

## 18 WH-Movement

### Introduction

We have seen that Phrase Structure rules alone cannot generate all the sentences of English, and rules of another kind are also needed. These transformational rules take Deep Structures generated by PS rules as their input, affect these structures in some way, and produce Surface Structures as their output. The transformational rule we have already discussed, Subject-Auxiliary Inversion, affects the DS by *moving* an element from one location to another. The next transformation we will present is also a movement rule, called WH-Movement. After introducing the basics of this rule in this chapter, we will continue to discuss structures affected by WH-Movement for the rest of this part. We concentrate on WH-Movement because of the variety of structures and constraints which are relevant to it.

### 1 Indirect Questions

The WH-Movement transformation involves words (or phrases) called WH-words. These are question words such as "who," "what," "where," and so on, which in English generally start with the letters "WH." Even though their equivalents in other languages do not start with the letters "WH," they have come to be known as "WH"-words generally. WH-words are used in WH-questions (as well as some other structures), which come in several types. We begin by discussing indirect questions.

Consider the following sentence:

- (1) Bill wondered who Al spoke to.

This kind of sentence is called an indirect question because the whole sentence isn't a question (the listener isn't expected to reply), but it has something resembling a question embedded in it, namely, "who Al spoke to." The presence

of the question fragment "who Al spoke to" as an embedded (= subordinate) clause identifies an indirect question.

Upon short reflection we will see that it is not possible to generate this indirect question with PS rules alone. Assuming that the WH-phrase "who" is an NP, and that the proper name "Al" is another NP, then it appears that the PS component would require the addition of a PS rule that introduces two NPs at the beginning of the embedded clause, to license the appearance of both "who" and "Al" following the verb "wondered" in (1). Yet another rule would also be needed to generate (1). In ordinary declarative sentences, we find that the verb "spoke" is followed either by an NP (e.g., "Hussein spoke Arabic"), or by an adverb (e.g., "Vanna spoke softly"), or by a full PP (e.g., "Hussein spoke to Vanna"). However, it would be grammatically deviant to lop off the NP after the P in ordinary declarative sentences (e.g., "Hussein spoke to"). But in the indirect question under consideration, there is a PP following "spoke" without an NP. Therefore, we would need to add a rule permitting a P to be left with no NP following it.

Unfortunately, the addition of these two new rules causes certain unwanted consequences. By adding these rules to the PS component, we would add new options for expanding IP and PP, allowing ungrammatical sentences to be produced. For example, it is not correct to leave off the NP in the PP following the verb "spoke" in an ordinary declarative, as (2) shows.

- (2) \*Bill thought Al spoke to.  
(Cf. Bill wondered who Al spoke to.)

And, in fact, the converse is true. If we choose the option of including an NP in the PP in the indirect question under consideration, the result is also ungrammatical:

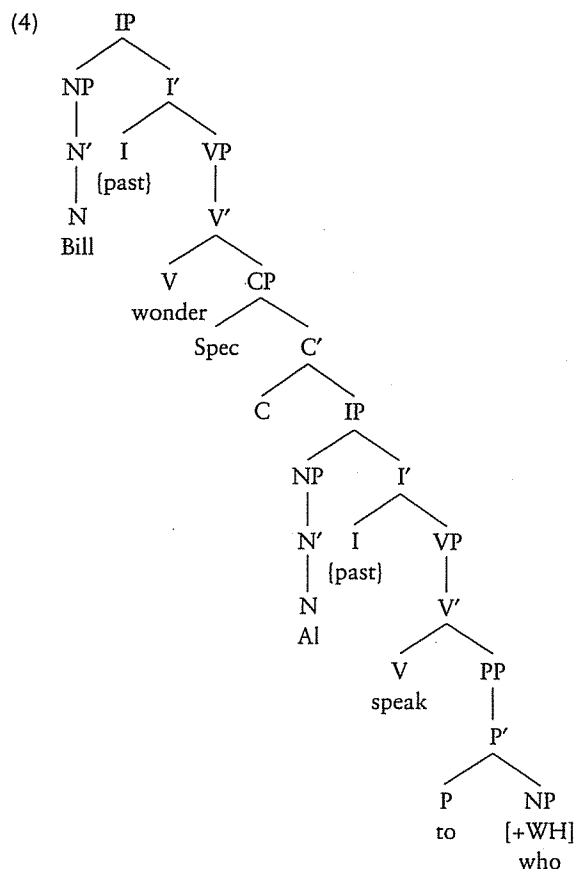
- (3) \*Bill wondered who Al spoke to Fred.

The point here is that the two "new" rules form a tandem, and cannot work alone. If one applies, the other must also be applied. But if one does not apply, the other also must not. In other words, there can be a "missing" NP in a PP if and only if an "extra" NP appears elsewhere. This relationship is called a *dependency*: the missing NP is dependent on the extra NP.

The problem with the potential PS rules under consideration is that there is no way to guarantee that PS rules are applied in a dependent way, such as under a condition stating: rule X if and only if rule Y. At any point in a derivation any PS rule can apply. There is no means at present for keeping track of the other PS rules that might have been applied elsewhere in a phrase marker. This means that "dependent" PS rules like this must be avoided. If either rule is added to our PS system, there would be ungrammatical consequences. This discussion points out the need for another kind of rule, one that relates the presence or

absence of an NP in a PP to the presence or absence of an NP at the front of the embedded clause in the indirect question.

