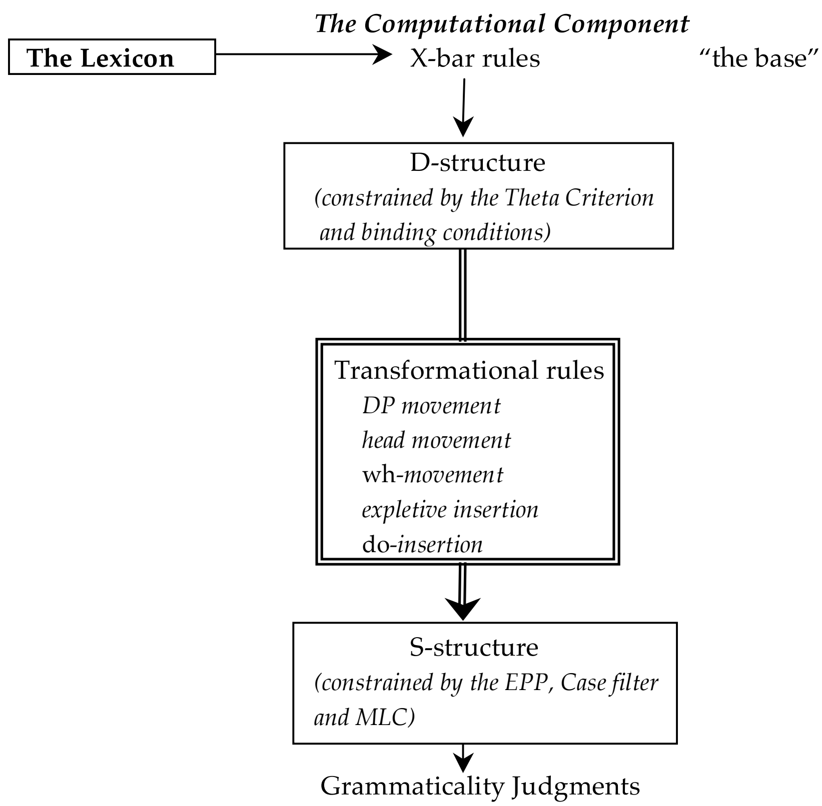
chapter 12

A Unified Theory of Movement

0. Introduction

At the beginning of this book, we looked at rules that generate the basic phrase structure of human syntax. These rules generated trees that represent hierarchical structure and constituency. These trees have particular mathematical properties that we investigated in chapters 4 and 5. In chapter 6, we saw that stipulated phrase structure rules missed some very basic generalizations, and refined them into X-bar phrase structure rules. The X-bar rules, being very general, allow us (informed by parameter settings) to generate a wide variety of trees, and capture structural differences between heads, complements, adjuncts, and specifiers. In chapter 7, we extended the rules to various clause types, complementizers, and DPs. In chapter 8, we saw that, in fact, the X-bar rules actually generated too many structures, and that we had to constrain their power. The device we use to limit them is a semantic one: the thematic properties of predicates (stored in the lexicon) and the theta criterion. What results from the output of the X-bar schema and the lexicon is called D-structure. The theta criterion holds of D-structures, as do the binding conditions. In chapters 9, 10, and 11, we saw a variety of cases where lexical items either could not be generated where they surfaced by X-bar theory (e.g., head-adjunct-complement ordering in French) or appeared in positions other than the ones predicted by theta theory. We developed a new kind of rule: the movement rule or transformation, which moves items around from their base position in the D-structure to the actual position they appear in on the surface. There are three movement transformations: Head-to-head movement (T → C and V → T), DP movement, and *wh*-movement. In each of these cases movement occurs because it *has* to. Each movement has a trigger or motivation. Heads move to fill empty [Q] features or to take an inflectional suffix. DPs move to check case features. *Wh*-phrases move to be near the [WH] feature. We also posited two insertion transformations: *Do*-support and expletive insertion. The output of the transformations is called S-structure, which is itself subject to several constraints: the Case filter, the EPP and the Subjacency Constraint. The model (flowchart) of the grammar looks like (1).

1)



This straightforward model can generate a large number of sentence types. It is also a system with explanatory adequacy, which makes specific predictions about how a child goes about acquiring a language (via parameters).

This is a fairly complete and simple system, but we might ask if the system can be made even simpler. Are we missing any generalizations here? Recent work in syntactic theory answers this question suggests that we might unify the different types of movement into a single rule type with a slight reorganization of the architecture of the grammar.

