

THE ARBITRARY BASIS OF TRANSFORMATIONAL GRAMMAR

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Baker & Brame, in this issue of *LANGUAGE*, correctly observe that, in three of the cases cited in my paper on global rules (Lakoff 1970), the effect of global rules can be obtained by the use of ad hoc coding mechanisms using arbitrary grammatical elements, in one case an infinite number of such elements. This raises the question of whether the elements used in grammatical descriptions should be arbitrary or whether they should have a natural basis. In addition, Baker & Brame incorrectly claim in three other cases to be able to handle global phenomena within the Aspects theory. In each case they use apparatus that goes beyond that theory. Moreover, they claim that a theory of global grammar is necessarily 'more powerful' than the Aspects theory and their proposed extensions. This is shown to be false.*

Baker & Brame 1972, in their reply to my paper on global rules (Lakoff 1970), claim that the phenomena discussed in that paper can and should be handled differently, and that a uniform global treatment of those phenomena was not warranted. Their proposals fall into two classes. In three of the cases (arguments 1, 3, and 4), they propose an ad hoc extension of the Aspects theory which has the effect of introducing arbitrary markers in order to code global phenomena. In the other four cases, their proposed re-analyses are based on still other changes in the Aspects theory. The general issues raised are (1) whether the elements used in grammatical descriptions should be arbitrary or should have a natural basis,¹ and (2) whether global grammar is necessarily 'more powerful' than either their alternative proposals or the classical theory of transformational grammar. I will take up the issues in that order.

ARBITRARY MARKERS AND CODING

1.1. ARGUMENT 1: GREEK CASE. B&B, discussing my informal description of Greek case agreement, make the following claim (52):

It by no means follows that no transformational description of case agreement is possible in Greek. It is in fact possible to give a formalization of principle 1 [my description of the agreement rule] in transformational terms. This formalization consists of two transformational rules: first, a rule that gives nouns and their modifying participles or adjectives an index which marks them as having been in the same simple S at the end of the relevant cycle; second, a post-cyclic rule which assigns case to an adjective or participle on the basis of the case given to its co-indexed NP ... We conclude that it is possible to give a general formulation of principle 1 in the Aspects theory.

Thus B&B claim that both rules are transformations. But the first rule they propose is in fact not a transformation: a rule that 'gives nouns and their modi-

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¹ For another discussion of using arbitrary markers to code global rules, see Postal 1972.

lying participles or adjectives an index' is an insertion rule. Transformational rules that insert things would have to insert either (1) a copy of some constituent already in the tree, or (2) a constant, i.e. some single, specific, fixed grammatical element. One might think that the rule proposed by B&B is an instance of (2), but it is not. The reason is that their 'index' is not a single, specific, fixed grammatical element, with the SAME element being added to each NP-adjective/participle pair. Moreover, the rule must be capable of checking that no given element is ever inserted twice in the same tree; otherwise, the post-cyclic agreement rule would give the wrong results. Since there is no upper bound on the number of NP-adjective/participle pairs in a natural language, their rule would have to be capable of inserting an INFINITE NUMBER OF DIFFERENT GRAMMATICAL ELEMENTS, and moreover it must be able to keep track of which ones have been previously inserted. Now transformational rules cannot do this sort of thing. They can only insert specific, fixed elements listed in the rule, with each such element to be inserted in a specific class of environments. What B&B have proposed is not a transformational rule at all, but an elaborate global coding mechanism. The purpose of this coding mechanism is simply to keep track of where certain elements which enter into an agreement rule were at an earlier stage of the derivation. The B&B proposal is not within transformational grammar proper. Since it involves an extension of the sort discussed above, it might most appropriately be called 'extended transformational grammar', which is of course a very different animal.

Global coding mechanisms are, interestingly enough, not new in the history of linguistics in the past decade. For example, Harman 1963 proposed that one could extend phrase-structure grammar by the addition of a global coding mechanism and thus avoid the need for transformations. Harman's proposal involved, in essence, adding markers to non-terminal symbols, forming complex symbols, and letting phrase-structure rules be sensitive to such markers. Chomsky (1966:42), in rejecting extended phrase-structure grammars, commented as follows: 'The rules are designed so that indices can be carried along in the course of a derivation. The indices can be used, in effect, to code many "global operations" on strings (e.g. certain grammatical transformations) and to code context restrictions of various sorts.'

