*A Note on the Organization of the Grammar**

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In Chomsky (1989) the following picture of the grammar is proposed: There are three fundamental levels of representation: Logical Form (LF), D-structure and Phonetic Form (PF). They are interface levels with the central conceptual systems, the lexicon and with motor-perceptual systems respectively. Principles of Universal Grammar (UG) determine properties of these levels of representation, which furthermore have to satisfy "external" constrains that are consequential on their interface status. The three interface levels are taken not to be related to each other directly, -- the relationship among them is mediated (solely) by S-structure. Properties of S-structure are determined by the fundamental levels and by the requirement that all three be related to it by the postulated system of principles. "The level of S-structure for *L* [=a given language, MB] is the system that satisfies these conditions, something like the solution to a certain set of equations" (p.3.).

This elegant picture implies that there is a three way symmetry: S-structure in the centre with three (sub-)derivations to relate it to the three fundamental levels. To express this we shall capitalize on a perhaps somewhat tenuous visual analogy and call the system outlined the Ferris Wheel theory. The structure of the grammar is then taken to be along the lines of (1), where S-structure is an axis around which the interface levels appear at the endpoint of three radiuses:

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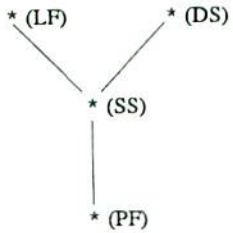
(1) The Ferris Wheel Theory



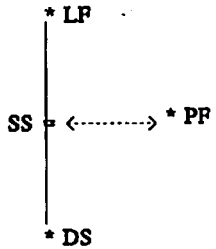
A problem for the three way symmetry implied by the Ferris Wheel theory is posed by the fact that there is little evidence that the principles that relate S-structure to PF have the diagnostic properties of move-α the rule that relates D- and S-structure and also S-structure and LF. We have little reason to think that subjacency, ECP and theta theory would constrain a central principle mapping between S-structure and PF stated in minimal terms, say as affect-α. This fact leads to a modification of the Ferris Wheel view: Since the mapping between S-structure and D-structure and S-structure and LF appears to be of the same type in contradistinction to the mapping between S-structure and PF, we are led to what is probably the more generally accepted version of the standard view: there is a derivation that relates D-structure and LF and S-structure is a level of representation somewhere along this mapping. Let us use the term "syntax" in one of its now standard senses to refer to the principles that characterize the levels of D- and S-structure and LF and their interrelationships. Since we assume that in syntax the derivations on both sides of S-structure are similar in essential respects, syntax-internally S-structure appears to be some arbitrary point on the mapping. We can define this point as the one where the rules that relate PF to syntax branch off.

Let us call this second picture of the grammar that takes account of the different nature of phonological and syntactic principles the Window theory. As the name suggests, under this system S-structure is taken to be a window on the syntactic derivation between D-structure and LF. Phonological rules will relate the representation in this window to PF representations, ultimately to sensory and motor systems. Proponents of the Window theory generally assume that phonological rules relay the information they find at S-structure to PF, ie. that the phonological component is directional, and it is "interpretive". But we should perhaps not prejudge the issue of whether (in our competence theory) we should think of the mapping between S-structure and PF as (uni-)directional.Thus the Window theory as understood here only

claims that at S-structure information is being exchanged and is meant to leave open the question of the directionality of the S-structure -- PF mapping.

If we add some indication to our illustration of the Ferris Wheel theory in (1) to show that the mapping between D- and S-structure and S-structure and LF is of the same general type, whereas the mapping between S-structure and PF has different characteristics we have a sketch of the Window theory. I do this in (2) by putting S-structure on a straight line connecting LF and D-structure, thus indicating also that under the Window theory it is natural to take the D-structure/LF derivation to be unitary with S-structure characterized as the point on this derivation where phonology connects to syntax.

(2) The Window Theory



There is a certain feature of the organization of the syntactic subtheory that both the Ferris Wheel and the Window theory share that is quite curious and even on the rather general level of this discussion one might wonder about. Recall that LF and D-structure are taken to be interface levels with the central conceptual systems and the lexicon respectively. The relationship of these levels is mediated by the syntactic derivation. Since it is necessary for the lexicon and our central cognitive processes to interact, everything else being equal, it would clearly be preferable in principle to have just one interface level between them. The lexical constraints on our conceptual systems could then be defined on this unique interface. This would be in contrast to the standard alternative where we have two interfaces with two potentially completely different sets of properties interrelated by a third system devised for precisely that purpose with precisely the right properties to link up to these two potentially completely different representations.

The argument of the previous paragraph concerning the undesirability of having LF and D-structure as two distinct levels could be repeated with any pair of interface levels, say LF and PF for example. But of course even though

abstractly it might be desirable to have a common sensory/motor and conceptual interface, we know that it is most unlikely that such a direct interface exists. The principles of PF organization and the elements they operate on appear to be of a very different nature and completely disjoint from the principles and primitives of LF. Given this fact we are led to assume that there must be two distinct levels related through some mapping. However, no similar situation is encountered in the case of the pair D-structure and LF. The concepts and principles necessary to characterize D-structure, like for example X'- and theta theory constraints and their conceptual apparatus is a subset of the principles necessary to characterize LF. Thus there is no general empirical difficulty in taking DS and LF to be nondistinct.

It is this fact that makes the standard view in both its Ferris Wheel and Window theory incarnation curious. Since it is both desirable and possible to collapse LF and D-structure, why keep them distinct?

