

HOW MUCH DEEP ARE THE 'DEEP STRUCTURES'? FROM THE CHOMSKIAN PERSPECTIVE

KUMAR MITRA

The conception of a generative - transformational system was introduced by Chomsky to overcome a limitation of taxonomic or phrase - structure grammar (henceforth, PS - grammar), namely the failure to reveal the underlying conceptual scheme of a sentence. The sentences that we see written or hear spoken have a sort of arrangement of their components. We may call it 'actual arrangement' or 'surface structure' In PS - grammar, the surface of a sentence is the structure of a sentence demonstrated by a phrase - marker (henceforth, PM) only in accordance with phrase-structure rules (henceforth, PS - rules). But this visible or audible arrangement does not always reveal the full semantic content contained in those sentences. To bring out the full semantic interpretation of a sentence, we are to search for an 'underlying arrangement' of sentences, or, in other words, we are to develop the concept of an underlying 'deep structure'. Chomsky hopes that through this concept of an underlying deep structure, we shall be able to explain our intuitive understanding of many aspects of language.

The grammatical transformations embody those rules which we apply to make an actual sentence from an underlying mental system. As sound and meaning join together in language, similarly deep and surface structure must be joined through some mental operations to enable us to generate infinite number of sentences from a finite repertoire.

Notion Of 'Syntactic Description'

Chomsky introduces an abstract technical notion of 'syntactic descrip-

tion' (henceforth, SD) which determines the semantic interpretation of a sentence. The 'deep structure' and the 'surface structure' are the two aspects of the SD, the former determining the semantic part and the latter determining the phonetic part. SD is generated by the syntactic component. A phonetic interpretation is given to the surface structure by the phonological component. A semantic interpretation is given to the deep structure by the semantic component. In the grammar, then, the phonetic and semantic interpretations are associated through the syntactic component.

Syntactic Features Below The Surface Structure

The taxonomic description of a sentence cuts a sentence off into continuous phonetic stretches and classifies them as constituents of one or another sort. Chomsky argues that such description cannot mark a variety of syntactic features because it cannot go below the surface structure of sentences. To illustrate the point, Chomsky takes up two sentences : (1) 'John is easy to please' and (2) 'John is eager to please'. As per a taxonomic description, both the sentences get the same syntactic analysis which fails to emphasize the logical difference between them. These two sentences are only superficially similar, the similarity is in their surface structure. Their difference becomes manifest when they are put under certain grammatical operations, like the conversion from active to passive forms. In (1) 'John' is the object of the verb 'please' and in (2) 'John' is the subject of the verb 'please'. If we try to convert them in an exactly similar way, we will find one sentence of the two turning ungrammatical.

Even if we enrich the complexity of superficial phrase-markers, problems of this type will not get solved. The concept of 'deep structure' has to be developed within a generative - transformational grammar. It is a form of syntactic description in which grammatical relations, which are semantically significant, are represented. They are shown to underlie the phonetic form of sentences on the basis of transformational rules. As in the preceding example; the surface - structure may not always reflect its deep structure and the deep structure may not have a direct manifestation in the speech signal.

The Abstract Nature Of Deep Structure

The deep structure itself and the rules determining and relating deep and surface structures are abstract and remote from conscious thought. The stress lies on this abstractness, because, as Chomsky puts it,

.....it is on this property that our inferences about mental processes are based.¹

Both the surface structure and the deep structure are systems of categories and phrases; but surface structure, unlike deep structure, is directly linked with the physical signal. Deep structure is something more abstract than the surface structure.

Components of Grammar Redefined

The three traditional components of a grammar, namely, recursive, semantic and phonological, may be redefined in terms of their connection with the deep and surface structure in the following way. By the recursive rules a grammar generates some strings composed of some symbols taken out of the vocabulary. By the recursive component, sentences are assigned surface structures which determine the phonetic pattern of those sentences. Underlying deep structures also are assigned by the recursive component.²

The SD is assigned semantic interpretation by the semantic component, and phonetic interpretation by the phonological component. Assignment of semantic interpretation refers essentially to deep structure. Assignment of phonetic interpretation refers to surface structures.²

The syntax of a language has two rule - systems : (1) base system and (2) transformational system. Deep structures are generated by the base system which introduces new propositions. The transformational system maps those deep structures onto surface structures. In the base system there are the rewriting rules of PS-grammar. In the transformational system there are the rules like deletion, rearrangement, adjunction, etc.

Transformations Relating Deep And Surface Structures

Initially, Chomsky held the view that in the surface structure we find

linguistic dissimilarities and at the deep structure level we may expect to find uniformity. He took the deep structure to be absolutely mental, subscribing the meaning - content of the sentences generated.⁴ Diversity in the surface features of language does not necessarily reflect diversity at the level of semantics.

