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Arguing for Constituents*

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0. Introduction. Linguists of many different schools have maintained that syntax is not merely a matter of putting words together 'like beads on a string'--not merely, that is, a set of sequential constraints on word combinations--but rather involves hierarchical structure, the grouping of words into constituents (or phrases), and these into larger constituents. Every elementary discussion of syntax confronts this question in some way, and important observations have been made by linguists from a great variety of traditions, but nowhere have the many strands of evidence in favor of constituent structure been drawn together in one place. What I propose to do here is to survey this evidence in a reasonably systematic way, giving examples to illustrate the various lines of evidence.

A few words of caution are in order. I am not proposing to support here the idea that 'immediate constituent structure' or 'surface structure' is representable as a labeled tree structure, nor will I defend the existence of 'surface structure' as a definable level in syntactic derivations. There is much to be said for each of these (very popular) assumptions, but what I have to say does not depend on them, nor does it argue for them in any direct way. I am aware of the problems with labeled trees as representations of surface syntactic structures,[1] in particular the fact that some elements that clearly belong together are discontinuous, either optionally (as in the English verb-particle construction in We gave up the struggle/We gave the struggle up) or obligatorily (as in the French negative ne ...pas or the English idiom keep company in I kept my friends company versus *I kept company my friends). I am also aware of the many attacks on surface structure as a single level in derivations, a level that meets several independent conditions (Schmerling 1973, Rivero and Walker 1976, and others).[2] What I am defending here is merely the idea that there is some significant division of the words in sentences into intermediate units.

It should be clear that from the point of view of production and perception it is absolutely necessary that intermediate units exist in every language. This follows from the fact that the stock of sentences is infinite, so that speakers and hearers must have

smaller units to deal with, and indeed it would be true even if the stock of sentences were merely very large rather than infinite, so long as speakers exhibited productivity rather than the repetition of memorized strings.

1. Semantics. What are traditionally regarded as constituents tend to have semantic unity (that is, on the whole they are semantically interpretable on their own)--and it is hard to see how a usable language could be organized in any other way, for there must be some repeatable units with content. This property of (surface) constituents is what makes possible theories of semantics--like Montague grammar--that involve interpretation of surface units and the composition of these interpretations by regular principles.

The semantic unity of constituents shows up in a number of ways. First, the domain of subcategorization and selection is essentially the constituent;[3] the determinations are between the elements that combine to form a constituent (for instance, the adjective effeminate with the noun neighbor but not with the nouns phonograph or actress) and then between these constituents and others of the same rank (the determining element my, but not the determining element much, with the phrase effeminate neighbor; the subject phrase my effeminate neighbor with the predicate phrases is a masseur or admires a masseuse but not with the predicate phrase is a masseuse).

Moreover, since an idiom is a combination of words that has meaning associated with it as a whole rather than by compositional principles, it follows that idioms should tend to be single constituents, and this is indeed so. Most idioms can be identified as belonging to a particular phrase type: a fat chance is an NP idiom, trip the light fantastic a VP idiom, the cat is out of the bag an S idiom. It is well known that English has an extraordinarily large collection of idioms consisting of a verb and its direct object, but not its subject--VP idioms--but no clear cases of an idiom consisting of a verb and its subject, but not its direct object, a fact that corresponds to the fact that a verb-object combination is a phrase but that a subject-verb combination is a phrase only if the verb lacks an object.[4]

Finally, it follows from the semantic unity of constituents that combinations of words occurring in isolation--as fragmentary answers to questions or as other sorts of incomplete sentences--should be constituents, and this is indeed the case. So, English permits dialogues like

(1) A: What are you going to do tonight?
B: Dissect a ferret and prove Fermat's Last Theorem.

(where B's answer is a constituent, namely a VP) but not like

(2) A: What did the penguin do?
B: *It slaughtered. [= It slaughtered something.]

(where B's answer is a nonconstituent, namely a subject-verb combination without the object).

