Extending X-bar Theory to Functional Categories

Carnie, 2013, chapter 7

Extending X-bar Theory to Functional Categories

- The phrase structure rules that we have looked account for intermediate structure and captures cross-categorial similarities between NPs, VPs, PPs, AdjPs and AdvPs.

- In this lecture, we're going to extend the same X-bar schema to functional categories such as D, T, and C.

Extending X-bar Theory to Functional Categories

1) a) *Specifier rule:*   XP   (YP) X' or XP   X' (YP)
   b) *Adjunct rule:*   X'   X' (ZP) or X'   (ZP) X'
   c) *Complement rule:*   X'   X (WP) or X'   (WP) X

Extending X-bar Theory to Functional Categories

- These rules generate most of the trees we need for the sentences of the world's languages.

- They also capture the additional properties of hierarchical structure found within the major constituents.

- But there are problems.

Extending X-bar Theory to Functional Categories

- First, there is the status of specifiers. In particular, the specifier rule we proposed above requires that the specifier be a phrase- (XP-)level category. However, the only instances of specifiers we've looked at are determiners, which appear *not* to be phrasal

Extending X-bar Theory to Functional Categories

- To remedy this situation, we will look at determiners and specifiers and propose a new category that fits X-bar theory: a **determiner phrase** (DP).

- We will see that determiners are not specifiers. Instead, we'll claim that the specifier position is used to mark a particular grammatical function: that of subjects.

- You'll see that specifiers (of all categories) are where subjects go.

Extending X-bar Theory to Functional Categories

- Another troubling aspect of the X-bar theory is the exceptional CP and TP rules that we have yet to incorporate into the system:

- 2)   CP → (C) TP

     TP → NP (T) VP

Extending X-bar Theory to Functional Categories

- These rules do not fit X-bar theory. In the X-bar rules in (1), you'll note that the only obligatory element is the head. In the sentence rules in (2), the opposite is true: the only optional element is the head itself.

- We're going to look at how we can modify these so that they fit into the more general pattern.
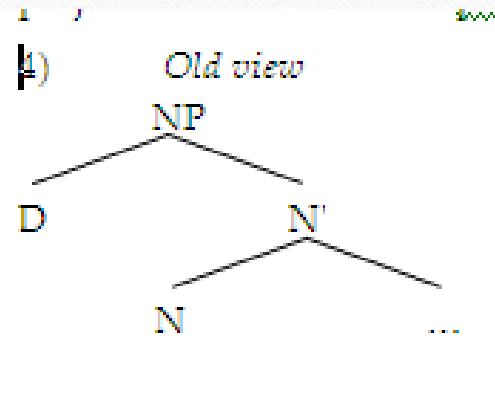
Determiner Phrases (DPs)

- Previously, we have been putting determiners like *the*, *a*, *that*, *this*, *those*, and *these* in the specifiers of NPs.

- This, however, violates one of the basic principles underlying X-bar theory: All non-head material must be phrasal.

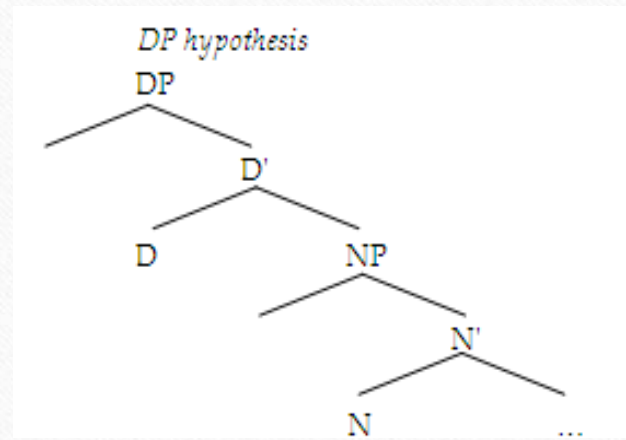- One thing to note about determiners is that they are typically heads.

- Normally, there can only be one of them in an NP, at least in English:

- 3)   *the that book

- In other words, they don't seem to be phrasal.

