

# 15 Word Syntax

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## Introduction

Leafing through older literature on generative grammar, one soon notes that the 1970s mark a beginning of an intensive discussion of word structure in that framework. This was, by and large, for the following reasons. First, Chomsky (1970) argued in the influential “Remarks on nominalization” that word-formation facts cannot be accounted for by means of transformational rules as had until then been assumed. Instead, he suggested, a lexical approach was appropriate, where the term *lexical* essentially means that complex words (such as those formed with derivational affixes) are accounted for in the so-called lexical component of the grammar (“Lexicalism”) – in any case not in the syntax. Second, a fundamental theoretical reorientation was beginning to exert its effect in the 1970s, amounting to what can be described briefly as a move from rules to principles. This philosophy of research, in many ways shaping up as early as the 1960s (cf. Ross’s 1967 thesis), began to regard grammatical constructions (e.g. passive) as resulting from the interaction of simple elementary principles, rather than as a product of construction-specific rules (e.g. a passive transformation). This approach has guided the development of generative theories to the present day.

Both of these trends, Lexicalism and the abandonment of a construction-oriented transformational grammar, had a perceptible influence on a number of studies, mostly from the early 1980s, that aimed at explaining properties of words by recourse to general grammatical principles rather than word-formation rules. Among them a distinct group of investigations emerged, including Lieber 1980, 1983; Moortgat et al. 1981; Selkirk 1982; Toman 1983; E. Williams 1981a, b; and others. It seems fair to say that Elisabeth Selkirk’s (1982) monograph *The Syntax of Words* and a series of articles by Edwin Williams (including his 1981a, b) became the most representative examples of this approach. The interest in this defined perspective continued well into the

1980s and beyond, as witnessed, among others, by *On the definition of word*, a monograph by Anna Maria Di Sciullo and Edwin Williams (1987), and *Deconstructing morphology* by Rochelle Lieber (1992). Alternative approaches to morphology also emerged, mainly in the work of Mark Baker (1988a); despite differences, however, Baker continues the word-syntactic tradition by relying on headed tree structures and employing percolation conventions (see below). In the present chapter, I will review the main tenets of the theory of word syntax that was emerging in the period described. For reasons of space the survey must remain highly selective. I will turn to basic issues only, but will, at a few places, include critical discussion. Inconclusive as this discussion often may be, it should draw the reader's attention to the strategies and possibilities that inhere in the framework presented here. Borer, MORPHOLOGY AND SYNTAX, also discusses some of these trends, from a slightly different viewpoint.

## 1 Word syntax as a theory of word competence

As pointed out, Chomsky (1970) prompted an increased interest in questions of morphology in generative grammar, and a number of competing concepts of the lexicon emerged as a result. Two basic variants can be noted: one regards the lexicon as nothing more than a list – be it a list of morphemes, or of all nonderived words, or even of all actually occurring words of the given language. Alternatively, the lexicon can be seen as a component which hosts not only lists, but also rules that actually produce words; in this conception the lexicon emerges as an “active” component of the grammar. Most of these approaches claim the label “Lexicalism” for themselves, and, indeed, since Chomsky (1970), a popular opinion, bordering on value-judgement, has emerged, that sees Lexicalism as superior to any other theory that does not explicitly consider the existence of the lexicon (or a lexical component) in the grammar.

In some sense, however, the focus on the lexicon leads away from the classical question of generative theories. In generative syntax, for instance, the declared aim has been a principled representation of the (human) linguistic faculty rather than the study of lists. In view of this, it seems appropriate to recall that some researchers have argued that the lexicon itself is not the primary focus of morphological, or word-formation, theories, especially if understood as a real-time object. Of course, the “real-time” lexicon (Di Sciullo and Williams's (1987) “psychological lexicon”) remains a legitimate object of inquiry, as witnessed by numerous psycholinguistic studies; but one cannot presume that list-based mechanisms of storage and retrieval are the basic mechanisms of the human “word-faculty.” Discussing this issue, Di Sciullo and Williams have suggested:

Morphology is more like syntax than heretofore thought. Both of course have lists – the list of primes, which are the words in syntax and the morphemes in morphology. In syntax there is of course no further list of “actual” versus “potential” phrases; the whole theory is about potential objects, though some are in fact actual (*How are you, kick the bucket*). In our view *morphology is a theory of potential objects in exactly the same sense*. (Di Sciullo and Williams 1987: 21; emphasis added)

Rephrasing this point of view, one can say that a generative theory of word structure is in the first place a theory of the human word-forming capacity. Obviously, this approach frees up the investigator to study principles that govern “the ability to create and understand new words” (Toman 1983: 6) rather than stick to superficial differences in the material nature of the data investigated.