The Minimalist Program

The system of grammar described in this chapter is a very cursory look at some of the principles underlying the most recent version of generative grammar: The Minimalist Program (Chomsky 1993, 1995). The Minimalist Program is motivated not only by the search for explanatory adequacy but also for a certain level of formal simplicity and elegance. What is outlined here is by no means a complete picture, but is meant to give you a taste of what current work is striving towards.

1. MOVE

In this book we've proposed the following motivations for transformations:

2) a) Head movement *to get a suffix or fill null* [+Q]
   b) DP movement *to check case features* [NOM] or [ACC]
   c) *Wh*-movement *to check a* [+WH] *feature*

Notice that while there are significant differences between the motivations for the various types of movement, there is one overwhelming similarity. The movements all occur so that one item can appear near another. In the case of head movement the V or T head needs to appear as part of the same word as the place it moves to. With *wh*-movement, the *wh*-phrase needs to be near the [WH] feature, just as DP movement occurs so the DP can check its Case feature with T or V. All the motivations for movement then seem to be ***locality constraints***. That is, two items must be near or ***local*** to one another. This is a trend that we've seen before in previous chapters.

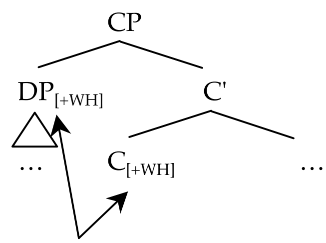
If all the movement types are motivated by locality, then there isn't really a significant difference between the rule types. Perhaps we can unify them into a single rule: ***Move***. Move says simply "move something" (but only if you have to):

3) *Move (very informal version)*
   Move something somewhere.

Now of course, this is a bit vague and we'll have to sharpen it up in some way. In particular, we will want to constrain the rule so there isn't just random movement all over the sentence. So the next step is to formulate a constraint that motivates and forces this transformation to apply (in all the different circumstances).

Let's take *wh*-movement as our paradigm case. In *wh*-movement the *wh*-phrase moves to the specifier of CP so as to be local with a [WH] feature. Another way to think of this, as we suggested in chapter 11, is to say that both the *wh*-phrase and the complementizer have a [+WH] feature, and they need to compare them, or ***check*** them. Checking of features can only occur in a local configuration. In this case we have what is called a ***specifier–head configuration*** for reasons that should be obvious from the following partial tree.

4)



Specifier–head checking configuration.

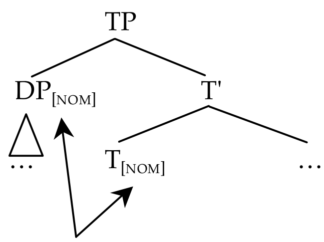
The constraint that forces this movement to occur is called the ***Principle of Full Interpretation*** (Chomsky 1993, 1995).

5) *Full Interpretation (FI)*
Features must be checked in a local configuration.

6) *Local Configuration (preliminary)*
[WH] features: Specifier–head configuration.

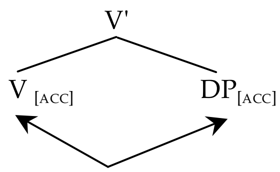
We can extend this to the other cases of movement too. As we suggested in chapter 10, imagine that Case is not simply an ending, but is also a feature. A subject DP bears a [NOM] Case feature. Imagine also that the heads of the phrases that assign case (T and V) also bear this feature (although they don't show it morphologically). We can thus reduce the Case filter to full interpretation: Nominative Case is feature checking like that in (7) and accusative Case is like that in (8):

7)



Specifier–head checking configuration

8)



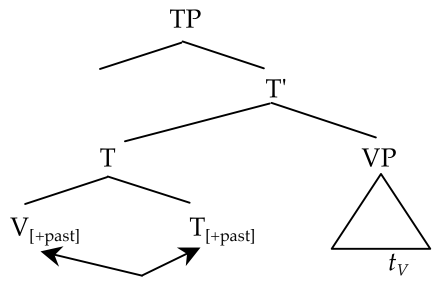
Head–complement checking configuration

Case and Agreement

The notion that T bears some kind of Case feature often troubles people, since Case is an inherently nominal kind of inflection and T seems to be associated with verbal material. One clever solution to this problem is to claim that verbal items like T do in fact bear Case; we just call case on verbs "agreement." In fact, cross-linguistically, there does seem to be some kind of correlation between the kinds of agreement markers that are found on verbs and the case marking on the subjects. Languages with ergative/absolutive case marking systems often also have ergative/absolutive agreement. So we could claim that [NOM] when on a noun is case, but when on T or a V is agreement, thus at least partly motivating the structure in (7) and (8).