- The solution to this problem is to claim that the determiner is not actually inside the NP.

- Instead, it heads its own phrasal projection. This was first proposed by Abney (1987)

The DP Hypothesis

- Determiners, in this view, are not part of the NP.

- Instead the NP is the complement to the determiner head.

- This solution solves the theoretical problem of the non-phrasal nature of the D.

- , but we still need empirical evidence in its favor.

4)   *Old view*

```
           NP
          /    \
        D        N'
                /   \
              N       ...
```

DP hypothesis

DP

D'

D   NP

N'

N   …

Evidence for DP

- One piece of evidence comes from the behaviour of genitive (possessive) NPs. There are two kinds of possessive NPs. The first is of less interest to us. This one is often called the **free genitive** or **of-genitive**:

- 5)   a)   the coat of the panther

-         b)   the roof of the building

-         c)   the hat of the man standing over there

Evidence for DP

- The free genitive uses the preposition *of* to mark the possessive relation between the two NPs. More important in terms of evidence for DP is the behaviour of the other kind of possessive: the **construct** or **'s-genitive**.

- 6)   a)   the panther's coat

-       b) the building's roof

-       c)   the man standing over there's hat

Evidence for DP

- The *'s* marker appears after the *entire* possessor NP.
- It attaches to the whole phrase *the man standing over there,* not just to the head *man* as in (7):
- 7) a) [the man standing over there]'s hat
-       b) *the man's standing over there hat

Evidence for DP

- Next, note that it is in complementary distribution with (i.e., cannot co-occur with) determiners as shown in (8).

- 8)   a)   *the building's the roof (cf. the roof of the building)

-        b)   *the panther's the coat (cf. the coat of the panther)

-   c)   *the man standing over there's the hat (cf. the hat of the man standing over there)

Evidence of DP

- Unlike the *of*-genitive, the *'s*-genitive does not allow both the nouns to have a determiner. In other words, *'s* and determiners are in complementary distribution.

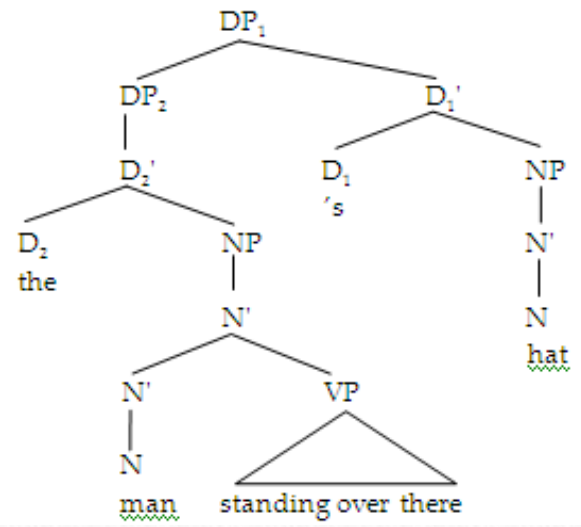- From this, we assume that determiners like *the* and *'s* are different tokens of the same type.

Evidence for DP

- Assuming that *'s* is a determiner, and assuming the DP hypothesis holds true, we can now account for the positioning of the *'s* relative to the possessor. The *'s* occupies the head D position, and the possessor appears in its specifier (9–10):