The interest in the parallel between the Harman and B&B proposals goes beyond the fact that both use global coding mechanisms. In both cases, one must consider the naturalness of the linguistic units used in the coding operation. It is generally conceded that the units used in phonological description should have an independent natural basis in phonetics. Phonological rules are taken as using phonetic features, which are given independent of those phonological rules. The same considerations of naturalness obtain in syntax. The theory of generative semantics claims that the linguistic elements used in grammar have an independent natural basis in the human conceptual system. Rational thought requires a distinction between things named and what is said about those things. In other words, an elementary proposition is taken as consisting of one or more arguments and a single atomic predicate that says something about those arguments. Natural logic characterizes natural classes of atomic predicates in terms of their

logical properties, as given in truth conditions. Generative semantics takes grammar as being based on the independently given natural logical categories such as predicate and argument, and on natural logical classes of atomic predicates, given by independently needed truth conditions. In generative semantics, possible grammars are limited by the requirement that the non-phonological elements used have a natural semantic basis, independent of the rules of the grammar of any particular natural language.

Most of the arguing about generative semantics in recent years may be viewed as centering on the issue of whether the categories of the human conceptual system can or should provide the independent natural basis for syntax (the generative semantics proposal) or whether there must be some other independent natural basis for the choice of elements used in rules of grammar.² But there is no question that any explanatorily adequate account of universal grammar must provide such an externally motivated (and therefore independent) class of elements to be used in the statement of rules of grammar. Any arbitrary choice of elements is a movement away from naturalness and a movement away from an explanatory basis for syntactic theory.

It is illuminating to look at Harman's coding proposal from this point of view. For each sentence type he proposed to account for, he needed a separate grammatical category: S_1, \dots, S_{20} . For each type of noun phrase, he needed a different grammatical category: NP1, NP2, NP3, NP3A, NP3B, NP4, NP5, NP5A, NP5B, NP6 etc. In order to accomplish the coding, he needed to introduce arbitrary grammatical categories. What made the transformational solution preferable was that it enabled one to avoid such moves in the direction of arbitrary grammatical elements, and thus to gain more insight into grammatical structure.

A similar situation arises in the case of B&B's extended transformational grammars. Their proposal requires an infinite number of grammatical elements that can appear in trees—i.e., an infinite number of grammatical category distinctions, none of which are required in the corresponding global proposal. Under the B&B proposal there would be an infinite sequence of new grammatical categories: $\text{NEWGRAMMATICALCATEGORY}_1, \dots, \text{NEWGRAMMATICALCATEGORY}_{237}, \dots, \text{NEWGRAMMATICALCATEGORY}_{1042} \dots$. Each of these must be an entity distinct from all the others, as different as NP's and V's, just like Harman's NP1, NP2, NP3, NP3A, NP3B etc. Thus, the B&B proposal for extended transformational grammar represents a giant step away from a natural basis for grammatical categories, and toward an arbitrary basis for them. Any step in this direction is a step away from an understanding of grammar in terms of human mental capacities. The corresponding global proposal avoids the introduction of arbitrary grammatical elements, and therefore represents a move to keep grammar on as natural a basis as possible.

A comparison with phonology is useful. Kisseberth (ms a) has provided evidence for the existence of global rules in phonology. Obviously, one could apply a B&B

² So far, the generative semantics proposal is the only one that has been made for providing external motivation for grammatical elements. No such proposal has ever been made in transformational grammar.

solution for such cases by constructing a coding mechanism using the feature \pm ARBITRARY to code certain global phenomena. There would, of course, be a clear difference between the feature \pm ARBITRARY and the feature \pm VOICE. The latter has an independent phonetic basis; the former would have none. Clearly, one gains a deeper insight into the nature of phonology by avoiding non-natural features such as \pm ARBITRARY. If avoiding non-natural features leads one to the conclusion that global rules are necessary in phonology, then that is an interesting fact about the phonological structure of natural languages. Similarly, if the avoidance of arbitrary grammatical elements leads one to global rules, then that is an interesting fact about syntax. After all, it isn't true a-priori. It might have been the case, as was thought around 1965, that transformational grammar without coding devices that use arbitrary grammatical elements was adequate to the task of accounting for the grammatical phenomena of natural languages. Just about everybody (including B&B) agrees that classical transformational grammar is inadequate. By the scrupulous avoidance of arbitrary grammatical elements, we have gained some insight into the source of the inadequacy. Rules of grammar must mention corresponding nodes in non-adjacent phrase-markers. In theories of grammar where arbitrary grammatical elements are avoided, rules of grammar must be global in nature.

