

# AM2 — Syntax: theories and models

## Week 6: Formal aspects of movement

Here we begin the second block of the course, which will run until the Christmas break. So far, we have concentrated on the decomposition of the verb phrase, and we saw that occasionally constituents could move around. However, we haven't paid much attention to the formal aspects of movement. This will be the focus of the next two classes.

### 1 Why do we need movement?

The question of why we need movement is a slightly misleading one. Everything begins with the observation that some constituents appear to be fulfilling two functions simultaneously, each one of which requires them to appear in a different structural position. Consider, for example a *wh*- question like the following.

- (1) What did she say [ ]?

The *wh*- word *what* contains an interrogative operator *Q* that needs to take the entire clause in its scope. In turn, this requires *what* to be in a very high structural position. Simultaneously, *what* is also receiving a  $\theta$ -rôle (THEME) from *say*, and we have seen in the previous block of the course that this can only be done if *what* is merged as the sister of *say*. We call this latter position the *gap*, and we notate it as [ ]. Note a single moved element might be associated to more than one gap, as we will see below.

So, movement is a way of relating a constituent to two different positions in the tree. Ross (1967) noted that movement rules differ in a very significant respect from other types of long-distance dependencies —namely, the fact that movement rules are island-sensitive. An island is an environment that blocks the creation of a movement dependency, but not of any other kinds of dependencies. Here is an example of *wh*- movement attempting to cross a prototypical island boundary, namely, an adjunct clause boundary.

- (2) \* What did Alice go to bed [<sub>adjunct</sub> after Bob said [ ]]?

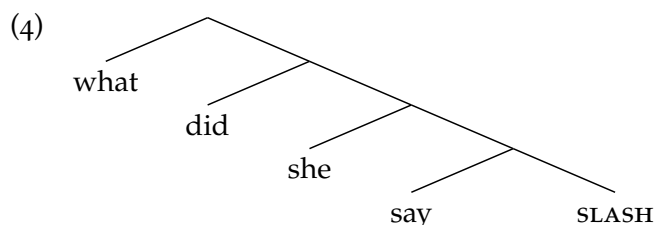
Compare this to non-movement dependencies, like ellipsis or quantifier binding, which are unaffected by islands.

- (3) a. Alice read a book [<sub>adjunct</sub> after Bob did [<sub>ellipsis</sub> \_\_\_]].  
b. Every<sub>i</sub> student read a book [<sub>adjunct</sub> after his<sub>i</sub> advisor recommended it].  
c. Every<sub>i</sub> student read a book [<sub>adjunct</sub> after his<sub>i</sub> advisor did [<sub>ellipsis</sub> \_\_\_]].

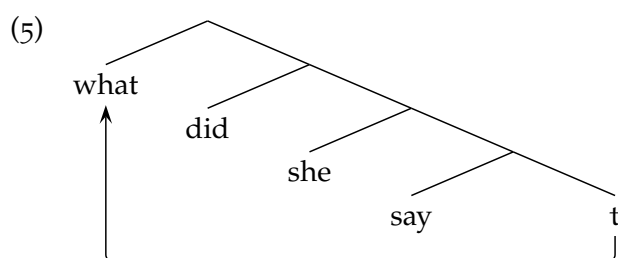
**In summary** Movement is necessary to allow a constituent to be interpreted simultaneously in more than one position in the structure. It establishes a dependency between the surface position of this constituent and its gap position; however, unlike other types of dependencies, movement cannot cross island boundaries.

## 2 The trace theory of movement

Essentially, what we need is a mechanism that allows a constituent to be related to more than one structural position simultaneously. Movement is one way of formalizing this mechanism, but not the only one. For example, the HPSG formalism makes use of the [SLASH] feature; in (1), the complement position of *say* would be occupied by a dummy constituent with a [SLASH] feature, which allows the assignment of relevant  $\theta$ -rôle to happen at a distance.