## 2 The internal syntax of words

### 2.1 *Phrase structure morphology*

The insight that words can be broken down into constituents is probably as old as the study of words itself. For instance, in the descriptive practice of American structuralists of the 1940s and 1950s, immediate constituent analysis proceeded unimpeded right into words. A major step in the understanding of word structure in early word-syntactic theories has been the apparently trivial idea that word structure can be represented by means of phrase-structure rules. This “phrase structure morphology,” to use D. G. Miller’s (1993) term, stands in contrast to a number of studies characteristic of the classical Lexicalist period which attempted to make the so-called lexical rules radically dissimilar from those of syntax. Jackendoff (1975), for instance, developed so-called lexical redundancy rules that were supposed to work in a dual way to actively create new words and passively assess the cost of irregular formations in the lexicon. These rules were only minimally concerned with the internal structure of derived words. But Jackendoff himself nearly abandoned this approach as he was introducing it. In the conclusions to his 1975 article, in which he was arguing for lexical redundancy rules *sui generis*, he suggested that phrase structure rules are a perfectly viable alternative to morphological redundancy rules (Jackendoff 1975: 668).

A data domain in which this “tree”-oriented approach has been applied with notable success is compounding in languages such as English, German, and the like. Thus Selkirk discusses at length how context-free rewriting rules should be modified in order to generate English compounds. Following is one of the variants of her rules for English compounds (Selkirk 1982: 16):

- (1)
- |   |   |  |   |              |
|---|---|--|---|--------------|
| N | → | $\left\{ \begin{array}{c} \text{N} \\ \text{A} \\ \text{V} \\ \text{P} \end{array} \right\}$ | N | mill wheel   |
|   |   |  |   | smallpox     |
|   |   |  |   | rattle snake |
|   |   |  |   | overdose     |
|   |   |  |   |              |
| A | → | $\left\{ \begin{array}{c} \text{N} \\ \text{A} \\ \text{P} \end{array} \right\}$             | A | nationwide   |
|   |   |  |   | icy cold     |
|   |   |  |   | underripe    |
|   |   |  |   |              |
| V | → | P  | V | overdo       |

Leaving questions of detail aside, we note that this is a simple list of language-particular rules. Among other things, the list is so designed as not to generate structures such as [PP] or [VV]: that is, compound prepositions and compound verbs. This is accomplished by simply stipulating that the requisite rules are not included in the list. While this approach appears to be descriptively correct, a move to a principled analysis is not yet visible – the question of why the English compounding system shows the gaps it shows is not addressed.

Speculating about alternatives, we note that the flavor of arbitrariness inherent in such lists as (1) can be removed by allowing overgeneration and explaining the nonoccurring products by recourse to independent principles. In other words, rather than stating particular rules, we may generalize the above list of rules to a schema such as:

- (2)  $X \rightarrow YZ$

where  $X$ ,  $Y$ , and  $Z$  stand for category variables, and try to explain the non-occurrence of overgenerated forms by recourse to independently motivated principles. Some of such explanations will presumably be universal; some, however, will remain language-particular. We note, for instance, that in Slavic languages compounding is generally not very popular, yet certain subtypes are surprisingly productive. In other words, if a schema such as (2) is assumed for Slavic languages, the burden of explanation actually consists in explaining away the nonexistence of most of its outputs. Although this strategy is in principle straightforward, work of this type has in general been rare, and there is still little understanding even of such basic questions as why certain language types have very productive compounding systems, while others do not.

While word syntax may have benefited initially from thinking about word structure in terms of phrase-structure rules, major progress has consisted in an assimilation of phrase-structure rules for words to the general theory of phrasal architectonics generally known as X-bar theory. (The above suggestion to generalize a list of phrase-structure rules to a structural schema such as (2) is in fact a rudimentary attempt to apply X-bar theory to the structure of words.) A crucial element of X-bar theory is the principle according to which phrases are

either uniquely headed, or, perhaps in a special case (such as word-internal coordination – see below), have a level structure. An early version of the principle of headedness for English words (then labeled as a rule) is Williams's:

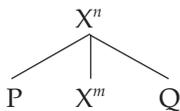
(3) Right-hand Head Rule (RHR)