1.2. ARGUMENT 3: AUXILIARY REDUCTION. In their discussion of this section, B&B again appeal to a global coding device. They propose (56):

a special extension in the Aspects theory: any language-particular rule which moves or deletes constituents leaves a special boundary symbol at the site of the missing constituent, and particular phonological rules may then be blocked by the presence of this boundary within the domain of the rule.

The only function of this device is to code the fact that certain phonological rules are sensitive to the occurrence of certain syntactic rules at some distant earlier point in the derivation. Again a new grammatical element (the 'special symbol') appears. The implicit claim is made that this new element characterizes a real category distinction. Again, the stock of grammatical categories is increased by an arbitrary category, and the naturalness of the description is correspondingly decreased.

B&B also consider seriously, as an alternate solution, a proposal made by Bresnan (MS). Recall that the phenomenon in question involves the distinction between sentences like these:

- (1) Irv is there and John is too.
- (2) *Irv's there and John's too.

I had proposed the global rule in question (Lakoff 1970:632) to account for this phenomenon.³ Bresnan, however, makes the basic claim that, in a sentence like

³ The original proposal contains an error of omission that B & B correctly point out. My rule as stated will block incorrectly in the case of Equi-NP deletion. This is easily remedied by the addition of a condition limiting the rule to cases where the moved or deleted constituent is a clause-mate of the auxiliary in question.

It should be noted that the global rule as proposed makes certain correct predictions which I did not point out. The rule as stated constrains the possibility of stress reduction. Since stress reduction was taken to be a necessary (though obviously not sufficient) condi-

(3) John's there,

the traditional orthographic convention which makes *John's* a single word is wrong. Traditionally, 's in 3 would be viewed as being an enclitic on John, and the surface constituent break would be as follows:

(4) John's – there.

Bresnan rejects this tradition. She claims that 's in 3 has been made a proclitic on *there*, making '*s*there a single word. Thus the real constituent break becomes

(5) John – 's*there*.

Assuming this, she then proposes to account for the ungrammaticality of 2 by using a constraint to the effect that the structural indices of movement and deletion rules cannot pick out a word-internal constituent. With this principle, and the claim that the procliticization rule yielding structures like 5 applies as the last rule in the syntactic cycle, Bresnan can account for the ungrammaticality of 2 without appealing to a global rule. Assuming that 2 is derived via a deletion rule from the structure underlying

(6) Irv is there and John is there too,

procliticization yielding '*s*there would apply on a cycle before the application of the rule deleting the second *there* in sentence 1. By the time that the deletion rule becomes applicable, *there* has been made part of the phonological word '*s*there, and deletion cannot take place, since the constituent to be deleted is word-internal.

There is, however, a fundamental difficulty with Bresnan's analysis. The orthographic tradition which prefers the segmentation in 4 to that in 5 is based on a deep fact about English morphophonemics. The fact is that 's assimilates in voicing to the PRECEDING, not the following, segment. The assimilation rule is the same rule that applies to suffixal /S/ in the possessive and plural, where it clearly applies to a suffix rather than to a prefix on the following word. It is natural for such assimilations to apply word-internally; it would be completely unnatural for them to apply across word boundaries (in fact, across major constituent boundaries), but not word-internally. Under Bresnan's analysis, the assimilation of /S/ would have to apply word-internally in the case of possessives and plurals, but

tion for contraction, it follows that in positions where stress reduction is blocked, contraction cannot take place. In the following examples, the word in small capitals cannot undergo stress reduction when followed by a parenthetical expression, as in the (b) sentences, but can do so in the (c) sentences:

- (i) a. Here's something that WILL, I think, surprise you.
 b. * Here's something that'll, I think, surprise you.
 c. Here's something that, I think, 'll surprise you.
- (ii) a. What I say is, my dear, no business of yours.
 b. * What I say's, my dear, no business of yours.
 c. What I say, my dear, 's no business of yours.
- (iii) a. John is, they say, a bastard.
 b. * John's, they say, a bastard.
 c. John, they say, 's a bastard.