Finally, we can extend this to the head movement cases. Instead of claiming that verbs move to pick up inflectional suffixes in V → T movement, let's claim that both the V and the T head bear some kind of abstract inflectional features (e.g., [±past]). This allows us to capture the behavior of verbs with null T morphology as well as that of ones with affixes. When the verb and T check these features against one another then the suffix representing that tense feature (or agreement feature) is allowed to surface on the verb. The local configuration in this setting is within the head itself (a relationship which is called a head–head configuration):

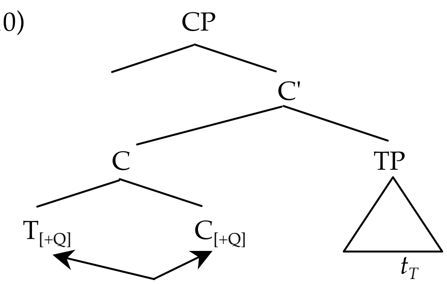
9)



Head/Head checking configuration

Similarly, both T and C bear a [+Q] feature, and they must be in a head–head checking relationship:

10)



Head/Head checking configuration

Local Configuration is thus defined in terms of features. The particular configuration required is determined by which feature is being used. This is very similar to the way in which we formally defined the conditions on the Minimal Link Condition in the previous chapter, where the intervening categories were relativized to the kind of feature being checked by the element that is moving. (11) is a summary of these local configurations.

11) *Local Configuration*:
[WH], [NOM] features: Specifier–head configuration.
[ACC] features: Head–complement configuration.[1]
[PAST], etc., [Q] features: Head–head configuration.

With this in place we actually have a very elegant transformational system. We have combined our three movement rules into one: Move and two constraints: full interpretation and the Minimal Link Condition. In previous chapters, we've already argued that constituent structure is created by a few very limited phrase structure rules, which are constrained by the theta crite-

[1] In the next chapter we will claim that [ACC] is actually checked in a specifier–head configuration like [NOM], this will allow us to create a phrase structure system that accounts for double object verbs and dative constructions.

rion and the lexical entries of categories. Computationally speaking, this is a surprisingly simple system of grammar.

2. EXPLAINING CROSS-LINGUISTIC DIFFERENCES

The system outlined above in section 1, is simple and elegant. It does however, make the unfortunate prediction that all languages will have exactly the same set of transformational rules (although they can still differ in phrase structure, due to the parameters). This is clearly not the case. English does not have V → T movement. Many other languages lack passive and raising. Still others appear to lack *wh*-movement. Take the case of Mandarin Chinese (data from Huang 1982; tone is omitted).

12) a) Ni xiang chi sheme?
you want eat what
"What do you want to eat?"

b) *Sheme ni xiang chi?
what you want eat
"What do you want to eat?"

c) Ni kanjian-le shei?
you see-ASP who
"Who did you see?"

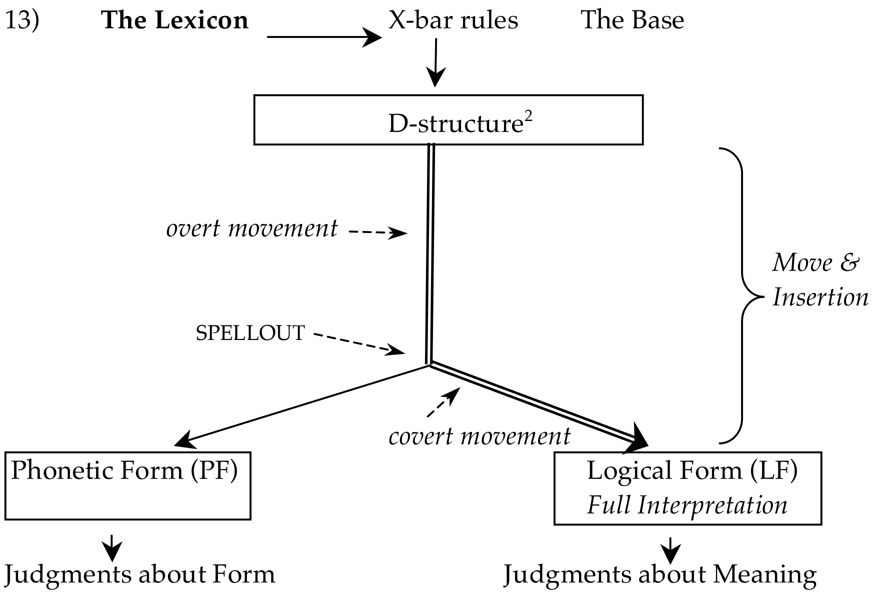
d) *Shei ni kanjian-le?
who you see-ASP
"Who did you see?"

