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PREFACE

The three essays that follow take as their point of departure the formulation of grammatical theory presented in such work as J. J. Katz and P. M. Postal, *An Integrated Theory of Linguistic Descriptions*, 1954, and Chomsky, *Aspects of the Theory of Syntax*, 1965. For ease of exposition, I refer to this formulation as the "standard theory". The essays deal with problems that arise within this framework, and present a revision of the standard theory to an "extended standard theory" (EST). The status of deep structure is a central concern in all three essays. In the first, "Remarks on nominalization", the device of syntactic features is exploited to formulate the "lexicalist hypothesis" with regard to derived nominals, and evidence is presented indicating that this hypothesis is correct and that the properties of these structures can be appropriately expressed only in terms of the abstract concept "deep structure", in the sense of the standard theory and EST. The status of deep structure is discussed again in the third essay, where further evidence is presented leading again to the conclusion that a level of deep structure (in the sense of the standard theory and EST) must be postulated. The second essay is concerned with inadequacies of the standard theory, and a more refined theory of semantic interpretation is proposed, giving EST: the grammatical relations of the deep structure remain fundamental for semantic interpretation, determining what have been called "thematic relations" or "case relations", but other aspects of meaning are determined by surface structure. The third essay develops EST further. Both the second and third essays compare EST with alternatives, in particular with the approach now often called "generative semantics", and present

evidence that in the areas of difference, EST is to be preferred on methodological as well as empirical grounds. It is also argued that the areas of difference are more slight than much current work suggests and that many issues that appear to be significant in reality reduce to matters of terminology and notation, when clarified.

N. C.

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"Remarks on Nominalization" from *Readings in English Transformational Grammar*, Roderick A. Jacobs and Peter S. Rosenbaum (eds.) (Waltham, Mass.: Ginn and Co., 1970).

"Deep Structure, Surface Structure, and Semantic Interpretation" from *Studies in General and Oriental Linguistics Presented to Shiro Hattori on the Occasion of His Sixtieth Birthday*, Roman Jakobson and Shigeo Kawamoto (eds.) (Tokyo: TEC Co. Ltd., 1970).

"Some Empirical Issues in the Theory of Transformational Grammar" from *Goals of Linguistic Theory*, Stanley Peters (ed.) (Englewood Cliffs: Prentice-Hall Inc.).

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REMARKS ON NOMINALIZATION*

For the purposes of this paper, I will assume without question a certain framework of principles and will explore some of the problems that arise when they are applied in the study of a central area of the syntax of English, and, presumably, any human language.¹

A person who has learned a language has acquired a system of rules that relate sound and meaning in a certain specific way. He has, in other words, acquired a certain competence that he puts to use in producing and understanding speech. The central task of descriptive linguistics is to construct grammars of specific languages, each of which seeks to characterize in a precise way the competence that has been acquired by a speaker of this language. The theory of grammar attempts to discover the formal conditions that must be satisfied by a system of rules that qualifies as the grammar of a human language, the principles that govern the empirical interpretation of such a system, and the factors that determine the selection of a system of the appropriate form on the basis of the data available to the language learner. Such a "universal grammar" (to modify slightly a traditional usage) prescribes a schema that defines implicitly the infinite class of "attainable grammars"; it formulates principles that determine how each such system relates sound and meaning; it provides a procedure of evaluation for grammars of the appropriate form. Abstractly, and under a radical but quite useful idealization, we may then think of language-learning as the process of selecting a grammar of the

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¹ The presupposed framework is discussed in greater detail in a number of recent publications, specifically, J. Katz and P. Postal (1964); Chomsky (1965); and references cited there. For bibliographic references, see pp. 117-119.

appropriate form that relates sound and meaning in a way consistent with the available data and that is valued as highly, in terms of the evaluation measure, as any grammar meeting these empirical conditions.