In morphology we define the head of a morphologically complex word to be the right-hand member of that word. (E. Williams 1981b: 248)

The principle remains domain-specific, though, in that it holds only in morphological structures. One may argue, however, that the problem is just a matter of a historical coincidence, in that the Right-hand Head Rule merely reflects the state of research in syntax prevalent at the point it was proposed. Recall, among other things, that early variants of X-bar theory accepted ternary and higher branching. However, with an X-bar theory in place that permits binary branching only, one can in fact use the left–right distinction – that is, a positional definition of head – in both syntax and word syntax. Naturally, important questions remain: among others, whether binary branching is a primitive or a property to be explained. In the domain of maximal projections – that is, syntax proper – Kayne has suggested that binarity falls out from a principle that is independently needed to determine antecedent–anaphor relations uniquely (Unambiguous Path Principle, Kayne 1984). In word syntax, we may speculate, binarity might also be a consequence of higher-order principles which perhaps do not even have to be typologically comparable to principles like the Unambiguous Path Principle. Note, for instance, that a great number of derivational suffixes can be viewed as operators (functors) that operate on a single domain to form a (derived) single domain upon which another functor can operate. Thus the distinction operator/operans seems to imply binarity to start with.

Other definitions of headedness have been suggested in the word-syntax literature:

(4) In a word-internal configuration,



where X stands for a syntactic feature complex, and Q contains no category with the feature complex X,  $X^m$  is the head of  $X^n$ . (Selkirk 1982: 20)

This, too, is a domain-specific definition proposed largely under the “pressure of facts,” mainly the existence of particle verbs in English. Assuming *put up* to be a single unit, (3) identifies *up* as the head, implying that the whole unit is a particle. By contrast, (4) prevents this incorrect conclusion. But again, Selkirk's modification can be evaluated only vis-à-vis a particular analysis of particle verbs, not against unanalyzed facts. That *put up* is a simple word

structure is far from clear; for instance, if we accept the analysis of verb-particle combinations in terms of small clauses, the apparently simple verb-particle concatenation will receive a more complex analysis, and it is not clear whether a modification such as (4) will retain its force on an alternative analysis. At any rate, the modified version does not comply with the binarity principle, and seems to hard generalize beyond word syntax.

*2.1.1 Uniquely headed structures* Proceeding to other cases, we recall that Germanic compounding has proved to be particularly successful in demonstrating the headedness of words. Thus German *Winternacht* 'winter night', a compound based on *Winter* 'winter' and *Nacht* 'night', is right-headed. This is demonstrated by the fact that the head subconstituent determines the gender of the entire compound (see below for additional discussion). Accordingly, NP-internal concord shows feminine morphology, since it takes *Nacht* (feminine), not *Winter* (masculine), as a point of reference:

- |     |     |      |             |               |
|-----|-----|------|-------------|---------------|
| (5) | (a) | eine | stürmische  | Winternacht   |
|     |     | 'a   | stormy      | winter night' |
|     | (b) | *ein | stürmischer | Winternacht   |

Moreover, there is a semantic intuition that associates the head with a certain kind of reference. Under the set/subset perspective, a winter night is a kind of night rather than a kind of winter. This semantic intuition may not always be reliable, though, and thus cannot be the exclusive basis of a formal definition. For instance, the intuition as to whether the German derogative compound *Kommunistenschwein* 'Commie pig' denotes a subset of pigs is hazy – I would suggest, rather, the possibility that *Schwein* 'pig' is an epithet of sorts, and that the compound actually denotes a subset of Communists. But whatever semantic subtleties might be involved, morphological data reveal more. Taking NP-internal concord into consideration again, we observe that the adjective agrees in gender with the neuter noun *Schwein*, not with the masculine *Kommunist* in the following constructed examples:

- |     |     |             |               |                     |
|-----|-----|-------------|---------------|---------------------|
| (6) | (a) | ein         | häßliches     | Kommunistenschwein  |
|     |     | an (neuter) | ugly (neuter) | Commie-pig (neuter) |
|     | (b) | *ein        | häßlicher     | Kommunistenschwein  |
|     |     | an (masc.)  | ugly (masc.)  | Commie-pig (neuter) |

This is expected under the standard assumptions about headedness of German compounds.

