A second attack on constituency: a reply to Dahl

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Abstract

In order to counter Dahl's objections I introduce more theoretical background on 'panlexicalism', the model of language which I presupposed in the earlier article. With this background I am able to dispose of some of his objections, at least to my satisfaction: those concerned with idioms, with nouns that refer, and (perhaps) with multiple modifiers. However I accept his arguments about coordinate structures, so my claim must now be rephrased: the only phenomenon for which units larger than words need be recognized by postulating 'higher nodes' is coordination. I add an appendix containing a revised definition of dependency, which requires modifiers to fill optional slots in the structure of their heads.

1. Introduction

In Hudson (1980a) I put the case for dependency representations and against constituency representations as strongly as I could, since it is widely assumed that the need for constituency is self-evident. I felt that if I put the contrary case the effect might be to encourage other linguists to sharpen up the reasons why they believe that structural analyses of sentences should be based on the part:whole relations shown in phrase-markers (for instance). This could only be beneficial to the development of linguistic theory, whichever point of view turned out in the end to be right, after all the arguments had been presented. I was therefore gratified to see the reply by Östen Dahl (1980) in which he argues that there is in fact a place for constituent-structure analyses even if dependency relations are treated as basic. He makes some valuable points and raises some apparently tricky problems for the kind of 'dependency-only' approach I advocated, and in this reply I shall try to defend this approach against his criticisms. I must admit at the outset, however, that I shall have to concede...
the need for constituent-structure at least in the case of coordinate structures (section 5).

I particularly welcome the introduction to Dahl's paper in which he defines the issue very clearly: what is at issue is whether or not we need 'higher nodes' (i.e. representations of strings of words taken as a single unit, in addition to the representations of the individual words in the string). There is no disagreement about the existence of grouping-relations among the words in a sentence, such that some words belong together more closely than others do, nor about the need to show such groupings in the structural analysis of a sentence. The disagreement is about HOW to show them. My position is that they will be shown adequately if we show how the individual words depend on one another, in the sense that a word and the words that depend on it may be considered to constitute a 'group' in the intended sense. Dahl's position is that, although we need to show such dependency relations, they will not be sufficient to show all the groupings of words, and to make the analysis complete we need to postulate higher nodes, with properties different from those of their parts.

One thing that emerges from Dahl's paper is that my paper had probably taken the argument about as far as it could be taken in a (relative) theoretical vacuum. His objections take the form: 'You say that you can do without constituent structure, but what about phenomenon X — in standard treatments of X constituent structure plays a crucial role, and I don't see how dependency analysis will make it unnecessary'. In order to justify my claim that constituent-structure is not necessary, I must explain more of the other assumptions that I am making about grammatical theory than I did in the first paper. This is the task of the next section.

2. Some theoretical assumptions

I assume that the grammar consists of three parts. The bulk of the information is in a list of normalized structures, which mostly correspond to individual lexical items but may also represent syntactic constructions and whole word-classes. I have called this list the 'panlexicon', for obvious reasons (1979). The other two parts of the grammar are performance rules for using the panlexicon. First, there is a set of what I call 'operating instructions', for putting different entries from the panlexicon together in sentences — how to combine information about particular words with information about general constructions, what types of deviation are allowed from the normalized contents of entries, and so on. The other performance rules are perhaps not too clearly distinct from the first type,
since they too allow deviations from the lexical norm, but their main function is to allow for the creation of new entries, so I call them 'word-formation rules'. We shall not need to consider word-formation rules in this paper, but we shall have more to say both about the panlexicon and about the operating instructions.