Evidence for DP
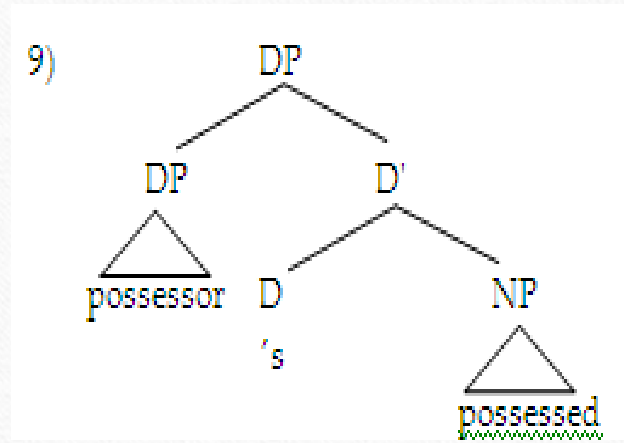
The DP Hypothesis

- The possessor $[_{DP2}$ *the man standing over there]* sits in the specifier of DP$_1$, which is headed by *'s*. So *'s* follows the whole thing. Notice that with our old theory, in which determiners are specifiers of NP, there is no way at all to generate *'s* as a determiner and to also have the possessor NP preceding it.
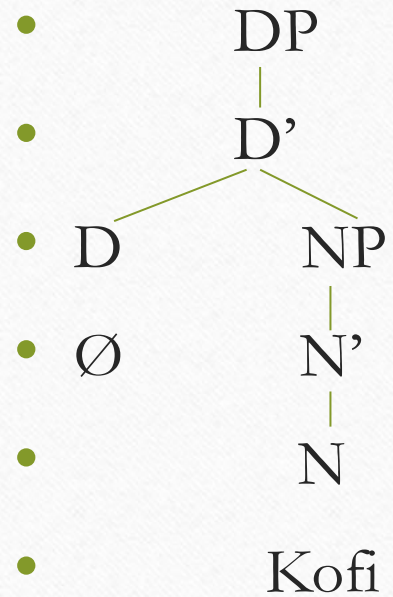
11)

NP
the man standing over there

NP
D
's
N'
N
hat
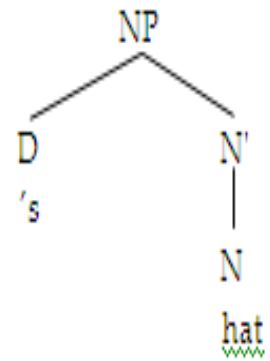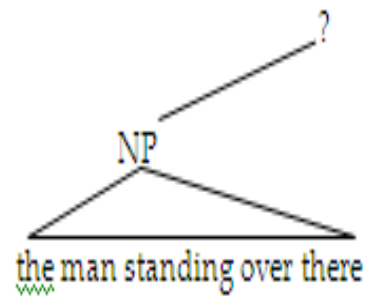
The DP Hypothesis

- How about proper nouns such as *Kofi?*

- We assume that these are also DPs headed by a null D. notice that some languages like Greek have proper nouns the can have overt determiners.

- Having a null D also helps to explain why such nouns are definite in meaning.

The DP Hypothesis

- DP
- D'
- D   NP
- Ø   N'
-               N
-          Kofi

Clause Types

- A **clause** is made up of a **subject** (usually a DP that has the property indicated by the predicate; this is what the clause is about) and a **predicate phrase** (a group of words that assign a property to the subject).

- The most obvious kind of clause is the simple sentence. In the following examples, the subject is indicated in italics and the predicate phrase is in bold:

- 12) a) *The boy* **ran**.

-   b) *Howard* is **a linguistics student**.

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Clause Types

- A clause that stands on its own is called a **root**, **matrix**, or **main clause.** Sometimes, however, we can find examples of clauses within clauses. Examples:

- 13) a) [Peter said [that Danny danced]].

-      b) [Bill wants [Susan to leave]].

- In sentence (13a), there is the clause *(that) Danny danced*, which is inside the root clause *Peter said that Danny danced*. In (13b), we have the clause *Susan to leave*, which has the subject *Susan*, and the predicate phrase *(to) leave*.

Clause Types

- In (13b), the clause *Susan to leave,* which has the subject *Susan,* and the predicate phrase *(to) leave.* This is contained within the main clause *Bill wants Susan to leave.*

- Both of these clauses within clauses are called **embedded clauses**. Another name for embedded clause is **subordinate clause**. The clause containing the embedded clause is still called the **main** or **root clause**.