Given the relative success of word syntax in the domain of compounding, it is not altogether surprising that among the strategies pursued in word syntax has been an assimilation of suffixal derivation to compounding. In general,

word-syntactic analyses regard what have traditionally been termed “derivational affixes” as bound tokens of parts of speech they in turn derive. Thus *-er* in German *Les-er* ‘reader’, *-ness* in English *empti-ness*, etc., are essentially interpreted as bound nouns occupying the head position of a complex noun. The reasoning is that it is these elements which provide the relevant morphological properties (Lieber’s (1992) categorial signature – see below) of the complex words they appear in. Thus in *Les-er*, the base is a verbal root, but the entire structure is a masculine noun; it is thus reasonable to conclude that the suffix apparently has the relevant nominal features – that is, that it acts as a noun.

While not differing from other, perhaps more prototypical, nouns in having the categorial label “noun”, derivational suffixes differ in other respects, though. For instance, their lexical entries include specific subcategorization frames:

- (7) *er*, [V<sup>0</sup> \_\_\_\_]N  
*ness*, [A<sup>0</sup> \_\_\_\_]N

Suffixes may in addition carry morphophonemic information: for example, about ablaut, accentuation, and other similar properties.

Early work in word syntax, such as Selkirk 1982, was hesitant about analyzing inflectional suffixes as heads. To be sure, the semantic intuitions about headedness discussed above in connection with compounds like *Winternacht* break down when forms such as *hous-es* or *(they) work-ed* are tested. Clearly, the absence of a natural intuition along set/subset lines in these cases is an interesting cognitive fact in and of itself. However, more recent generative studies of the role and structure of so-called functional categories have removed some of the barriers to regarding inflectional suffixes as heads. Staying with verbal forms, we note that they are derived by incorporating the verbal root into the functional head carrying inflectional features by so-called head-to-head movement. In this system (inspired by Pollock 1989) inflected words are thus created in syntax by movement. Outside generative grammar, however, the idea that inflectional formatives are heads remains controversial.

*2.1.2 Level structures (coordination)* It is interesting to note that besides the X-bar schema for uniquely headed structures (cf. (2)) the X-bar schema for coordinate structures is also instantiated in word-syntactic structures, although with severe restrictions (cf. Toman 1985). Turning to German again, we observe the following grammaticality judgments:

- (8) schwarz-weißer Hintergrund  
 ‘black-white background’

The meaning is that the background is black and white. Among the points to be explained is why only *and* readings are acceptable in such structures; coordinate compounds comparable to disjunctive or negated phrasal coordinations like *black or white*, *neither black nor white*, do not seem to exist.

Other questions arise also. Observing compounds such as:

- (9) Kind-Mutter-Beziehung  
'child-mother relationship'

note that the "coordinate subcompound" *Kind-Mutter* is distributable only in the nonhead position of the compound. In other words, the following form cannot appear as a freely distributable compound:

- (10) \*Mutter-Kind  
'mother-child' (on the attempted reading "mother and child")

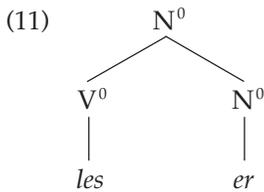
By contrast, such compounds are quite acceptable in languages such as Sanskrit and a number of contemporary languages of the Indian subcontinent (cf. Fabb, COMPOUNDING). It is not clear why languages show such restrictions.

### 3 Operations on base-generated word structure

Once we accept the idea that word structure can be related in a principled manner to the structure of phrases in general, it is natural to ask whether other principles of grammar apply to word structure, or whether word structure remains in some sense autonomous. Below, I will discuss three subtheories that shed some light on this issue. First, I will review word-syntactic literature on percolation, a mechanism claimed to be specific to word syntax. I will speculate on whether percolation could be understood as a general, domain-independent mechanism. Subsequently, I will discuss two subtheories of generative grammar, Case theory and Theta theory, both of which were designed independently of word syntax. I will be mostly interested in whether they also apply to word structure. The reader is referred to other sources for complementary information (D. G. Miller 1993, in particular, contains a discussion structured along similar lines to mine; Lieber 1992 discusses the validity of the theory of Binding in word syntax; and Spencer 1991 discusses questions of argument structure in complex words extensively).

#### 3.1 Percolation

Continuing the discussion of examples such as *Leser* 'reader' from a slightly different angle, we recall that in German the suffix *-er*, traditionally understood as a derivational affix, derives, among other things, agent nouns from deverbal bases (*Les<sub>v</sub>-er*, *Lehr<sub>v</sub>-er*). The products of this process are invariably masculine nouns belonging to the so-called strong declension. Positing the tree representation in (11):



and assuming the approach to suffixes discussed above, it is evident that the properties “masculine” and “strong declension” do not materialize on the mother node in an arbitrary manner. If agent noun spellout proceeded without reference to the suffix, there would be no principled reason why *Leser* could not be a feminine noun, for instance.