An entry for a particular lexical item in the panlexicon is a structure combining phonological, syntactic and semantic information. In the entry for a noun, this information will (typically) all be specific — a specific meaning, and a specific pronunciation, that is — but this specific information will be located in labelled 'slots', such as 'predicate' or 'root'. The following is an example:

(1) predicate: 'Hat'
   class: noun
   root: /æt/

(Failing a satisfactory representation for the meaning of hat, and other words to which I shall refer in this article, I shall show the meaning of a word by putting the orthographic form of the word, with a capital letter, between quotes.) The labelled slots allow generalizations to be made across lexical items — for example, a general entry for nouns as a whole will be able to relate the singular/plural distinction to the presence or absence of a sibilant after the root, and will be able to refer to the root as such in doing so since all nouns will have their pronunciation entered in the slot labelled ‘root’.

Not all the information in a lexical entry need be specific, however. In particular, valency information is typically given in terms of variables — types of word which are allowed to depend on the word in question as its modifiers, and which may be defined either syntactically (e.g. 'accusative noun' or 'infinitive') or semantically (e.g. 'locative'). These variables may also be thought of as labelled slots, but they will not be filled by specific entries as far as the entry in the panlexicon is concerned. The specific fillers for the slots must be found in the sentence (or context) in which the word is used on a particular occasion. A fundamental distinction is made between semantic slots and syntactic slots, in their relation to the rest of the lexical entry. Semantic slots are unordered relative to the 'main' slot, that for the predicate, whereas syntactic slots are at least shown as separate words and may (in some but not all cases) be positioned on one side of the main syntactic slot. (See Hudson, 1980b for a justification of some ordering of syntactic slots.) In English, the syntactic object of a verb is shown as a noun-slot following the verb, whereas the semantic element which the object helps to define is shown as a semantic slot directly underneath the 'predicate' slot. The syntactic and semantic slots are related by a
specification against the semantic slot of the particular syntactic modifier which helps fill it. (2) is an entry for a verb, \textit{like}.

(2) predicate: \textquote{Like}
experience: = subject
phenomenon: /|— noun
class: verb noun
root: /laik/

In this entry, \textquote{phenomenon/|— noun} means \textquote{the filler for the semantic slot \textquote{phenomenon} is the referent of the noun following the verb — i.e. of the syntactic object}. The semantic \textquote{experiencer} slot, on the other hand, is not given a syntactically defined filler, but rather is said to have the same filler as another semantic slot, the one labelled \textquote{subject}, which in turn has its filler defined semantically but in an entry for verbs in general. (For the justification for treating \textquote{subject} as a semantic slot and further details, see Hudson, 1980c.)

In addition to the entries for particular nouns and verbs, like those in (1) and (2), there are general entries for the word-classes noun and verb (and similarly for other word-classes). These general entries specify information which applies equally to all members of the class. For example, the one for nouns includes the slots which are obligatory for all nouns, which I assume will include a slot for some kind of index to show the noun's referent, and other slots for definiteness, number and other general semantic properties (plus, where relevant, their morphological reflexes). The general entry for nouns must also allow an indefinite number of \textit{ad hoc} properties to be added to its inherent set by adjectives and relative clauses. (We shall leave open the question of how this is to be done.) Similarly, the entry for verbs in general will specify that there must be a semantic slot \textquote{subject}, and will say how this is to be filled, but will also allow a large number of other semantic slots to be included in the semantic structure, such as \textquote{cause}, \textquote{time} and so on. These general entries in the panlexicon are similar in form to the specific entries for lexical items, the difference between them being in the distribution of information. In a lexical item's entry, the slots \textquote{predicate} and \textquote{root} are filled (with a meaning and a pronunciation respectively), whereas general entries have these two slots empty. We may take (3) as an example of a general entry.

(3) predicate: (inherent)
referent: X
number: Y
class: noun
root: (inherent)
(In this entry, X and Y stand for a complex of information on how to establish the referent and the number of a noun on a particular occasion; they may be thought of as 'triggers' for particular operating instructions. It should be clear that in other respects too (3) is incomplete as a general entry for nouns.)

