

Week 9 Handout

1 Lecture review

1.1 Phrase structure

Main idea: phrases are not built arbitrarily.

- The head determines what type of elements can be taken as specifier or complement.

| Phrase | Head | Specifier | Complement(s) |
|--------|------|----------------|-----------------------------------|
| CP | C | wh-phrases | TP |
| TP | T | NP | VP |
| NP | N | Determiner | PP, CP |
| VP | V | Adverb | NP, PP, AdjP, CP, VP ¹ |
| AdjP | Adj | Degree | PP, CP |
| AdvP | Adv | Degree | PP |
| PP | P | r-word, Degree | NP, PP |

¹ The only Vs that can take a VP complement are auxiliary *be* and *have*.

Table 1: Valid phrase structure combinations

- Complements are always phrases. A head can take up to two complements.
- Specifiers can be heads or phrases. A head can take at most one specifier.

1.2 Transformations

Main idea: Deep structure + transformation(s) = Surface structure

- Transformations are operations that rearrange syntactic trees. A string has two different syntactic structures: (1) a Deep structure that represents its underlying form, and (2) a Surface structure that represents its overt form. **If a string does not have any transformations, its Deep structure and Surface structure are identical.**
- Transformations capture the observation that certain sentences are related. In the (a) sentences, the bolded element follows the subject. In the (b) sentences, the bolded element precedes the subject. The (a) and (b) pairs are related in meaning, but differ in word order.

- (1) a. Adam **could** win.
b. **Could** Adam win?
- (2) a. Adam **is** winning.
b. **Is** Adam winning?
- (3) a. Adam could win **what**¹.
b. **What** could Adam win?

¹In English we would actually say *Adam could win something*, but I use *what* for illustrative purposes. Although the exact relationship between *what* and *something* is beyond the scope of this class, the words are related.

- In this class, we will posit that the (a) and (b) sentences have near-identical Deep structures, but that transformations distinguish their Surface structures.
- **Be careful:** We are *not* positing that the (a) and (b) sentences have the same Deep structure. The (a) sentences are declaratives and have a [-Q] C head; The (b) sentences are questions and have a [+Q] C head (see Section 1.3.1).
- **What if...:** We could argue that Deep structures, Surface structures, and transformations do not exist, and propose the structure in Figure 1 for (1b). In this structure, there are 2 TPs: the first T head is pronounced, and the second T head is silent, as indicated by \emptyset .

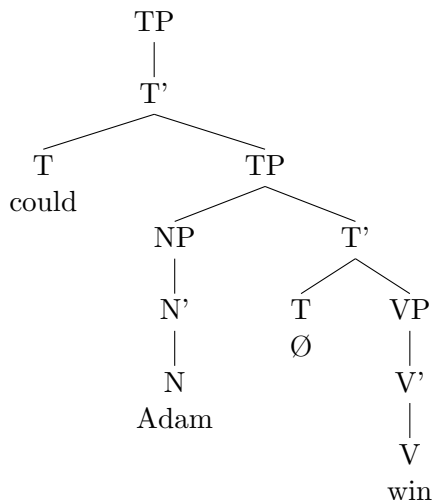


Figure 1: Proposed syntactic structure of (1b) with two TPs

If we assume that Figure 1 is the correct structure for (1b), we need to answer the following questions:

Why do questions have two TPs? We have never seen a syntactic structure/tree with two TPs before.

If questions have two TPs, why is only one T head pronounced? Why is a question where both Ts are pronounced, like **Could Adam would win?*, not okay?

Unsurprisingly, these questions are very difficult to answer! A proper discussion of these questions is beyond the scope of this class, so for simplicity we will just assume that transformations exist, and that there is only ever one TP per clause².

1.3 Movement

- In this class, we will only look at movement transformations. In a movement transformation, some element of a syntactic tree moves to another position in the same tree.
- Not all strings involve movement. If a string does not have any movement, its Deep structure is identical to its Surface structure.
- Movement can be silent. If a string has a silent movement, its Deep structure is *not* identical to its Surface structure, but the word order is identical in both structures.
- There are two types of movement.
 - Head movement: a head (X) moves to another head position
 - ex) Subject-Auxiliary Inversion, Verb Raising
 - Phrasal movement: a phrase (XP) moves to the specifier position of another phrase
 - ex) *wh*-movement

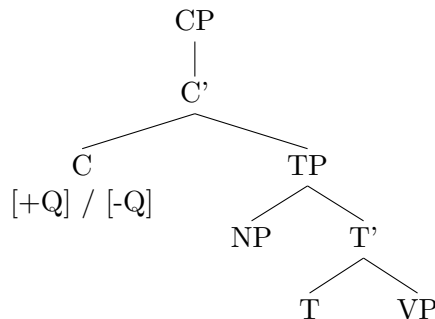
²Take Ling 120B: Syntax I to learn more :)

- A moving element always leaves a trace, indicated by t in the syntactic tree. Traces indicate that the moving element's original position is "full", and that nothing can move into this seemingly empty spot.

