X-bar Theory and Standard Arabic

Fall Term, 2006\7
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1. Introduction

1.1 Background

X-bar theory is a component part of linguistic theory which was developed by Ray Jackendoff and Noam Chomsky from 1970. X-bar theory (also X’-theory) attempts to give the same underlying structure to all phrases in a sentence and, therefore, it claims that there exist specific similarities in all languages at the level of structure. Earlier, a sentence was seen as consisting of a noun phrase and a verb phrase (traditionally a subject and a predicate). This was embodied by phrase structure (PS) rules or rewrite rules: \( S \rightarrow \text{NP VP} \). Each element in turn consists of sub-elements. For example, the VP is a constituent headed by V and may or may not comprise one or more NPs and/or PPs; hence \( \text{VP} \rightarrow \text{V-(NP*)-(PP*)} \). Comparably, an NP can be written in the following manner: \( \text{NP} \rightarrow (\text{det})-(\text{AP*})-(\text{N})-(\text{PP*}) \). Also, an adjective phrase can be so written: \( \text{AP} \rightarrow (\text{Adv})-(\text{A})-(\text{PP*}) \), and a preposition phrase: \( \text{PP} \rightarrow (\text{Adv})-(\text{P})-(\text{NP}) \). I should note that the parenthesized constituents are optional, and the asterisk shows that there can be one or more of the same constituent.

X’-theory replaces the various structures of NP, VP, AP, and AdvP with a single structure. Each lexical category X which can be noun, verb, adjective, or preposition is the head or the basic word of an XP or phrase. The XP incorporates the head X and its different qualifiers. The XP is semantically of the same nature as its head X; for example, passed the ball to Fernandez is like passed. The XP is called a projection of its head. X’-theory distinguishes two further levels of projection. Complements combine with X to form X’-projection; similarly, adjuncts combine with X’ to form topmost X’-projection, and the specifier combines with the topmost X’ to form the maximal projection XP.

1.2 Aim

This essay will consist of two parts. In the first part will be an attempt to explore and elaborate on X’-theory. I will also treat of the changes or refinements, as it were, to this theory by different syntacticians since its emergence. I will further account for variation across such languages as German, English, Japanese and Turkish. Then in the second part I will attempt to apply the theory involved to the Arabic language. The goal will be to supply a systematic description of Standard Arabic sentence formation. In so doing I will test to what extent X’-theory is really based on UG, our internal grammar which neither teaching nor concrete evidence seem to be its source. More importantly I shall reveal how to integrate Standard Arabic in X’-theory via making a crucial assumption.

1.3 Method

In what follows I shall explain the way in which I will go about writing this essay. I will start off with a simple observation that phrase structure rules give a flat structure and do not reflect the various relations between head and complement on the one hand and between the head and the adjunct on the other. This will lead to the need for a hierarchical organization, and therefore for making specific assumptions to arrive at the X’-format. First I will consider how to map the
structure of VP on the X´-format, depending upon what is called the substitution test as a starting point for making the assumptions. I will then extend the X´-format to the remaining phrasal categories. It is only then that I will be able to consider functional categories, namely IP and CP. Last but not least, I will consider the application of X´-theory to Standard Arabic, which differs considerably in its word order from English which has been the basis in coming up with X-bar theory. This application will reveal that certain modifications or assumptions have to be made.

2. Lexical categories

At this point it is useful to give a brief definition of what lexical categories are. The lexical categories are words which are constantly changing in that new words are coined and old ones are dropped. Therefore the lexical categories are nouns (N), adjectives (A), full verbs (V) and adverbs (Adv).

2.1 Verb phrase structure

As was explained in the background there are four phrase structure rules corresponding to the phrases headed by the lexical categories. A closer look at the structures of these four phrases reveals that there exist certain properties common to all of them (Baker, 1995:95).

I shall start the discussion with VP. I have brought up that a VP includes a head V. Then the VP can be schematically represented in the following way:

```
   VP
   \  /
    V ... or VP → V...
```

The three dots stand for material –be it obligatory or optional- other than the verb. Now let me consider the following sentence: "miss Marple will read the letters in the garden shed this afternoon" (Haegeman, 1994:88). Under phrase structure rules, the sentence would be represented as in (T1):

```
   "S"
  / \       /  \
 NP  Aux VP
 \   /|\   |
 Miss Marple will read the letters in the garden shed this afternoon
```

(Haegeman, 1994:88)
The VP has a flat structure: every constituent is approached with equal importance. Intuitively, however, it is felt that some phrases are more related to the verb than others, the more so since
the substitution test which is based on structure provides evidence that the VP can be divided into separate parts. Consider the following examples:

1 "miss Marple will read the letters in the garden shed this afternoon and Hercule Poirot will do so too.
2 miss Marple will read the letters in the garden shed this afternoon and Hercule Poirot will do so tonight.
3 miss Marple will read the letters in the garden shed this afternoon and Hercule Poirot will do so in the garage tonight" (Haegeman, 1994:88).

