Corepresentation of Grammatical Structure

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COREPRESENTATION OF GRAMMATICAL STRUCTURE

ON CASE GRAMMAR
Prolegomena to a Theory of Grammatical Relations
John M. Anderson

DEFINITENESS AND INDEFINITENESS
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OF GRAMMATICAL
STRUCTURE

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To E and W,
Joy and Comfort

ACKNOWLEDGMENTS

PROSPECTUS

This study is concerned with some descriptive and explanatory problems currently confronting the theory of generative grammar and presents an approach to them in terms of a model called COREPRESENTATIONAL GRAMMAR, henceforth 'CORG'. It will be argued that with regard to these problems, CORG has significant substantive advantages over transformational grammar ('TG').

The term 'corepresentational' derives from the assumption that the grammatical structure of a sentence is simultaneously specified by two representations of distinct formal types: a CATEGORIAL representation (or constituent structure analysis) and a RELATIONAL representation (which is here taken to be an unordered conjunction of statements indicating abstract relations among grammatically significant elements). The precise formal nature of these two modes is discussed in detail in Chapter 1. For purposes of this study, 'relation' can be taken to mean 'grammatical relation' (e.g., Subject-of, Object-of), though of course there are other types of abstract relations which must be recognized in linguistic analysis (e.g., anaphoric relations such as coreference and logical relations such as entailment). One goal of a corepresentational description of a language is to provide precisely formulated principles which will correctly determine for any arbitrarily selected and categorially analyzed sentence of a language the grammatical relations which obtain within it; it is this goal with which the present work is principally concerned.

There are two major differences between CORG and TG. First and foremost, CORG operates under the constraint that in so far as the rules of grammar make reference to categorial structure, they refer exclusively to SURFACE categorial structure. No abstract level of categorial representation, such as 'deep' or 'underlying' structure, is recognized. In this regard, CORG differs even from 'interpretive' transformational models (such as that of Jackendoff 1972), which hold that an abstract level of deep structure is necessary even though some facets of semantic interpretation are determined by rules operating on surface structure.[1] Second, in CORG the explicit provision of a mode of relational representation permits the formulation of rules which make direct reference to grammatical relations, whereas in TG these may be referred to only indirectly (via reference to associated

sequential or configurational information). In this regard, CORG resembles relational grammar,[2] though the resemblance ends with this one shared similarity. Relational grammar makes crucial use of rules that are essentially translations of transformational rules, the difference being that whereas transformations change order and configuration, their analogues in relational grammar change grammatical relations. (An example of such a 'transrelational' rule, as Johnson calls them (1976), is the cognate of the passive transformation which consists in part of the instruction to convert Objects into Subjects.) In CORG, there is no mechanism for deriving one grammatical relation from another; accordingly, terms such as 'Subject' and 'Object' refer exclusively to LOGICAL Subject and Object, so that in an active-passive sentence pair such as *Harry likes Maxine/ Maxine is liked by Harry, Harry* is characterized as Subject of the verb in both. The status of the 'surface Subject' of passives is handled differently from the usual way − for details, see §2.4.[3]

Lest there be misunderstanding on this point, let it be said at the outset that this study will not, for the most part, be concerned with presenting new facts, nor will it argue for anything revolutionary in the way of a basic conception of linguistic structure. The phenomena to be discussed here are largely familiar (though this does not necessarily mean that they are well understood), and the fundamental assumptions are essentially those of traditional grammar. What is new is the way in which certain well-known phenomena will be interpreted theoretically and related to one another. There is also an important difference in emphasis between CORG and its generative forebears: In TG, the central questions pertain to the nature of underlying structures and of the rules required to map them into surface structures; accordingly, much stress is placed on the degree of difference between the two kinds of structure and on the formal properties of transformational rules. In CORG, the principal issue is perceived rather differently, namely, as pertaining to the discovery of regularities in the manner in which abstract relational information is encoded by sentences. This in turn means that surface structure must be the main object of attention. The main question to which we are addressed is: To what structural information about a sentence must a language user have access in order to determine correctly its abstract relational content? TG, at least in practice, has given this question marginal attention at best, though there can hardly be any doubt as to its importance or interest.[4]

The data in this study are drawn primarily from English, though it

is hoped that the resulting hypotheses will have cross-linguistic validity.
In any event, careful description of individual languages is a necessary
first step in defining the issues which must be faced in constructing a
theory of grammar with universal or near-universal scope.

The presentation is organized as follows:

Chapter 1 outlines the basics of corepresentational theory and
presents an initial comparison with TG. Chapter 2 then develops and
defends a specific set of principles for the analysis of simplex sentences
in English. One of these principles, the 'Oblique Distance Condition',
provides another comparison point with TG, and an argument is
presented to the effect that the generalization expressed by this
principle strengthens the case in favor of CORG.

