and specification of change; it can instead be visualized as involving first a statement of the target or output, and then a statement of the appropriate technique for reaching the target, perhaps something like the following:

HAB target:	either . . . CV# (unmarked forms)
	or . . . CV́CVCVC# (marked forms)
HAB process:	. . . $V_1C\# \rightarrow V_1{}^{?}V_1C\#$ (repeated until the target is hit)

For example, the form téw, HAB in column A of Figure I does not already satisfy the target, so the process will be applied as follows: téw, HAB → té?ew, HAB. This form still does not match the output target, so the process will be reapplied, e.g. té?ew, HAB → té?e?ew, HAB. The target is now matched, and HAB formation is complete.

An Example of a Descriptively Inadequate Interpretive Theory

George Lakoff,
University of Michigan

Suppose someone were to make the following proposal:

I. There exist surface structure interpretation rules, which are defined as taking surface structures as input and giving semantic representations as output.

II. Surface structures are defined in terms of phrase structure trees, and semantic representations are *not* defined in terms of phrase structure trees.

III. a. The meaning of anaphoric expressions in surface structure is to be determined by surface structure interpretation rules.

b. The relative scopes of quantifiers and negatives is to be determined by surface structure interpretation rules.

I would like to show that any theory assuming I, II, and III together will be descriptively inadequate to account for the facts of English.

Let us begin by observing an immediate consequence of I and II.

IV. The output of a surface structure interpretation rule may not be the input to any surface structure interpretation rule.

IV is a trivial consequence of the assumption that surface structures are phrase structure trees and semantic representations are not, and that only phrase structure trees can be inputs to surface structure interpretation rules. Thus, any theory assuming I and II cannot have surface structure interpretation rules that apply in sequence, so that the

output of one is the input to another. All that remains to be shown now is that III, taken together with the facts of English, requires that surface structure interpretation rules apply sequentially.

Consider (1).

(1) a. Sammy has*n't* taken out *many* girls.
b. *Many* girls have*n't* been taken out by Sammy.

As is well known, the leftmost of the italicized elements in single clauses is interpreted as having wider scope,[1] which accounts for the difference in meaning between (1a) and (1b). Under assumption III, the difference in meaning in these cases would be accounted for by a surface structure interpretation rule. Let us call it Q-NEG. Now consider (2):

(2) a. Sammy hasn't dated Deana, and Norman hasn't either.
b. Sammy hasn't dated Deana, and Norman hasn't dated Deana either.

(2a) displays a type of anaphora which has previously been called VP-deletion, under the assumption that the VP *dated Deana* was deleted. However, under assumption III, that VP will be assumed not to have been there at any point in the syntax, but instead will be filled in by a surface structure interpretation rule which will give (2a) the meaning of (2b). Let us call this rule VP-FILLING.

Now consider (3):

(3) a. Sammy has*n't* taken out *many* girls and Norman has*n't* either.
b. Sammy has*n't* taken out *many* girls and Norman has*n't* taken out *many* girls either.

It is clear that (3a) is interpreted in the same way as (3b), which involves the rule of Q-NEG. In (3b), Q-NEG applies to both conjuncts. But Q-NEG cannot apply to the right hand conjunct of (3a), since the right hand conjunct has only a negative and no quantifier. It would be nice if VP-FILLING could fill in the VP on the right of (3a) first, so that Q-NEG could then apply. But this is impossible, since the output of VP-FILLING is a semantic representation, not a surface structure, and so could not be an input to Q-NEG. Moreover, VP-FILLING alone could not

[1] For discussion see Jackendoff (1969) and Lakoff (in press). Actually, this rule is true of only one of the three principal dialects that one finds for such sentences. The choice of dialect is irrelevant to the discussion below.

do the job, since it does not interpret the relative scopes of negatives and quantifiers. However, according to III, the anaphoric missing VP of (3a) must receive an interpretation via a surface structure interpretation rule. Thus, there must exist another rule, call it VP-FILL-AND-Q-NEG-COMBO which interprets (3a). Clearly, such a rule would duplicate the jobs of both VP-FILLING and Q-NEG, and a generalization would be missed. VP-FILL-AND-Q-NEG-COMBO is required only to satisfy the requirement that VP-FILLING and Q-NEG not apply in sequence, which in turn is required by I and II. Thus, I, II, and III, when applied to the data of English, lead to a situation in which an obvious generalization cannot be stated, and so any theory assuming I, II, and III is descriptively inadequate for English.

The examples given could be multiplied ad infinitum. A particularly interesting case was pointed out to me by Grinder and Postal (personal communication). Consider (4):

(4) a. Sammy injured his leg and Norman injured his leg too, and both of *them* had to be amputated.

According to assumption III, *them* would have to receive its interpretation via a surface structure interpretation rule. Let us call this rule ANTECEDENT-HUNT. Such a rule would have to find *in the surface structure* more than one antecedent for the pronoun *them*. In this case, the rule, if properly formulated, could find two occurrences of *his leg* to serve as antecedents. Now consider (4b):

(4) b. Sammy injured his leg, and Norman did too, and both of *them* had to be amputated.

In (4b), there is no surface VP in the second conjunct, and so ANTECEDENT-HUNT would not be able to find more than one antecedent in the surface structure. Of course, everything would be fine if VP-FILLING could apply first and ANTECEDENT-HUNT could apply to its output. But that is forbidden by I and II. Again we would need an additional rule, VP-FILL-AND-ANTECEDENT-HUNT-COMBO, which would duplicate already needed rules, just to preserve the requirement that surface structure interpretation rules not be able to apply in sequence, as I and II require. Again, a descriptive inadequacy arises.

The moral should be obvious. If an interpretive theory is to assume III, then the facts of English dictate that it permit surface interpretation rules to apply sequentially. That is, the outputs of such rules must be of an appropriate

form to be inputs to such rules. Since such rules must be able to take surface structures as input, and since surface structures are phrase structure trees, it follows that the output of such rules must also be phrase structure trees. If the output of each surface structure interpretation rule applied in sequence must be a phrase structure tree, then the output of the last such rule to apply must also be a phrase structure tree. Since the output of the surface structure interpretation rule component is, presumably, a semantic representation, it follows that *semantic representations must be given in terms of phrase structure trees*. But this, of course, is the fundamental claim of generative semantics.[2] It is interesting that merely the requirement that surface structure interpretation rules apply sequentially leads to the acceptance of the fundamental assumption of generative semantics, which is what interpretive semantics was in part set up to avoid.

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[2] For a discussion of generative semantics, see McCawley (1968), Lakoff (in press), and Postal (1970). It is particularly difficult to tell whether any interpretive theories that have actually been proposed assume I, II, and III. However, so far as I can tell, those proposed in Akmajian (1968), Chomsky (in press), and Jackendoff (1969) are possible candidates.