Grammatical transformations are formal operations, through the sequential application of which deep and surface structures are related. We may cite here an example given by Chomsky. To exhibit the operations of passivization and interrogation, he takes up two sentences, namely, (1) John was examined by the doctor and (2) Did the doctor examine John, and writes:

... both have a deep structure similar to paraphrase of Sentence (1), (3) the doctor examined John. The same network of grammatical relations determines the semantic interpretation in each case. Thus two of the grammatical transformations of English must be the operations of passivization and interrogation that form such surface structures as Sentences (1) and (2) from a deeper structure which in its essentials also underlies Sentence (3). Since the transformations ultimately produce surface structure, they must produce labelled bracketings.⁵

Now, if we make the sentence 'The doctor examined John' passive, we get a labelled bracketing of the sentence 'John was examined by the doctor'. If on the latter we apply the operation of interrogative transformation, we get another labelled bracketing of the sentence 'was John examined by the doctor'. So, we may say with Chomsky that

....a transformation such as interrogation maps a labelled bracketing onto a labeled bracketing.⁶

At this stage Chomsky is of the opinion that the aforesaid argument is applicable not only in the passive and interrogative cases, but also in the case of all grammatical transformations as well. All of them are 'structure - dependent mappings' and all deep structures are 'labelled bracketings'.⁷

The phrase - marker part and the transformation part of syntax are

entrusted with different tasks. For every sentence, apart from its syntactic surface structure, there is a deep structure determining the semantic interpretation of the sentence. The task of the phrase-marker part is to generate the deep structure of sentences which may not be grammatically well-formed sentences. The task of the T-rules is to generate well-formed sentences out of the terminal expressions of the phrase-marker.

Change In The Concepts of Surface And Deep Structure

Chomsky has introduced several changes in his model of linguistic analysis. In his book *The Logical Structure of Linguistic Theory*, the term 'deep structure' is not found, but a notion of 'T-marker' has been used. This notion may be taken to be the ancestor of the notion 'deep structure', because this 'T-marker' determines semantic representation. In *Syntactic Structures*, the meaning - determining property was contained in the deep structure. It was shown that a sentence has different meanings (Chomsky's example was 'They are flying planes'⁸) because it has different deep structures and one surface structure. And two sentences, though having different surface structures, have the same meaning (Chomsky's examples were 'Everyone in the lab considers John incompetent' and 'John is considered incompetent by everyone in the lab'⁹), because they have one and the same deep structure. Here Chomsky did not deal much with meaning because as a disciple of Leonard Bloomfield he was convinced that study of semantics would not lead to any useful result.

Within a few years, Chomsky felt the need for a change and presented a revised model in his book *Aspects of the Theory of Syntax*. In this model we find a base component consisting of two elements - the rewriting rules and the lexicon. The rewriting rules show the structure of sequences of words. The syntactic, semantic and phonological properties of lexical items are assigned to the lexicon. This base grammar, consisting of the rules and the lexicon, generates the deep structure, that is, structure in which the subject and all the objects of each verb are unambiguously presented. Another component of the model - the transformational component - transforms the deep structure into the surface structure in which words and morphemes

appear according to the order in which we pronounce them. The base and the transformational components together form the generative part of the model. Now, there are two interpretive components - the phonological and the semantic. The semantic component is joined with the generative part at the deep structure level. Thus the meaning - receiving syntactic structure is formed. Meaning is not changed when the transformations are applied to deep structures for the production of surface structures. So two sentences differ in meaning when there are corresponding differences in deep structure. This model is called the Standard Theory (henceforth, ST).

In this model, Chomsky upholds the view that the relation between the sounds and meanings of a language is specified by a grammar. He does not reject his earlier claim that a grammar should generate all and only the sentences of the language concerned, but adds that all and only the sentences of the language are generated in the syntax part of the grammar and then each sentence is being associated with both a sound and a meaning.

At this stage, Chomsky is of the opinion that the logical difference between two sentences of the grammatical form can be indicated with the underlying deep structures. The deep structure of a sentence reflects a sentence as expressing a thought; the surface structure of a sentence reflects a sentence as expressing its physical shape of sound sequence. Though surface structures fail to clear up meanings of ambiguous sentences, still they determine at least a part of meaning. Roughly speaking, the grammatical relations determining meaning are provided by the deep structure and the logical relations (along with some others) determining meaning are provided, partially at least, by the surface structure.¹⁰

In his later writings (for example in *Reflections on Language*) we find that the ST-model has undergone some more changes to take the shape of the Extended Standard Theory (henceforth, EST). Here the surface structure has been given more role to play in determining meaning. We may say that the most important issue that divides ST from EST is the role that surface structures play in semantic interpretation. From now on, surface struc-

tures look deeper, or, in other words, deep structures look less deep.