As gender and declension features are clearly associated with a particular suffix, one might account for their accessibility either by making them visible *in situ* (where corresponding rules of case affixation and agreement would check them) or by devising a mechanism that copies them on the mother node. The latter analysis implies that the whole word has morphological properties, including gender, while the former implies that this is technically not the case. In general, the traditional position that the entire complex word has morphological properties has been accepted in word syntax, and so-called percolation (or “inheritance”) mechanisms have been postulated that make the features of the head visible on the mother node. Lieber’s (1983) percolation conventions (first articulated in Lieber 1980) were an early attempt in this direction; Selkirk’s (1982) definition seems simpler, however:

(12) Percolation

- (a) If a head has a feature specification  $[\alpha F_i]$ ,  $\alpha \neq u$ , its mother node must be specified  $[\alpha F_i]$ , and vice versa.
- (b) If a nonhead has a feature specification  $[\beta F_i]$ , and the head has the feature specification  $[u F_i]$ , then the mother node must have the feature specification  $[\beta F_i]$ .

(Here,  $u$  stands for unspecified feature value.)

(Selkirk 1982: 76)

More recent discussions of percolation revolve, among other things, around the question of what properties can percolate in the first place. The problem has been explicitly addressed by Lieber (1992), who argues that not any feature can percolate. Lieber’s definition of percolation principles is based on Selkirk 1982, but introduces some subtle distinctions:

(13) (a) *Head percolation*

Morphosyntactic features are passed from a head morpheme to the node dominating the head. Head percolation propagates the categorial signature.

(b) *Backup percolation*

If the node dominating the head remains unmarked for a given feature after head percolation, then a value for that feature is percolated from an immediately dominated nonhead branch marked for that feature. Backup percolation propagates only values for unmarked features and is strictly local.

(Lieber 1992: 92)

Among the distinctions Lieber is introducing is the notion of “categorical signature”: that is, the set of morphosyntactic features that are allowed to percolate. Such feature sets are category- and language-specific:

(14) English nouns: [N, ± plural, ± I, ± II]  
(where I and II are person features)

(15) German nouns: [N, ± plural, ± case<sub>i</sub>, ± case<sub>j</sub>, ± fem., ± masc., ± I, ± II]  
(where the proper setting of case<sub>i</sub> and case<sub>j</sub> yields the four cases of the German case system)

(based on Lieber 1992: 90)

Lieber argues that diacritic features such as [±L], for “learned” (in French), or [±strong] (as applying to German verbs), are not eligible for percolation; she argues that all German verbs take the same set of past-tense endings, so the desinence is not selected according to whether the verb is weak or strong.

Evaluating percolation conventions and speculating about their status as principles, one may of course wonder whether head percolation mechanisms could not be dropped from word syntax as redundant, on the grounds that they restate a well-formedness condition needed independently in X-bar theory: the head-projection line is categorially uniform in both minimal and nonminimal projections – that is, in both word syntax and phrasal syntax.

Assuming that (12a), or its variant (13a), is dropped from word syntax, percolation from the nonhead branch will attract remaining attention, because no comparable phenomenon is known independently from X-bar theory. In fact, percolation from the nonhead branch is rare in word syntax as well: the best cases are certain types of denominal diminutives that seem to preserve properties such as gender and number of the base noun. This is so in certain cases in Russian (also discussed in Lieber 1992):

- |      |     |        |                |             |                     |
|------|-----|--------|----------------|-------------|---------------------|
| (16) | (a) | travá  | ‘grass’ (fem.) | diminutive: | tráv-ušk-a (fem.)   |
|      |     | pal’tó | ‘coat’ (neut.) |             | pal’t-íšk-o (neut.) |
|      |     | krýlo  | ‘wing’ (neut.) |             | krýl-yšk-o (neut.)  |
|      | (b) | šťaný  | ‘pants’ (pl.)  |             | šťan-íšk-i (pl.)    |

These words display a diminutive morpheme whose surface forms are *-ušk*, *-íšk*, and *-yšk*. On the face of it, the diminutive morpheme seems to be an

“interfix” that does not alter gender (16a) or inherent number (16b) of the noun from which the diminutive is formed; if this base noun is feminine, the product is also feminine; if it is neuter, the product is neuter.