I will assume that a grammar contains a base consisting of a categorial component (which I will assume to be a context-free grammar) and a lexicon. The lexicon consists of lexical entries, each of which is a system of specified features. The nonterminal vocabulary of the context-free grammar is drawn from a universal and rather limited vocabulary, some aspects of which will be considered below. The context-free grammar generates phrase-markers, with a dummy symbol as one of the terminal elements. A general principle of lexical insertion permits lexical entries to replace the dummy symbol in ways determined by their feature content. The formal object constructed in this way is a DEEP STRUCTURE. The grammar contains a system of transformations, each of which maps phrase-markers into phrase-markers. Application of a sequence of transformations to a deep structure, in accordance with certain universal conditions and certain particular constraints of the grammar in question, determines ultimately a phrase-marker which we call a SURFACE STRUCTURE. The base and the transformational rules constitute the syntax. The grammar contains phonological rules that assign to each surface structure a phonetic representation in a universal phonetic alphabet. Furthermore, it contains semantic rules that assign to each paired deep and surface structure generated by the syntax a semantic interpretation, presumably, in a universal semantics, concerning which little is known in any detail. I will assume, furthermore, that grammatical relations are defined in a general way in terms of configurations within phrase-markers and that semantic interpretation involves only those grammatical relations specified in deep structures (although it may also involve certain properties of surface structures). I will be concerned here with problems of syntax primarily; it is clear, however, that phonetic and semantic considerations provide empirical conditions of adequacy that must be met by the syntactic rules.

As anyone who has studied grammatical structures in detail is well aware, a grammar is a tightly organized system; a modification of one part generally involves widespread modifications of other facets. I will make various tacit assumptions about the grammar of English, holding certain parts constant and dealing with questions that arise with regard to properties of other parts of the grammar.

In general, it is to be expected that enrichment of one component of the grammar will permit simplification in other parts. Thus certain descriptive problems can be handled by enriching the lexicon and simplifying the categorial component of the base, or conversely; or by simplifying the base at the cost of greater complexity of transformations, or conversely. The proper balance between various components of the grammar is entirely an empirical issue. We have no a priori insight into the "trading relation" between the various parts. There are no general considerations that settle this matter. In particular, it is senseless to look to the evaluation procedure for the correct answer. Rather, the evaluation procedure must itself be selected on empirical grounds so as to provide whatever answer it is that is correct. It would be pure dogmatism to maintain, without empirical evidence, that the categorial component, or the lexicon, or the transformational component must be narrowly constrained by universal conditions, the variety and complexity of language being attributed to the other components.

Crucial evidence is not easy to obtain, but there can be no doubt as to the empirical nature of the issue. Furthermore, it is often possible to obtain evidence that is relevant to the correct choice of an evaluation measure and hence, indirectly, to the correct decision as to the variety and complexity that universal grammar permits in the several components of the grammar.²

To illustrate the problem in an artificially isolated case, consider

² Needless to say, any specific bit of evidence must be interpreted within a fixed framework of assumptions, themselves subject to question. But in this respect the study of language is no different from any other empirical investigation.

such words as *feel*, which, in surface structure, take predicate phrases as complements. Thus we have such sentences as:

- (1) John felt angry (sad, weak, courageous, above such things, inclined to agree to their request, sorry for what he did, etc.).

We might introduce such expressions into English grammar in various ways. We might extend the categorial component of the base, permitting structures of the form noun phrase-verb-predicate, and specifying *feel* in the lexicon as an item that can appear in prepredicate position in deep structures. Alternatively, we might exclude such structures from the base, and take the deep structures to be of the form noun phrase-verb-sentence, where the underlying structure *John felt* [_S*John be sad*]_S³ is converted to *John felt sad* by a series of transformations. Restricting ourselves to these alternatives for the sake of the illustrative example, we see that one approach extends the base, treating *John felt angry* as a NP-V-Pred expression roughly analogous to *his hair turned gray* or *John felt anger* (NP-V-NP), while the second approach extends the transformational component, treating *John felt angry* as a NP-V-S expression roughly analogous to *John believed that he would win* or *John felt that he was angry*. A priori considerations give us no insight into which of these approaches is correct. There is, in particular, no a priori concept of "evaluation" that informs us whether it is "simpler", in an absolute sense, to complicate the base or the transformational component.

There is, however, relevant empirical evidence, namely, regarding the semantic interpretation of these sentences.⁴ To feel angry is not necessarily to feel that one is angry or to feel oneself to be angry; the same is true of most of the other predicate expressions that appear in such sentences as (1). If we are correct in assuming that it is the grammatical relations of the deep structure that determine the semantic interpretation, it follows that the deep structure of (1) must not be of the NP-V-S form, and that, in fact,

³ Henceforth I shall use labeled brackets to indicate structures in phrase-markers; an expression of the form $X[A\ Y]_AZ$ signifies that the string Y is assigned to the category A in the string XYZ .

