formatives* involved. Now, however, that the most clear cut aspects of that architectural distinction even in DM are now being eroded in the face of empirical evidence. Over the past five years, it has now been convincingly argued that root suppletion is real (Haugen and Siddiqi 2013, Harley 2011), and late insertion of roots must be reinstated as part of the architecture. This has the desirable consequence that readjustment rules, a powerful and unconstrained mechanism required in the context of early root insertion, can plausibly be eliminated from the DM architecture altogether (see Haugen and Siddiqi 2013 for discussion). This means, among other things that the sharp distinction between l-morphemes and f-morphemes starts to erode. I quote from Haugen and Siddiqi (2013) here.

> "... nor does it require that we treat a subclass of the Vocabulary (i.e. Roots) as needing a special status with respect to the syntax (i.e. Early Insertion, or visibility). We suggest that the real issue for suppletive pairs in natural languages is not necessarily one of "functional" morphemes vs. "lexical" ones; rather, it is one of high word frequency for suppletive pairs. "
> Haugen and Siddiqi (2013), pg 501

The reader does not need me to remind them of the quote from *Syntactic Structures* in section 1.

Further, if a model like spanning (Svenonius 2012), or Siddiqi's version of DM (Siddiqi 2009) is correct in allowing 'roots' to fuse with the functional heads in their extended projection before spelling out as particular vocabulary items, then the formatives themselves seem to be morphemes that are featurally specified for syntactic functional information, as well as bearing lexical-conceptual content.

The view from morphology now would suggest, that actual 'formatives' must be allowed in principle at least, to have 'relational significations', at least with regard to syntactic contexts of insertion, and the possession of inflectional features, even when they also possess 'external signification'.

However, this still does not undermine the distinction between lexical and functional/grammatical at the level of syntactic structure and *abstract* formatives. We could recoup the distinction in terms of lower versus higher category labels in the functional sequence (i.e. V versus Asp and T), and state a weaker generalization about a certain class of grammatical formatives, that encode meaning in the functional domain, stating that they are concomitantly devoid of lexical conceptual meaning or 'external signification' in my sense. I will argue that even the weakest version of this idea is probably false.

4.1 Lack of Categoricality

Those who would take the extended projection view would argue that N, and V are lexical labels (abstract formatives) while everything that sits on top of N and V—- the things that the syntactician has deemed necessary for the analysis of language above and beyond the simple word classes—- are functional items. But once we go beyond the obvious example that *dog* is a lexical formative while *the* is functional, it is quite hard to find even abstract formatives that are categorical in this regard.

Take the lowly preposition. In Grimshaw's original paper on extended projections, this was taken to be an extension of the nominal extended projection, and therefore by this reasoning, a functional element. However, if we look at the class of prepositions in English, we see that in addition to possessing clear and abstract relational content, they also possess conceptual information that distinguishes one kind of spatial relationship from another. (In general, see Svenonius 2010 for a detailed decomposition of the extended projection of P, and for a careful discuss of the separation of conceptual content from structural semantic content).

(4)

	structural	**conceptual**
on	FIGURE located with respect to GROUND	ON
in	FIGURE located with respect to GROUND	IN
under	FIGURE located with respect to GROUND	UNDER
opposite	FIGURE located with respect to GROUND	OPPOSITE

If we are to separate the functional formatives from the lexical, then what is the label for the lexical category that P is rooted in? LOCATION, perhaps? But then how do we integrate that with the denotation of the DP that the preposition combines with? In fact, it is the preposition that seems to be doing the explicitly relational job. But if these are relational meanings, and this should be encoded in a functional head, then where do the differences between the different spatial prepositions get represented, if not in the conceptual content/'external signification' part of the formative's meaning? One alternative might be to say that in fact there is a different functional subtype of P for each different relation. It is exactly this kind of reasoning

in the verbal domain that leads certain analysts to the idea of 'flavours' of functional heads (flavours of little v handle phenomena that would otherwise be dealt with by abstract selectional facts about verbal lexical items, deprecated under the asyntactic roots idea of DM). Here, we would have to have flavours of locational heads. There is a fairly large class of relational spatial prepositions in English, much larger than the number of tense or aspect distinctions for example, so there would have to be as many of these flavours are there are distinct prepositional formatives.