1.3.1 Subject-Auxiliary Inversion: Move T to [+Q] C

Main idea: In the Subject-Auxiliary Inversion transformation (Sub-Aux Inversion), the T head moves from its original position and lands in the C head of the CP above the TP.

- We will assume that every TP has a CP above it.



The C head can have a [+Q] value (for questions), or a [-Q] value (for non-questions).

For now, [+Q] C heads and [-Q] C heads are silent.

- **Sub-Aux Inversion always and only occurs when the C head has a [+Q] value.**

- Sub-Aux Inversion does *not* occur when the C head has a [-Q] value.
- Sub-Aux inversion is T-to-C **head movement**, and leaves a trace.

- Example of Sub-Aux Inversion, applied to (1b) *Could Adam win?*

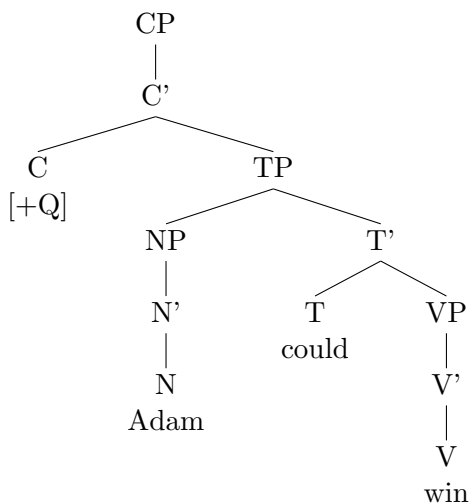


Figure 2: Deep structure of (1b)

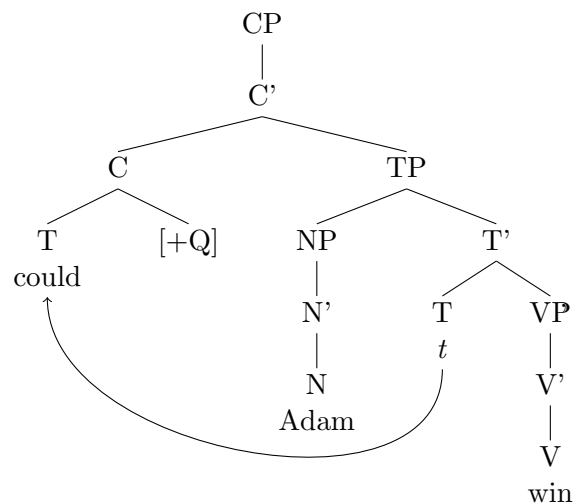


Figure 3: Surface structure of (1b)

- In Figure 3, when the T head *could* moves to the C head, the C head becomes a binary branching node. The left branch is the moving element (*could*). The right branch is the original value of the C head (the value [+Q]). This is called a **complex head**.

1.3.2 V-Raising: Move auxiliary V to $[\pm \text{pst}]$ T

Main idea: In the Verb-Raising transformation (V-Raising), the V head moves from its original position and lands in the T head of the TP above the VP.

- **V-Raising always and only occurs when (1) the V head is auxiliary *be* or *have* and (2) the T head has a $[\pm \text{pst}]$ value.**
 - V-Raising does *not* occur with main verb V *have* (“to possess”).
 - Example of auxiliary *be*: I am sleeping.
 - Example of auxiliary *have*: I have slept.
 - Example of main verb *have*: I have a cat.
 - V-Raising does *not* occur when the T head is a modal like *could*.
 - V-Raising is V-to-T **head movement**, and leaves a trace.
- When V-Raising occurs, it may be followed by Sub-Aux Inversion. If C has a $[-Q]$ value, V-Raising moves the V head to the T head, and no further movement occurs. If C has a $[+Q]$ value, V-Raising moves the V head to the T head, and then Sub-Aux Inversion moves the complex T head to the C head.
- Example of V-Raising alone, applied to (2a) *Adam is winning*³.