Now we shall show how to capture this kind of dependency using the transformational rule of WH-Movement. Again, our target is the sentence "Bill wondered who Al spoke to." This sentence corresponds to the Surface Structure, remember, because this is how the sentence is actually pronounced. First, we need to uncover its Deep Structure. This, we said, was a function of the PS rules. Of course, these PS rules do not include the potential rules we discussed above, since it was argued that these rules were too costly. Instead, the usual PS rules will have to suffice. These can be employed in coming up with a Deep Structure that can be transformed appropriately by the WH-Movement rule. We propose the phrase marker in (4) as the Deep Structure.

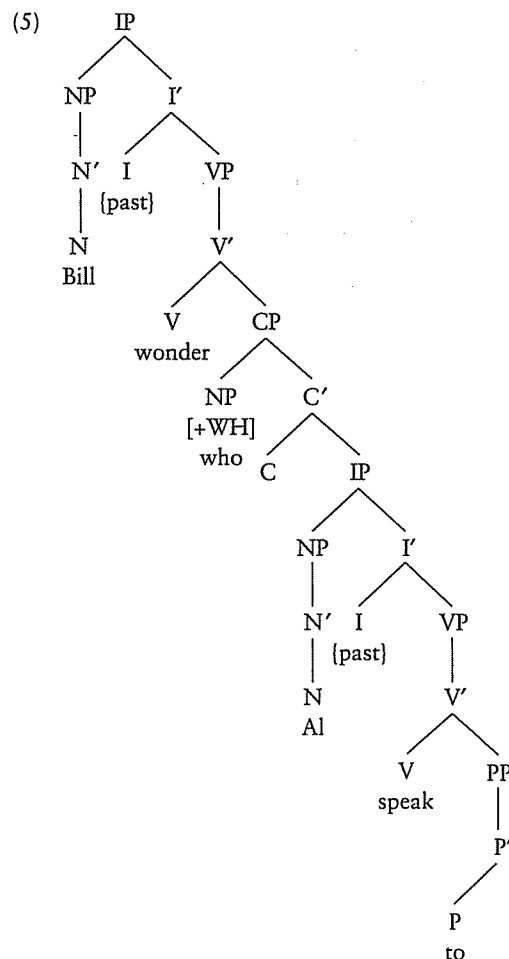


Notice that as with the yes/no questions discussed in chapter 16, this Deep Structure contains empty nodes: both C and the specifier of CP have nothing beneath them at the level of Deep Structure. As before, we include these nodes here in anticipation of needing them later. Although we noted the existence of the specifier position of CP, we have not yet seen which elements go in it. Now the time has come to use this position. In (4), the empty Spec of CP position is used to create an open slot. This slot has no words in it at Deep Structure, but it is filled with "who" in the Surface Structure of the sentence. To obtain the desired result, the Spec of CP node is left empty at the level of Deep Structure.

So we have created a Deep Structure in which every clause has a verb, there are no "extra" noun phrases, and the PP has an NP. It is important to see that this is the Deep Structure of the sentence, because it follows the PS rules, but it cannot be the Surface Structure, because the words are not in their appropriate places. If we uttered the words in the order given at Deep Structure, the result would be the ungrammatical sentence, "\*Bill wondered Al spoke to who." This means that the transformation that is needed is obligatory.

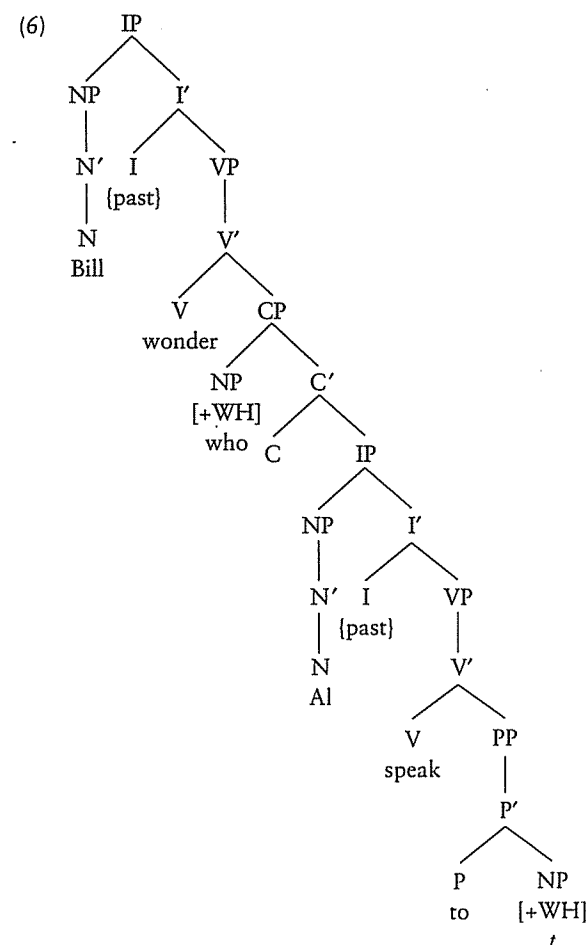
It is the task of the WH-Movement transformation to convert the Deep Structure into another phrase marker, a Surface Structure, which does exhibit the proper order relation among the words. The WH-Movement transformation moves an NP with so-called "WH-features" into an empty Spec of CP at the beginning of a clause. In the present example, the transformation moves the NP "who" (which is marked [+WH] in the tree, to identify it as bearing WH-features) to the appropriate position. Now we can see why there is an extra NP at the beginning of the clause: this NP, at Surface Structure, corresponds to the NP at the end of the clause, at Deep Structure. Notice that this explains the fact that we understand "who" as the object of "speak to." The question is asking who was spoken to (by Al). We understand the sentence in relation to the Deep Structure position of the WH-word.