The [SLASH] formalization is equivalent to the *trace theory of movement* assumed in transformational grammar approximately from the mid/late-1970s to the early 1990. A trace (notated *t*) is a placeholder for a moved constituent. Formally, we say that a moved constituent and its trace form a *chain*, and the dependency is notated with an arrow going from *t* to the moved constituent.



## 3 The copy theory of movement

The trace theory of movement is strange. To begin with, it requires us to adopt the notion of *trace*. We have seen that sentences are built up from lexical items, but a trace is not a lexical item as we usually think of it, i.e., as a pre-built matrix of features. A trace is simply a placeholder for an actual lexical item, but it doesn't have any features of its own. This is something that we would like to avoid, but if we find reasons why traces are a good thing to have in our theory, then in principle we could modify our theory to accommodate them.

### 3.1 Reconstruction

A more serious problem though, is that, by definition, a trace is an atomic entity; it cannot be decomposed into more simple parts. This is problematic because we have ways of telling that a trace must have an internal structure that mimics that of the moved element. The evidence comes from the phenomenon called *reconstruction*, in which parts of a moved phrase are interpreted as though they literally were in the gap/trace position. For example, we have already seen that Condition A of Binding Theory requires anaphoric pronouns to be c-commanded by their antecedents.

- (6) a. Alice<sub>i</sub> saw a picture of herself<sub>i</sub>.  
 b. \* The man that Alice<sub>i</sub> married saw a picture of herself<sub>i</sub>.

However, an anaphoric pronoun contained inside a fronted *wh*- phrase can be bound by an antecedent that doesn't c-command the surface position of this pronoun.

- (7) [Which picture of herself<sub>i</sub>] did Alice<sub>i</sub> see t?

Importantly, this is only possible if the antecedent c-commands the trace.

- (8) \* [Which picture of herself<sub>i</sub>] did the man who married Alice<sub>i</sub> see t?

Importantly, note that the anaphoric pronoun is only a proper subconstituent of the wh-phrase that t is a placeholder for. That is, *Alice* is binding something *inside* the gap, which is incompatible with the idea that gaps are atomic entities. This conclusion is reinforced by examples like the following, in which two different elements (*Alice* and the quantifier *every*) are binding two different subconstituents (the anaphoric pronoun *herself* and the pronoun *he*) inside the fronted wh- phrase.

- (9) [Which picture of herself<sub>i</sub> that he<sub>k</sub> took] does every boy<sub>k</sub> think that Alice<sub>i</sub> hates t?

The conclusion is that traces have to have an articulate internal structure, so that we can bind things contained in them. The way in which can formalize this conclusion is by postulating that “traces” are actually copies of the moved element, which happen not to be pronounced. From now on, I will typeset unpronounced copies in a light gray font and I will enclose them in  $\langle$ angle brackets $\rangle$ . Example (7) will have the following structure.

- (10) [Which picture of herself<sub>i</sub>] did Alice<sub>i</sub> see  $\langle$ which picture of herself<sub>i</sub> $\rangle$ ?

### 3.2 Multiple copy pronunciation

Copies are usually not pronounced; however, in some cases they can be pronounced. If reconstruction didn't, the fact that you can sometimes have pronunciation of copies should convince you that “traces” are actually copies of the moved constituents. This is something that typically happens for morphological reasons. Consider, for example, the German negative quantifier *kein*, which we have already seen in a previous week is composed of two lexical items, *viz.*, negation plus an indefinite article. Suppose that we want to move just the article, stranding negation. The result is ungrammatical, because the morpheme realizing negation (*k-*) is an affix and therefore cannot appear with a nominal host.

- (11) \* Einen alten Professor habe ich k- gesehen.

However, we can salvage this example by re-spelling out the indefinite article in the gap position, so that it provides a host for *k-*.

- (12) Einen alten Professor habe ich *keinen* gesehen.