In each case, where stress reduction is blocked, contraction is blocked, just as predicted. Oddly enough, these sentences are cited by Bresnan as evidence against this position.

across word and major constituent boundaries in the case of /S/ resulting from contraction of *is*. The facts, which are well-known, are as follows:

(7)	TENSE CONTRACTION	POSSESSIVE	PLURAL
[s]	Jack's boring.	Jack's book	The jacks bounced.
[z]	Ted's tall.	Ted's teacher	The Feds tried.
[iz]	Liz's tall.	Liz's teacher	The fezzes turned yellow.

Under Bresnan's analysis, we would, with tense contraction moving 's to the right, get the phonological words 'sboring, 'stall. On this analysis, we would expect the /S/ to assimilate word-internally to the following segment to give [zbɔrɪŋ] and [stəl] in *Jack's boring* and *Ted's tall*; but these are exactly the wrong results. We would expect these results because there is a rule of s-assimilation to the right that applies to the /S/ resulting from contraction of *is* when the contracted form really does procliticize onto the following word, as in initial position:

(8)	[s]	Is Tim here?	'S Tim here?	[stim hiyr]
	[z]	Is Dan here?	'S Dan here?	[zdæn hiyr]
	[z]	Is it so?	'S it so?	[zɪt sow]

According to the traditional treatment, both assimilation rules are word-internal, and depend on which word the /S/ is attached to—to the left as in 7, or to the right as in 8. According to Bresnan's treatment, the /S/ resulting from tense contraction always goes to the right. But in the case of 7, the rule that assimilates /S/ to the voicing of the following segment word-internally does not apply, while the rule assimilating the /S/ to the voicing of the previous segment does apply across word and major constituent boundaries. This is a situation which is, as far as I know, unprecedented in phonology. In general, when two assimilation rules are both applicable, one word-internally and the other across word boundaries, the word-internal rule takes precedence. Since Bresnan's treatment violates this general principle of universal phonology, it must be rejected. Anyone who wants to maintain Bresnan's analysis must show that the choice of word-external assimilation over word-internal assimilation follows from general phonological principles (which are determined by a study of the world's languages). In the absence of such a demonstration, one must conclude that, as is so often the case, there is a real basis for the traditional orthography.

1.3. ARGUMENT 4: SLUICING. Here B&B suggest using another global coding mechanism, this time one proposed by Chomsky 1970:

What [Chomsky] proposes is that when some island-forming node had a constituent moved out of it, a special symbol should be associated with the node in question, this symbol indicating that a violation has occurred. If this node is later deleted, as by Sluicing in the sentences under discussion, then the special symbol marking the violation is erased along with the node in question, and the resulting elliptical sentence is thereby predicted to be well-formed (61).

Here another new grammatical element is introduced, this time its function being to mark ungrammatical sentences by appearing in surface structure in violation of an output condition saying that no such element can appear in surface structure. It is important to note that this new grammatical element must be 'invisible' with respect to deletion under identity, since when Sluicing applies, the deleted portion of the tree will contain this element, while the deleting portion will not. Invisibility with respect to identity conditions must also be a property

of each of the infinite number of new grammatical elements proposed by B&B for handling Greek case. This is an important fact about these proposed new elements, since identity conditions provide a test for the existence of proposed grammatical elements that do not appear overtly. Elements introduced purely for the purpose of coding global rules flunk this test, which raises serious doubts as to their existence.

Besides suffering from the general inadequacies of coding proposals, Chomsky's claim runs into empirical difficulties as well. These have to do with (1) dialect variations and (2) degree of ill-formedness. Let us call the special symbol proposed by Chomsky '+BAD'. According to Chomsky's proposal, a sentence generated by the grammar with +BAD in its surface structure is ungrammatical. But this does not account for the facts. Take sentences like these:

(9) John and someone were dancing, but I don't know who.

(10) John didn't lift a finger to help, but Bill did.