Examples (1) to (3) are entries in the panlexicon — i.e. part of a grammar. It is simple to see how they can be used for generating structures for sentences. Each word in the sentence is given a structure made up partly out of the entry for that particular word, and partly out of the general entry for its word-class. For instance, when the word hat occurs in a sentence, it has a structure consisting of (1) and (3) combined:

(4) predicate: 'Hat'
    referent: X
    number: Y
    class: noun
    root: /hæt/

Moreover, in a particular sentence some of the unfilled slots will be able to be filled (such as the number slot in (4)), and for a particular utterance of a particular sentence the remaining unfilled slots can be filled (e.g. the referent slot, showing which particular object, if any, is being referred to).

With this much theoretical background we can now return to the main question, about the need for constituent structure. The question is whether or not we need 'higher nodes' in sentence structure; in other words, do we need any more structure than that which is allowed for by the structures for the individual words in the sentence? My claim in the paper to which Dahl is replying was that we do not, and I was able to make this claim with some confidence because I was assuming a theoretical framework like the one I have just described. However, it should be clear by now that this framework in fact blurs the issue somewhat, since it assigns to head-words many of the properties which in other frameworks might be assigned to higher nodes, such as the referent or definiteness of a noun(-phrase). To avoid accusations of cheating, I should like to point out two things. One is that this approach only works to the extent that it is possible to identify a head-word in every word-group, so that the properties of the whole group can be assigned to the head-word's structure. It is an empirical matter whether we can find justification, for instance, for assigning the referent to the noun (rather than, say, to the determiner). The other point is that I cannot be cheating very effectively, even if I am cheating, since there is one game at which I lose, namely the coordinate structure game.
3. Idioms

We now turn to the first of Dahl's specific objections. He points out that idioms such as red tape and hot potato must be listed in the panlexicon, 'which means that there is at least one respect in which groups of words exist as entities in their own right'. I accept completely the claim that idioms must be included in the panlexicon, along with the single words (indeed, I insist on this in a number of unpublished papers, such as Hudson, 1979); it was an oversimplification when I said that the panlexicon 'refers only to words'. What I should have said was 'although the panlexicon refers only to words, the entries in it may refer to more than one word at a time'. We have already seen an example of this in the entry for like, which refers to the noun following like as well as to this verb itself. In this case the noun is referred to simply as a noun (with its attendant modifiers, of course), but it can easily be specified as a particular word, simply by supplying phonological information about it. This possibility is exploited for dealing with idiomatic verb-object combinations, but more generally idioms can be treated as a head with a phonologically specified modifier. Another defining characteristic of idioms is that their meaning is not a function of the meanings of their parts, as it is in their literal interpretations. This means that the meaning of the whole idiom must be shown in the lexicon, but there is no reason (that I can see, at any rate) why this meaning should not be assigned to the head word, just as the literal meaning would be. If this conclusion is correct, then idioms do not show that we need higher nodes — all they show is that we need to treat at least some groups of words as complex lexical entries, which is a very different claim.

To show how this type of analysis would work, let us consider first a non-idiomatic example, related to the example red tape which Dahl mentions. I assume that one interpretation of the word bureaucracy may be paraphrased by the expression administrative procedures, so the two expressions should have the same semantic structure (ignoring problems of number). If this is so, the similar semantic structure will be shown on the head noun procedures, according to the theory sketched above, but it will be put there by the general rules for constructing sentences (the 'operating instructions'), using the separate lexical entries for administrative and procedure(s), and will not be shown in a separate lexical entry for the whole phrase. (At least, it need not be shown in one, though it is of course possible that the phrase will be memorized and stored by some individuals.) This establishes the principle of a phrase with its combined meaning located in the structure for the head word. We now turn to Dahl's example, red tape. I assume that this too has the meaning shared by
bureaucracy and administrative procedures, but there is now no objection to locating this meaning in the structure for the head word, tape, by analogy with the analysis of administrative procedures. The difference between administrative procedures and red tape is just in the way in which this bit of the semantic structure got located in the head word, and in the fact that no meaning is assigned at all to the modifier red. The entry in the panlexicon for red tape would thus be roughly as in (5).