Types of Clauses
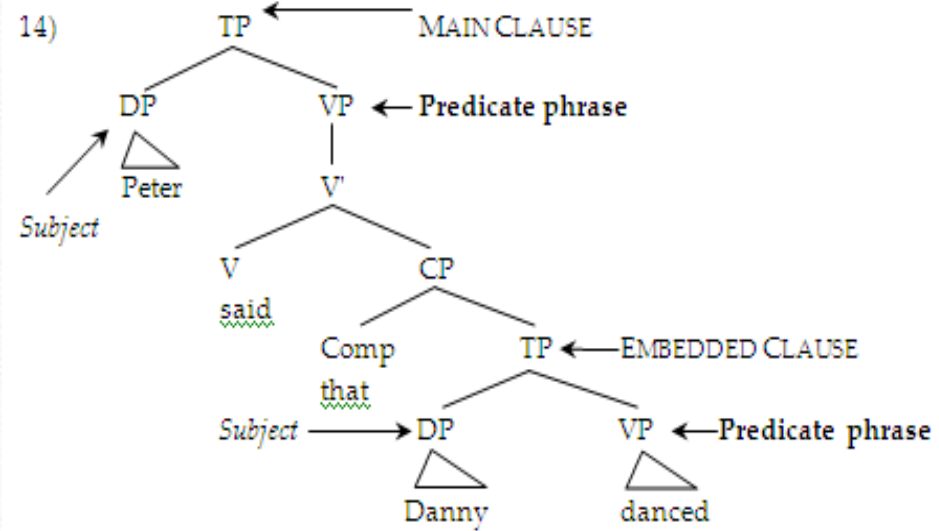
Types of Clauses

- In addition to the distinction between main and embedded clauses, we can also distinguish among specifier, complement, and adjunct clauses. Here are some examples of **complement clauses**:

- 15) a)   Heidi said [that Art loves peanut butter].

-       b)   Colin asked [if they could get a mortgage].

- .

- These complement clauses (CPs) are sisters to the verb, and thus complements

Types of clauses

- Relative clauses are one example of **adjunct clauses**:

- 16) [The man [I saw get into the cab]] robbed the bank.

- The relative clause in (16) *[I saw get into the cab]* modifies the head *man*.

- ***Specifier clauses*** are ones that serve as the subject of a sentence (why these are specifiers will be made clear below):
- 17) a) [[People selling their stocks] caused the crash of 1929].
- b) [[For Mary to love that boor] is a travesty].

Clause types

- There two basic kinds of clauses: main and embedded.

- Embedded clauses are contained within main clauses.

- There are three types of embedded clauses:

- specifier clauses,

- complement clauses,

- and adjunct clauses.

Clause types

18)

Main clauses	Embedded clauses		
	specifier clauses	complement clauses	adjunct clauses

Finite and non-finite clauses

- Clauses are also classified into two groups depending upon whether they are tensed or not.

- Clauses with predicates that are tensed are sometimes called **tensed clauses**, or **finite clauses**.

- Clauses without a tensed verb are called **tenseless** or **non-finite clauses** (sometimes also **infinitival clauses**).

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Finite and non-finite clauses

- 19) a) I said [that Mary signed my yearbook]. *tensed or finite*

-         b) I want [Mary to sign my yearbook]. *tenseless or non-finite*

- For tests for distinguishing finite from non-finite clauses see Carnie, 2013, pp 213-216.
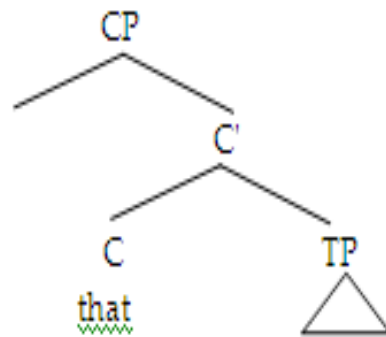
Complementizer Phrases

- We've observed that the TP rule and the CP rule stand out, since they don't fit X-bar theory.

- In X-bar theory, the head is always obligatory. This is not true of these two rules:

- 29) a)   CP→ (C) TP

- b)   TP → DP (T) VP

- If we take X-bar theory to extend to CPs, we can assimilate the rule in (29a) to get a tree like that in (30):

Complementizer Phrases

Complementizer Phrases

- This CP structure has C as the head, a TP complement and an empty specifier position

- This empty specifier position will become very important later for us when we do *wh*-movement.

Complementizer Phrases

- Is it only embedded clauses that have CPs?