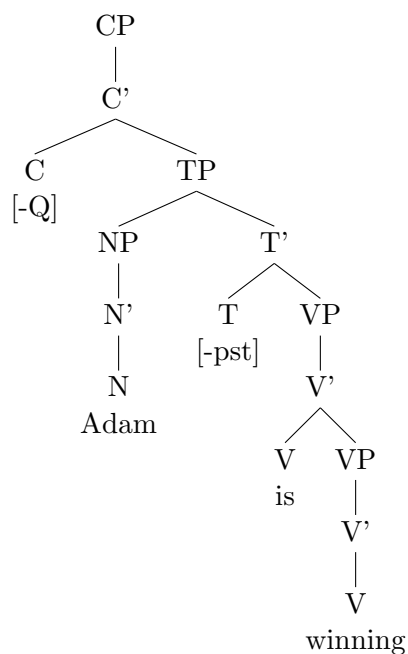


Figure 4: Deep structure of (2a)

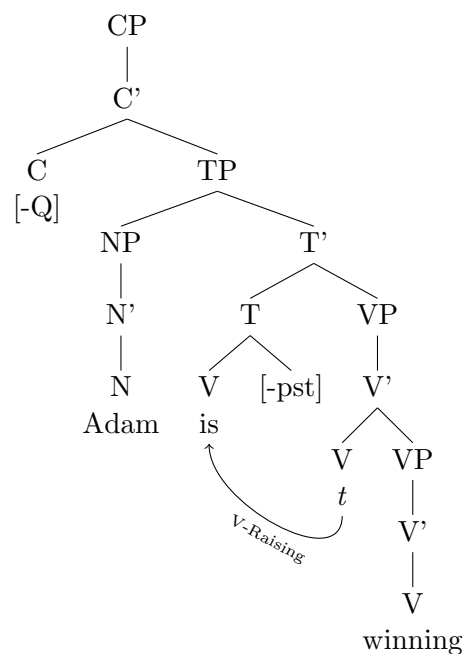


Figure 5: Surface structure of (2a)

- (2a) *Adam is winning* is an example of silent movement. Its Deep Structure (Figure 4) is not identical to its Surface structure (Figure 5), but the word orders are the same.

³In the homework, CPs with a $[-Q]$ C head can be omitted. However, I include the CP here for completeness

- Example of V-Raising and Sub-Aux Inversion, applied to (2b) *Is Adam winning?*

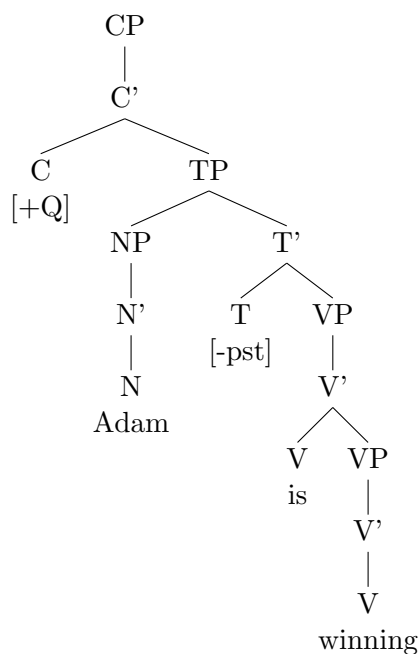


Figure 6: Surface structure of (2b)

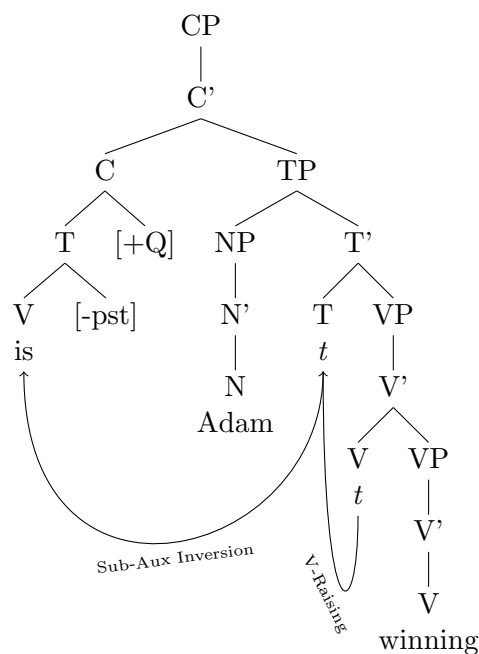


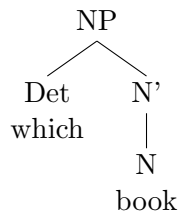
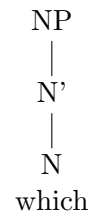
Figure 7: Surface structure of (2b)

- In Figure 7, the V head *is* forms a complex head with the T head (the value [-pst]) during V-Raising. Then, the complex T head forms another complex head with the C head (the value [+Q]) during Sub-Aux Inversion.