One might thus take the position that we are dealing with diminutive suffixes which are “underspecified” for gender (and, in one example, number), and that these features must thus percolate under clause (12b). Although there is some degree of plausibility to such an approach, the scarcity of such instances is striking. Moreover, with clause (12a) eliminated, one might think about getting rid of clause (12b) also, thus simplifying word syntax considerably. Two lines of approach emerge: we either argue that percolation from the nonhead branch is only apparently unique to word syntax, or we re-analyze the cases under discussion so that eventually they do not require percolation from the left branch. Given the available data, it seems plausible to pursue the second approach and assume that the desinence itself is marked for gender. By this token, there is no necessity to supply the head with gender information.

### 3.2 Case assignment

The question of whether case morphology can appear word-internally, or, in generative terms, whether complex words are a proper domain of Case theory, is difficult both on the descriptive and the theoretical levels. In descriptive terms we observe that *bona fide* straightforward data are relatively scarce; and theoretical discussion has to come to grips with the fact that classical Case theory, outlined by Chomsky (1981), is constantly changing.

Word-internal case morphology is well attested in some languages. Sanskrit compounding is often cited:

- |      |     |      |                               |                      |
|------|-----|------|-------------------------------|----------------------|
| (17) | (a) | ACC  | ásva-m <sub>ACC</sub> -isti-  | ‘horse-desiring’     |
|      | (b) | INST | bhas-á <sub>INST</sub> -ketu- | ‘bright with light’  |
|      | (c) | DAT  | asm-é <sub>DAT</sub> -hita-   | ‘errand to us’       |
|      | (d) | GEN  | ray-ás <sub>GEN</sub> -káma-  | ‘desirous of wealth’ |
- (Examples from Miller 1993: 79)

Contemporary languages, both non-Indo-European, such as Finnish (Andrew Spencer, p.c.), and Indo-European, such as Czech, can be quoted also. Turning to Czech, we observe deverbal adjectives that incorporate a case-inflected noun in examples of the following kind:

- |      |     |     |                                 |   |
|------|-----|-----|---------------------------------|---|
| (18) | (a) | DAT | ohn-i <sub>DAT</sub> -vzdorný   | fire <sub>DAT</sub> -resistant                    |
|      | (b) | DAT | pravd-ě <sub>DAT</sub> -podobný | lit. truth <sub>DAT</sub> -similar, i.e. probable |
|      | (c) | GEN | duch-a <sub>GEN</sub> -plný     | lit. spirit <sub>GEN</sub> -full, i.e. witty      |
|      | (d) | GEN | boj-e <sub>GEN</sub> -schopný   | fight <sub>GEN</sub> -able, deployable            |

Finally, we also note German examples such as *Ich-Roman*, literally ‘I-novel’: that is, a novel written in the first person; *Wir-Gefühl*, literally ‘we-feeling’: that is, a sense of togetherness. In these cases, the intriguing part is the full form of the personal pronoun that appears fully inflected.

As regards these examples, the main difficulty is to assess clearly whether we are dealing with curiosities or with major patterns. The answer is to some extent easy in the German cases, which are perhaps best analyzed as instances of an incorporated citation form. As far as Sanskrit is concerned, it is my understanding that word-internally inflected forms represent a minor pattern. In other words, Sanskrit compounds typically do not have a case morpheme on the left-hand member (Miller 1993: 79). The Czech examples are similar in this respect, in that they do not represent a major pattern, and often have a literary ring. Assuming, then, that we are really dealing with nonproductive patterns, perhaps historical residues, the question arises as to whether word syntax as a theory of word competence is the appropriate theory to explain these data. I tend to believe it is not.

Recent generative theory rules out the case of word-internal structure as a matter of principle. Under the newer understanding of case, so-called structural cases are assigned under Specifier-Head Agreement by functional categories AgrS and AgrO. These in turn must be licensed by other functional elements such as tense or finiteness. In general, then, the question of word-internal case marking reduces to the question of the distribution of functional categories within words. Put another way, asking why compounds typically do not have word-internal case equals asking why there is no inflection in compounds with a verbal element in the nonhead position. Consider German again:

- (19) (a) Miet<sub>v</sub>-wagen ‘rent-car’, Schrumpf<sub>v</sub>-leber ‘shrink-liver’  
 (b) \*Miet-et-wagen, \*Schrumpf-t-leber

These are VN compounds – that is, compounds with a verbal root in the nonhead position – and the *-et*, *-t* affixes in (19b) are attempts to add third-person singular inflections.