- There is evidence that all clauses, even root clauses like (31), require some kind of complementizer.

- 31) a) John thinks that the asparagus is yummy.

- b) *That the asparagus is yummy. (cf. Asparagus is yummy.)

- 32) Asparagus grows in California.

Complementizer Phrases

- We'll claim that some sentences have null complementizers.

- The structure in (33) shows one of these null complementizers.

- 33)   [$_{CP}$ [$_{C'}$ Ø [$_{TP}$ Asparagus grows in California]]]

Evidence for null complementizers

- One piece of evidence comes from **yes/no questions.**

- 34) a) Did John leave?

- b) Have you seen Louis?

- In English, to form a yes/no question you either insert some form of the verb *do* (*do, does, did*) before the subject, or you invert the subject and the auxiliary (*You have seen Louis/Have you seen Louis?*).

- This operation is called **subject- aux inversion**.

Evidence for null complementizers

- Many other languages form yes/no questions with a complementizer particle that precedes the verb. Irish, for example, indicates yes/no questions with a special particle *Ar* (or its allomorph *An*):

- 35) Ar thit Seán?

-     Q   fall John

-     "Did John fall?"

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Evidence for null complementizers

- Languages like English that use subject-aux inversion don't have special complementizer question particles.

- If a language has complementizer question particles, then it won't have subject-aux inversion.

- The phenomena are in complementary distribution.

Evidence for null complementizers

- Ghanaian languages like Akan, Ga, Ewe, have complementizer question particles, so they don't have subject-aux inversion

- Akan

- Kofi a-ba   anaa?

- Kofi PERF.come Q

- "Has Kofi come."

Evidence for null complementizers

- It seems reasonable to claim, then, that question complementizers and subject-aux inversion are part of the same basic phenomenon.

- In order to make this concrete, let's make the following proposal: There is a question complementizer particle in English, just like there is in Irish and other languages.

- The difference is that in English this complementizer particle is null (has no phonological content).

Evidence for null complementizers

- This **null complementizer** will be represented with the symbol Ø[+Q]. It has no phonological content, but it must be realized or pronounced someway.

- The way English satisfies this requirement is by moving T into the C head:

Evidence for null complementizers
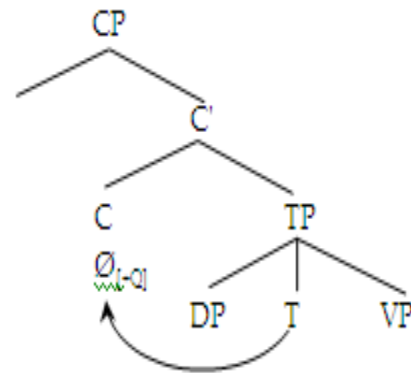
Evidence for null complementizers

- This results in the correct order, where the auxiliary (in T) now appears before the subject.

- By contrast, languages like Irish don't utilize this mechanism. Instead they have a particle that fills their [+Q] complementizer (like *Ar/An* in Irish).

-

Evidence for null complementizers

- English does, in fact, have an overt [+Q] complementizer, but it is only found in embedded questions. This complementizer is *if*. Unsurprisingly, subject-aux inversion is completely disallowed when *if* is present:

- 37) a)   Fabio asked if Claus had run a marathon.

-      b)   *Fabio asked if had Claus run a marathon.

-      c)   *Fabio asked had if Claus run a marathon.

-      d)   ?Fabio asked had Claus run a marathon.

Evidence for null complementizers

- *If* occupies the [+Q] complementizer, so no subject-aux inversion is required (or allowed).

Evidence for null complementizers

- Given the existence of overt root complementizers in other languages and the evidence that subject-aux inversion patterns like these overt root complementizers, we can conclude that, for questions at least, there are complementizers (and CPs) present even in main clauses.

Evidence for null complementizers

- It is indeed possible to conjoin a statement with a question:

- 38) [You can lead a horse to water] but [will it drink]?

- Since the second clause here shows subject-aux inversion, we know there is a Ø[+Q] question complementizer present.