⁴ There are a number of suggestive remarks on this matter in Kenny (1963).

the correct solution is to extend the base. Some supporting evidence from syntax is that many sentences of the form (1) appear with the progressive aspect (*John is feeling angry*, like *John is feeling anger*, etc.), but the corresponding sentences of the form NP-V-S do not (**John is feeling that he is angry*). This small amount of syntactic and semantic evidence therefore suggests that the evaluation procedure must be selected in such a way as to prefer an elaboration of the base to an elaboration of the transformational component in such a case as this. Of course this empirical hypothesis is extremely strong; the evaluation procedure is a part of universal grammar, and when made precise, the proposal of the preceding sentence will have large-scale effects in the grammars of all languages, effects which must be tested against the empirical evidence exactly as in the single case just cited.

This paper will be devoted to another example of the same general sort, one that is much more crucial for the study of English structure and of linguistic theory as a whole.

Among the various types of nominal expressions in English there are two of particular importance, each roughly of propositional form. Thus corresponding to the sentences of (2) we have the gerundive nominals of (3) and the derived nominals of (4):⁵

- (2) a. John is eager to please.
- b. John has refused the offer.
- c. John criticized the book.
- (3) a. John's being eager to please
- b. John's refusing the offer
- c. John's criticizing the book
- (4) a. John's eagerness to please
- b. John's refusal of the offer
- c. John's criticism of the book

Many differences have been noted between these two types of nominalization. The most striking differences have to do with the

⁵ The fullest discussion of this and related topics is in Lees (1960), from which I will draw freely.

productivity of the process in question, the generality of the relation between the nominal and the associated proposition, and the internal structure of the nominal phrase.

Gerundive nominals can be formed fairly freely from propositions of subject-predicate form, and the relation of meaning between the nominal and the proposition is quite regular. Furthermore, the nominal does not have the internal structure of a noun phrase; thus we cannot replace *John's* by any determiner (e.g., *that*, *the*) in (3), nor can we insert adjectives into the gerundive nominal. These are precisely the consequences that follow, without elaboration or qualifications, from the assumption that gerundive nominalization involves a grammatical transformation from an underlying sentencelike structure. We might assume that one of the forms of NP introduced by rules of the categorial component of the base is (5), and that general rules of affix placement give the freely generated surface forms of the gerundive nominal:⁶

(5) [sNP *nom* (Aspect) VP]_s

The semantic interpretation of a gerundive nominalization is straightforward in terms of the grammatical relations of the underlying proposition in the deep structure.

Derived nominals such as (4) are very different in all of these respects. Productivity is much more restricted, the semantic relations between the associated proposition and the derived nominal are quite varied and idiosyncratic, and the nominal has the internal structure of a noun phrase. I will comment on these matters directly. They raise the question of whether the derived nominals are, in fact, transformationally related to the associated proposi-

⁶ I follow here the proposal in Chomsky (1965, p. 222) that the base rules give structures of the form NP-Aux-VP, with Aux analyzed as Aux₁ (Aspect), Aux₁ being further analyzed as either Tense (Modal) or as various nominalization elements and Aspect as (perfect) (progressive). Forms such as * *John's being reading the book* (but not *John's having been reading the book*) are blocked by a restriction against certain -ing -ing sequences (compare * *John's stopping reading*, *John's having stopped reading*, etc.). Tense and Modal are thus excluded from the gerundive nominal, but not Aspect. Nothing that follows depends on the exact form of the rules for gerundive nominalization, but I think that a good case can be made for this analysis.

tions. The question, then, is analogous to that raised earlier concerning the status of verbs such as *feel*. We might extend the base rules to accommodate the derived nominal directly (I will refer to this as the "lexicalist position"), thus simplifying the transformational component; or, alternatively, we might simplify the base structures, excluding these forms, and derive them by some extension of the transformational apparatus (the "transformationalist position"). As in the illustrative example discussed earlier, there is no a priori insight into universal grammar — specifically, into the nature of an evaluation measure — that bears on this question, which is a purely empirical one. The problem is to find empirical evidence that supports one or the other of the alternatives. It is, furthermore, quite possible to imagine a compromise solution that adopts the lexicalist position for certain items and the transformationalist position for others. Again, this is entirely an empirical issue. We must fix the principles of universal grammar — in particular, the character of the evaluation measure — so that it provides the description that is factually correct, noting as before that any such hypothesis about universal grammar must also be tested against the evidence from other parts of English grammar and other languages.