Chinese appears to have no *wh*-movement. As we discussed in the last chapter this is called **wh-*in-situ*.** The Chinese case differs from English, however, in that these are not echo-questions. These are real *wh*-questions. As such they should have [+WH] features on their Cs and on the *wh*-phrases. Why, then, is it the case that the unchecked [+WH] features on the *wh*-phrases don't violate Full Interpretation? They have not moved so they are not in a local configuration with their C. Full Interpretation predicts that (12a) should be ungrammatical and (12b) should be grammatical – the exact opposite of the facts.

Our solution to this problem is going to surprise you. We're going to claim that in Chinese the *wh*-phrase does move, you just don't hear it! This requires a refinement of our grammar model.

Ferdinand de Saussure (a linguist from the late nineteenth century) observed that every linguistic expression consists of two parts: the signifier and the signified. For our purposes, this roughly corresponds to the phonological or ***phonetic form*** of the sentence (abbreviated as PF) and its semantic or ***logical form*** (LF). We call these "forms" the ***interface levels***, because they represent the interface with the phonological system and with the interpretive system respectively. This means that when we're computing the grammaticality of a sentence we're really computing two distinct things: its sound (for the purposes of a syntactician this means the sequence of the words) and its meaning. To a certain degree these interface levels are computed together, but they also diverge from one another. When we look at the question cross-linguistically, we see that any particular PF order of elements does not directly correspond to some specific meaning. For example, the English sentence *I saw the man* and the Irish sentence *Chonaic mé an fear* (literally *Saw I the man*) <u>mean</u> the same thing, but they have different word orders. One way to represent this conundrum is by having two separate levels in our model of grammar that correspond to these interface levels. These levels represent the final products of our computation, so they should appear at the end of the derivation. This gives us a more refined model of the grammar than the one we saw in (1):

13)



Let me draw your attention to some of the important differences between this model and the model we had in (1). First of all you'll note that there is no S-structure. In the old model, S-structure was the level from which we drew grammaticality judgments. In this new model it is the interface levels PF and LF that give us well-formedness judgments (judgments about form) and semantic judgments respectively. Some of the derivation applies in tandem generating both the PF and the LF; these operations apply on the "stem" of the upside down Y. Then there is a point at which the derivation branches into operations that are purely about form and sound and operations that are purely about meaning. This branching point is called ***SPELLOUT*** (usually in all capital letters). After SPELLOUT, the derivation proceeds along two distinct paths, one generating the PF, the other the LF. Chomsky (1993) makes two important claims. First he claims that Full Interpretation is a con-

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[2] This model isn't entirely an accurate representation of Chomsky's minimalist model. I have retained the notion of D-structure here. In Chomsky's version, the X-bar rules are replaced by an operation called Merge and there is no D-structure. In Chomsky's model the constraints we've claimed to be D-structure constraints (The Theta Criterion and the binding conditions) are handled differently. Getting rid of D-structure involves some tricky argumentation that lies beyond the scope of this textbook. Once you are finished reading this book have a look at some of the suggested readings at the end that will take you onto this more advanced material. This aside the diagram in (13) is a fair representation of how many linguists working within the minimalist program is structured.

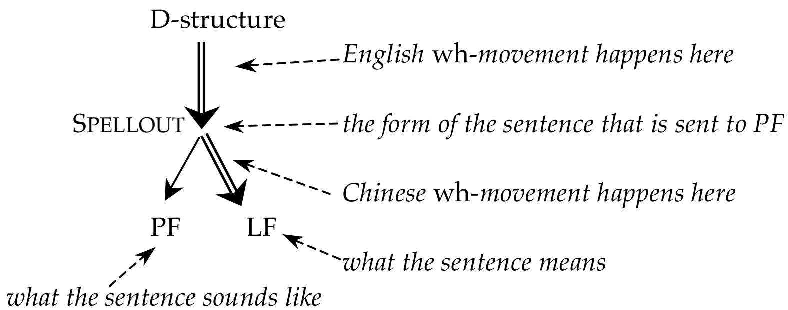
straint that holds of sentences at LF. Second, he claims that exactly the same operations that happen between D-structure and SPELLOUT can also happen between SPELLOUT and LF (in (13) this is indicated by means of the double line that extends from D-structure to SPELLOUT and from SPELLOUT to LF). Move can apply anywhere along this double line.