- By extension, we know that the clause it is conjoined with must *also* have a complementizer – this time, a non-question Ø[–Q]. A CP can only be conjoined with another CP.

Evidence for null complementizers
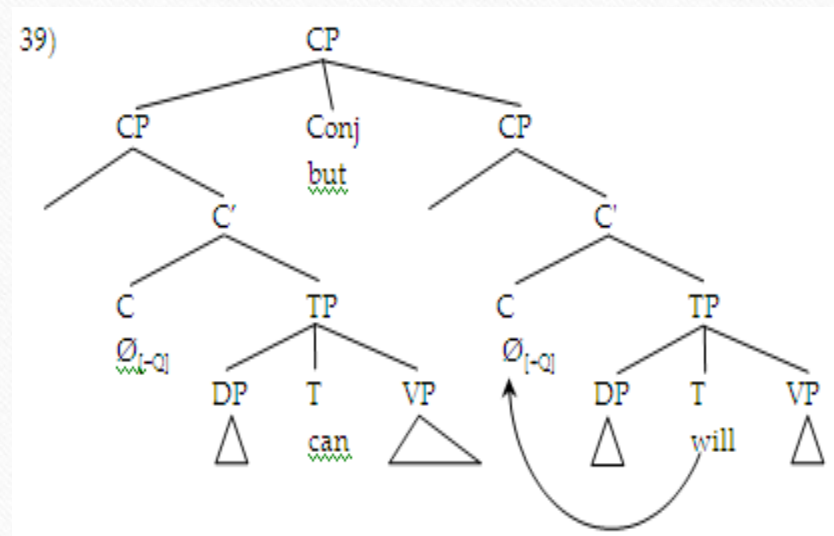
Evidence for null complementizers

- This is an argument for null complementizers attached to root clauses, even in simple statements.

- From this point forward, we will assume that there is a CP on top of **every** clause.

Tense Phrases (TPs)

- The other rule that doesn't fit the X-bar pattern is our S rule:

- 40) TP → DP (T) VP

- Assimilating this rule to X-bar theory results in a structure like the following:

Tense Phrases (TPs)
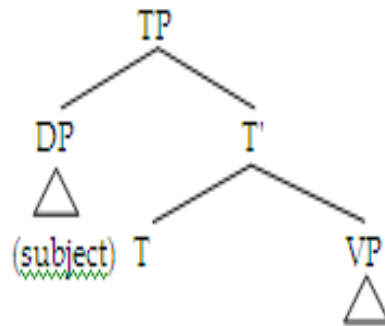
Tense Phrases (TPs)

- The subject DP sits in the specifier of TP, and the VP is the complement.

- The problem here is that the element that we have designated as the head of the phrase (T) is apparently optional.

- In X-bar theory, heads are the only obligatory element.

Tense Phrases (TPs)

- In an earlier lecture, we equated T with auxiliary verbs.

- But we might ask what happens in clauses where there is no auxiliary: Is there a TP? Is there a T? Can we make the same claim we did for CPs that the C is obligatory?

- In order to answer this question, let's make the following observation: Tense inflection on a verb is in complementary distribution with auxiliaries (you never get both of them at the same time):

Tense Phrases (TPs)

- 42) a)   The roadrunner walks funny.

-         b)   The roadrunner is walking funny.

-         c)   *The roadrunner is walks/walkings funny.

- Recall that when two elements are in complementary distribution then they are instances of the same category.

- This means that T can be realized both by auxiliaries and by inflectional endings on verbs.

Tense Phrases (TPs)

- Recall that you can only coordinate two items that are of the same category and bar level. In the following sentence, we are conjoining a T' that has an auxiliary with a T' that has a tensed verb. The tense inflection and auxiliary are italicized.

- 43) [$_{TP}$ I [$_{T'}$ [kiss*ed* the toad] and [$_{T'}$ *must* go wash my mouth now]]].

- This evidence suggests that the two T's are identical in some deep sense. That is, they both involve a T node: one an auxiliary, the other a tense inflectional ending.