What will the Surface Structure look like? First, we know that the WH-word occupies the Spec of CP position in the Surface Structure. There are two possibilities to consider regarding the structure of the phrase marker following WH-Movement, with respect to the position from which the WH-word is moved. One possibility is that the position that the WH-phrase moves from is completely eliminated. This would result in the phrase marker in (5) for the present example.



A second possibility, known as the *trace theory of movement*, is that a marker of the WH-phrase that previously occupied this position is left behind following WH-Movement. On this analysis, the Surface Structure phrase marker keeps a record of the Deep Structure position of the moved WH-phrase. This record takes the form of a trace, abbreviated *t*, as illustrated in the phrase marker in (6). The theoretical and empirical motivation for leaving behind a trace of any moved constituent is discussed in later chapters. For now, we will follow the convention of leaving a trace from WH-Movement. However, to keep the trees from becoming too complex, we will not mark the trace of Subject-Auxiliary Inversion. It will become clearer in later chapters why we make this distinction

between these two operations. Trace Theory has wide consequences within the theory of Universal Grammar.



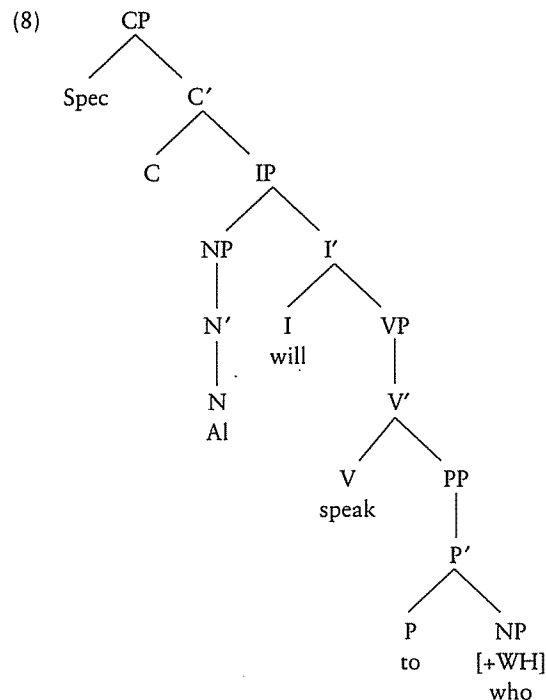
## 2 WH-Movement in Direct Questions

We now turn to consideration of WH-Movement in direct questions, that is, those which the listener is expected to answer. To begin, compare the indirect question in (7a) with the direct question in (7b).

- (7) a. Bill wonders who Al will speak to.  
b. Who will Al speak to?

As before, our target is the Surface Structure of (7b), the result of applying the WH-Movement transformation. But we must see how this transformation applies for direct questions. We begin by deciding what is the Deep Structure underlying the Surface Structure. The Deep Structure must be derived from our system of PS rules. Then, the WH-Movement transformation is applied. This converts the Deep Structure into the Surface Structure, namely, one with the words in the right order at the bottom of the phrase marker. Let us call the words at the bottom of a phrase marker the "terminal string." Our goal is to proceed through these steps in order to derive a phrase marker with the terminal string, "Who will Al speak to?"

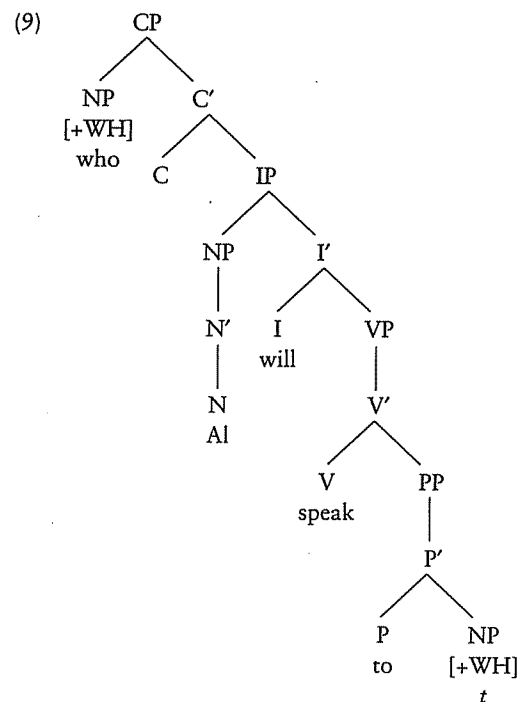
The first step is to use the PS rules to generate the Deep Structure. Check for yourself that (8) is a well-formed Deep Structure.