Chapter 3, the first of three concerned with complex sentences,
deals with complementation. Three major topics are taken up,
namely, the determination of the predicational structure of com-
plement constructions, the treatment of discontinuous argument-
predicate dependencies in such constructions, and the behavior of
complementizers. The apparatus developed is defended on the
grounds that there are constructions whose behavior can be
explained in a corepresentational treatment but not in a trans-
formational one.

Chapters 4 and 5 deal with the phenomena usually accounted for
in transformational theory by the Complex NP and Coordinate
Structure Constraints (Ross 1967). It is argued that these constraints
(and the general theoretical framework within which they are
couched) are nonexplanatory but that at least a minimal level of
explanatory adequacy can be achieved given a corepresentational
model. It is shown first that certain restrictions must be imposed on
the manner in which predicational structure is assigned to well-formed
sentences containing complex NP's or coordinations; given these
restrictions, it follows automatically that structures which violate
the Complex NP or Coordinate Structure Constraint will be ill-formed,
since they must be analyzed as containing predications that violate
other principles of the theory. Thus the facts motivating these
constraints are a consequence, given the corepresentational approach,
of general principles which govern predicational structure and which
would be required in any case.

The concluding chapter, Chapter 6, seeks to place the results
of this study in a broader metatheoretical context. Certain objections
are anticipated and discussed, and the question of the relationship of
linguistic and psychological theories is considered. Finally, it is argued

that the advantages of CORG over TG are a consequence of a 'notionalist' or 'conceptualist' viewpoint taken by the former, as opposed to the 'formalist' viewpoint of the latter.

Although CORG is conceived of as an alternative to TG, it is none the less important to emphasize that the two theories have some significant properties in common. For one thing, both are generative in orientation in the sense that both seek to provide a finite set of principles for the characterization of essential properties of the members of an infinitely large set of linguistic objects. Moreover, both derive their impetus from the conviction that formal rigour is essential to linguistic description. The claim by Chomsky (1957, p. 5) that 'precisely constructed models of linguistic structure can play an important role, both negative and positive, in the process of discovery itself' is taken here as an indispensable premise. Though a measure of polemic is inevitable in a work of this sort, it must not be allowed to obscure the fact that no new approach can completely escape indebtedness to what preceded it; the present case is certainly no exception. If my conclusions are correct, this can only enhance the value of the method of inquiry associated with the generative grammatical tradition.

Notes

1. Although interpretive semantics takes a rather narrow view of what may be accomplished by transformations, it does not represent a fundamental challenge to the basic assumptions underlying TG. The impetus for the development of the interpretive model comes from the desire to limit transformations and the structures interrelated thereby to a purely 'syntactic' function; thus, semantic considerations are not valid in motivating them. Jackendoff (1972) assumes that there is other than semantic motivation for abstract deep structures and that these are the natural inputs to the portion of the semantic component which determines predicate-argument relations. But 'assumes' is to be taken literally here: he provides no defense of either claim. He also relies crucially on such notions as 'transformational cycle' and on the intermediate structures of transformational derivations.

2. This term refers to a model suggested by D. Perlmutter and P. Postal, but not yet developed by them in print; a closely related model is given a detailed presentation in Johnson 1976. A proposal to incorporate direct reference to grammatical relations in the statements of certain kinds of rules is made in Kac (1972a) and is justified on much the same sorts of grounds as those employed by Johnson. Yet another approach having some points in common with CORG is currently under investigation by Derwing, Prideaux, and Baker and their associates at the University of Alberta; I would like to express my thanks to Gary Prideaux for providing me with a preview of this work.

3. Another example of a transrelational rule is the analogue of the transformation of Subject Raising, consisting in the instruction to convert the Subject of a predicate into an Object of the immediately superordinate predicate. For an alternative|analysis,|see Kac 1976a.

4. Something like this issue does arise in connection with work on 'perceptual strategies' for reconstructing deep structures given their surface reflexes. But the tendency is to treat the problem as one pertaining to 'performance' and hence as of only ancillary relevance to the study of grammar. See §6.2.1 for further discussion.

1 FUNDAMENTAL PRINCIPLES

1.1. Corepresentation Defined

Grammatical theory since antiquity has recognized that there are two modes of representation of the grammatical structure of a sentence. The first, which we may call CATEGORIAL, involves a segmentation of the sentence into constituents and the identification of each constituent as a member of one of a finite set of categories such as 'noun', 'verb', 'noun phrase', and so on. A graphic display such as a labelled bracketing or tree ('P-marker') may be regarded as specifying the categorial structure of the sentence with which it is associated.[1] Henceforth we will refer to any such structural description as a CATEGORIAL REPRESENTATION.

