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Prolegomena to a Theory of Syntax without Constituent Structure

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1. Introduction

Since its inception, generative grammar has never failed to recognize that its ultimate task is to explicate the issue as to how and why only human beings come to use language with very limited input of linguistic data within a few years from their birth. In his talk (around 1965), for example, Chomsky remarked that the general intellectual interest of linguistic study lies not in the particular facts that it reveals, useful as these may be for pedagogical purposes or other applications, but in the conclusions that can be drawn concerning linguistic universals, ultimately, concerning the nature of human mental processes. Although the interest mentioned in the above remark has been placed, throughout the history of

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generative grammar, at the core of the issues that generative grammar is to resolve, it was not until the late 1980s that time so matured as to make a direct and explicit approach to this central issue of generative grammar. Around 1990, the theoretical achievements that had been induced from the results of the studies that analyzed (i.e. described) linguistic data by means of the theoretical devices of generative grammar began to converge; as a consequence, it stimulated researchers who were more curious about the mechanism of human language faculty than human language itself; hence, it greatly enhanced the straight exploration into the core issue about the nature of the mental processes within the human language faculty.

Along the trend of the aforementioned research project, a number of researchers have been actively investigating various aspects of the Minimalist program over the past decade. Although it is obvious that important researches as well as the concepts and terminology of the Minimalist program should be both familiar and invigorating, the status quo is that, at times, they may seem alien and their ramifications seem obscure. This is solely because the program itself is rapidly developing with radical and abrupt revisions of the most basic assumptions of the preceding decades of linguistic research, discarding many of the central principles, relations, and technical mechanisms which have been both the objects and tools of study since, at least, the GB era.

In what follows, I will, first, sketch out the kernel thesis of the Minimalist Program proposed and elaborated in the recent articles by Chomsky (1998, 1999, 2001) from a rather general viewpoint without going into technically minute details. Then, I will make a conjecture on the possibility of eliminating constituent structures in syntactic theory: It will be demonstrated that, although the conception concerning the total elimina-
tion of constituent structures seemingly forfeits tremendous things of great importance, it is, indeed, righteously requisite, under the strongest Minimalist thesis, for the bona fide exploration into the core issue of generative grammar.

2. Essentials of Minimalism

The ideas developed and elaborated in the series of papers collected in his book *The Minimalist Program* (MIT Press, 1995), in which Chomsky radically revised the Principles and Parameters framework, constitute the manifesto of the Minimalist program. For the purpose of exploring the core issue of generative grammar, the Minimalist program questions some of the most basic assumptions of the preceding decades of linguistic research and jettisons many of the central principles, relations, and technical mechanisms. At the same time, other familiar properties of the theory persist, though sometimes in surprising forms.

Over the past few years, Chomsky has written another series of papers (Chomsky (1998, 1999, 2001)) in which he further submits the accumulated assumptions to profound and extensive scrutiny, paring away technical accretions to reveal a compelling vision of the language faculty as a biologically-based system with surprisingly elegant computational properties. More than before, these papers are overgrown with the dependence upon the conviction that human language faculty is a biological organ with a marvelous capacity of computation. According to this quite strong thesis, Chomsky (2001) goes so far as to claim that we have to seek a level of explanation deeper than explanatory adequacy, asking not only what the properties of language are, but why they are that way, and suggest that these questions, optimally, are best approached by hypothesizing
that UG is conditioned by nothing but the interface conditions (ICs)\(^{(1)}\) and the general properties of computational efficiency. He calls this hypothesis “strongest minimalist thesis (SMT)”, and maintains that this thesis, which guarantees that properties of language have a principled explanation (which goes beyond explanatory adequacy), lets us accessible to the core issue of generative grammar.

3. Eliminating Constituent Structures

Recall, once again, that the premier Minimalist thesis is that there should be no operations or conditions that make reference to any conceptually unnecessary entity in the syntactic theory of natural language. Let us explore this thesis in a rather radical fashion.

Now I would like to consider the notion “constituent” or “constituent structure”. Constituent (or phrase) structures (or phrase markers) have long been alleged to be subsistent in the theory of grammar. But, in what follows, I attempt to show that they are not a necessary substance in syntactic theory. Therefore, I will show that in the narrow syntax in the sense of Chomsky (1995), there are no operation or condition that makes reference to constituent structures. This quite radical proposal, however, is pungently demanded by the SMT.