Again, assuming that the distribution of finite verbal desinence (cf. *-t*, *-et*) is normally licensed by functional nodes, we see that no such licenser is available word-internally. In other words, in order to be grammatical, the compounds under discussion would contain whole clauses. But this seems generally impossible, primarily on the ground that clauses are semantic objects whose denotation (the truth-value) cannot be incorporated word-internally.

### 3.3 Operations on argument structure

There is an intuition going back to the ancient Indian grammarians that what we call thematic roles can be assigned inside compounds. Although there is

no general consensus about the nature and actual importance of such entities as theta-roles in a generative model that is primarily based on tree geometry, this old intuition has by and large carried over into word syntax. All major studies of word syntax assume Theta theory, a set of component-independent principles, and apply it to words by showing that, and how, constituents of words saturate theta-grids (or, alternatively, argument structure) of theta-assigners – that is, mostly of verbs and adjectives. Virtually all principles of theta-role satisfaction maintain that there is a distinction between Theta-roles as regards their saturability in compounds. Much of the pertinent discussion is actually embedded in the discussion of argumenthood. For Selkirk the dividing line falls between the SUBJECT/non-SUBJECT function:

- (20) All non-SUBJ arguments of a lexical category  $X_i$  must be satisfied within the first order projection of  $X_i$ . (Selkirk 1982: 37)

where first-order projection means ‘within the compound’ for the purposes of word syntax. This then accounts for such differences as:

- (21) (a) trash removal by specialists  
 (b) \*specialist-removal of trash  
 (c) \*Girl-swimming is common.

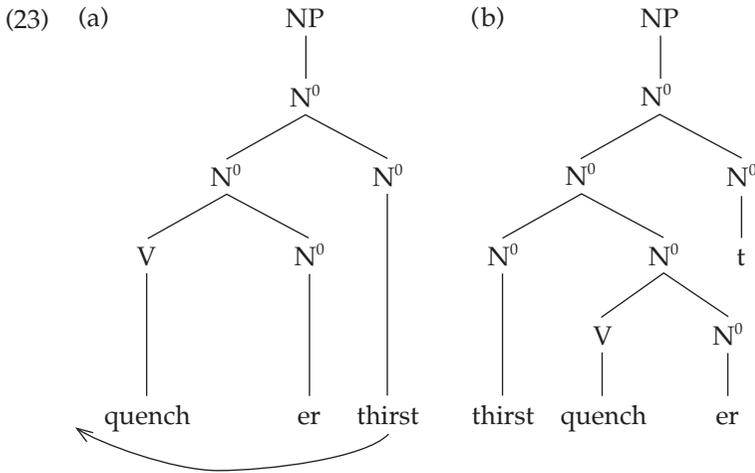
Spencer (1991: 328) is correct, though, in glossing (20) as the use of “brute force.” In view of this, E. Williams’s system represents a more principled account, in that it argues that the external argument must not be realized within a compound, since it can be licensed only through predication, a relation that is not available word-internally.

German VN compounds merit some attention in this connection. Note that this rather productive pattern seems to involve theta-roles assigned from the nonhead position to the right, whereby recipients seem to be both internal (22a) and external arguments (22b):

- (22) (a) Mietwagen            *rent-car*, i.e. ‘rented car’  
           Rührei                *stir-egg*, i.e. ‘scrambled eggs’  
           Hackfleisch        *chop-meat*, i.e. ‘minced meat’  
 (b) Sprechvogel        *speak-bird*, i.e. ‘talking bird’  
           Schrumpfleber    *shrink-liver*, i.e. ‘shrinking liver’  
           Kriechtier            *creep-animal*, i.e. ‘reptile’

Clearly, a number of problems remain. (22b) seems to point to the occurrence of external arguments compound-internally. A possible explanation would consist in analyzing the supposedly external arguments as unaccusative – that is, internal arguments. Unfortunately, *Sprechvogel* defies this analysis (cf. Boase-Beier and Toman 1986 for further discussion).

Continuing the discussion of theta-satisfaction, we note that nontransformational analyses in this domain have been the rule. Some researchers, however, resort to movement in certain cases. For instance, Lieber (1992) derives verbal compounds such as *thirst-quencher* by movement:



(23a) is the input structure, (23b) the derived structure (adapted from Lieber 1992: 60).