This time, the Deep Structure begins with CP as the topmost node (root) of the phrase marker. Thus, the first PS rule that is used will be:  $CP \rightarrow \text{Spec } C'$ . Note

that, as with an indirect question, the Spec and head C nodes are empty. It is a special property of CP that its specifier (and head) can appear empty at the level of Deep Structure. Although empty initially, the specifier serves as a "landing site" for the WH-phrase to move into at Surface Structure. Also note that this example contains the auxiliary verb "will" in I.

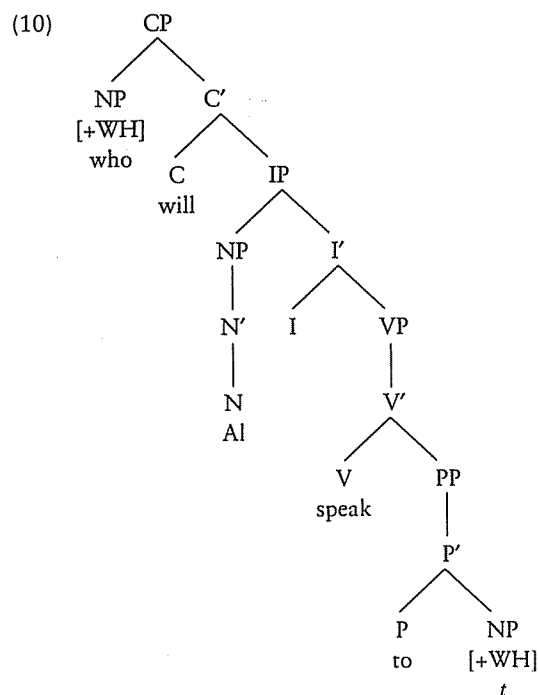
Having constructed the Deep Structure, we are in position to apply the WH-Movement transformation. In the present example, this rule must move the NP "who" (which bears the [+WH] feature) to the Spec of CP position at the beginning of the sentence. The result is given in (9).



This phrase marker is not yet the desired result. Notice that the words "Al" and "will" are in the wrong order. If the CP in (9) followed the verb "wonder" in an indirect question, as in "Bill wondered who Al will speak to," the words "Al" and "will" would be in the correct order. But, this is a difference between indirect questions and direct questions. An additional transformation is needed to obtain the correct Surface Structure for matrix (main clause) WH-questions. Since more than one transformation has to apply, we will call the structure

above, which was derived on the way from the Deep Structure to the Surface Structure, an **Intermediate Structure**.

What is the additional transformation that is needed? The additional transformation must change the order of the subject noun phrase (Al) and the auxiliary verb (will). That is, the additional transformation is Subject-Auxiliary Inversion, which we discussed in chapter 16. As we saw there, SAI moves the element in I to the head of CP (i.e., C). The result will be the structure given in (10). (As mentioned earlier, we will not include the trace left by I-to-C movement in our diagrams. Under current linguistic theory, it has a different status from the trace left by WH-Movement.)



This is the correct Surface Structure, because the terminal string of words is in the correct order for pronunciation.

When does the rule of SAI need to apply? So far, we have seen that it applies in direct questions, but it does not apply in indirect questions. If you think of more examples, you will see that this is always the case. What would happen if SAI applied in an indirect question? To find out, let's consider the indirect question given in (11).

(11) Bill wonders who Al will speak to.

The relevant difference between this sentence and the sentence diagrammed in the previous section ("Bill wondered who Al spoke to") is that this sentence uses the auxiliary "will." In (11), there is a subject NP (Al) in the embedded clause, and an auxiliary (will) in the embedded clause which could invert with the subject. But, if we try applying the rule of SAI, the result would be (12).

(12) \*Bill wonders who will Al speak to.

Since (12) is ungrammatical, we know that SAI does not apply in indirect questions. We are just going to stipulate that SAI applies in direct WH-questions, but not in indirect questions. You will always be able to tell if SAI has applied, simply by looking at the subject and the auxiliary in the Surface Structure. If the subject is first, SAI has not applied. If the auxiliary is first, SAI has applied.

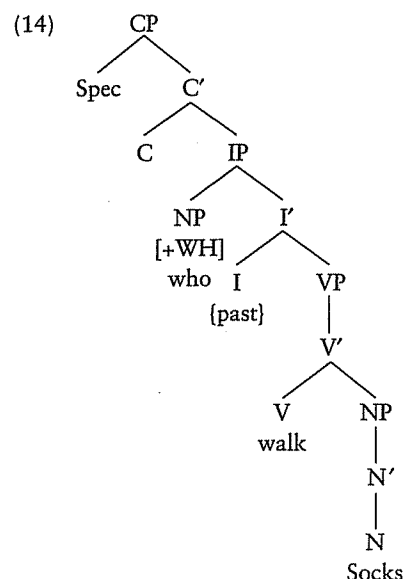
### Subject questions

If you look back at all the examples of WH-Movement we have given so far, you will see that in every case the constituent that has moved has been an object – in fact, the object of a preposition. It is important to point out that objects are not the only constituents which can be affected by WH-Movement. Adjuncts undergo WH-Movement in much the same way as objects. Subjects can also be questioned. However, when subjects are questioned there are interesting consequences, especially for SAI. Let's look at an example to see how this is.