Though I, like B&B, find both 9 and 10 fully grammatical, many speakers of English find them somewhat ungrammatical, but not nearly as bad as their counterparts without deletion. In such dialects, Chomsky's proposal does not account for the facts. If we attempt to modify Chomsky's proposal to account for them, it turns out that we have to say something like this:

(11) If +BAD was ever present in a derivation and subsequently deleted, then the sentence is partly ungrammatical.

But 11 is a global rule, requiring information about the derivation as a whole. Thus, one would need a global rule to make Chomsky's proposal work for dialects with reduced rather than full grammaticality.

Of course, neither Chomsky's principle nor 11 is fully general. B&B propose that such principles apply in the case of all deletions of negative polarity elements, as in 10, and in all deletions of any sort universally. But not even all negative polarity items work that way:

(12) *John won't arrive until tomorrow, but Bill will.

(13) *John hasn't been here in a coon's age, but Sam has.

(14) *John doesn't have a red cent, though I do.

B&B claim (62): 'There is no evidence that this constraint would have to be included in a grammar of English as a language-particular constraint.' Here they propose to make the constraint universal. But it doesn't even work in all cases in English, as 12-14 show. One would still have to distinguish, in a GRAMMAR OF ENGLISH, those negative polarity items for which the constraint worked from those for which it didn't. The Chomsky-B&B proposal is hopeless for cases like 12-14.

DESCRIPTIVE POWER

2.1. B&B claim (51) that global grammar 'has the effect of widening the range of grammars consistent with a finite body of primary data' and that it is, relative to transformational grammar, 'the more powerful of the two models in question'. It is not clear exactly what they mean by 'more powerful'. They cannot mean that it has a greater weak generative capacity than transformational grammar, since,

as Peters & Ritchie (ms) have shown, transformational grammars have the weak generative capacity of universal turing machines. Of course, one can state rules in global grammar that are unstatable as transformations. Thus, if one imagines global grammar as simply keeping everything that transformational grammars have and adding global rules, then certainly the range of possible grammars would be widened. But that was never claimed, in 'Global rules' or anywhere else. In fact, global rules enable one to get rid of many of the non-natural descriptive devices of classical transformational grammar, e.g. such unneeded (and not externally motivated) categories as VP, AUX, MODAL, ADV_{LOC}, ADV_{TIME}, ADV_{MANNER} etc., in favor of the externally motivated categories of sentence, predicate, and argument. Global rules allow one to get rid of such arbitrary elements as syntactic features. There is every reason to believe that they will allow one to get rid of the unprincipled blocking device of extrinsic rule-ordering.⁴ And, of course, they permit us to get rid of interpretive semantic rules—surface and otherwise. (Perhaps 'get rid of' is the wrong term, since few were ever proposed.) There is no question that global rules permit a different range of grammars than classical transformational grammar. But there is no reason to believe that it is a wider range. In fact, if arbitrary categories, syntactic features, rule-ordering, deep structure, and interpretive rules are eliminated, the resulting theory of global grammar can hardly even be said to be commensurate with a theory of grammar which has such devices but lacks global rules. Without such devices, with appropriate constraints on both the form and content of rules (perhaps in the form of a list of possible rules), and with externally motivated grammatical elements, there is every reason to believe that the class of grammars characterized by such a theory of global grammar will be fairly narrow, at least compared to current proposals for extending transformational grammar. The issue is not one of greater or less descriptive power, but of the ability of very different collections of descriptive devices to state the general principles of natural language, and of the extent to which the systems are restricted to the use of externally motivated as opposed to arbitrary grammatical elements.