In the earliest work on transformational grammar (cf. Lees (1960)), the correctness of the transformationalist position was taken for granted; and, in fact, there was really no alternative as the theory of grammar was formulated at that time. However, the extension of grammatical theory to incorporate syntactic features (as in Chomsky (1965, Chapter 2)) permits a formulation of the lexicalist position, and therefore raises the issue of choice between the alternatives.⁷ My purpose here is to investigate the lexicalist

⁷ The transformationalist position is adopted in much recent work, for example, Lakoff (1965). It is argued in some detail in Chapin (1967). The lexicalist position is proposed in Chomsky (1965, pp. 219-220), but with the analysis of possessive subjects that is rejected here on p. 36; it is implicitly rejected, incorrectly, as I now believe, in Chomsky (1965, p. 184). A compromise position of the sort noted above is developed in detail by Langendoen (1967). It is also discussed in Annear and Elliot (1965). Langendoen presents an analysis very much like the one that I will propose directly, and cites a good

position and to explore some of the consequences that it suggests for the theory of syntax more generally.

Consider first the matter of productivity. As noted above, the transformation that gives gerundive nominals applies quite freely.⁸ There are, however, many restrictions on the formation of derived nominals. The structures underlying (6), for example, are transformed to the gerundive nominals of (7) but not to the derived nominals of (8):

- (6) a. John is easy (difficult) to please.
- b. John is certain (likely) to win the prize.
- c. John amused (interested) the children with his stories.
- (7) a. John's being easy (difficult) to please
- b. John's being certain (likely) to win the prize
- c. John's amusing (interesting) the children with his stories
- (8) a. * John's easiness (difficulty) to please
- b. * John's certainty (likelihood) to win the prize
- c. * John's amusement (interest) of the children with his stories

There are, of course, derived nominals that superficially resemble those of (8), for example, those of (9), which pair with the gerundive nominals of (10):

deal of evidence in support of it. He refrains from adopting a full lexicalist position because of such ambiguities as that of *proof* in *John's proof of the theorem* (*took him a long time, is reproduced in the new text*). However, this objection to the full lexicalist hypothesis, for which I am responsible, seems to me very weak. One might just as well suppose that a lexical ambiguity is involved, analogous to the ambiguity of such words as *book*, *pamphlet*, etc., which can be either concrete or abstract (*the book weighs five pounds, ...was written in a hurry*), as was noted by Postal (1966b). See Note 11 in this connection.

⁸ There are certain restrictions. For example, the transformation is inapplicable when the subject is of a type that does not permit possessives (e.g., * *that John was here's surprising me*), and it often is very unnatural with verbs that involve extraposition (* *its surprising me that John was here*, * *John's happening to be a good friend of mine*), although *its having surprised me that John was here* and *John's happening to be there* seem tolerable.

- (9) a. John's eagerness to please ((2a), (4a))
 - b. John's certainty that Bill will win the prize
 - c. John's amusement at (interest in) the children's antics
- (10) a. John's being eager to please ((2a), (3a))
 - b. John's being certain that Bill will win the prize
 - c. John's being amused at (interested in) the children's antics

These discrepancies between gerundive and derived nominals call for an explanation. Specifically, we must determine why the examples of (8) are ruled out although those of (9) are permitted.⁹

The idiosyncratic character of the relation between the derived nominal and the associated verb has been so often remarked that discussion is superfluous. Consider, for example, such nominals as *laughter*, *marriage*, *construction*, *actions*, *activities*, *revolution*, *belief*, *doubt*, *conversion*, *permutation*, *trial*, *residence*, *qualifications*, *specifications*, and so on, with their individual ranges of meaning and varied semantic relations to the base forms. There are a few subregularities that have frequently been noted, but the range of variation and its rather accidental character are typical of lexical structure. To accommodate these facts within the transformational approach (assuming, as above, that it is the grammatical relations in the deep structure that determine meaning) it is necessary to resort to the artifice of assigning a range of meanings to the base form, stipulating that with certain semantic features the form must nominalize and with others it cannot. Furthermore, the appeal to this highly unsatisfactory device, which reduces the hypothesis that transformations do not have semantic content to near vacuity, would have to be quite extensive.¹⁰

⁹ There is also at least one class of cases where the derived nominals are permitted but not the gerundive nominals, namely, examples where the gerundive is blocked because the subject does not possessivize (cf. Note 8). Thus the gerundive nominal *his negative attitude toward the proposal's disrupting our plans* is clumsy and *his bringing up of that objection's disrupting our plans* is impossible, but we can form the associated derived nominals: *the disruption of our plans by his negative attitude toward the proposal*, ... *by his bringing up of that objection*. We return to these cases directly.