(5) ^predicate: 'Administrative procedures'  
   class: adjective  class: noun  
   root: /red/  root: /teip/  

It is worth pointing out, incidentally, that if we DID take idioms as evidence for constituency, the results would sometimes be problematic. For example, many linguists nowadays do not accept a 'verb-phrase' constituent, but rather treat peripheral adverbials (e.g. time and cause adverbials) as sisters of the verb along with its objects and so on. The fact is, however, that idioms tend not to involve such elements, so this criterion would push linguists to recognize a constituent consisting just of a verb and its objects in spite of their other reasons for not recognizing a VP node (such as the problem of languages in which the verb and its objects are typically not adjacent, as with VSO languages). Worse still, there are idioms like pull X's leg where the strictly idiomatic bit would not be a constituent by anybody's analysis (in this case, verb + 's + noun).

4. Do nouns refer?

Another of Dahl's objections is that 'it is from the start rather suspect to attribute reference to a noun rather than to a noun phrase', though to be fair he does not cite this as a principal objection. I do not see any problem in assigning referents to nouns, given the framework outlined above, though I agree entirely that it would be wrong to do so in a constituency-based approach. The main problem for such an approach would be that a lot of important information needed for finding the referent is given in the determiner rather than the noun itself. Consequently the principle of compositionality would demand that the referent be assigned to the lowest node dominating both the noun and its determiner, which is the NP node. For my approach, however, the equivalent of the principle of compositionality is the principle that modifiers contribute to the filling of slots in the structures of their heads; so there is no difficulty in taking account of the determiner (a modifier of the noun) in filling the 'referent' slot in the noun's own structure. For example, in (4) we saw that the structure for hat
contains a slot for its referent, which would be filled by means of rules which could take account of the determiner (and other factors).

It would be fair to ask what justification there is for including the 'referent' slot in the head-noun's structure in the first place. One part of the answer is that this is the most obvious word to have the slot — the only other candidate is the determiner, but this is often absent so we should then have to justify postulating an 'underlying' determiner as a bearer of the referent-slot. Another part of the answer is that proper nouns must (I assume, controversially) be shown in the lexicon with some information already attached to them regarding their referent (either a particular referent-index, or at least the information that a particular index should be attachable when the word is used in an utterance). If such nouns need a referent slot, then there is no problem in generalizing to nouns as a whole. Furthermore, pronouns can be considered as nouns with partially filled referent slots (at least in the case of definite pronouns), and again the same argument applies. Finally, there are languages in which the definiteness of a 'noun-phrase' is determined by elements outside that phrase — for instance, in Swahili an object phrase is shown as definite by means of a clitic attached to the verb, and the absence of such a clitic shows that the object is indefinite. In such cases, the principle of compositionality falls down, since the referential part of the meaning of the noun-phrase is not a function of the meanings of its parts. Consequently, the reference might just as well be assigned to the noun head as to a postulated noun-phrase node.

5. Coordinate structures

One of the two most serious objections made by Dahl concerns coordinate structures, and in particular conjoined noun-phrases. (I shall use the term 'noun-phrase' informally, to refer to a noun and its modifiers; I hope this will not give the impression that I am bringing constituent-structure in again through the back door, as it is simply a matter of terminological convenience.) He points out that if there are no units in syntax larger than single words, there is no way in which a coordinated string of noun-phrases may be treated as a single unit, on a par with a single noun-phrase, whereas it is quite clear that in every respect coordinated noun-phrases parallel single noun-phrases as far as their relations to the rest of the sentence are concerned. For instance, *my mother and my father* is indistinguishable from *my parents* in its syntactic distribution, and also in its meaning and reference (ignoring non-typical cases where a child somehow acquires extra parents). (This is my example, not Dahl's.) Dahl
points out that the similarity between single and conjoined noun-phrases has consequences for quite superficial matters of concord (such as English subject-verb concord) as well as for semantic interpretation. I find it hard to argue against this objection, and indeed I have myself argued for the close parallel between conjoined and single noun-phrases (Hudson, 1970). I accept then that, at least as far as coordinated noun-phrases are concerned, there must be a higher node dominating the conjuncts. (We can leave open the question whether the same is true of coordinated strings of clauses; I think it probably is, but the main point here is to admit that there is at least one clear case of higher nodes being needed.)