B&B base many of their claims, especially in discussing arguments 2, 5, 6, and 7, on the assumption that the grammatical framework in which their counter-

⁴ See Borkin et al., ms, for a discussion. Also see Kisseberth, ms b, for a discussion of eliminating rule-ordering in phonology. Extrinsic rule-ordering—that is, the inclusion of rule-ordering statements as part of the grammar of a language—has been taken for granted since the beginning of studies in generative grammar. In effect, extrinsic rule-ordering is a blocking device, blocking derivations in which rules apply in other than the permitted order. But it is a peculiar blocking device, since it operates 'blindly'. In phonology, rule-ordering blocks phonological derivations without mentioning any phonological elements. In syntax, rule-ordering blocks derivations without mentioning any grammatical elements. Given that the elements of phonology and syntax form (or should form) natural bases for those areas of study, the use of rule-ordering as a blocking device is completely unnatural. As Kisseberth observes, in the case of phonology one can in most cases accomplish the same blocking in two ways: (1) extrinsic rule-ordering, or (2) letting a phonological rule have a global environment which mentions phonological properties of either underlying phonological or phonetic representations. The latter method accomplishes the blocking on a phonological basis. Thus, any choice of extrinsic rule-ordering over global rules in such cases would be a step in the direction of arbitrariness.

proposals are given is 'less powerful' than the global framework, and therefore preferable. As we have seen, that is not the case. If one looks closely at their counter-proposals, one finds that they employ all sorts of grammatical devices not needed in an appropriately constrained theory of global grammar of the sort discussed above. The claim that they are using more restrictive and 'less powerful' descriptive devices turns out to be false. They are using different descriptive devices, and assuming the existence of grammatical elements which are not externally motivated. In some cases, they assume that the devices and elements they use, e.g. extrinsic rule-ordering statements and syntactic features, require no justification, since they were proposed at a historically earlier period and accepted then without question. However, the possibility of eliminating such devices and such elements raises the issue of their justification. The same is true of various other descriptive devices and grammatical elements that B&B assume without question. Let us look at their discussions of arguments 2, 5, 6, and 7, with respect to the types of devices and elements which they require, but which are not required in a theory of global grammar with a semantic basis.

2.2. ARGUMENT 2: ONE-PRONOMINALIZATION. B&B propose to account for the facts of this section in two steps. First, they propose to order the morphophonemic rule *the ones* \Rightarrow *those* (their rule 8) before the level-constraint prohibiting *one of NP* (their rule 2). Here they are extending the Aspects theory in two ways: (1) letting morphophonemic rules be interspersed among the syntactic rules, and (2) introducing level-constraints which block derivations (recall that their rule 2 is not a transformation) and letting them also be interspersed among the transformations. In both instances, they are widening the class of possible grammars. In addition, their solution requires extrinsic rule-ordering, which seems not to be needed in global grammars. Second, they do not distinguish between noun phrases like *the pictures of Raquel Welch* and *the lovers of Raquel Welch* on the basis of the different semantic relations involved (a distinction which must be specified independently of any particular grammar of English, and is therefore externally motivated); instead they choose a category distinction (suggested by Bresnan), using the category \bar{N} , which is arbitrary rather than externally motivated. The global solution avoids extrinsic rule-ordering, does without the arbitrary category \bar{N} , and permits one to limit the class of possible grammars by requiring all morphophonemic rules to apply closer to surface structure than all syntactic rules. The B&B proposal is by no means a 'less powerful' alternative. If anything, it is a less natural alternative.

2.3. ARGUMENT 5: PASSIVE AND EQUI. Before we get to the B&B discussion of this section, it should be observed that the proposal made by Robin Lakoff in 1965, which was the basis for the discussion in this section, has recently been found by Perlmutter & Postal (ms) and by Grinder 1971 to be a special case of a more general phenomenon. Both the Perlmutter-Postal and Grinder proposals require global rules. B&B, not having seen these proposals, do not attempt to account for the wider class of phenomena. I will, therefore, concern myself solely with the B&B proposal for handling the special case. I doubt that this matters much, since they would no doubt employ similar techniques in trying to handle the more general situation.

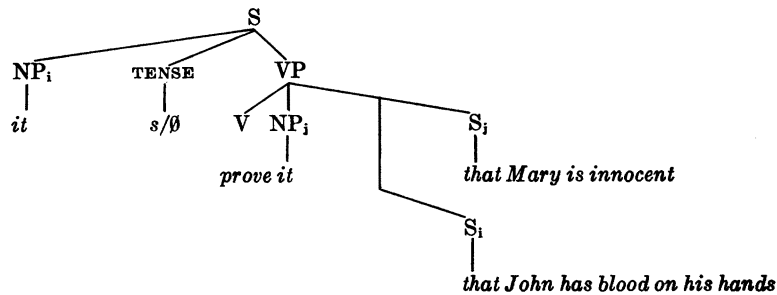


FIGURE 1

In their solution, B&B resort to the proposal made by Emonds 1970 to build much of surface structure into deep structure and thereby allow many transformations to be 'structure-preserving'. In particular, they adopt Emonds' analysis of complements, including his rule of 'intraposition'. They neglect to mention, however, that Emonds' intraposition analysis requires the notion of a 'doubly-filled node', in order to handle such cases as

(15) That John has blood on his hands proves that Mary is innocent.