At first this may seem counterintuitive, but the kinds of movement can happen *after* SPELLOUT; that is, after the pronounced order has been created, and the "form" portion of the sentence is sent off to PF. This is a mind-bending notion, but actually allows us to make the following remarkable claim about cross-linguistic variation: *Every instance of feature-checking motivated movement happens in every single language*. Why would we want to do such a thing? Let us assume, not uncontroversially, that the kinds of meaning determined by the syntax are universally held by all humans. This is ***not*** to say that all humans have identical world-views or identical perceptions of events etc.; we are not making such a strong claim here. This is not a claim about cultural or personal interpretations. This is simply a ***limited*** statement that all humans have a notion of what it means to express a declaration, a yes/no question, a *wh*-question, a passive, a sentence with raising, etc. These kinds of constructions, and relationships such as constituency and the binding conditions *do* seem to be universal in interpretation even if they do have different forms cross-linguistically. Let us call such basic interpretations ***universal semantics***. If, as we have hypothesized throughout this book, this basic semantic content is determined by our X-bar phrase structure system (which creates constituents) and the movement operations (which check to make sure that there is a featural correspondence among the words in the constituent structure), then universal semantics should be generated the same way in every language. Yet it goes without saying, that every language has different (yet narrowly limited) ways of expressing that universal semantics. The Y model gives us a straightforward way of accounting for this. The differences between languages are in when that movement occurs: before SPELLOUT or after. Essentially there are two kinds of movement, movement that happens between D-structure and SPELLOUT (called ***overt*** movement) and movement that happens between SPELLOUT and LF (called ***covert*** movement). Since covert movement happens after the branching off to the PF (phonology) component, you simply can't hear it happen! The differences between languages then, are in when they time specific instances of the general operation Move. English times those instances involving [WH] features overtly before SPELLOUT, Chinese times those same movements covertly, after SPELLOUT. This can be simply encoded in a parameter:

14) Wh-*parameter*: Overt/Covert
(English sets at "Overt", Chinese sets at "Covert")

This parameter determines whether movement applies before S-structure or after:

15)



To make this clearer let us abstractly show each step of the derivation for Mandarin Chinese and English (I'm abstracting away from *do*-insertion, etc.):

16)

	English	*Mandarin Chinese*
D-structure	you did see who?	Ni kanjian-le shei? you see what
	overt movement	
SPELLOUT	Who did you see t_i?	Ni kanjianle shei?
		covert movement
LF	Who did you see t_i?	Shei ni kanjianle t_i?

You'll notice that the order of elements in the LFs of this sentence is identical in both languages, but the SPELLOUT form is different. You never hear the LFs. You only hear the SPELLOUT forms. The LFs are identical because the two sentences (in the two languages) mean the same thing.

This kind of analysis has a nice side effect. It also allows us to get rid of the odd-man-out of transformations: Affix (T) lowering. This was the only movement that we looked at that ever went downwards. It also appeared to be in complementary distribution with V-movement. If a language has one, then it doesn't have the other. This is suspicious; when we find items in complementary distribution, it suggests they are really instances of the same thing. With the system described above we can get rid of the affix lowering account of English. English doesn't have affix lowering. Instead, it has V → T movement like any other language, only in English it is timed covertly, so you never hear it.

17)

	French	*English*
D-structure	Je souvent mange des pommes. I often eat of.the apples	I often eat apples.
	overt movement	
SPELLOUT	Je mange$_i$ souvent t_i des pommes.	I often eat apples.
		covert movement
LF	Je mange$_i$ souvent t_i des pommes.	I eat$_i$ often t_i apples.

Again, these sentences mean the same thing, so they have identical LFs. The word order in the two sentences is different, so the SPELLOUTs are different. Again this is encoded in a parameter:

18) *Verb raising parameter*: Overt/Covert
(French sets at Overt; English sets at Covert)[3]

In this view of things, differences in the word order of the world's languages reduce to a matter of timing in the derivation.

You now have enough information to try General Problem Sets 1 & 2 and Challenge Problem Sets 1 & 2

3. Scope, LF Movement, and the MLC

At first blush the whole notion of a movement you cannot hear seems pretty suspicious (just like empty words that you can't hear seems suspicious). There is some evidence it does exist, however. This evidence comes from the behavior of *wh*-questions in Japanese and from English sentences with quantifiers.

3.1 MLC Effects in Wh-*in-situ Languages*

Let's compare two hypotheses. One is the covert movement hypothesis proposed above in section 1. That is, in languages like Mandarin Chinese and

[3] Of course if you assume this, you can't claim that tense suffixes are generated in T, otherwise there is no way to get them onto the verb overtly. Chomsky (1993) gets around this problem by hypothesizing that the features that trigger movement aren't actual morphological items, like *-ed*, but instead are merely abstract features [+past]. The morphology on the verb is simply base generated on the verb in the lexicon and the features associated with it are checked at LF.