Moreover, I can add an argument to the one Dahl gave in favour of a constituent-structure treatment of coordinate structures. This rests on the ambiguity of strings like John and Bill or Harry, between ‘(1 and 2) or 3’ and ‘1 and (2 or 3)’. In such cases it is clear that a pair of coordinated phrases needs to be treated as a single unit at least in the semantics, in order to allow it in turn to be coordinated with another phrase. The reason why there is no way of doing without constituent structure in cases such as this (and also in all the other coordinate structures we might consider) is obvious: there is no head-word in a coordinate structure, whereas our treatment of the other cases raised by Dahl has rested heavily on treating the head-word as the bearer of the information which might otherwise be located on a higher node.

It is interesting to note that Tesnière himself recognized coordination as a special kind of relation which could not be subsumed under his notion of dependency (1959: 80), though he failed to arrive at a consistent treatment of coordination, since he recognized some coordinate structures as single units (80) but not others (339). It is therefore especially inexcusable for me to have overlooked coordination in my earlier paper.

What conclusion should we draw about the general discussion of constituent-structure? One possibility would be to say that we now have evidence that constituent-structure is necessary, so we shall recognize it in all the cases where it has been recognized in the past — noun-phrases, verb-phrases and so on should thus be represented by higher nodes. However, I don’t think this conclusion is justified yet, since coordinate structures are generally recognized to be different from other kinds of structure, so we should not generalize from one to the other. It might even be the case that the need for constituent-structure is one of the defining characteristics of coordinate structures, in contrast with non-coordinate structures, in which case it would obviously be wrong to generalize across the two types of construction. My view is that we should accept that coordinate structures need constituency, but demand similarly cogent arguments before recognizing constituency in other structures.
How does coordination fit into the framework outlined above? Without going into details, I can show that it does not raise any great problems of principle. The essence of the analysis is to have an operating-instruction which is sensitive to coordinate structures and which creates a new node dominating all the conjuncts. (The general theory will have to specify under what circumstances higher nodes may be created, of course, otherwise we shall lose one of the advantages of the approach I have been advocating, namely that it restricts the class of possible grammars to those which have no constituent-structure.) This node is a copy of the structure on each of the conjuncts, so the latter must be similar to each other in at least some respects, but there are some slots which are differently filled. Most obviously, in the case of a coordinated string of noun-phrases, the referent slot for the higher node must be filled by the conjunction of the fillers for the individual noun-phrases' referent slots (or by the disjunction of them if the coordinating conjunction is or). Similarly, the number slot must be adjusted in its filler to take account of the combined numbers of the conjuncts, and the whole 'root' slot must be replaced by a slot containing the phonological realizations of the individual noun-phrases. (In this way the analysis will show the part:whole relation between the conjuncts and the whole structure.) Since the higher node is created by means of an operating instruction, and we have not (yet) imposed any constraints on what operating instructions may do, there is no difficulty in principle in effecting these rather straightforward changes. As a matter of notation we can use a box to bring together the whole construction, as in the simple example in (6).