Under Emonds' intraposition analysis, 15 would have the deep structure of Figure 1. Here S_i and S_j are to be taken as occupying 'the same phrase-structure position' (see Emonds, §3.2.1). Such a structure is, of course, not a phrase-marker; phrase-markers cannot have different sentences one on top of the other. Thus B&B, in accepting Emonds' intraposition proposal and with it his doubly-filled nodes, are giving up the notion of phrase-marker. This is a considerable change in the Aspects theory. B&B give the impression of being conservative and uncontroversial; but their proposals, when looked at seriously, are often anything but that.

2.4. ARGUMENT 6: SAY. B&B claim here (66) that the global treatment of exceptions has no advantage over the treatment of exceptions in my dissertation. The advantage is a simple one: global rules enable us to eliminate syntactic features—in particular rule-features. Like most syntactic features proposed to date, rule-features were elements with no other purpose than to code global information. Though they could be predicted from the governed rules of the grammar, and though there weren't very many of them (only about 10 or 15 governed rules have been found to date), they were still grammatical elements that appeared in trees. Like most other syntactic features, they had no external motivation, no natural basis outside the grammatical system. Thus, eliminating them has the same advantage as eliminating other syntactic features and arbitrary markers from trees: one gets that much closer to a natural basis for syntax, while the avoidance of elements that are not externally motivated enables one to see more clearly the true nature of syntactic rules, namely that they are global.

The B&B counter-proposal makes heavy use of syntactic features and employs other arbitrary elements such as Δ . B&B claim that they are staying 'within the Aspects theory'; but again they make an important change (67), accepting Emonds' empty-node proposal. Emonds proposes that certain NP nodes

do not dominate anything in deep structure. This is a considerable change in the notion of the phrase-marker, which is at the heart of the Aspects theory. A phrase-marker is, in that theory, a labeled bracketing of a terminal string. Without the terminal elements, there can be no bracketing of them. If one views Emonds' proposal in terms of the Aspects theory, one finds he is proposing something impossible: bracketing of a terminal element without its being there. Emonds is proposing a rather different theory of a phrase-marker—a proposal by no means 'within the Aspects theory'.

2.5. ARGUMENT 7: COMPARATIVE SIMPLIFICATION. B&B claim that they can avoid the use of a global rule if they give up Geis' analysis (MS) of *earlier* and *before*, and instead set up 16 (their 94) as the deep structure for 17:

(16) John left _{AP}[_{DEG}[more than _S[Bill left that early]_S]_{DEG} early]_{AP}

(17) John left earlier than Bill left.

There are several strange things about 16. First, it uses categories AP and DEG, which as usual have no external motivation. Second, there is no indication that *earlier than* is a relation holding between two times. The whole point of Geis' analysis is to make explicit the fact that sentences like 17 involve time relations, but 16 does not show that. It is for this reason that Geis proposes that sentences like 16 have a remote structure roughly like that underlying

(18) The time at which John left was earlier than the time at which Bill left.

Here the time relation is made explicit. Since any account of the meaning of 17 must make this time relation explicit, Geis' analysis has an externally motivated basis. The analysis that B&B suggest in 16 lacks just such a basis. Here again, an externally motivated analysis leads to the conclusion that there are global rules. The conclusion can be avoided, as might be expected, by adopting an analysis which lacks such motivation.

CONCLUSION

3. We may summarize as follows:

(a) B&B's coding proposals lead to an increase in the arbitrariness of syntactic descriptions. To avoid such an increase in arbitrariness, global rules seem to be necessary.

(b) The alternative analyses proposed by B&B do not fall within the Aspects theory proper. On the whole, they involve considerable changes in the Aspects theory.