These examples clearly indicate that do so substitutes for part of the VP only, read the letters.

On the basis of the evidence supplied by the do so test, it is felt that the string read the letters should be exhaustively dominated by one node. Therefore there arises the need to readjust the foregoing tree diagram and to develop the structure of its VP. One way to sort out this problem is to add an intermediate level of projection between head and phrase. Technically, the label given to this particular level is V-bar, or V´ for short. In view of this, the structure will look as in the following tree (T2):

(Haegeman, 1994:90). Unlike (T1), the VP has now got a layered structure, and various levels of projection have been incorporated. The NP the letters combines with the head read to form the lower V´, the first projection in (T2). The PP combines with the first V´ to form the second V´, the second projection. And the NP this afternoon combines with the higher V´ to form the VP, the maximal projection (Haegeman, 1994:90-91).

Up to now I have focussed only on one category, the VP. What about the other categories? Is it possible to extend the hierarchical structure just discussed?

2.2 Noun phrase structure

To begin with, consider the following NP: "the investigation of the corpse after lunch" (Haegeman 1994:98). PS rules would render this NP in the following way:
However the one substitution test – *the investigation of the corpse after lunch was less horrible than the one after dinner* – points out that this structure is inadequate since the string substituted for *investigation of the corpse* with the proform one is not one constituent in the tree above.

As with the VP, insertion of an extra level, N’, provides a node which exhaustively dominates the string in question. Thus the resulting structure will be as in (T3):

The PP of *the corpse* combines with the N to yield N’; the latter in its turn combines with the PP *after lunch* to form the maximal projection, the NP.

2.3 Adjective phrase structure and adverb phrase structure

Considering adjective structure and adverb structure, it seems possible to apply the layered format of the VP and NP above and to distinguish different levels of projection. Consider the following AP and AdvP:

1. *very nervous of exams*
2. *nearly into the hole* (Poole, 2002:44)

To account for the layered structure of VP, I took resort to the do so substitution test. Here because there are no proforms for A and Adv, I have to resort to another test, the coordination test.

3. *very nervous of exams and anxious about the result*
4. *nearly over the water hazard and into the hole* (Poole, 2002:44)
Capitalizing on intermediate bar categories, the structures of AP and AdvP will look as the following:

As with VP, NP, AP and AdvP, the layered structure can also be applied to PP. Thereby a PP like "across the bridge" (Haegeman, 1994:103) will have the following structure:
2.5 The X-bar format

In view of the analysis above the format of phrasal projection for all the lexical categories can be schematized as follows:

X stands for the head which can be V, N, P, A, or Adv. Another important term in the configuration is the complement; the complement is the optional sister of the head X. It is always defined as relative to the head. Traditionally, the complement can be regarded as the equivalent to the object of the head (especially the verb and the preposition). As for the adjunct, it is a sister of X’ but not the daughter of XP. The third element in the tree is the specifier. It can be defined as the element immediately dominated by XP and a sister of X’. Traditionally it can be counted as the equivalent of the subject. All three elements can be syntactically complex. A VP, for example, can have a complex NP as its complement. This NP will include a head N and a complement or adjunct or both. An important property of X-bar theory is that it brings out what is common to the structure of the phrases.
3 Functional categories

Having explained the X´-system with regard to the lexical categories N, V, P, A and Adv in the first chapter, I now shift the focus on what are known as the functional categories. These are categories like determiner (D), inflection (I), complementizer (C) and degree (Deg). They form the so-called closed classes of words. Their membership, unlike the lexical categories, is to a lesser or greater extent stable and unchanging in a language (Greenbaum and Quirk, 1997:15-16).

3.1 From NP to DP

It has not been long since NPs have begun to be analyzed as determiner phrases (DPs). A variety of arguments has been supplied in the literature that determiners are actually heads and that noun phrases are in fact determiner phrases. In other words, it is determiners that project and NPs are their complements. Consider the following example:

"John's book" (White, 2006:12)

Intuitively, there is a similarity between this sequence and the sentence "John has a book" (White, 2006:12). Here the genitive plays the role of equivalent to the verb. Thus the sequence will have the following structure assuming that the head is the genitive-'s:

```
"DP
  DP D`
    D  NP
    John 's book" (White, 2006:12)
```

The NP book is the complement of the head D and the DP is its specifier.

3.2 From AP to DegP

Previously Deg was stuck in the position of the specifier of APs such as "very good at syntax" (White, 2006:8):
The configuration exhibits that the string *good at syntax* is analyzed as AP since the substitution test so implies: ‘*students are good at syntax, but teachers are more so*’ (White, 2006:8). Obviously *so* substitutes for *good at syntax*.