(6)

| predicate: ? | pred.: 'Hat' | pred.: 'Coat' |
| referent: {a, b} | ref.: a | ref.: b |
| identifiability: indefinite | ident.: indef. | ident.: indef. |
| number: plural | no.: singular | no.: singular |
| class: noun | class: noun | class: noun |
| root: /a/ | root: /hæt/ | root: /æ/ |
| root: /æ/ | root: /æn/ | root: /kout/ |

It will be seen that several loose ends have been left dangling in the structure above — for instance, how should the conjunction and be
related, if at all, by dependency relations to the conjuncts? The important thing is that some kind of constituency analysis both must and can be generated by the grammar for at least some kinds of coordinate structure. As already mentioned, this concession considerably weakens the theory unless we can find general constraints on the use of constituent-structure, but it is not hard to come up with plausible hypotheses for testing. One is that only COORDINATE structures may involve higher nodes, but another is less restrictive: that only ENDOCENTRIC constructions may involve higher nodes. Coordinate structures are of course one type of endocentric construction, since the properties of the whole are similar to those of each of the conjuncts, but there are also subordinating endocentric constructions such as the adjective + noun structure, where the whole is similar only to one of its parts, the head. We shall consider in the next section whether there is any evidence for higher nodes on non-coordinate endocentric constructions, in order to decide between these two hypotheses. At this point, however, we can already note that if we can accept either of these hypotheses we have considerably limited the type of structure for which linguistic theory needs to allow, since WE CAN RULE OUT HIGHER NODES FOR EXOCENTRIC CONSTRUCTIONS, such as noun-phrases and verb-phrases. (It is easy to see that such constructions are exocentric, since there is no process which can apply recursively to create larger and larger instances of the same structure; for instance, once you have added a determiner to a noun, you have a structure which cannot be another noun since it cannot have another determiner added to it.)

6. Multiple modifiers

Dahl's other serious objection to my proposals was that a sequence of a head and one of its modifiers sometimes needs to be treated as a single unit in order to allow this unit in turn to have another modifier. For example, an ordinary French house means something which is ordinary for a French house, not just something which is a house, ordinary and French. Consequently, as Dahl points out, we must be able to identify French house, to the exclusion of ordinary, as a unit at least in the semantics. But if we recognize only single words as units how can we do this? Admittedly the head-word may be used as a gathering-point for all the properties of its modifiers in the way I have assumed so far, but this still does not help since house is the head-word for ordinary as well as for French, so there will apparently be no sense in which French house is treated as a unit which can then be modified by ordinary. On the other hand, we also need to recognize that it is sometimes right to allow two modifiers to have the
same head, so we cannot make the semantic interpretation follow in some mechanical way from the relative nearness of the modifiers to their head, such that the nearest modifier always forms a unit with the head to which the further modifier is always applied. For instance, a *small French house* allows two interpretations: either it means a house which is small (for a house) and French (two modifiers on the same footing) or it means a French house which is small for a French house (one modifier of a group formed by the other modifier plus the head). If these arguments are valid, then we must recognize a higher node combining a head and a modifier, which may then be modified by another modifier.

It is much less clear to me whether this conclusion is right than it was in the case of coordinate structures. For a coordinate structure, it is clear that the whole structure needs to be represented as a unit, as there is no single existing node to which this representation could be attached. In the cases we are discussing now, however, this is not so: there is the node for the head-word, and it is at least conceivable that a way could be found for analysing the head word in such a way that a distinction can be made between the two modifiers. One possibility which comes to mind, for example, is that we might refer to the *order* in which the modifiers are applied to the head, recognizing the fact that in a processing model the analysis of a sentence must be arranged chronologically. Thus, *French* would be applied to *house* before *ordinary* is, on the principle of ‘nearest first’, so the unit *French house* would in fact be available for *ordinary* to apply to. It could be objected that this is tantamount to recognizing a higher node, since the structure on *house* is different before and after *French* has been applied to it; but this does not prove that we have a ‘higher node’ after applying *French*, because we already allow a structure to change without recognizing higher nodes. For instance, there is a structure for *house* in the panlexicon, which is combined in sentence structure with the structure for ‘noun’ (see the progression from (1) and (3) to (4)), and which has various slots filled in to take account of the particular sentence and utterance in which it occurs — all without turning into anything which need be recognized as a ‘higher node’. Thus the addition of the predicate of *French* to that of *house* would be simply one step in this general progression from the incomplete lexical structure to the complete contextualised structure, and the application of *ordinary* to this complex predicate would be the next step in the process.