Among the reasons for this analysis is the fact that in verbal compounds of this type the “logical” object precedes the verb, whereas it follows the verb in clausal syntax: that is, (something) quenches thirst. The reason for the clausal distribution of direct objects is assumed to be directionality of case assignment (to the right) and directionality of theta-role assignment (likewise to the right). Clearly, theta-assignment to the right cannot proceed in English compounds under these premises, because the receiving nominal is to the left of the verb (but it would actually be possible in corresponding German forms). Thus the underlying structure (23a) is posited in which the theta-role can be assigned to the right, and the eventual linear order is established by movement (incorporation) – cf. (23b).

The justification for this account does not seem strong, though, mainly because the validity of the premise that theta-role assignment is directional has never been demonstrated. Moreover, the movement is an instance of lowering, a somewhat problematic analysis in view of the fact that traces of lowered material are not c-commanded properly. If we conceive of theta-role assignment as nondirectional, both NV and V NP structures follow naturally: in the former case N receives its theta-role *in situ*, since nothing prevents the theta-assigner from seeking a left-hand recipient; in the latter case, the nondirectionality of theta-role assignment makes it possible to assign the role both to the right and to the left, yielding something like (24):

- (24) (a) (something) quenches thirst  
 (b) \*(something) thirst quenches

but directionality of case assignment, or an equivalent syntactic principle, is sufficient to take care of this: case can be assigned in (24a), but not in (24b).

## 4 Concluding remarks

As stated at the outset, this survey has been geared towards a discussion, rather than a monolithic statement about a particular doctrine. Given the close dependence of development in word syntax on developments and often radical changes in its “mother theory” – the theory of generative grammar – we can not expect to be able to provide the last word on the subject. Nonetheless, the range of questions and strategies within word syntax, and a certain consensus about them, do exist. Among questions agreed upon is that it is meaningful and theoretically legitimate to discuss the question of whether general principles of grammar hold in word structures. One of the superficial effects of this approach to morphology is that morphology now looks very much like syntax. In some ways this is hardly surprising, since the word-syntactic approach focuses precisely on those aspects of word structure that are not concerned with sound shape. Morphophonemic rules (such as *k/š* alternation in English *logic/logician*) are not assumed to be part of word syntax. On closer inspection, however, we are not obliged to regard morphology as being completely assimilated into syntax. Note that the application of the principles of X-bar theory, theta theory (or a comparable theory of argument saturation), and other sub-theories of generative grammar to the domain of complex words means simply that we have created a single domain in which those particular principles hold. It does not necessarily imply that only syntactic principles apply in the domain of morphology.

Clearly, a number of conceptual and empirical problems remain. To conclude, consider so-called atomicity (Di Sciullo and Williams 1987), a property meant to characterize  $X^0$  structures – that is, words. Words enter syntax as sealed-off “atoms” in the sense that some of their properties, such as their internal structure, are invisible, and hence inaccessible in syntax. Thus Di Sciullo and Williams argue that compounds, although superficially “more phrasal” than words formed by affixation are just as wordlike as affixed forms – for instance, both are islands with respect to Wh-movement, an uncontroversially syntactic phenomenon, as seen in (25) (Di Sciullo and Williams 1987: 52):

- (25) (a) \*[How complete-ness] do you admire?  
 (b) \*The who-killer did the police catch?

The unanalyzability of words in syntax has often been stressed in the literature, yet there are counterexamples which come to mind as well. Consider,

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for instance, the kind of coordination illustrated in the German examples (26) (Toman 1986: 424):

- (26) (a) Luft- und Wasserverschmutzung  
'air- and water-pollution'
- (b) Wiederaufnahme der Inlands- und des größten Teils der Auslandsflüge  
'resumption of domestic, and of the larger part of international, flights'
- (c) rote Seide- und blaue Wollstoffe  
'red silk and blue cotton fabrics'

While we might argue that cases such as (26a) are base-generated coordinations, which could thus be accounted for by an extension of the coordination schema to the  $X^0$  domain, examples such as (26b) point to the transparency of words – there must be some process that “sees” the internal structure of compounds.

Di Sciullo and Williams (1987) stress that the atomicity of words is a property to be explained – an *explicandum* rather than an *explicans*. But if atomicity is not a primitive property of words, ample space remains for rethinking the property, and thus the relationship between phrase syntax and word syntax. This, again, illustrates the challenges a word-syntactician must live with. But the benefits of this challenge clearly outweigh its day-to-day frustrations.