Japanese, *wh*-phrases move just as in English, but they move covertly, so that you don't hear the movement. The other hypothesis (on the surface less suspicious) is simply that *wh*-phrases don't move in Mandarin and Japanese. Consider the predictions made by these two hypotheses with respect to island conditions and the MLC. Island effects are seen in English precisely because there is movement. Too long a movement (violating the MLC) causes the sentence to be ill-formed. When there is no movement, obviously, no violations of the MLC will occur. Now compare our two hypotheses about Japanese. The first hypothesis, according to which there is (covert) movement, predicts that Japanese will show MLC violations. The other hypothesis predicts that no violations will appear since there is no *wh*-movement. The following sentence is only ungrammatical with the meaning indicated (it is grammatical with other meanings, such as an echo-question interpretation).

19) *[Nani-o doko-de katta ka] oboete-iru no?
what-ACC where-at bought Q remember Q
"What do you remember where we bought?"

If this data can be explained by the MLC, then we know that movement occurs – even if we can't hear it – because this constraint is sensitive to movement.

You now have enough information to try General Problem Set 3 and Challenge Problem Set 3

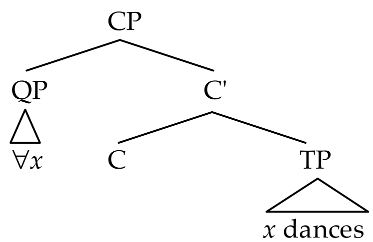
3.2 *English Quantifiers and Scope*

If LF is truly a semantic construct, we expect to find some semantic correlations to covert movement. One typical assumption about semantics is that there are some similarities between it and the semantics expressed by formal logic. With this in mind consider the following discussion of English quantifier scope.

We call words like *every* and *all* ***universal quantifiers.*** In formal logic these are represented by the symbol ∀. Words like *some* are ***existential quantifiers*** and are represented by the symbol ∃. In logic, quantifiers are said to hold ***scope*** over constituents containing variables. Variables are items that stand for arguments in the meaning of the sentence. The logical representation of an expression like *Everyone dances* is:

20) $\forall x$ [x dances]

This means that for every (∀) person you choose (represented by x), then that person (x) dances. The quantifier ∀ has scope over the variable x. This is indicated by the brackets that surround *[x dances]*. One popular interpretation of the logical relation of scope is that it corresponds directly to the syntactic relation of c-command. So at LF the structure of (20) is (21):

21) 

The quantifier phrase (QP) c-commands the TP, thus is holds scope over it. The quantifier is said to bind the variable it holds scope over. (In logic, this is represented as having the first x next to the ∀, and then the other x inside the brackets). In the notation we have used up to now in this book, we could translate this using indexes:

22) $\forall x_i$ [x_i dances]

However, since the logical notation is more common for drawing LFs we will use it here.)

An interesting phenomenon arises when we look at sentences with more than one quantifier. The following sentence is ambiguous in English:

23) Everyone loves someone.

This can have two meanings. The first meaning is that for every person in the world there is some other person who they love: Mary loves John, Bill loves Susy, Rose loves Kim, …, etc. The other meaning is that there is one person in the world that everyone else in the world loves: Mary loves John, Bill loves John, Rose loves John, …, etc. Using a pseudo-logical paraphrase we can represent these two meanings as (24). The actual logical representations are given in (25):

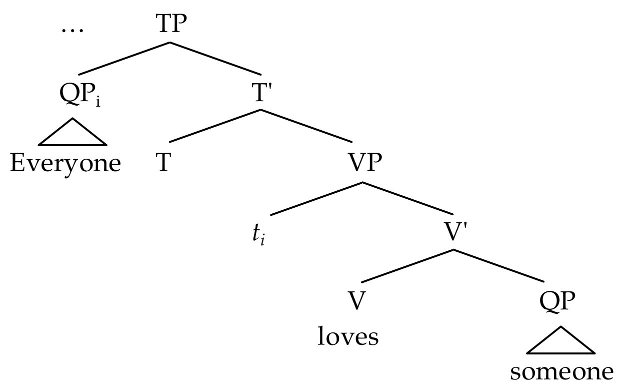
24) a) For every person x, there is some person y, where x loves y.
    b) For some person y, every person x loves y.