1.3.3 *wh*-movement: Move *wh*-phrase to [Spec, CP]

Main idea: In the *wh*-movement transformation, the *wh*-phrase moves from its original position and lands in the specifier of the CP ([Spec, CP]).

- ***wh*-movement always and only occurs when (1) there is a *wh*-phrase and (2) the C head has a [+Q] value.**
 - *wh*-movement always occurs with Sub-Aux Inversion, because a [+Q] C head triggers Sub-Aux Inversion.
 - *wh*-movement is **phrasal movement**, and leaves a trace.
 - A *wh*-word can be a Determiner, i.e. a specifier to an N head, as in Figure 8. A *wh*-word can also be an N head, as in Figure 9. Since *wh*-movement is phrasal, when a *wh*-word is an N head, be sure to move the entire NP, as in Figure 11, and not just the N head.

Figure 8: *which* as a Determiner headFigure 9: *which* as an N head

- Example of *wh*-movement, applied to (3b) *What could Adam win?*

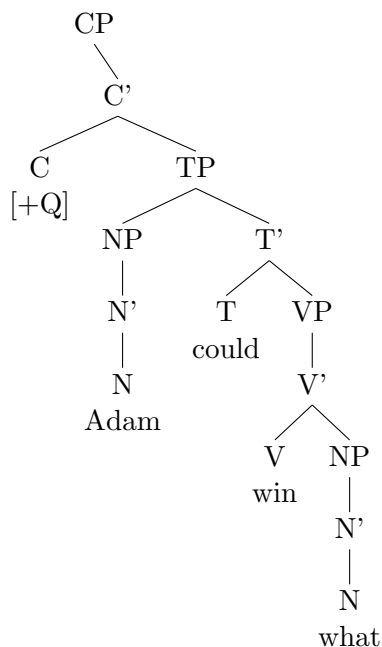


Figure 10: Deep structure of (3b)

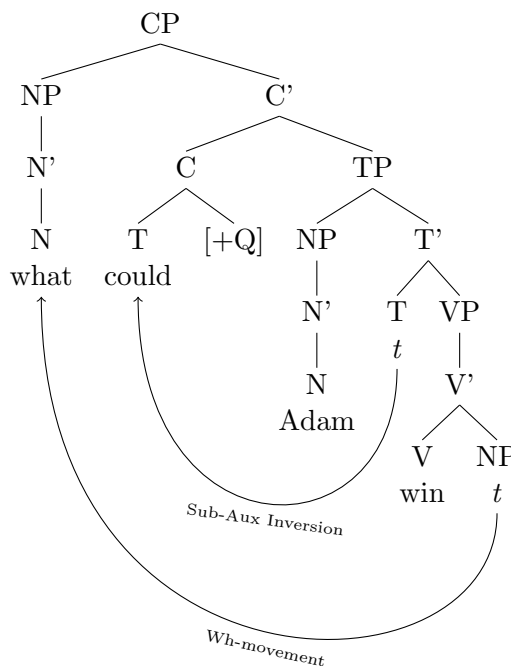


Figure 11: Surface structure of (3b)

2 How to draw Deep and Surface structures

1. Given a string, identify if there is any movement. If the string is a question, there is Sub-Aux Inversion. If the string is a *wh*-question, there is *wh*-movement (and Sub-Aux Inversion). If the string has auxiliary *be* or *have*, and a $[\pm \text{pst}]$ T head, there is V-Raising.
 - ex) Is it raining? → Sub-Aux Inversion and V-Raising (no *wh*-movement)
 - ex) Which book should I buy? → *wh*-movement and Sub-Aux Inversion (no V-Raising)
 - ex) I am hungry. → V-Raising (no *wh*-movement or Sub-Aux Inversion).
2. If the string has movement, work backwards to identify the word order of its Deep structure⁴. If a string does not have movement, its Deep structure and Surface structure are identical and have the same word order.
 - ex) Is it raining? → It is raining
 - ex) Which book should I buy? → I should buy which book
 - ex) I am hungry. → I am hungry
3. Draw the Deep structure tree according to previous lectures.
4. If there are movement transformations, apply them to draw the Surface structure tree.
 - Don't forget that movement always leaves a trace.