Following, entirely, the ideas presented in Collins & Ura (2001), I propose that constituent structures be eliminated not only because they are representational, but rather they have no conceptual necessity. Put differ-

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(1) The ICs are the conditions that are imposed on human language faculty by the systems with which it interacts. It is thoroughly natural that no information in the expressions generated by language should be inaccessible to other systems including the sensory-motor system and the conceptual-intentional system (which enters into thought and action).
ently, the rationale behind the proposal is that the SMT disputes the subsistence of such notions as constituents and constituent structures because they do not fall into the categories that condition the form of UG as a biological system with a computationally marvelous properties. As an immediate consequence of the proposal of eliminating constituent structures, it is not only tree diagrams (and their subsidiary notions such as nodes, branches, etc.) and (labeled) brackets, but also sisterhood, c-commanding, and even domination that cannot be postulated in the theory of grammar. This proposal is, therefore, a natural extension of the idea elaborated by Collins (2001), which is a refinement of Chomsky’s (1994) conception of “Bare Phrase Structure” on the basis of more rigid scrutiny from the minimalist viewpoint.

Historically, it has long been assumed that phrase structures (or phrase markers) can be identified with trees in graph theory, and trees are formally defined as a collocation of nodes and labels (see Partee et al. (1990)). If Collins (2001) is right in claiming that no labels are needed in syntactic theory (and I assume so), then it is no longer possible to define trees or constituent structures by utilizing labels. Two possibilities remain: First, assuming that trees and constituent structures are necessary in syntax, we seek for a possibility to define them without labels; and, second, we simply expel those notions from syntactic theory as an unnecessary substance.

In fact, the SMT disputes constituent structure as a necessary notion, so that we are to take the latter approach. But, what leads to the conclusion that the notion “constituent structure” or “constituent” lacks conceptual necessity under the SMT? Recall that no entities are conceptually necessary under the SMT unless (i) they are reduced to the ICs, or (ii) they are resolved into the general properties of computational efficiency.
Obviously, it is impossible to accredit the notion “constituent structure” or “constituent” with either of the property described in (i) or the one in (ii). Consequently, these notions and any construct defined by using them should be dispelled from the theory of syntax if we pursue the SMT in the sincerest fashion.

Before we go into the technical details concerning a theory without constituent structure, it is worth while deliberating on the raison d’être of constituents in syntax, because it might well be conceived that not a few readers conjecture that no one can deny the psychological reality of constituent structures. Since constituents or constituent structures have been very common and familiar since the tradition of the structural linguistics, they seem to be inevitable in order to refer to something about any syntactic relation, and, thus, it seems prima facie almost impossible to imagine syntax without them. A metaphor is in order to make it easier and clearer to imagine syntax without constituents\(^2\). Suppose that there are two magnets in your hand, each of which differs from the other in color. If the distance between the two magnets happens to be reduced, they attract each other, and then come together; that is, there seems to have emerged a unit of two magnets in your hand. Then, someone comes and asks you what you have in your hand. Do you reply to him that you have two magnets and a unit of them? The unit itself is not a subsistent entity in the real world. Owing exclusively to the magnetic force between them, the two magnets act as a unit. I would like to say that constituents are analogous to the unit of two magnets in this example, and more importantly, the syntactic operation, Merge, is analogous to the magnetic force between them.

Here is another metaphor: Our solar system may be viewed as a unit

\(^2\) I am indebted to Chris Collins for the first metaphor.
which consists of the sun, the nine planets, and the satellites of the planets. Suppose that an intergalactic rocket is approaching to our solar system. The crew may recognize the solar system as a unit if they make a close observation of every star’s movement in the solar system. But, for the purpose of sailing their rocket safely through the solar system, it is not necessary for them to recognize the solar system as a unit. Rather, it suffices for them to know the movements of the stars which are relevant to the course of their rocket. In other words, the solar system per se does not exist at all for their purpose. The subsistence of the solar system is not necessary and, hence, it is regarded as a kind of artifact. Now, recall that no dependence on any conceptually unnecessary conceptions is permitted under the SMT. If we are right in arguing that constituents (and constituent structures) are analogous to the solar system in the above metaphor, they should be avoided in the theory of grammar.