25) a) $\forall x(\exists y[x \text{ loves } y])$
    b) $\exists y(\forall x[x \text{ loves } y])$

In logical notation, you'll notice that the difference between the two meanings lies in the order of the quantifiers, which reflects the embedding of the structure. The universal quantifier in (25a) is said to have ***wide scope***, whereas in (25b) it has ***narrow scope***.

In chapter 3, we claimed that if a sentence is ambiguous, then there are two tree structures for the sentence. It would be nice if we could draw two different trees that represent the two meanings of these sentences. As mentioned above, one hypothesis about scope phenomena is that they reflect c-command. That is, a quantifier has scope over everything it c-commands.[4] Consider the meaning in (24a). We can easily see this scope when we draw the simplified tree (QP stands for Quantifier Phrase):

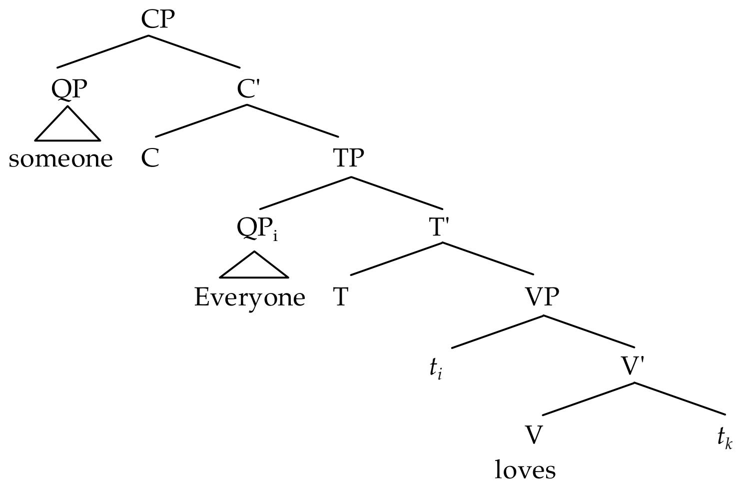
26)



Everyone here c-commands *someone*, so the wide scope reading for the universal quantifier is derived. The narrow scope reading is more difficult, if this hypothesis is correct, then in the tree for (24b) *someone* must c-command *everyone*. The only way to get this fact is to move the quantifier. This kind of movement is called ***quantifier raising*** or ***QR***.

[4] A full discussion of the semantics and structure of scope lies well beyond the purview of this book. See Heim and Kratzer (1998) for more on this complicated topic.

27)



In this QR sentence, *someone* c-commands *everyone*, and so has scope over it. This derives the narrow scope reading for the universal quantifier. Obviously, this quantifier raising analysis cannot be overt. The surface string for this ambiguous sentence is *everyone loves someone* (not **someone everyone loves*). In order to get the second meaning for this sentence we need to propose movement you can't hear, in other words, covert movement. Covert movement thus has independent justification.

You now have enough information to try Challenge Problem Set 4

4. CONCLUSION

In this chapter we made the big jump from three movement rules with different but similar motivations to a single rule with a single motivation (Full Interpretation). We also claimed that cross-linguistic variation in movement, when we assume a universal semantics, requires that movement can both be overt (before SPELLOUT) and covert (after SPELLOUT). The Y model with Saussurian interface levels (LF and PF) allows this to occur. We also looked very briefly at an example from quantifier scope that provides independent support for the notion of covert movement.

IDEAS, RULES, AND CONSTRAINTS INTRODUCED IN THIS CHAPTER

i) ***Move*** *(very informal version)*: Move something somewhere.

ii) ***Full Interpretation***: Features must be checked in a local configuration.

iii) ***Local Configuration***:
[WH], [NOM] features: Specifier–head configuration.
[ACC] features: Head–complement configuration.
[PaST] etc, [Q] features: Head–head configuration.

iv) ***Logical Form (LF)***: The semantic/interpretive system.

v) ***Phonetic Form (PF)***: The component of grammar where word order is expressed.

vi) ***SPELLOUT***: The point at which the derivation divides into form (PF) and meaning deriving structures (LF).

vii) ***Overt Movement***: Movement between D-structure and SPELLOUT (heard/pronounced movement).

viii) ***Covert Movement***: Movement between SPELLOUT and LF (silent movement).

ix) **Wh-*Parameter***: Overt/Covert.

x) ***Verb raising Parameter***: Overt/Covert.

xi) ***Universal Quantifier (∀)***: Words such as *every, each, all, any. Identifies all the members of a set.*

xii) ***Existential Quantifier (∃)***: Words like *some*, or *a. Identifies at least one member of a set.*

xiii) ***Scope***: A quantifier's scope is the range of material it c-commands.

xiv) ***Wide vs. Narrow Scope***: Wide scope is when one particular quantifier c-commands another quantifier. Narrow scope is the opposite.

xv) ***Quantifier Raising (QR)***: A covert instance of Move that moves quantifiers.