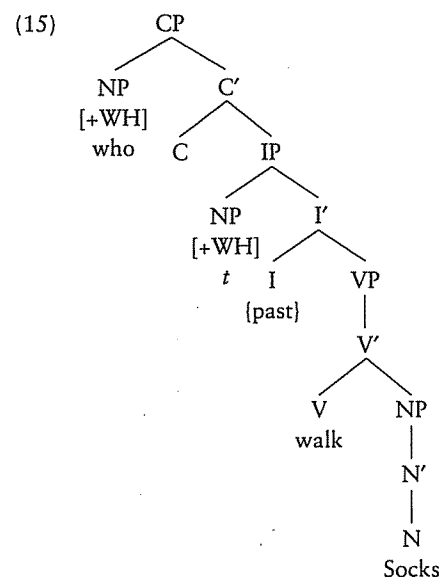
First, consider the following subject question:

(13) Who walked Socks?

This is a subject question, because it is the subject – the person who took Socks for a walk – which is being questioned. What is the Deep Structure for this question? If you try to construct the Deep Structure by using the PS rules, the structure in (14) will be the result.

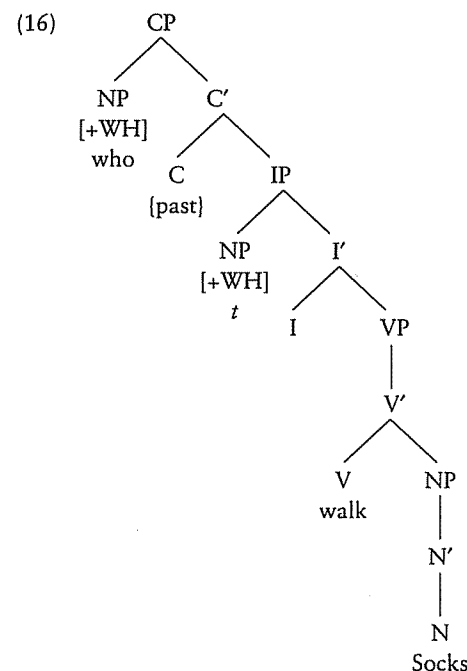


Notice that the subject "who" is in the subject position, not in the Spec of CP (yet). Now, to move the [+WH] phrase to Spec of CP, we use the WH-Movement transformation. The result is given in (15).



You have probably noticed that this change in the structure does not affect the way the sentence is pronounced. The WH-word "who" was first in the Deep Structure, and it is still first in the Surface Structure. However, we will still claim that the subject WH-word moves to Spec of CP. There are two reasons for this. First, we will consider another type of question, long-distance questions, later in this part, and there we will see that subject WH-elements do move, so to maintain our generalization we will say that matrix subject WH-phrases are not an exception, but move like all other WH-phrases. Second, the interpretation of all WH-questions involves a notion called scope. Scope tells us whether the question is direct or indirect, for example. The most straightforward way to define scope uses CP: a WH-phrase has scope over the clause in which it appears in CP. Thus, subject questions must have a WH-word in CP for the correct scope. (We will discuss scope further in chapter 19.)

Now, consider whether SAI should apply in the derivation of subject questions. Tree (15) shows the structure after WH-Movement has applied, but SAI has not applied. What happens if SAI applies in the derivation of subject questions? The result is shown in (16).



How is (16) to be pronounced? Notice that the affix {past} in C must have a host. Can it combine with "walk" in V by affix-hopping? Not if we maintain

the constraint on affix-hopping which requires an affix to be adjacent to the verb. In (16), the WH-trace comes between the affix {past} and the verb. Even though they are not pronounced, WH-traces do block certain phonological processes. In chapter 23 we will see a clear example of this. So, we will assume here that the WH-trace blocks affix-hopping. In this case, Do-support must be applied. If we apply Do-support, however, we do not derive the correct question ("Who walked Socks?"). Instead, we derive (17).

(17) \*Who did walk Socks?

Do-support is not allowed in subject questions unless the "do" is emphatic. This tells us that SAI must not apply in subject questions. This means that tree (15) represents the Surface Structure of the question. All that is needed is for {past} to hop onto the verb, and the correct question will result.

## Conclusion

In this chapter, we have seen the application of WH-Movement in direct and indirect questions. WH-Movement moves a WH-element to Spec of CP, leaving behind a trace. In direct WH-questions (except matrix subject questions), SAI also applies. So far, we have only discussed relatively simple WH-questions. We will continue to concentrate on simple (one-clause) WH-questions for now, turning to examine some of the cross-linguistic aspects of the structure and acquisition of simple WH-questions. Later in this part, however, we will turn to examine more complex WH-questions, which serve to illustrate several constraints of UG.

## Bibliographical Comments

WH-Movement has been, and continues to be, one of the most extensively researched areas of syntax. The two specific transformations discussed in this chapter, WH-Movement and Subject Auxiliary-Inversion, were first proposed in Chomsky (1957) and Chomsky (1975). Other early analyses of WH-questions are proposed in Bach (1971), Baker (1970), Klima (1964), and Ross (1967). More introductory discussions of these two transformations are given in Baker (1978), Radford (1981), and Emonds (1976). For early discussion of trace theory see Chomsky (1976), Fiengo (1977), and Wasow (1972).