⁴Keep in mind that the word order of a string's Deep Structure may be identical to the word order of its Surface structure.

3 Practice

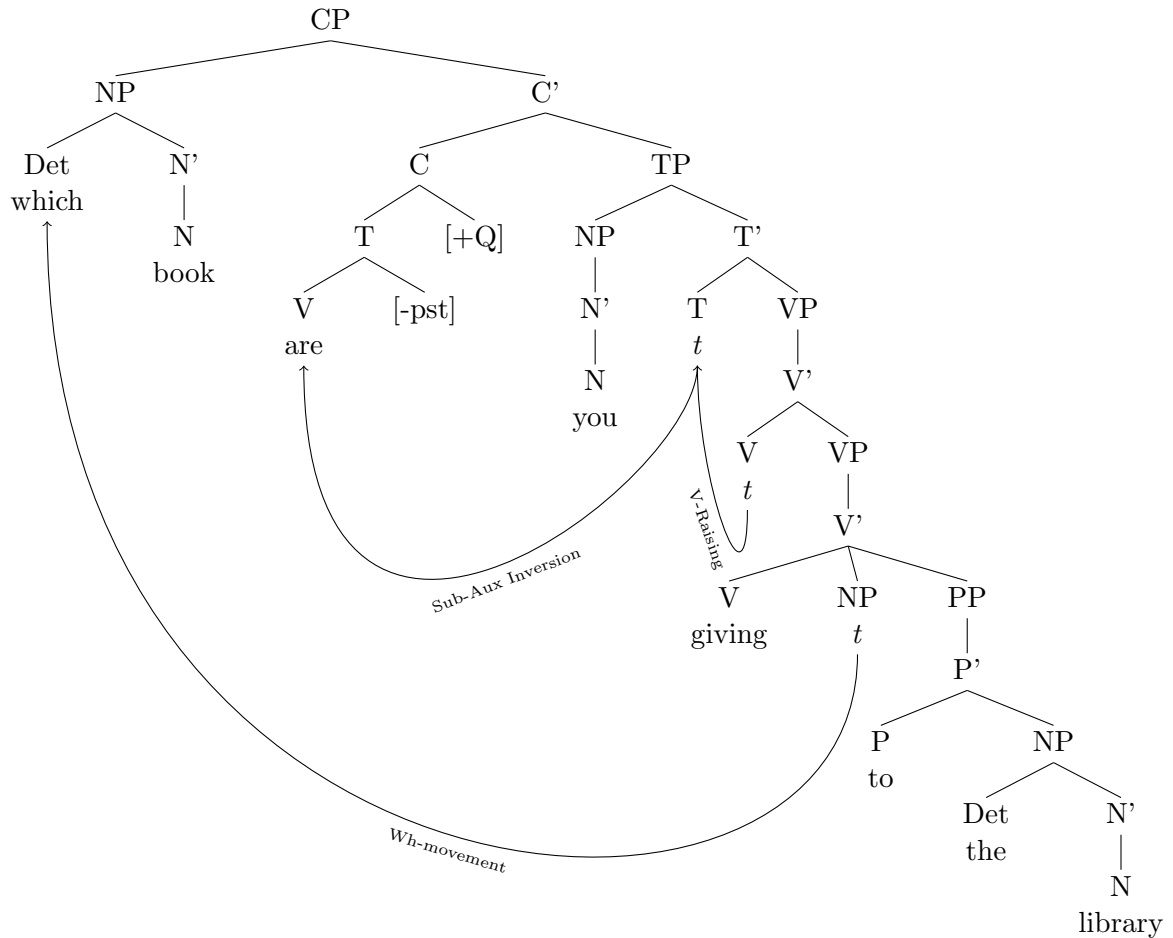
3.1 Questions

Draw the Surface structure tree for the following sentences.

- (4) Which book are you giving to the library?
 (5) I heard the rumor that you are moving.

3.2 Answers

- (4) Which book are you giving to the library?



(5) I heard the rumor that you are moving.