In order to make our point still clearer, more on the metaphor about the solar system is in order. It seems to us that our solar system itself consists of several units, because the earth has a satellite, the moon, Mars has two satellites, and so on. Take the earth and the moon, for example. Why does it seem to us that they form a unit? If we take into consideration these two stars alone, then it is not necessary to regard them as a unit. The moon is merely subjugated by the earth in its movement: While the earth’s movement is free from the moon, the moon is bound to revolve around the earth for the reason that they attract each other by their gravitation. Here no unit is necessary to be assumed, though it is possible to assume a unit because they have a relation; one subjugates the other (subjugation-relation). Now let us take into consideration the sun in addition to the earth and the moon. Then, it is easy for us to regard the earth and the moon as a unit when we consider the relations that hold among
them. The relation between the sun and the earth is the same as the one between the earth and the moon: The movement of one is subjugated by the other. But, in this case, the entity that is subjugated by something subjugates some other thing. Note, here, that the subjugation-relations are interlaced cumulatively. Moreover, the sun holds the same subjugation-relations with the other planets and their satellites. Thus, the motivation to regard each set of a planet and its satellite(s) as a unit is strengthened because it is rather difficult, without regarding each set of a planet and its satellite(s) as a unit, to calculate all the relations that hold among the sun, the nine planets, and their satellites at once. But, it is very important to notice that the unit of the earth and the moon, for example, is not a subsistent entity in the galaxy; rather, what really exist are the earth and the moon, and there is a relation between them. Again, I would like to emphasize that a unit has no subsistence and there is only a relation there.

Now I would like to conclude that a constituent is a unit, and a constituent structure (or phrase structure), which is constructed by more than one constituent, is an interwoven layer of units. I therefore go on to claim that these notions are not a necessary concept in syntactic theory. In what follows I will show that, when it seems that more than one syntactic object forms a constituent, there is no such subsistence as constituent and what really exists is only a syntactic relation that is created by checking of formal features in the course of CHL, just as the case of the aforementioned metaphor of the solar system, in which the unit that consists of the earth and the moon does not exist and what really/physically exists is only the subjugation-relation between them. In the minimalist viewpoint, it is natural to say that relations that are created by checking of formal features (i.e., checking-relations) really exist because they should be inter-
preted at the interface levels (third person agreement, for example, should be legible both at PF and at LF, because its morphophonological realization should be guaranteed at PF and its meaning (especially, in the case of some Romance languages with null subjects) should be interpreted at LF). In other words, checking relations obey the ICs; thus, regarding them as a syntactic object is very natural under the SMT. Therefore, I would like to argue that there is no constituent and what really exists in syntax is a checking relation, and that what seems to us to be a constituent structure is an interwoven layer of checking relations.

Of course, when we are trying to comprehend the whole perspective of the solar system, it is easier to imagine it by regarding the earth and the moon as a unit. Similarly, when we are trying to analyze a sentence (a construct that is created by applying syntactic operations to syntactic objects in a legitimate way), it may be easier to exploit a constituent or a constituent structure. But the SMT demands no reference to any conceptually unnecessary notion. Hence, the theory of grammar should not refer to a constituent (or any concept defined by using them).

4. Preliminaries to a Theory without Constituent Structure

Now that no constituents exist in syntax, the next question is: how can we construct a theory of syntax without them? In the previous section I hinted that checking relations are really substantial entities in a theory of syntax. Checking relations are created by legitimate syntactic operations such as Merge and Move/Attract (or Agree). Note that, in any theory without constituents, it must be the case that these syntactic operations also manipulate relations to create another relations. Thus, given a theory as to how to execute the syntactic operations properly, we can construct,
without referring to constituents, any structural or representational notions which we used to utilize in syntax. One of the most promising lines for the purpose of establishing such a theory is to explore the notion of local economy (Ura 1995, 1997, and Collins 1997), but I leave it to future research (see Collins & Ura 2001 for some further elaboration of the theory outlined here).

References