

**Surface X-Bar Theory, Prosodic Structures,  
and  
First Language Acquisition**

This paper assumes that we, human being are born with language processors, which distinguishes us from other species. The language processors are assumed to activate with linguistic stimulus or linguistic inputs.

The purpose of this paper is to attempt to explain

- i) how a child learns branching directions for a language or parsing algorithms for a language, by showing what kind of linguistic inputs trigger or feed the learning.
- i) how a child learn “c-commanding/m-commanding,” revealing what kind of linguistic inputs are assumed to be the trigger for the learning, arguing that syntactic “long-distance” binding may not always be prosodically or phonologically “long-distance” ones.

In order to achieve the purpose, I will introduce the Surface X-bar Theory in (2a) derived from Kimball (1973)’s New Node Principle in (1), and Extended Surface X-bar Theory in (3) derived from the Surface X-bar Theory.

(1) New Node Principle: The construction of a new node is signaled by the occurrence of a grammatical function word.

(2) Surface X-bar Theory:

- i) a language with phrase-initial function word:
  - a.  $XP \rightarrow fw X'$  (Surface X-bar Theory)
  - b.  $X' \rightarrow X YP$  (X-bar Theory)
- ii) a language with phrase-final function word:
  - a.  $WP \rightarrow XP fw$  (Surface X-bar Theory)
  - b.  $XP \rightarrow X'$  (X-bar Theory)
  - c.  $X' \rightarrow YP X$  (X-bar Theory))

(3) Extended Surface X-bar Theory:

- i) a language with phrase-initial function word:
  - a.  $XP \rightarrow fw^* YP$ , or (fw\* means more than one function words concatenated)
  - b.  $XP \rightarrow FW YP$  (FW = fw\*)
- ii) a language with phrase-final function word:
  - a.  $WP \rightarrow XP fw^*$ , or
  - a.  $WP \rightarrow XP FW$

The arguments for the Surface X-bar Theory are the following: (1) It is difficult to rely on only X-bar Theory as a surface phrase structure principle for parsing. Japanese Case markers are “head-detectors,” but they are not incorporated in the X-bar Theory. English lexical items for SPEC are function words, and head-detectors. The Surface X-bar Theory complements the X-bar Theory in more general way, in terms of parsing. (2) If a prosodic

phrase is a “sense unit” (Selkirk: 1984), or a “comprehension unit,” the smallest prosodic phrase can be described by the Surface X-bar Theory. The implication of the Surface X-bar Theory for language acquisition is that once a child learns the position of a function word in a phrase structure, (s)he learns the branching direction. And (3) the Surface X-bar Theory leads us to the explanation of how a child learns parsing algorithm to build the parsed tree for an input sentence as his/her interpretation of the sentence.

The arguments for the Extended Surface X-bar Theory are the following:

- (4) Japanese is abundant with sentence final particles as well as phrase final particles which are concatenated at the end of a sentence, or at the end of a phrase. not only concatenated sentence final particles, but also concatenated phrase final particles. In the former case, they function as head-detectors, either INFL-detectors or COMP-detectors. In the case of those phrase final particles, however, they do not detect the head of their mother node WP, but they have pragmatic functions;  $W = X$  in (3-ii-a). Both sentence and phrase final particles are well described by Extended Surface X-bar Theory.
- (5) English sandhi-variations like the following also can be captured by Extended Surface X-bar Theory: i) *They've gone* can be described as  $fw^* XP$  (“They've” =  $fw^*$ ) and ii) *Who've you been seeing?* will also be  $fw^* XP$  (“Who've you been” =  $fw^*$ ). Interestingly, a sentence like the following *Who does he think comes?* or *What does he think I am?* (either one is described as  $fw^* XP$ ) is believed to be syntactically “long-distance” filler-gap binding, but prosodically it may not be a “long-distance” one. This kind of bridge construction with Wh-phrase can be uttered in one intonation phrase as Extended Surface X-bar Theory indicates, and the structure has pure right branching; as far as branching direction remains in the same direction, the constituents associated to those branches, or the constituents in the domain of a c-commanding can consist of one intonation phrase. Our prediction for a parastic gap construction like the following also can be uttered by one intonation phrase: *Which student did her talking to  $\_p$  bother  $\_\_$  most?* Or *did her talking to  $\_p$  bother  $\_\_$  most?* can be uttered as one intonation phrase. In other words, by virtue of learning prosodic phrases, a child will learn syntactically “long-distance” binding without difficulties.

In this paper it is assumed that when a child learns an argument structure of predicate, (s)he knows that each arguments are constituents of the same predicate.

Reference:

- Kimball (1973) “Seven Principles of Surface Structure Parsing in Natural Language,” *Cognition* 2, 15-47.
- Selkirk, E. O. (1984) *Phonology and Syntax: the Relation between Sound and Structure*. Cambridge: MIT Press.