The change in the role of deep structure has been enunciated by Chomsky in this way :

The Extended Standard Theory maintains that it is not the deep structure which undergoes semantic interpretation.under trace theory one can say that surface structure is associated directly with semantic representation.¹¹

A trace *t* has been defined as a phonological zero element. The position of an element that has been displaced by a transformation is marked by trace. The trace-theory has shown that the phonological level, the intonation is changed by the trace and at the semantic level, co-reference is blocked by it. Development of this theory has considerably changed the concept of surface structure. The word 'surface' does not mean that surface structure involves properties appearing in the physical form, rather it is being treated as quite abstract in nature. Introducing this concept of trace, Chomsky writes :

... *all* of semantic representation, including thematic relations, can in a sense be derived from surface structure¹²

At one point, in the EST version, 'deep structure' has been renamed as 'initial phrase markers'. One reason for this terminological change has been stated by Chomsky thus :

In this theory, the syntactic and semantic properties of the former "deep structures" are dissociated. Either class of properties might, then, be taken as defining the technical notion "deep structure". To avoid the issue, with the possible attendant confusion, I will simply drop the term, speaking only of "initial phrase markers" and "surface structures".¹³

Along with it, Chomsky speaks of another reason for this change :

The term "deep structure" has led a number of people to suppose that it is the deep structures and their properties that are truly

"deep" in the non-technical sense of the wordThis was never intended.¹⁴

The scope of misunderstanding still remains. 'Initial', in the term 'initial-phrase-marker', may mean 'earliest in time'. This again is not intended. That is why, to denote the abstract underlying structures, a different nomenclature, namely, 'D-structure' has been tried and the observable structures have been termed 'S-structures'.¹⁵

EST was revised and was renamed 'Revised Extended Standard Theory' (henceforth, REST). It was renamed again as 'Government-Binding' Theory (henceforth, GB)¹⁶. Apart from the change of names, several important revisions were made, particularly regarding the transformational component. Both in REST and in GB, transformations took a more general shape. In REST, transformations were renamed as 'NP-movement' etc., in GB as 'Move a' (a standing for any constituent), and the more specific names like Passivization etc. were dropped. Questions of 'deep' and 'surface' features of language have become questions of points of view. We may conclude with a quotation from a recent article written by Chomsky :

..... though there is a hint of the notions "deep" and "surface grammar" of philosophical analysis, the concepts do not closely match Everything else is "deep". The surface grammar of philosophical analysis has no particular status in the empirical study of language; it is something like phenomenal judgement; mediated by schooling, traditional authorities and conventions, cultural artificats, and so on.¹⁷

NOTES

1. Chomsky, N., 'Language and the Mind, in Aaron Bar-Adon and W.F.Leopold (eds.), *Child Language : A Book of Readings*, Prentice Hall, N.J.,1969,p.430.
2. cf. Chomsky, N. and Halle, M., *Sound Pattern of English*, Harper and Row, N.Y., 1968, p.6.

3. cf. *Ibid*, p.6.
4. cf. Chomsky, N., *Cartesian Linguistics*, Harper and Row. N.Y.,1966.p.35.
5. Chomsky, N., '*Language and the Mind*', *op.cit.* p.431.
6. *Ibid*, p.431
7. *Ibid*, p.431.
8. Chomsky, N., *Syntactic Structures*, Mouton, the Hague, 1957, 7th Printing, 1968,p.87.
9. *Ibid*, p.76.
10. cf. Chomsky, N., *Language and the Mind*, enlarged ed., Harcourt Brace, N.Y.,1972, pp. 110-111.
11. Chomsky, N., *Language and Responsibility*, (Trans. of Dialogues avec Mitson Ronat. English translation and revisions done in 1979, Pantheon Books, N.Y., 1979, p.171.
12. *Ibid*, p.164.
13. Chomsky, N., *Reflections on Language*, Fontana, UK, 1976, pp. 81-82.
14. *Ibid*, p.82.
15. cf. Chomsky, N., *Knowledge of Language : Its Nature, Origin and Use*, Praeger. N.Y., 1986, pp.64-65.
16. cf. Chomsky, N., *Some Concepts and Consequences of the Theory of Government and Binding*, MIT, NY, 1982.
17. Chomsky, N., '*Explaining Language Use*', p.8 of the typed article. I hereby express my gratitude to Professor Noam Chomsky for sending me this article through personal communication.

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