The logical alternative is to preserve the simple structural description of FIGURE-GROUND as a universal and pervasive structuring principle in natural language expressions of space, and combine it in parallel with conceptual content that specifies the physical properties of that relation for different real life situations that English speakers feel the need to have a word for.

To repeat, the alternative idea is to see the prepositional formative as combining both 'relational' and 'external' signification. There is no motivation for decomposing all prepositions into a prepositional root and a little p head, which it *always* occurs with. Apart from everything else, it also causes problems for the combination of the decomposed P root with the compositionally built up DP that represents the GROUND in the relation, since by hypothesis roots are at the bottom of the functional sequence and should be completely syntactically inert.

The same sorts of problems arise with different types of modal verbs in English (*must* vs. *should*), or for languages where there are different 'flavours' of PAST (for example, Wikipedia tells me that "the six-tense language *Kalaw Lagaw Ya* of Australia has the remote past, the recent past, the today past, the present, the today/near future and the remote future.").

Even the evidence from psycholinguistics does not show that lexical and grammatical information are cleanly separable from each other. It shows that they are different and that they are negotiated differently in the overall hardware of the brain, but nothing we currently know actually lines up this difference with formatives (or even labels) in a clean categorical way. Pathways that connect sensory and affective information communicate anatomically with those regions of the brain that deal with syntactic combination, and all of our actual data shows combined and distributed activation on all tasks, and graded, not categorical difficulties for different formatives.

To summarize, any detailed categorization of the formatives, or even abstract formatives of a particular language, will immediately expose cases (possibly the majority), where the grammatical MORPHEME in question bears both grammatical and conceptual content. See also the discussion in Svenonius (2014), which comes to the same general conclusions based on the noncategoricality of the distinction between the lexical and functional in practice. Even the seemingly unproblematic *dog* is only purely conceptual if we deprive it of its category label N (as DM does). If we reinstate N for *dog*, then it too carries some minimal sliver of 'relational' signification,

grammatical information that shows how it is to be integrated into a system of symbolic representation.

4.2 Systematic Polysemies

Another argument for the integration of both grammatical meaning and conceptual meaning within *every* formative in grammar comes from cases of polysemy. It is well known that diachronically, formatives can be reanalysed from more contentful lexical behaviour into being grammatical morphemes (an intuition going back to Meillet 1912, Kurylowicz 1965). However, what is less often acknowledged is the large number of cases of systematic polysemy where the same formative coexists in the language in both lexical and more 'grammatical' incarnations. The recourse of the l-morpheme vs. f-morpheme person is to say that these simply have to be distinct, homophonous, formatives. This move belies the ubiquity of the phenomenon, and the deep generalizations that carry over between the different polysemous meanings. To take an example from my own work on light verbs (Ramchand 2014), the phenomenon of light verbs regularly conforms to what I have labelled *Butt's Generalization*, repeated here in (5).

(5) *Butt's Generalization* (Butt 2003, Butt and Lahiri 2013):
Unlike auxiliaries which may become grammaticalized over time to have a purely functional use, light verbs always have a diachronically stable corresponding full or 'heavy' version in all the languages in which they are found.

The significance of this generalization is that there is a stable polysemy here, where one member of the pair is fairly functional and abstract, and the other member of the pair has richer conceptual content. If the two versions (to put it neutrally) of the lexical item were merely related diachronically via some grammaticalization chain, then we would expect the members of the pair to be subject to semantic drift and reanalysis. We would also expect the two versions to potentially drift apart from each other over time, both phonologically and allomorphically, and to eventually count as distinct lexical items. The situation we do see however, points to systematic polysemy rather than diachronic relatedness, if Butt and Lahiri (2013) are right.

If light verbs were f-morphemes and their heavy counterparts were roots, as for example in the theory of Persian light verbs given in Folli et al. (2005), then there would be no ready explanation for their systematic relatedness. But in fact, as I show in Ramchand (2014), the polysemies are stable and show systematic generalizations. A theory that sees all formatives as combining both grammatical and conceptual information has a chance of capturing these generalizations in a constrained theory of polysemy.