(c) The Baker-Brame claim that global grammar is necessarily 'more powerful' (that is, characterizes more possible grammars) than transformational grammar is false. The two are incommensurable.

The point to be borne in mind is that grammatical elements, like phonological elements, need external motivation. Generative semantics has claimed that the human conceptual system, as characterized by the study of natural logic, provides such motivation. Transformational grammar, which claims that syntax is independent of meaning, logic, and the human conceptual system in general, has so far made no attempt to provide external motivation for the elements used in syntax. If those who are still trying to make transformational grammar work are to avoid the pitfalls of the Baker-Brame coding proposals,

they must seriously address themselves to this issue. They must find external motivation for grammatical elements, so that arbitrary coding proposals can be avoided. The question of whether rules of grammar are global cannot be separated from considerations of naturalness. At present, such considerations favor the theory of global grammar.⁵

REFERENCES

- BAKER, C. L., and M. K. BRAME. 1972. 'Global rules': a rejoinder. *Lg.* 48. 51-75.
- BORKIN, ANN, et al. ms. Appendix to the 3rd edition of *From deep to surface structure*, by Marina K. Burt. New York: Harper & Row.
- BRESNAN, JOAN. ms. *Contraction and the transformational cycle in English*. Cambridge, Mass.: MIT.
- CHOMSKY, NOAM. 1966. *Topics in the theory of generative grammar*. The Hague: Mouton.
- . 1970. Some empirical issues in the theory of transformational grammar. To appear in *The goals of linguistic theory*, ed. by P. Stanley Peters. Englewood Cliffs, N. J.: Prentice-Hall.
- EMONDS, JOSEPH E. 1970. *Root and structure preserving transformations*. Doctoral dissertation, MIT.
- GEIS, MICHAEL. ms. *A derivational constraint on simplification of certain comparative constructions*. University of Illinois.
- GRINDER, JOHN. 1971. *On deletion phenomena in English*. Doctoral dissertation, University of California, San Diego.
- HARMAN, GILBERT. 1963. *Generative grammars without transformational rules: a defense of phrase structure*. *Lg.* 39.597-616.
- KISSEBERTH, CHARLES. msa. *A global rule in Klamath phonology*. University of Illinois.
- . msb. *Is rule ordering necessary in phonology?* To appear in *Papers in Linguistics presented to Henry and Renee Kahane*, ed. by B. Kachru. Linguistic Research, Inc.
- LAKOFF, GEORGE. 1970. *Global rules*. *Lg.* 46.627-39.
- PERLMUTTER, D., and P. POSTAL. ms. *The passive-deletion constraint*.
- PETERS, P. STANLEY, JR., and R. W. RITCHIE. ms. *The generative power of transformational grammars*. To appear in *Information Sciences*.
- POSTAL, PAUL. 1972. *A global constraint on pronominalization*. *Linguistic Inquiry*. 3.35-60.

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⁵ Toward the end of their paper, B & B make a strange claim: 'the question of whether or not transformations are a "unified phenomenon" could conceivably have content only for the history or philosophy of science' (73). On the contrary, such considerations are involved in the day-to-day work of syntactic theorists. The assumption that transformations are a unified phenomenon is built into the classical theory of transformational grammar in a number of ways. For example, one of Chomsky's defining characteristics for the level of deep structure is that it precedes all (non-lexical) transformations. Such a definition presupposes that there is a class of transformations, and that general statements in the theory of grammar can refer to that class. For example, the classical theory claims that transformational rules apply in a block, that they can be ordered with respect to each other, that they are of certain specific forms, that they obey certain general constraints, etc. All such statements presuppose that transformations constitute a unified phenomenon.

Global rules, like transformations, are sufficiently alike to constitute a unified phenomenon. They each involve a small number of nodes (hopefully no more than three or four). They involve category labels assigned to those nodes, and logical properties associated with those nodes in logical structure. They involve between two and four 'level conditions' on various stages of the derivations, the conditions specifying precedence and dominance relations in a given tree. There is a small finite list of the way these level conditions can be related. And the levels meeting the conditions are either (1) a designated level of the grammar—namely, logical structure, surface structure, shallow structure, or the end of the first cycle on some specific node—or (2) all trees in the derivation.