This kind of doubling is very pervasive among the languages of the world. For example, Spanish (among many other languages) has a process of clitic climbing, in which a clitic pronoun can appear attached to a higher verb than the one it is dependent on. We know, through various tests, that clitic climbing is a case of movement.

- (13) a. Vamos acostumbrando **nos** a este país.  
 go.3SG getting.used CL to this country  
 “We are slowly getting used to this country”  
 b. **Nos** vamos acostumbrando a este país.  
 CL go.3SG getting.used to this country  
 “We are slowly getting used to this country”

In most dialects of Spanish, these two forms are in complementary distribution. However, some dialects (e.g., those in the Río de la Plata region of Argentina) allow simultaneous pronunciation of both clitic positions.

- (14) **Nos** vamos acostumbrando **nos** a este país.  
 CL go.3SG getting.used CL to this country  
 “We are slowly getting used to this country”

Additionally, many languages have doubling of verbal constituents. A case in point is the Trinidad and Tobago dialect of English, in which verbs are focalized by means of doubling within a cleft structure (Cozier 2006). Consider first the nominal cleft construction, in which a DP is moved to the focus position.

- (15) Is a car that Tim did give to Misha.  
 “It is a car that Tim gave to Misha”

If the fronted constituent is a verb, then the lower copy is pronounced too.

- (16) Is walk that Tim go walk.  
 “Tim will walk (as opposed to running, driving...)”

If you are interested in the phenomenon of multiple copy pronunciation, you can find plenty of example in the work of Jairo Nunes, especially the following two books.

- Nunes, Jairo. 2004. *Linearization of chains and sideward movement*. Cambridge: MIT Press.
- Corver, Norbert, and Jairo Nunes. 2007. *The copy theory of movement*. Amsterdam: John Benjamins.

### 3.3 Formalization

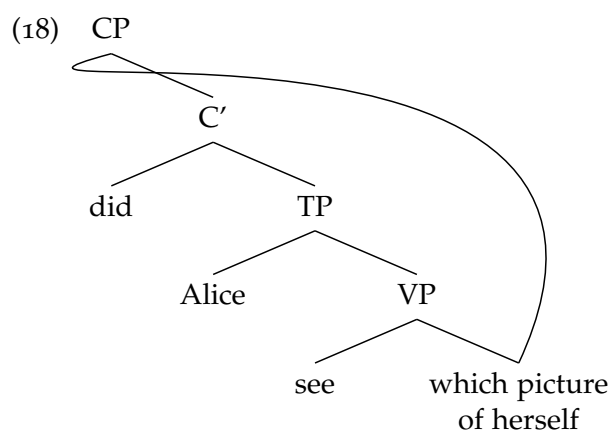
It is not enough to say that movement leaves a copy: we also need to ensure that each copy is linked to the correct constituent. To ensure that this is the case, we tag copies of the same constituent with the same index (it doesn't really matter which index we use, so long as we use the same index for all the copies). So:

- (17) [Which picture of herself]<sub>1</sub> did Alice<sub>i</sub> see ⟨which picture of herself<sub>i</sub>⟩<sub>1</sub>?

Ultimately, though, an index is simply a trick we (as linguists) use to remind ourselves which copies go together. Ideally, we should have a way of ensuring that this result follows from the process of movement itself. This can be done, and we will look at the details the next week.

## 4 The multidominance theory of movement

The copy theory of movement says that each position a constituent is associated to contains an exact copy of that constituent. The question that arises is: how do we ensure that copies are exact? One could posit a process of copying that produces exact copies. There is an alternative, though, in which movement is modelled as the drawing of an extra branch going from the base position of movement to the surface position. This is the *multidominance theory of movement*, and here is the multidominance representation of example (7) —I am skipping projections like vP because they are not directly relevant to this example.



The inherent advantage of a multidominance approach is that it trivially solves the two requisites that we had to impose on the copy theory of movement, namely, (i) that copies that “go together” had to be coindexed to ensure that they are interpreted as one constituent; and (ii) that copies had to be exact. In a multidominance theory of movement, both requisites follow trivially because there is only one constituent, even though it is linked to multiple places in the structure.