# 19 Cross-Linguistic Aspects of WH-Questions

## Introduction

We have seen several properties of WH-questions in English, including the application of WH-Movement and Subject-Auxiliary Inversion. In later chapters, we will see how constraints apply to restrict the operation of WH-Movement, and how children perform with respect to these constraints. First, however, we will step back for a moment and ask which aspects of our current treatment of WH-questions are part of UG, and which are particular to English. If WH-Movement and SAI are universal, then they can be part of the innate component of grammar, and we can expect to see evidence of them in very young children. On the other hand, if there are aspects which require learning or parameter setting, these may be acquired later.

## 1 Cross-Linguistic Variation in WH-Movement

In our discussion of English, we have seen that WH-Movement moves a WH-phrase to the specifier of CP position, which is at the beginning of the clause. After studying a large number of languages, many linguists believe that these two aspects of WH-questions are universal:

- (1) WH-Movement universally moves a WH-phrase to Spec CP  
Spec CP is universally on the left

This claim would reasonably lead you to believe that WH-phrases appear at the beginning of the clause in all languages. This, however, is not true.

All languages have WH-questions. However, not all languages show WH-Movement in the surface order of questions. For example, in numerous languages, including Japanese (an SOV language), and Chinese (which is SVO),

WH-words can remain in their Deep Structure position, as illustrated in (2)–(3). When a WH-word remains in this position on the surface, it is said to be *in situ*.

(2) *Japanese*

John-ga dare-ni sono hon-o age-ta no  
 John-NOM who-DAT that book-ACC give-PST Q  
 "Who did John give that book to?"

(3) *Chinese*

ni kanjian-le shei  
 you see-ASP who  
 "Who did you see?"

In yet other languages, WH-phrases can either remain in their Deep Structure position, or optionally move to the topmost specifier of CP. One example of a language of this type is French, in which a WH-phrase may move or remain in its Deep Structure position only in matrix clauses. Examples are shown in (4a) and (4b) respectively.

- (4) a. qui as-tu vu  
       who have-you seen  
       "Who did you see?"  
       b. tu as vu qui  
       you have seen who  
       "Who did you see?"

Do these facts require us to reject the claim that the phenomena in (1) are universal? No, these differences in the surface form of WH-questions can be accounted for by considering a further level of the grammar which we have not yet discussed. We have seen so far two levels of syntax: Deep Structure and Surface Structure. We also know that the Surface Structure gives us the order of the words as they are actually pronounced. The component of the grammar which takes care of the pronunciation is called the **Phonetic Form**. So far, then, the model of the grammar which we have discussed can be illustrated as in figure 19.1.

However, the model as given is incomplete. There is an additional component needed, which is called **Logical Form**. This is the representation which gives important information for the semantics, or meaning, of the utterance. A diagram of the model including the relationship between Logical Form and the other levels is given in figure 19.2.

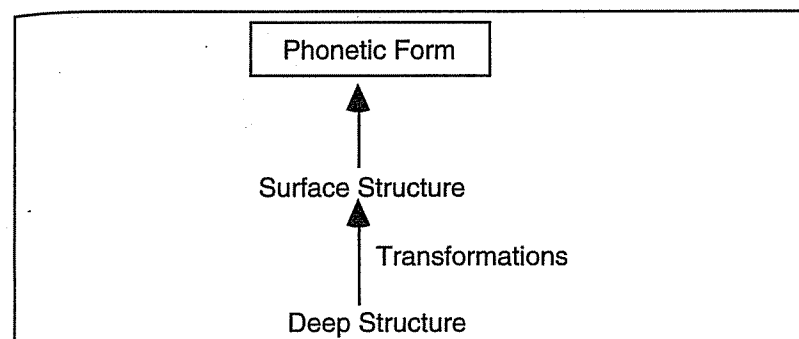


Figure 19.1 The model of the grammar so far

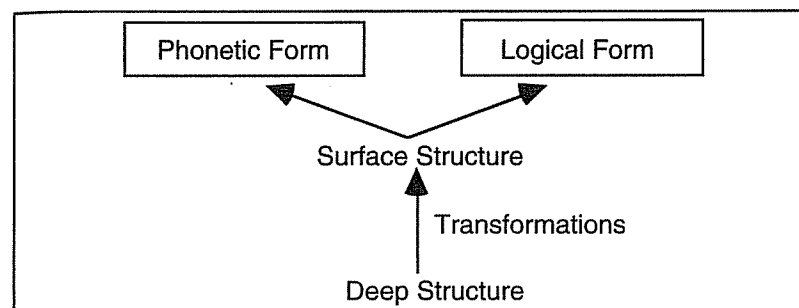


Figure 19.2 The revised model of the grammar

What purpose does Logical Form (or LF) serve? Just as Phonetic Form can be considered as an interface between language and pronunciation, Logical Form is the interface between language and thought. One important function of language is to communicate thought. To do this, some concept must be translated into language, and transmitted by the movements of our vocal organs (or hands and body, in the case of signed languages). Logical Form connects the language component to the concept component, and Phonetic Form connects it to the pronunciation component.