FURTHER READING

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Saito, Mamoru and Howard Lasnik (1994) *Move Alpha: Conditions on Its Application and Output.* Cambridge: MIT Press.

GENERAL PROBLEM SETS

1. FRENCH

[Data Analysis; Basic]

Go back and look at all the French data in chapters 9 and determine if French has overt or covert DP movement. Explain your answer.

2. IRISH

[Data Analysis; Basic]

Go back and look at all the Irish data in chapters 9, 11 and determine whether Irish has overt or covert *wh*-movement, overt or covert DP movement and overt or covert head movement.

3. PF MOVEMENT

[Creative and Critical Thinking; Advanced]

In the text above, we proposed that some movement was covert. That is, it happened between SPELLOUT and LF. This movement affects meaning, but it doesn't affect how the sentence is pronounced. Can you think of any kind of movement that might occur just on the PF branch of the model? That is, are there any phenomena that affect only how the sentence is pronounced, but not its meaning?

CHALLENGE PROBLEM SETS

CHALLENGE PROBLEM SET 1: SERBIAN/CROATIAN/BOSNIAN
[Data Analysis; Challenge]
Compare the data in challenge problem set 3 of chapter 11 with their English Equivalents:

a) *Who what where buys?
b) Who buys what where?
c) *Who what buys where?
d) *Who where buys what?

Using the terms "covert movement" and "overt movement," explain the difference in parameter setting between Serbo-Croatian and English.

CHALLENGE PROBLEM SET 2: NEPALI AND MONGOLIAN
[Data Analysis; Challenge]
Consider the following data from Nepali and Mongolian (data from Erin Good and Amy LaCross respectively). Do these languages have overt or covert *wh*-movement? How can you tell?

Nepali:

(a) Timilai uu kahile aunche jasto-lagcha?
you she when coming think
"When do you think she is coming?"

(b) Timi kahile aaunchau?
you when coming
"When are you going to come?"

(c) Ramle Sitale kun manche ayecha bhaneko sochecha?
Ram Sita which man came said think?
"Which man did Ram think that Sita said came?"

Mongolian:

(d) Ekč jamar hɔl hix ve?
older-sister which-one food make $C_{[+Q]}$
"Which food will the older sister make? "

CHALLENGE PROBLEM SET 3: ECHO QUESTIONS IN ENGLISH
[Critical Thinking; Challenge]
Give an argument that echo questions in English involve no movement at all (neither overt nor covert), and thus are very different from the covert move-

ment found in languages like Chinese and Japanese. Hint: The evidence will come from the MLC: The following sentence might help you:

a) Who does John think loves *what*?

CHALLENGE PROBLEM SET 4: SCOPE OF NEGATION

[Data Analysis, Creative and Critical thinking; Challenge]

The following sentence is ambiguous:

a) The editor did not find many mistakes in the paper.

This can either mean

i) The editor isn't very good, and although there were many mistakes he didn't find them.
ii) The editor searched thoroughly for mistakes, but the paper didn't have many mistakes in it.

We can express these variations in meaning using scope. With meaning (i), we have a situation where *many* has scope over negation (i.e. *many* c-commands *not* (¬) or in logic: MANYx [¬ find (editor, x)]). (That is, *many* has wide scope). By contrast the narrow scope reading (ii), *not* c-commands *many* (¬ find (editor, MANYx).

Part 1: Draw the LF tree for each of the meanings. Keep in mind that the word order for (i) will not be the same as the SPELLOUT order, you are drawing the tree for the LF which includes movement that is covert. Also assume that only quantifiers move; negation does not move.

Part 2: Consider now the passive form of this sentence:

b) Many mistakes were not found in the paper by the editor.

This sentence is not ambiguous. It only has one meaning: wide scope for many (that is, the meaning in (i) above). This sentence can never have the meaning in (ii) above. Why should this be the case? (Hint: ask yourself if it is possible to create an LF with negation c-commanding *many* for (b). Remember negation does not move.)

Part 3: English passives involve overt DP movement from the complement of V to the specifier of TP. Explain why it is crucial that this movement be overt, in explaining why *many* cannot have narrow scope (reading ii) at LF.

Optional really advanced question: are the traces of DP movement var iables? How can you tell?