2. Prosodic features. Closely related to the tendency towards semantic unity of constituents is their prosodic unity. Linguistic elements that can occur in isolation must be assignable patterns of prosodic features, in particular intonation. Moreover, the patterns associated with whole sentences must be related to the patterns associated with their parts in a way that is at least partially systematic; thus, all approaches to stress and intonation in English recognize this fact, though they may incorporate it into their descriptions in very different ways (some composing the patterns for larger parts out of those for the smaller, others distributing the patterns for the larger parts onto the smaller).

From the hierarchical structure of sentences and the prosodic unity of combinations at several different levels in such structures, it follows that elements combined at the 'inner' or 'lower' levels will be more tightly bound to one another than those combined at 'upper' or 'higher' levels. And, indeed, for prosodic purposes we see a difference in binding at different levels, a difference that shows up in a differential of interruptability, with tightly bound elements resisting interruption by pauses, parenthetical material, and the like, much more than more loosely bound elements, other things being equal. This is the very familiar observation that in sentences like

(3) Your youngest cousin adores kangaroos.

interruptive material like the vocative my friend or the expository adverb frankly or the parenthetical construction you must realize can easily be placed between cousin and adores (that is, between the subject phrase and the predicate phrase)--and a pause is natural there--but that the break between adores and kangaroos is less easily filled by an interruption, while the breaks between your and youngest and youngest and cousin are even more resistant.[5]

Another observation that is relevant in this connection is Lehiste's (1973) finding that the only syntactic ambiguities that speakers can disambiguate by prosodic means (timing and intonation) are those involving different surface organization of constituents.

3. Phonological phenomena. Without reference to constituent structure it would be impossible to describe satisfactorily many facts about sandhi phenomena in various languages. There are two classes of rules here: those requiring 'close syntactic connection' to be applicable, and those with a demarcative function, applicable only at major phrase boundaries.

As an example of the first sort, consider the English contraction of the auxiliary verb will with a preceding pronoun you. Sometimes this contraction is possible, sometimes not:

(4) {You will / You'll} enjoy the wallaby casserole.

(5) Everyone less resistant to novelty than {you will / *you'll} enjoy the wallaby casserole.

In both cases the boundary between you and will separates subject from predicate, but in the second the syntactic connection between the two words is very loose, because of the many levels of structure within the subject phrase.

As an example of the second sort, consider the prepausal phenomena of Sanskrit--in particular, the replacement of word-final s and r by h (the visarga). These substitutions are obligatory in utterance-final position, prohibited in close syntactic construction. There is a sense in which they are optional before major phrase boundaries; roughly, where pauses can be easily inserted the appearance of visarga is not obligatory.

4. Distributional facts.[6] A prime reason for referring to constituents in the description of a language is that such reference makes it possible to state generalizations about sentence patterns. We observe, for instance, that in English the distribution of proper nouns, plural common nouns, and pronouns is roughly the same, and that this distribution is shared (again roughly) by many sequences of words: determiner plus noun, adjective plus plural noun, determiner plus adjective plus noun, and so on. Treating the sequences as instances of the same category as the single words enables us to subsume a great many facts about permissible sequences of words in English under relatively few principles. Looked at another way, these facts about distribution indicate that the internal organization of sentences in the language is not merely a matter of simple sequential constraints on word combinations.

When we are dealing with recursive patterns, as in complements, relative clauses, and adverbial subordinate clauses, reference to constituents makes it possible to state a finite grammar at all, of course.

Another relevant class of distributional facts concerns the distribution of anaphoric elements (proforms and zeros) in individual languages. Referring to constituents makes it possible to specify which subparts of sentences can be missing, or can appear as one of a set of special anaphoric morphemes, and which cannot. The generalization is, of course, that only subparts that make constituents can have these possibilities. A language may have a pro-NP morpheme or a pro-S morpheme, but not a single morpheme standing for the underlined sequence in

(6) DET ADJ N M V

nor would we expect a language to permit an anaphoric zero realization for this sequence (unless it permitted anaphoric zero realizations for each of the parts separately).

Still another class of distributional facts concerns constraints on which subparts of sentences can be conjoined with one another and which cannot. The generalization is the familiar

one that these must be constituents, and moreover constituents of the same type.[7] Thus, in (7) two full sentences can be conjoined with one another but the subparts that differ in the two sentences (the head noun of the subject plus a following modal) cannot be conjoined, because they are not constituents:

(7) Few American men can play rugby, and few American women will play rugby.
(8) *Few American men can and women will play rugby.