¹⁰ The artificiality might be reduced by deriving nominals from underlying nouns with some kind of sentential element included, where the meaning can be

The third major difference noted above between gerundive and derived nominals is that only the latter have the internal structure of noun phrases. Thus we can have such expressions as *the proof of the theorem* (* *the proving the theorem*, with a gerundive nominal), *John's unmotivated criticism of the book* (* *John's unmotivated criticizing the book*), and so on. Correspondingly, the derived nominals cannot contain aspect; there is no derived nominal analogous to *John's having criticized the book*. Furthermore, many derived nominals pluralize and occur with the full range of

expressed in this way: for example, *John's intelligence from the fact that John is intelligent* (in *John's intelligence is undeniable*), and from *the extent to which John is intelligent* (in *John's intelligence exceeds his foresight*). It is difficult to find a natural source for the nominal, however, in such sentences as *John's intelligence is his most remarkable quality*. This idea runs into other difficulties. Thus we can say *John's intelligence, which is his most remarkable quality, exceeds his foresight*; but the appositive clause, on this analysis, would have to derive from * *the extent to which John is intelligent is his most remarkable quality*, since in general the identity of structure required for appositive clause formation to take place goes even beyond identity of the given phrase-markers, as was pointed out by Lees (1960, p. 76). Many open questions regarding recoverability of deletion in erasure transformations arise as this problem is pursued. For some discussion, see Chomsky (1965, pp. 145f., 179f.). Ross (1967); and Chomsky (1968). Ross (1967) suggests (Chapter 3, n. 19) that identity of base structures is required for erasure.

The scope of the existing subregularities, I believe, has been considerably exaggerated in work that takes the transformationalist position. For example, Lakoff (1965) gives what are probably the strongest cases for this position, but even of these very few are acceptable on the semantic grounds that he proposes as justifying them. Thus *John's deeds* does not have the same meaning as *things which John did* (p. IV-2), but rather, *fairly significant things which John did* (we would not say that one of John's first deeds this morning was to brush his teeth). We cannot derive *John's beliefs* from *what John believes* (p. V-23), because of such sentences as *John's beliefs are not mutually consistent, ... are numerous, etc.*, or *John's beliefs, some of which are amazing, ...*; nor can we derive it from *the things that John believes*, since the semantic interpretation will then be incorrect in such expressions as *I respect John's beliefs* or *John's beliefs are intense*. It is difficult to see how one can transformationally relate *I read all of John's writings* to *I read all of what John wrote*, in view of such expressions as *I read all of John's critical writings*, etc. And if one is to postulate an abstract verb *poetize* underlying *John's poems*, then what about *John's book reviews, dialogues, sonnets, limericks, Alexandrines*, etc.? In general, there are few cases where problems of this sort do not arise. Correspondingly, the transformationalist position is impossible to support, and difficult even to maintain, on semantic grounds.

determiners (*John's three proofs of the theorem, several of John's proofs of the theorem, etc.*). And derived nominals, in fact, can appear freely in the full range of noun phrase structures. For example, the sentence *John gave Bill advice* is just like any other indirect object structure in that it has the double passive (*advice was given (to) Bill, Bill was given advice*). It is difficult to see how a transformational approach to derived nominals can account for the fact that the structures in which they appear as well as their internal structure and, often, morphological properties, are those of ordinary noun phrases. None of these problems arises, as noted earlier, in the case of gerundive nominals.

These properties of derived nominals are quite consistent with a lexicalist approach and, in part, can even be explained from this point of view. Before going into this matter, let us elaborate the lexicalist position in slightly greater detail.

I noted earlier that the lexicalist position was not formulable within the framework of syntactic theory available at the time of Lees's work on nominalizations. The problem was that the obvious generalizations concerning the distributional properties of the base and derived forms were expressible, in that framework, only in terms of grammatical transformations. There was no other way to express the fact that the contexts in which *refuse* appears as a verb and *refusal* as a noun are closely related. However, when the lexicon is separated from the categorial component of the base and its entries are analyzed in terms of contextual features, this difficulty disappears. We can enter *refuse* in the lexicon as an item with certain fixed selectional and strict subcategorization features, which is free with respect to the categorial features [noun] and [verb]. Fairly idiosyncratic morphological rules will determine the phonological form of *refuse*, *destroy*, etc., when these items appear in the noun position. The fact that *refuse* takes a noun phrase complement or a reduced sentential complement and *destroy* only a noun phrase complement, either as a noun or as a verb, is expressed by the feature structure of the "neutral" lexical entry, as are selectional properties. Details aside, it is clear that syntactic features provide a great deal of flexibility for the expression of generalizations