At first, a multidominance syntax might seem strange, but that’s only because you are not used to it. Theoretically, there is nothing wrong with it. The ban against a constituent being multiply dominated comes from McCawley, in a very dense 1968 article entitled “Concerning the base component of a transformational grammar” (if you try to read it, make sure you have plenty of free time and plenty of paper to take notes). In that article, McCawley stipulated a series of conditions that syntax trees had to obey, and one of them is that any given node could have at most one single node immediately dominating it. This is called the *Single Mother Condition*. However, it is important to bear in mind that McCawley modelled this condition as an Axiom—that is, something that doesn’t follow from previous theoretical or empirical factors. In any system, we are free to eliminate Axioms as long as the result is internally consistent. In the case of syntax trees, a system without the Single Mother Condition is still internally consistent, so we can have a multidominance syntax.

For practical purposes, however, there is no real difference between having a multidominance or a copy theory of movement. In the handouts, I will mostly use the copy theory, but that’s only because typesetting multidominance trees is a more complicated process (additionally, once we start looking at trees with multiple movements, things get too cluttered). You may use whichever one you like the best.

#### 4.1 Multidominance without movement

An argument in favor of a multidominance theory of movement over the copy theory of movement is based on the fact that it seems to be necessary anyways to handle certain non-movement processes. The most famous case is *Right Node Raising* (RNR), in which two sentences share their rightmost constituent.

(19) Alice bought, and Bob baked [a premade pepperoni pizza].

In case you think RNR sentences are stilted or unnatural, here are some attested examples (from Phillips 1996). He comments that “even the briefest of surveys shows this common assumption [that RNR is an exotic and stylistically marked quirk] to be false”.

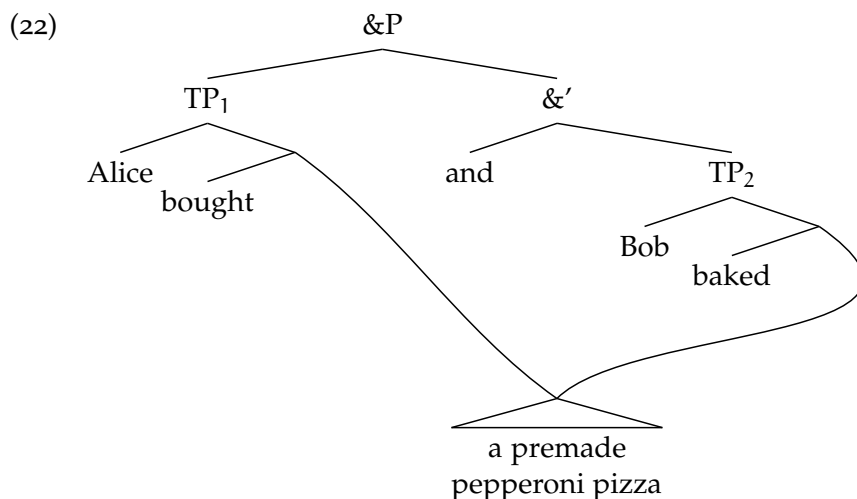
(20) a. Stone also suggests that Nixon knew of, though he did not attempt to participate in, [US attempts to assassinate Fidel Castro].

- b. Textbook-classic homuncular maps can predict, but not guarantee, [structure-function relations even in normal subjects].

We know that RNR cannot be a case of movement because it can take place inside islands. Here is an example with a relative clause island.

- (21) I know a man [<sub>RC</sub> who loves] and a woman [<sub>RC</sub> who hates] [the winter weather in Germany].

In order to analyze these sentences, various people have proposed that the RNRed constituent is multidominated by both conjuncts simultaneously.



If this analysis holds (and we have good reasons to suppose so, at least for a significant subset of sentences), then a multidominance-based syntax receives additional support.