4.3 The Meaning Integration Problem

The final argument comes from the technical problems of meaning integration. If the root, or lexical morpheme carries *only* conceptual information devoid of relational or syntactic content, then we are owed a theory of how these components of meaning compose systematically. How does the conceptual content integrate with the functional structure so as to deliver the interpretational facts for (6-a) and (6-b).

(6) (a) The boy broke the glass.
(b) The boy hammered the metal.

In (6-a), the conceptual content of *break* tells us something about the result state of the event, namely that the UNDERGOER becomes 'broken'. In (6-b), the conceptual content of *hammer* tells us something about the manner in which a pounding event was effected. In a Levin and Rappaport style representation of the meaning of these verbs would combine both structural and relational facts with the conceptual, these are explicitly separate, but unified in the nature of the representation, with the conceptual content modifying the structurally introduced subevents.[3]

(7) *break*: [x Cause [CHANGE IN MATERIAL INTEGRITY OF y] / BREAK
hammer: [x Do [MAKE CONTACT WITH y]/ HAMMER

However, nobody has ever shown me a compositional semantic treatment of how the root is integrated with the functional structure of the verb phrase to give the right results, if the root is uniformly at the bottom of the structure in each case. I could imagine a proposal for the functional structure of *break* which differs from the functional structure of *of hammer* in a diacritic way. The semantic structural effect of these heads would then need to be specified directly so that one can see whether it makes the right predictions. Alternatively, one could imagine a system in which differential positions of the root in different parts of the structure combine according to different mechanisms (as in recent proposals about 'manner' roots vs. 'result' roots in e.g. Mateu and Acedo-Matellán 2012), which will conspire to give the correct results. But these devices will have to be augmented with selectional information that ensures that the roots match up with the correct functional structures. A fully explicit implementation of how the structural and conceptual pieces of information combine, I suspect, will reduce to a notational variant of the positions advocated in Ramchand (2008) or Levin

[3]Ramchand (2008) also expresses these facts directly using a decomposed event structure within a neo-Davidsonian style representation, based on the syntactic specification of the verbal item. The conceptual content of the root modifies/describes the different types of subevents introduced.

and Rappaport (1998) where verbal roots possess both conceptual and and structural information, with regulated points of integration.

5 Conclusion

There is a famous passage in Jonathan Swift's *Gullivers Travels* where he describes the denizens of Laputa who have a bizarre Academy involved in a number of experiments, one of which has to do with language, and a scheme for making communication 'easier'.

> ... since Words are only Names for Things, it would be more convenient for all Men to carry about them, such Things as were necessary to express the particular Business they are to discourse on ... I have often beheld two of those Sages almost sinking under the Weight of their Packs, like Pedlars among us; who when they met in the Streets would lay down their Loads, open up their Sacks, and hold Conversation for an Hour together; then put up their Implements, help each other to resume their Burthens, and take their Leave. (185-6)

It is intuitively obvious to most readers that Swift's example is an absurd one. Language simply doesn't work like that. Apart from the fact that not all words are physicalizable in this way, language isn't just a sequence of presentations of signs. I have argued that the 'relational signification' of language signs are central to what it takes to be a human language, because it is essentially a *syntactic* system. However, this does not mean that a Swiftian bag of 'signs' needs to be carried around on the Laputan backs of an autonomous syntax machine.

Chomsky does not seem to use the word 'meaning' to pick out 'relational signification' in my sense, but I agree with him that 'external signification' is irrelevant to the functioning of the syntactic system. Relational signification on the other hand is an inseparable part of the syntactic system that eventually allows it to provide the scaffolding for the productive construction of meaning, broadly construed.

Actual investigation of the formatives of natural language shows that relational signification and external signification do not seem to be separable from each other in practice, even at the level of the easiest cases *dog* vs. *the*. Each linguistic sign is a complex signifier, which seems to exist as a potent *combination* of the outward looking (external signification) and sideways-looking (relational signification). We have seen that attempting to separate these within the grammar leads to paradoxes, extra mechanisms, and loss of generalizations. All the effects of grammatical vs. lexical can be seen to be epiphenomenal of the differences in degree of sensory associations, and the size of the paradigmatic choices for each formative available within the system.

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