Next, by referring to constituents we are able to describe which subparts of sentences recur in related constructions and which do not. Again the generalization is that these recurring subparts are constituents, as in the underlined portions of the following examples:

(9) It is tough to understand <u>that sort of viciousness</u>.
(10) <u>That sort of viciousness</u> is tough to understand.

Finally, there are conditions on the location of certain morphemes which appear to be impossible to state except by reference to the notion of constituent. A number of cases of clitic placement are of this sort. Thus, in English the possessive morpheme is located at the end of an NP constituent:

(11) Germany's defenses

(12) a. the Queen of England's hat
b. *the Queen's of England hat

(13) a. the woman I talked to's arguments
b. *the woman's I talked to arguments

and in Walbiri (Hale 1973), the tense and person clitics are located after the <u>first constituent</u> (which is not necessarily the first <u>word</u>) of the sentence:

(14) a. wawiri kapi-ṇa pura-mi
kangaroo fut. - I cook-nonpast

b. pura-mi kapi-ṇa wawiri
[both] 'I will cook the kangaroo'

(15) a. wawiri njampu kapi-ṇa pura-mi
this

b. *wawiri kapi-ṇa njampu pura-mi
'I will cook this kangaroo'

In many of these cases we might choose to speak of transformational relatedness--to refer to transformational rules generating anaphoric elements, reducing conjoined sentences, altering sentence structure in some other way, or placing clitics. From this viewpoint the generalization is the standard one that (on the whole) transformations refer to, and affect, constituents and only constituents. But it is important to see that, independent of any particular framework of transformational grammar, there are

real generalizations to be made about syntactic structure, and that these generalizations crucially involve constituency.

5. Further syntactic considerations. As is well known, constituent structure permits us to give an account of one class of ambiguities --old men and women and similar examples--and, in the same vein, to give some account of certain cases in which otherwise identical sequences are interpreted differently--as in (16) versus (17).

(16) They decided on the lamp.
(17) They decided on the brink.

And finally, by referring to constituent structure we can explain certain apparent counterexamples to general restrictions in individual languages. For instance, standard English has a general syntactic constraint against sequences of modal verbs, however reasonable the meanings conveyed would be:

(18) *Penguins might must fly.
(19) *Applicants must can read three Anatolian languages and speak either Lake Miwok or Xhosa.

But it is by no means the case that such sequences are everywhere disallowed in standard English, for the following examples are fine:

(20) As for flicking that switch, anyone who might must not be permitted in the Genetic Engineering Lab.
(21) People who must can learn to speak Hungarian in a fortnight.

Similarly, Englishhas a constraint against sequences of main verbs (hence is not a serial verb language):[8]

(22) *Cameron will sing make interesting company.
(23) *Doris returned uttered strange cries.

But again such sequences do sometimes occur:

(24) Dogs that sing make interesting companions.
(25) Everyone who returned uttered strange cries.

The solution is simple: these constraints apply only to coconstituents, not to any two modals or main verbs that happen to be sitting next to one another in a sentence.[9] In this case, as in the preceding, the phenomena of syntax are structure-dependent, in the sense of Chomsky 1975: ch. 1.

6. Beyond grammar. Thus far I have listed many sorts of phenomena that would move linguists to treat sentences as hierarchically structured (at least to some degree), so as to have a satisfying account of the semantics, phonology,or syntax of a language. But speakers, even those who are not linguists by profession, behave in ways that suggest that these structures have some psychological reality.

The practice of poets, for instance, shows that they appreciate--tacitly--the constituent structure of sentences. As Kiparsky (1975: sec. 3.2) argues, the location of line divisions varies in a principled way from one poet or period to another, with some writers permitting division only at major constituent boundaries, others permitting enjambment of various degrees.

However, it is in a series of perceptual experiments that the question of the psychological reality of constituent structure has been most extensively investigated. These 'click studies', which involve rather indirect approaches to constituents as units in processing, are not always easy to evaluate (see the survey of a variety of experimental approaches by Fodor, Bever, and Garrett 1974: 246-64), but it is perhaps fair to conclude that they point to some involvement of constituents in the processing of speech, at least insofar as the constituents are prosodic and/or semantic units.