The second mode of representation is RELATIONAL. As the term implies, a description in this mode identifies relations among elements (e.g., the grammatical relation 'Subject-of' or the anaphoric relation 'is coreferential with'). A RELATIONAL REPRESENTATION[2] will henceforth be construed as consisting of a conjunction of statements s_1 & s_2 & . . . & s_n where each s is of the form

(1) $X = \rho(Y)$

which is read as 'X bears the relation ρ to Y' or 'X is the/a ρ of Y'.[3] For example, the English sentence

(2)   Harry likes vodka.

may be presumed to have the relational representation

(3)   *Harry* = SUBJ*(like)* & *vodka* = OBJ*(like)*.

where the labels SUBJ/OBJ and the terms 'Subject/Object' will henceforth be taken to refer exclusively to the relations LOGICAL SUBJECT and LOGICAL OBJECT. We will say that a categorial and a relational representation COREPRESENT the grammatical structure of a sentence with which they are associated; any such pairing of a categorial and relational representation is thus a COREPRESENTATION.

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Strictly speaking, of course, a categorial representation has relational content as well. More precisely, such a representation is a graphic display of a type of structure expressible in terms of such relations as 'is a', 'dominates', 'precedes', 'commands', and so on. These relations may be called 'geometric' or 'formal', whereas a relation like SUBJ might be called 'notional'. Thus, 'relational representation' really means 'notional relational representation', and 'categorial representation' means 'geometric relational representation' where one of the geometric relations involved happens to be the CATEGORY IDENTIFICATION RELATION 'is a'.

In its broadest sense, the term 'corepresentational grammar' refers to any approach to linguistic description which, explicitly or or implicitly, associates relational (notional) characterizations with categorially (geometrically) analyzed sentences. Given such a broad definition, virtually every theory of grammar ever seriously proposed is corepresentational – including TG. We will, however, define the term more narrowly, as denoting a theory which (a) assumes only one level of categorial structure (i.e., surface structure) and (b) assumes exlicitly that relational structure is described formally via such representations as (3) or via some clearly equivalent formalism. Some specific arguments in favor of this formalism will be presented below.

1.2. Generation of Corepresentations

The core of a corepresentational description of a language is a set of axioms on the basis of which it is possible to prove as theorems all true statements of the form 'Sentence S with categorial representation K has relational representation R' and no false statements of this form. The sense in which CORG is a model for generative grammatical description should thus be clear: There must be finitely many axioms, formalized to the point where their consequences can be unequivocally determined, and from which infinitely many statements of the type just described can be derived. It is important to note, however, that axiomatization of this type does not – and need not – define an algorithm for generating corepresentations (i.e., a mechanical procedure for mapping between categorial and relational structures). The requirement that a generative grammar of a language be construed as an algorithm, though widely assumed, seems needlessly strong; we will require here only that all and only the set of true statements connecting categorially analyzed sentences with their relational representations be deducible from the principles of

the theory according to accepted rules of logical inference, whether or not there is always a mechanical step-by-step method for doing so.

The axioms for a given language will obviously have to include at least a set of lexical entries and a phrase structure grammar of some sort as well. These will be discussed later in the chapter. For the moment, we will focus on the principles involved in associating categorial and relational representations, principles which are of three major types:

(a) RULES OF COREPRESENTATION ('C-rules'), defined as language-specific conditions involved in determining the relational structure of categorially analyzed sentences. Each such rule associates some specific item of relational information with a sentence on the basis of some specific item of other information about the sentence.

(b) METACONDITIONS, defined as UNIVERSAL principles which govern the internal structure of predications and which jointly define for all languages the notion 'possible corepresentation'.

(c) DOMAIN RESTRICTIONS, defined as principles which in complex sentences identify the structural units that can be taken as representing the predications of which the sentence is constituted.

In addition, there are various miscellaneous principles pertaining to the interpretation and interaction of the components of the theory.

Chapters 2-5 develop and justify a system of C-rules, metaconditions, and domain restrictions for simplex and complex sentences of English. The remainder of this chapter is devoted to filling in certain further details to clarify the outlines of the corepresentational model.

1.3. On Comparing Approaches

I digress briefly at this early point to comment on the basis for comparison of CORG and TG. In regard to the scope and limits of such comparison, two major points must be made:

First, there is one level at which it is meaningless to compare CORG and TG, since at this level they do not represent different approaches. The reason is that the term 'transformational' is subject to so loose a construal that it applies to any formal model of grammatical description which aims at a reasonable degree of comprehensiveness and generality. Just as all grammars are corepresentational on the basis of a sufficiently loose definition of this term, so are all grammars transformational in that they must map between differing kinds of structural representations of linguistic objects in accordance with some set of explicitly formulated principles. Thus it makes no sense to compare CORG and TG in the