The operations which transform Surface Structures into structures of Logical Form are very similar to the operations in the syntax (the mapping from Deep Structure to Surface Structure). In fact, it has been proposed that one of the ways in which languages may differ from each other is that some operations may apply in the mapping from Deep Structure to Surface Structure in some languages, but in the mapping from Surface Structure to Logical Form in others. WH-Movement is one such operation.



A linguist named James Huang argued that the difference between languages such as English and languages such as Japanese or Chinese was not whether or not WH-Movement applies, but the level at which it applies. He claimed that at the level of LF, all WH-phrases occupy the clause-initial position. Thus, in Japanese and Chinese, WH-Movement applies between Surface Structure and LF – hence the movement is covert, or not reflected in the pronunciation, which is read off the Surface Structure, before the WH-Movement applies. On the other hand, in English WH-Movement applies between Deep Structure and Surface Structure, so it is overt – we pronounce the words in the moved order.

Huang reasoned as follows. As we mentioned before, in English the position of a WH-element aids in the interpretation of its “scope” – that is, whether it is in a direct or an indirect question. A WH-element in the matrix specifier of CP position signals a direct question, while a WH-element in an embedded specifier of CP position signals an indirect question. Examples of these two kinds of questions in English are given in (5).

- (5) a. Who does Mary believe bought books?  
b. I wonder who Mary saw.

Huang pointed out that Chinese has direct and indirect questions too. However, in Chinese, the WH-element is pronounced in the Deep Structure position, in both direct and indirect questions. Some examples are given in (6).

- (6) a. Zhangsan xiangxin shei mai-le shu?  
Zhangsan believe who bought books  
“Who does Zhangsan believe bought books?”  
b. wo xiang-zhidao Lisi mai-le sheme  
I wonder Lisi bought what  
“I wonder what Lisi bought.”

What indicates in Chinese whether the question is a direct or an indirect question? Huang suggested that the same signal is used in both languages: direct questions have a WH-word in the matrix specifier of CP, while indirect questions have a WH-word in an embedded specifier of CP – but in Chinese, only the Logical Form shows this distinction (while in English, both the Surface Structure and the Logical Form show it). The “invisible” movement of the WH-word on the way to Logical Form in Chinese results in the same scope information as in other languages at the level of Logical Form.

This, then, is another example of parametric differences allowed by Universal Grammar. UG permits languages to use the transformation WH-Movement to create WH-questions. UG requires that WH-elements be in their “scope” positions at Logical Form (the representation that is relevant to meaning). But UG

allows some languages to employ WH-Movement between Deep Structure and Surface Structure, while others employ it between Surface Structure and Logical Form. Thus, the parametric variation between languages such as English, Japanese or Chinese, and French, is in what level WH-Movement applies at, not whether it applies at all.

There is another reason to believe that in some languages WH-Movement applies in the mapping from Surface Structure to LF, and this has to do with multiple questions. Consider the English examples in (7).

- (7) a. Who bought what?  
b. \*Who what bought?

The question in (7a) is about both “who” and “what” – this is why it is called a “multiple question.” The expected answer to (7) is a paired list, such as that in (8).

- (8) John bought chips,  
Alice bought salsa,  
and Kim bought soda.

In other words, if we consider the scope of the question in (7a), we would say that both “who” and “what” have matrix scope – the respondent is expected to answer both questions. But we have seen that a WH-phrase should be in the specifier of the matrix CP if it has matrix scope (compare this to the Chinese examples). Thus, even in English, WH-Movement sometimes applies in the mapping from Surface Structure to LF. In particular, English allows only one WH-phrase to move to each Spec of CP overtly (we know this because (7b) is ungrammatical), so in multiple questions the other(s) must move covertly, that is, after Surface Structure.

Further evidence for the claim that all WH-elements move to the specifier of the CP at which they take scope comes by looking at multiple questions in Slavic languages such as Bulgarian and Romanian. In these and other languages, more than one WH-phrase can move overtly, as illustrated in (9)–(10).

- (9) Bulgarian  
Koj kogo vižda?  
who whom sees  
“Who sees whom?”  
(10) Romanian  
Cine cu ce merge?  
who with what goes  
“Who goes by what (i.e. means of transportation)?”

These languages show us that every WH-element can be in Spec of CP at Surface Structure. Then, just as we argued that in Chinese, WH-Movement applies from Surface Structure to LF, we can see that the same is true for English. The difference is that in English, one WH-element must move overtly, so covert movement is used only for multiple questions, while in Chinese, all WH-elements move covertly.

## 2 Cross-Linguistic Variation in I-to-C Movement

We have seen that WH-Movement is a universal operation, although languages may differ in the level at which it applies. What about SAI, the other operation we associate with WH-questions in English?

We showed that SAI is I-to-C movement. This makes it an example of a more general kind of operation known as Head Movement. Notice that both I – the thing moving – and C – the landing site – are *heads*, as we defined them in our discussion of Phrase Structure. This points to an important property of movement operations: heads move to head positions, while XPs move to XP positions. This general restriction on movement keeps the structure from changing too radically.

As the foregoing discussion indicates, Head Movement is a general operation made available in UG. So, children do not have to learn how Head Movement operates (for example, they do not need to learn that heads only move to heads). However, the particular instance of Head Movement we have been calling SAI is NOT a universal aspect of WH- or yes/no questions. Some languages are like English in having inversion, but others are not. For example, Russian does not use inversion in the formation of either yes/no or WH-questions, as illustrated in (11).