Somewhat more direct evidence on the production side can be obtained from the examination of slips of the tongue. As Fromkin (1973: 31) says,'when more than one word is involved in a tongue slip, they seem to belong to the same syntactic phrase', so that there are slips like the following, from Fromkin:

(26) If you'll meet him you'll stick around.

for

(27) If you'll stick around you'll meet him.

(with VPs switched). But we do not find slips like

(28) *If around you'll you'll stick meet him.

for (27), with the nonconstituents you'll stick and around you'll switched.

7. Conclusion. I have now enumerated what I think are the main lines of evidence in favor of constituent structure, and I have tried to indicate how some of these follow from or depend upon others. My observations are scarcely novel; I hope only to have collected conveniently in one place a series of types of arguments that linguists have appealed to over the centuries. It seems clear that despite the many problems that surround the notion of constituent or phrase, it must play a central role in any theory of syntax.

Footnotes

*A version of this paper was presented at the Ohio State University in April 1978; I got helpful comments from several members of that audience, most especially Ilse Lehiste, Nancy Levin, and Richard Warner.

An earlier paper (Zwicky 1977) includes a section also dealing with constituent structure; it asks what arguments there are for saying that particular sentences in some language have one

structure rather than another, while here I am asking a more fundamental question, namely why linguistic descriptions should include any reference to constituents at all. These questions are obviously not unrelated, however, so that the two papers cover some of the same material from somewhat different viewpoints.

1. There is now a literature of some size on deficiencies of and alternatives to ordinary labeled trees in syntax and/or semantics: Goodman 1961 (cited by Maxwell 1975), Morin and O'Malley 1969, Haas 1973: sec. 7.1, Sampson 1975, and Karlgren 1976 illustrate a few of the approaches that have been taken (convergent branches, crossing branches, and multiple roots are the most frequent proposals). It has sometimes been suggested that certain aspects of surface structures are indeterminate, in the sense that two different constituent divisions are possible without ambiguity; this is the position taken by Bolinger 1977: ch. 6 with respect to the structure of sentences like

(i) I believe/John/to be a man of integrity.

To avoid claims of indeterminacy one must either maintain that sentences like (i) have a single structure or that there is a subtle ambiguity of surface structure (as in the treatment of sentences like (ii) by Silva and Thompson 1977).

(ii) It was easy/for Fred/to sing.

2. The category of 'readjustment rules' in Chomsky and Halle 1968 was, in fact, invented to describe divergences between the structures resulting from the application of syntactic rules and those required for the operation of phonological rules.

3. For strict subcategorizations (which do not appear to be entirely semantic in character) this point is familiar; see the discussion in sec. 2.3.3 of ch. 2 in Chomsky 1965. For selections the point does not seem to have been fully appreciated, and the Aspects formalism permits the statement of selections in non-constituent domains.

4. The same is true even in VSO languages, where V and O are not contiguous. Thus, Welsh has verb-object idioms like cadw stŵr 'to make a noise' as well as a great many 'VP idioms' of the form verb + prepositional phrase, like mynd amdro 'to go for a walk'.

5. I am aware that different sorts of interruptions are not equally difficult to insert between tightly bound constituents. Explicitly contrastive material is, in fact, very freely insertable:

(i) Your, but not my, youngest cousin adores kangaroos.
(ii) Your youngest, but not my oldest, cousin adores kangaroos.

6. This section owes a good bit to the work of Zellig Harris.

7. It is well known that there are some types of conjunction in which this constituency requirement does not hold. See, for example, the discussion of Gapping and Right-Node Raising in Hudson 1976.

8. The constraint is violated by a few idiom types, among them go/come V:

(i) I'll go see if the wolf is still at the door.

9. Perlmutter (1971) makes this point with respect to the *se se construct in Spanish; (i) is entirely acceptable, since the two occurrences of se are separated by an NP boundary:

(i) El hombre que quiere lavarse se fué.
'The man who wants to wash himself has left.'

See also the discussion of the English 'doubl-ing' constraint in Pullum 1974.

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