It should be emphasized that the argument for adopting a single interface system unless facts force us to do otherwise is not a simpleminded argument from Occam's rathor that ignores the overall simplicity of the whole theory of grammar organized in a modular fashion. It is also not simply an argument that has to do with the overall theoretical simplicity and elegance of the theory of grammar, although such a point can validly be made. But there is a further consideration that would seem to strongly favour a single interface syntax, namely that such a system appears to provide a more efficient means of interaction between the lexicon and our conceptual systems. In the standard frameworks there will inevitably be D-structure representations that correspond to no well-formed LF configurations. If we do not take the LF--D-structure mapping to be directional then also conversely, we shall find LF representations that cannot be related to legitimate D-structures. Such overgeneration of structures is unavoidable in a transformational syntax, and clearly makes for a non-optimally efficient system. If on the other hand the lexicon had access to the conceptual interface, the constrains that it standardly imposes on D-structure could constrain LF directly and thus the overgeneration of syntactic interface structures could be avoided.

Suppose that the standard view involving a derivation between two syntactic interfaces is true at some point in the evolution of humans. The two fundamental levels are in principle different in kind but in point of fact one is constrained by a subset of the primitives and axioms that constrain the other. Since a mutation that would make it possible for the lexicon to interact with the conceptual systems directly through a single interface would make the system more efficient, it would result in an evolutionary advantage. Thus we would expect evolution to favour the mutant version and assuming that no

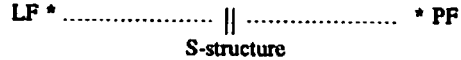
hidden advantages exist for the pre-mutation system, we would expect it to gradually disappear. Incidentally, we know on the usual level of abstraction characteristic of current linguistic theorizing what this mutation would have had to be: --trace theory.

We are proposing then a theory where there is only a single syntactic interface level, a level that both the lexicon and the conceptual systems have access to. We shall call this level of representation LF, keeping in mind that a different status is now attributed to this level. D-structure can now be thought of a level properly included in LF, or abstracted from LF in a particular way. LF still needs to be related to the interface of sensory and motor systems, PF. Let us call the theory incorporating these assumptions the Lexico-Logical Form (LLF) theory.

Consider now the status of S-structure. The standard framework assumes that this level is somewhere between D-structure and LF and relays information to PF. It is rather unclear however on both the Ferris Wheel and the Window theory view why there should be such a level in the first place. Thus one might ask why LF is not directly connected to PF, a question that we might express by asking why we do not "speak in LF"? Why does the PF of our sentences correspond more closely to their S-structure representation than to LF. Thinking of S-structure as a "solution to a set of equations" or as a level at some intermediate point on the D-structure--LF mapping does not appear helpful in bringing us closer to an answer. On either of these theories S-structure appears to be a gratuitous complication. Since it distorts LF it makes a representation on this level more difficult to map to and to recover from PF. Given either the Ferris Wheel or the Window theory the question arises why LF and PF are not directly connected, why is PF instead connected to some intermediate point on the syntactic derivation, an arrangement that again seems non-optimally efficient.

Consider now the status of S-structure in the LLF theory. If S-structure exists, and we shall assume here that it does, it cannot be an intermediate point on the D-structure--LF derivation since such a derivation is not part of the grammar. Thus if S-structure is a non-interface level of the grammar, it can now only be an intermediate level on the LF--PF mapping, the only derivation that UG contains. Schematically then we have a theory like (3):

(3) Lexico-Logical Form Theory



Thinking of S-structure as an intermediate point on the LF--PF derivation clearly does not pose the same problem that arose in the standard alternatives. LF is mapped to PF directly via S-structure, thus no problem arises of an intermediate point on the LF--D-structure mapping providing the input to the derivation leading to PF. Our theory will have to answer another question instead: how come that S-structure could have been taken as an intermediate point on a D-structure-LF derivation, why did S-structure appear to have such a status?

In earlier work (Brody 1985, 1987, 1991) I have argued that D-structure should be characterized in terms of chains, as in (4):

(4) (of the set of positions in chains) at D-structure all and only root positions are present

(4) is not meant as an additional stipulation, but rather as an alternative to the characterization of D-structure as "pure representation of thematic structure", ie. the level where all and only theta positions are present. It follows from (4) and the projection principle that only root positions of chains can be theta positions, since by the projection principle theta positions have to be present at every level. Since D-structure contains only chain-roots, only these can be thematic. Thus it follows that movement can land only in thematic positions. (4) allows chains with multiple thematic roots, as appears necessary in parasitic gap structures (cf. Browning 1987, Brody in prep).

In the framework defined by (4), it is natural and perhaps inevitable to think of movement as a chain-internal process. Thus standardly movement is taken to be free and chains are considered to recapitulate the movement history of a derivation (as eg. in Chomsky 1985). Movement applies to D-structure and creates the derived levels, S-structure and LF on which chains are defined. But we define D-structure in terms of chains, so it does not seem natural to define chains in terms of D-structure to S-structure/LF movement, leading by transitivity to defining D-structure in terms of such movement. This would result in defining D-structure in terms of a process that takes D-structure as its input. We shall instead take LF chain construction to be free in principle and define move-α as restricted to apply chain internally.

But this solves the problem of why S-structure appears to be an intermediate level between D-structure and LF. Since all movement is chain internal and chains relate D-structure and LF and levels may differ only to the extent made possible by move-α (or affect-α) it follows that all other levels must appear to be intermediate between these two levels. But as we have argued above, this is only appearance, since D-structure is only an abstraction on LF, and no derivation links the two.

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