Nowadays, the degree word *Deg* is analyzed as the head and the AP is its complement. Just as determiners project, so also do *Degs*.

3.3 From Aux and S to IP

Obviously the following phrase structure rule: $S \rightarrow NP\ AUX\ VP$ does not fit the $X^\prime$-format whatsoever since $S$ and $Aux$ are not associated with phrases. These categories do not dominate any categories of their kinds. In X-bar theory, every head is involved in a one-to-one relationship to phrases. One way to sort out this problem is to assume that Aux (later termed as Infl or I) is the head of an Aux-phrase, that is $S$: 

![Diagram of sentence structure]
The structure signifies that S has been renamed as IP. DP stands for the specifier of IP, and the VP plays the role of complement. Under the head I or Infl subsume nodes for tense, agreement, as well as auxiliaries. Here is an example to illustrate the structure under discussion:

3.4 Complementizers and CP

Consider the following sentences in light of the analysis in the previous section:

a. "Mary will meet her friend at the station.

b. I am wondering whether Mary will meet her friend at the station.” (Poole, 2002:63)
A thing worth noticing here is that just as the sentence *he is here* is an IP, so also is the sentence in a. But what about the category of the sentence in b? Comparing the sentence in b with that in a, it should be noticed that the complementizer *whether* appears before the subject *Mary* in sentence b. In the structure provided for IP is no place for the complementizer *whether*. There arises, therefore, the need to add some other category in order for the verb to occupy some position in the tree built upon X-bar theory (Poole 2002:64).

The part of the grammar concerned adds a phrase known as the complementizer phrase (CP). The complementizers are so named because they are added to the beginning of an IP. The reason is, of course, to help the IP to fit in as complement of the verb phrase. In this particular case, the IP is interrogative in that the complementizer *whether* introduces only this type of clause. That is to say, the mood of the subordinate clause is conditional upon choice of the complementizers. In English are only three complementizers in addition to *whether*: *that, if* and *for*. Unlike *whether*, the complementizer *that* selects declarative sentences: *he thinks that I am wondering whether Mary will meet her friend at the station* (Haegeman, 1994:116). In view of this, a sentence like *'I am wondering whether Mary will meet her friend at the station'* (Poole, 2002:63) will be assigned the following structure:
Further, in order to account for such examples as *is he here?* it is assumed that the verb *is* moves under C leaving what is called a trace (t) in the position of V. I have used the word *moves* in that it is assumed that the basic order in the English language is SVO (subject-verb-object). In other words, it is assumed that any clause of any other order than SVO starts off as a declarative sentence, that is SVO order. Then a process called a transformation takes place. It is thanks to this process that an element in the sentence is moved from position to position up the tree (White, 2006:17):

![Diagram](https://via.placeholder.com/150)

3.5 Head-initial and head-final languages

Now that linguists are not interested in English solely, other languages have been allowed for as far as X-bar theory is concerned. A number of languages are understood to differ from English with respect to word order. For example, in Japanese and Turkish prepositions are constructed in the opposite way round to English. So instead of coming before the DP, a preposition appears after the DP; hence, the appellation: the postposition. Consider the following examples:

a) "*Ben Newcastle-da otomiyorum.* (Turkish)
   *I Newcastle-in live-1s sg.pres.*
   *I live in Newcastle.*

b) *Watashi-wa Newcastle-ni sunde-iru* (Japanese)
   *I-subj Newcastle-ni live-present*
   *I live in Newcastle.*” (Poole, 2002:70)

To account for the apparent word order in these languages, a fresh schema has been adopted:
this new schema leaves open the possibility for both DP and specifier to appear either to the left or to the right of the P and P’ respectively.

So also with VPs. Again in Japanese the verb succeeds its complement, unlike English. This has been sorted out through a new schema:

the ellipses dominated by VP stand for potential specifiers, those dominated by V’ stand for adjuncts or for complements (Haegeman, 1994:96).

Some languages also differ in their word order in IPs. This is the case with German. Consider:

```
```
Tommy hat marijuana verkauft.
```
Tommy has marijuana sold
```
```
Tommy has sold marijuana```
(Roberts, 1997:34)

In this particular example the verb verkauft appears to the right of its complement marijuana:
4.X-bar theory and Standard Arabic

4.1 Phrases in Standard Arabic

VP in Standard Arabic is problematic in that it is of two types. I first distinguish subject-internal VP. Consider the following example:

\[ \text{ahad-a} \ l-?awlaad-u \ tilfaz-i. \]

Watched the boys TV.

'The boys watched TV.'

Here the subject intervenes between the head V and its complement. More on this later on.

The second type of VP in Standard Arabic is closely analogous to that of English such that the subject precedes the verb and no element comes between the latter and its complement. Here is an example to illustrate things:
The boys watched TV.

The relevant configuration is as follows:

However, unlike DegPs, the word order of PPs in both Standard Arabic and English is similar so that the preposition always comes before its DP complement:
The relevant tree is as follows:

```
PP
   P'
   P  DP
     ila  l-madrasat-i
```

It remains to note that constituents of various types in Standard Arabic can be elicited via questions and coordination.

4.2 Clauses in Standard Arabic

Most noticeable about Standard Arabic is that it belongs to the group of VSO languages. Equally remarkable is that Standard Arabic also allows the SVO order. These two orders are basically synonymous in their interpretations. Consider the following:

1. \[ \text{\textit{ahad-a}  ila-\textit{awlaad-u}  tilfaz-i.} \]
   \[ \text{Watched} \quad \text{the boys} \quad \text{TV.} \]
   \[ \text{‘The boys watched TV.’} \]

2. \[ \text{\textit{awlaad-u}  \textit{ahad-uw}  tilfaz-i.} \]
   \[ \text{The boys} \quad \text{watched} \quad \text{TV.} \]
   \[ \text{‘The boys watched TV.’} \]

A closer examination of these sentences reveals an important difference. In the first example (VSO order) the verb and subject do not agree in number. While the verb is singular, the subject takes the plural form. Conversely, both subject and verb agree in number in the second example (SVO order). Bearing in mind this difference in number agreement, it can be argued that agreement between subject and verb in SVO clauses entails that the subject is involved in a spec-head relation with I and therefore appears in the position [Spec,IP] -spec stands for specifier; I should also note that the subject is the specifier and the head is I. In contrast, since agreement in number between the subject and the verb is missing in VSO sentences, it follows that the subject is not in a spec-head relation with I (inflection) and so it does not occupy the [Spec,IP] position. Thereby in VSO sentences the subject remains within the VP, while in SVO sentences the subject moves to [Spec,IP]. As a result, the lack of number agreement in
VSO can be expected since the subject is not located in [Spec,IP] and not in relation to spec-head.

Following the crucial assumption in the literature that sentences are derived from some underlying or deep structure (DS), I assume that the subject in VSO order simply remains in its original [Spec,VP] position, that is in its DS position. Also in an analysis that accounts for variation in structure in a language such as Swedish, it is claimed that the verb moves up the tree to the position of I, leaving a trace in the VP position. This is also true for English sentences involving verbs like be. Following this assumption, I can assume that the verb in Standard Arabic moves to I.

In the light of this discussion, the structures of both sentences can be represented as follows:

\[
\begin{array}{c}
\text{SVO order} \\
\text{CP} \\
\text{C'} \\
\text{C} \\
\text{IP} \\
\text{DP} \\
\text{I'} \\
\text{I} \\
\text{VP} \\
\text{V'} \\
\tau \\
\text{DP} \\
\end{array}
\]

\[
\begin{array}{c}
l-\text{awlaad-u} \\
\mathfrak{I}\text{ahad-uw} \\
\text{tilfaz-i}
\end{array}
\]
I should note that the trace (t) signifies the movement of \( \text{\textit{\textit{ahad-}\textit{uw}}} \) or \( \text{\textit{\textit{ahad-}\textit{a}}} \) in both cases.
Summary and conclusions

In this essay I have discussed X-bar theory. In so doing, I have shed light on the advantages of adopting X’-format in lieu of the phrase structure rules. The latter suffer a severe failing. Their role seems largely redundant as they simply duplicate information included in the lexical entries of the lexical categories. On the other hand, I have revealed the consistency of X’-theory towards all the phrasal categories. The X-bar format permits to bring out what is common to the different types of phrase. Another significant property of X-bar theory is that it throws light on the hierarchical organization of the phrase instead of the linear order of the constituents which is intuitively felt to be wrong. Furthermore, the X’-schema can be extended to embrace the constituents of the clause as a whole.

Also, it seems that X-bar theory is flexible enough to incorporate all cross-linguistic variation via resorting to different assumptions. But in my view, there is at least one issue that should be considered by the syntacticians. The issue is the unreasonable assumption that, for example, DP combines with D’ to yield DP:

```
  "DP
   DP                     D´
   D                      VP
  John            ´s                building a spaceship" (Roberts, 1997:24)
```

To begin with I think that the terminology is not accurate. There is a DP which is in turn dominated by another DP. At least, there should be a different label for either of them. Second, intuitively I feel that the determiner is not the most important item in the phrase and therefore the phrase should not be named after it. This actually boils down to a contradiction in the grammar. At least some, if not all, syntacticians build their discussion of X-bar theory upon what is felt intuitively. I mean here the transition from the flat structure to the hierarchical depending on how close the relationship of the various component parts of VP to the head V.
References


www.everything 2.com

en.wikipedia.com

Appendix