### (11) *Russian*

- a. A Ivan sdal ekzamen?  
PRT Ivan passed exam  
“Did Ivan pass the exam?”
- b. čto Maša kupila v magazine?  
what Masha bought in store  
“What did Masha buy in the store?”

Furthermore, some languages raise all verbs to C, not just auxiliary verbs, as in English. For example, in French and Spanish questions (illustrated in (12)–(13)) the inflected verb appears in C.

### (12) *French*

- a. Où vas-tu?  
where go-you  
“Where are you going?”
- b. Veux-tu un café?  
want-you a coffee  
“Do you want a coffee?”

### (13) *Spanish*

- a. A dónde va Juan?  
where goes Juan  
“Where is Juan going?”
- b. Trabaja María hoy?  
works Maria today  
“Does Maria work today?”

In yet other languages, verbs move to C in questions and in declaratives. German, illustrated in (14), is a well-known example. In yes/no questions (14a), the verb appears first. In WH-questions (14b), the WH-element appears first (in Spec of CP), and the inflected verb is next (in C). In declaratives (14c, d), something must precede the verb, but it is generally assumed that the verb is in C, since the verb must always be “second,” whatever element (subject or object or adjunct) is first.

### (14) *German*

- a. *Kauft* Karl das Buch?  
buys Karl the book  
“Does Karl buy the book?”
- b. Was *kauft* Karl?  
what buys Karl  
“What does Karl buy?”
- c. Dieses Buch *kaufte* Karl gestern.  
this book bought Karl yesterday  
“This book Karl bought yesterday.”
- d. Gestern *kaufte* Karl dieses Buch.  
yesterday bought Karl this book  
“Yesterday Karl bought this book.”

In languages with verbs in C, inversion can be thought of as involving V-to-I (head) movement as well as I-to-C (head) movement. However, unlike WH-Movement, there is no reason to think that inversion applies in the mapping

from Surface Structure to Logical Form. No interpretive considerations require such movement. Hence, the application of SAI in questions is something that children must learn on the basis of experience with their target language.

One further comment about what is universal and what is language-particular in the syntax of questions. English is almost unique in its rule of Do-support. Of course, the word "do" is English-particular, so there can be no rule "Do-support" in UG. But even more abstractly, the use of a dummy verb to support a stranded affix as a last resort is not common. Hence, English-learning children will have to deduce the properties of this operation on the basis of their input, without much help from UG.

## Conclusion

We have seen that there are both universal and language-particular aspects of WH- and yes/no questions. WH-Movement is a universal operation, made available by UG. The level at which it applies: from Deep Structure to Surface Structure, or from Surface Structure to Logical Form, does vary from language to language. In fact, some languages have both overt and covert WH-Movement (such as French, which allows either overt or covert movement for all matrix questions, and English, which requires only one WH-element to move overtly, and thus has covert movement for multiple questions). Children must learn which kind of language is being spoken around them, but exposure to a few basic WH-questions should inform them about the correct parameter setting. On the other hand, the application of inversion is much more varied. The existence of Head Movement is allowed by UG, but its application in questions is subject to much more learning. Therefore, we might expect to see a difference between children's acquisition of WH-Movement and their acquisition of inversion. This is the topic to which we turn in the next chapter.

## Bibliographical Comments

The existence of a level of Logical Form is argued for by May (1977, 1985), and an overview of the properties of LF under current theory is found in Hornstein (1995). An introduction to many of the properties of LF representations, including the interpretation of WH-questions, is found in Riemsdijk and Williams (1986). Huang (1982) is the classic work on LF WH-Movement in Chinese and English. Lasnik and Uriagereka (1988) provides a lucid introduction to the main issues found in Huang's thesis. For technical discussion of LF movement of WH-phrases in English multiple questions, see Aoun, Hornstein, and Sportiche (1980). For discussion of multiple questions in Slavic languages, see Rudin (1988).

# 20 The Acquisition of WH-Questions

## Introduction

Chapter 19 illustrated one of the ways in which languages across the world may differ. Language variation occurs at the level at which WH-Movement takes place. In English, WH-Movement occurs between Deep Structure and Surface Structure; in Chinese and Japanese, WH-Movement takes place at Logical Form. Across all languages, WH-elements must be in their scope positions at Logical Form. Thus, WH-Movement is an area in which we see the influence of both a universal principle (WH-Movement moves WH-elements to the specifier of the CP over which they have scope by the level of Logical Form) and a parameter (WH-Movement may take place between Deep and Surface Structure, or after Surface Structure, at Logical Form). On the other hand, we saw that the application of Subject-Auxiliary Inversion requires language-particular knowledge. Not every language uses inversion in question formation, and some of the details of inversion in English (such as Do-support) must be learned by experience. The question we ask in the present chapter is how children acquire the correct forms of questions in English and other languages.

## 1 Parameter Setting: WH-Movement

Children's earliest WH-questions in the acquisition of English include examples such as those in (1).

- (1) a. What doing?
- b. What dat?
- c. Where Daddy?
- d. Dat?

Children produce simplified questions like these around the age of 2 years. However, note that some of children's earliest questions seem to be *formulaic*.