Similarly, the two interpretations of *small French house* could be achieved by allowing different ways of applying modifiers: either in the way just described, applying the nearest modifier first, or applying all modifiers together (or, presumably, any combination of these two approaches). In terms of processing, then, one interpretation would follow
the order outlined for *ordinary French house* above, while the other would apply both *small* and *French* to *house* at the same time, which means that *small* would be taken to mean 'small for a house', rather than 'small for a French house'.

One possible objection to this proposal is that it is tied too closely to the modelling of perception and production processes in time, and does not allow one to produce a static sentence structure, as a diagram, which makes the required distinctions. However, I am not sure that the assumption on which this objection is based is a valid one: it may well be that by applying the modifiers in different ways we actually end up with different analyses of sentence structure. Take the example of *small French house* again. It seems reasonable to assume that the meaning of *small* is quite complex, and requires reference to some standard against which size is measured — some kind of prototype, in fact. If this prototype is included in the meaning of *small*, as a variable slot to be filled by an appropriate prototype to suit the linguistic and non-linguistic context, then it will show whether the standard of comparison is just *house* (or rather, the prototype of a house) or *French house* (i.e. the prototype of a French house). This can easily be done without relying on the internal structure of the noun-phrase itself, by giving a separate specification of the prototype, so it would not require any bracketing of *French* with *house*. (More generally, it is easy to show that it is wrong to try to tie the standard of comparison to some linguistically identified prototype, since the relevant prototype need not be identified linguistically: cf. *She is small* referring to a baby or an adult, or even *She is a small girl* referring to a two-year old and a twelve-year old.)

I realise that there are major issues on which further discussion and argumentation are needed in connection with this proposal, but tentatively I conclude that higher nodes are not needed for modifier + head combinations. If this conclusion is right, it supports the more restrictive of our two hypotheses advanced in the last section: that higher nodes are needed only in the case of coordinate structures, and not for endocentric constructions in general.

7. Conclusions

I have now considered all but one of the objections that Dahl raises to my arguments against higher nodes. The one I have not yet faced is the first in his paper: that I provide no justification for my sweeping dismissal of constituent structure (specifically, the proposition and the term) in semantics. It is quite true that such a claim ought to have had some
supporting arguments, but what I was really trying to say was that (so far as I know) there is no established body of arguments for constituent structure and against dependency structure in the literature on semantic structure. It is true that 'most explicit proposals for how the semantic interpretation of utterances interacts with their grammatical structure are based on the compositionality principle', but that is not the same thing as saying that the alternative of dependency structures had been considered and rejected for reasons which I should have taken into account. On the other hand, it would be naïve to think that this was sufficient justification for my dismissal of the orthodox position. With hindsight, I should like to have written something like the following: 'An argument for higher nodes in syntax on the basis of higher nodes in the related semantic structures is no stronger than the arguments for higher nodes in semantics, but since we have no such arguments to counter, we may ignore any such possible justification for higher nodes in syntax too'.

What I think has emerged from the debate so far is that higher nodes are in fact needed for coordinate structures of at least some types, and possibly for all coordinate structures, but that otherwise they are not necessary. This means that the longest non-coordinate element to which syntax needs to refer is the word, though more or less complex patterns of words (constructions) are included in the panlexicon. Since syntax and semantics are kept very closely in step in this model, the implication is that semantic units will not be longer than words (except in the case of coordination) either, but in semantics the notion of 'length' is derivative, being based on the length of the overt realizations of the semantic elements concerned. How all this applies to phonology is not clear, but it is clear what is at stake: the existence of the syllable, the foot and the tone-group.