Tense Phrases (TPs)

- Problem:

- Auxiliaries appear on the left of verbs, and inflectional suffixes (like *-ed*, and *-s*) appear on the right:

- 44) a)   He *will* go.

-          b)   He   go*es*.

- How do we account for this?

Tense Phrases (TPs)

- There are other differences between auxiliaries and inflectional suffixes. For example, auxiliaries, but not suffixes, undergo subject-aux inversion. If we are to claim that inflectional suffixes and auxiliaries are both instances of T we have to account for these differences.
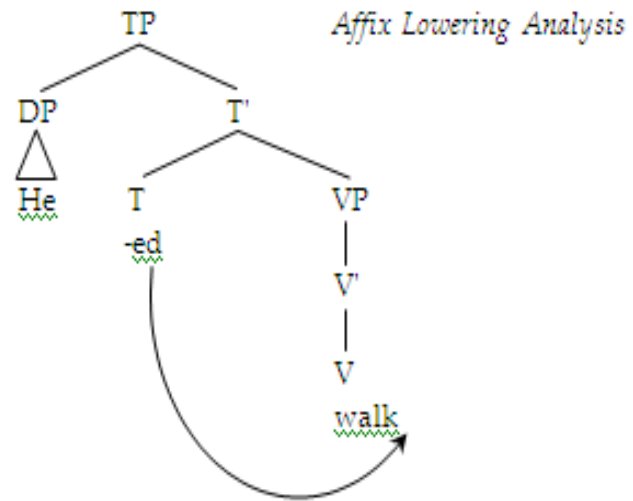
Tense Phrases (TPs)

- There are two possibilities out there in the literature. The older possibility, dating back to Chomsky's famous (1957) book, *Syntactic Structures*, is to claim that both inflectional suffixes and auxiliaries are indeed generated under T.

- They differ, however, in terms of whether they can stand alone or not.

- Auxiliaries are independent words and can stand alone.

- Suffixes like *-s* and *-ed* have to be attached to a verb.

Tense Phrases (TPs)

- Much like the case of moving T to C in order to pronounce Ø[+Q], we might hypothesize that endings like *-s* and *-ed* can't be pronounced in isolation, so they move to attach to the verb.

- In English, they seem to lower onto the verb as shown in the example below:
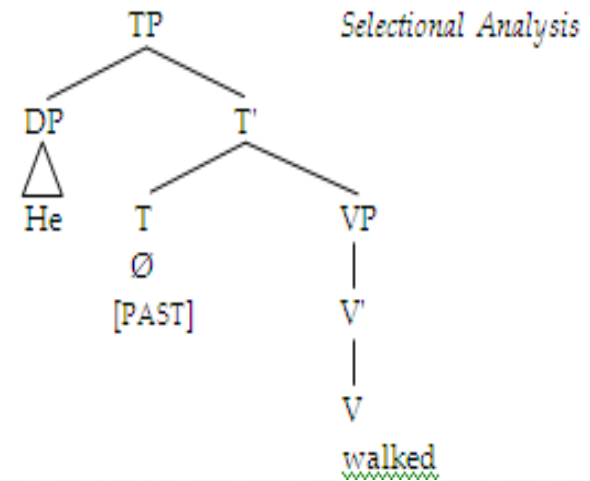
Tense Phrases (TPs)

Tense Phrases (TPs)

- A more modern approach doesn't have the affixes generated in T. Instead, there are two tense markers, both of which are null: $\emptyset_{[PAST]}$ and $\emptyset_{[PRESENT]}$.

- The $\emptyset_{[PAST]}$ simply requires that its VP complement be in a past tense (or preterite) form and $\emptyset_{[PRESENT]}$ requires that its VP complement be in a present tense form:

Tense Phrases (TPs)

Acknowledgement

These slides were prepared from:

Carnie, Andrew. 2013. *Syntax: A Generative Introduction*. 3rd edition. Oxford, UK & Cambridge, USA: Wiley-Blackwell Publishing, chapter 7.

https://www.google.com.gh/search?q=the+end+graphics&safe=off&client=firefox-b&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjXiObhx8TPAhVHvxQKHUwzAd8Q_AUICCgB&biw=1525&bih=73