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Appendix: A revised definition of dependency

Although it is not relevant to Dahl's paper, I should like to take this opportunity to present a revised definition of dependency, to replace the one I offered in my previous paper (1980a, section 3). The earlier definition was based on the notion of slots and fillers, to which I have
referred many times in the present paper, and stipulated that a word X is a modifier of a word Y if and only if X fills a slot in the structure of Y. Thus objects modify verbs because they fill slots in the verb’s structure (namely the slot labelled ‘noun’ in entries such as the one for *like* in (2)). On the other hand, there is no slot in the object noun’s structure that the verb fills, so the verb does not modify the object.

The trouble with this definition is that it rests very heavily on the notion that modifiers do not have slots for their heads, since if they did, there would be no asymmetrical dependency, only interdependence, so all the arguments for showing the DIRECTION of dependency would collapse, and with them the arguments for dependency and against constituency. This problem is not hypothetical, since there is reason for thinking that at least some modifiers — i.e. items which are generally recognized as modifiers — do need slots for their ‘heads’. Take adjectives, for example. These need to have a slot to be filled by the noun that they modify, whether they modify it attributively (e.g. *small house*) or predicatively (e.g. *the house is small*). First, there is what I take to be a fact, namely that adjectives, like verbs, have subject slots in their structure, and this must be filled by (the referent of) the modified noun. Secondly, some meanings of some adjectives are restricted to occurring with only certain types of noun as head — compare *dry* as applied to weather, sand, wine and humour. Consequently I assume that there must be a slot for the head-noun, partly specifying its meaning, associated with each such meaning. (I owe this observation to Thomas Hofmann.) Thirdly, as we have seen in the discussion of *small French house* (section 6), degree adjectives can only be properly interpreted if they are related to some kind of standard, which means that they must contain a slot into which a prototype can be inserted, and this prototype is in part defined by the head noun. And lastly, there are languages in which adjectives differ in their position relative to the noun, when in attributive position (e.g. in French the words meaning ‘small’ and ‘French’ must appear on opposite sides of the noun). I assume that this means supplying information about position in the lexical entries for individual adjectives, which in turn means that these entries must contain a representation for the head-noun, as a slot in their structure. It seems clear, then, that by our earlier definition of dependency there would be strong reasons for treating the ‘head-noun’ as a modifier of the adjective, alongside the reasons for seeing the adjective as a modifier of the noun (such as the direction of morphological determination, the fact that adjectives are generally positioned relative to the noun rather than vice versa, and so on). Consequently the relation between attributive adjectives and head-nouns would be a case of interdependence, and would not be subject to any of the generalizations which refer to asymmetrical dependency. (Similar argu-
ments could be mustered, I think, to show that the object and verb are interdependent, contrary to the original assumption.)

Rather than accept these consequences of the definition of dependency, I prefer to alter the definition slightly. The new definition is like the first in referring to slots, so that X is a modifier of Y if and only if it fills a slot in the structure of Y, but it also requires that this slot be an optional one. A slot is optional for Y if Y belongs to a class of words for which the slot is optional — i.e. if there is an entry in the panlexicon either for the word X itself, or for the class to which X belongs, which allows the slot to occur, but does not require it. Take objects, for example. These can now be shown to be modifiers of the verb, since the entry for verbs in general allows an object to occur, but does not require it. Thus even if a verb is obligatorily transitive, like take, the object slot still counts as an ‘optional’ slot by our definition, and the object therefore counts as a modifier of the verb. Now consider adjectives. These are easily shown to be modifiers of their head-noun, since the slot they fill is an optional one; but the noun can not be taken as a modifier of the adjective in spite of the fact that it is referred to in the entry for some adjectives (but possibly not for all adjectives), since the references to it do not allow it, as required by the definition. They say nothing about the presence or absence of a noun; all they do is refer to the position or semantic features of a noun, whose presence is determined by other considerations. Similarly satisfactory results emerge if we apply the new definition to all the constructions listed in (7) of my earlier paper, which I wrongly claimed to be produced by the old definition.

References


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