

1 Move WH in a Language without *Wh*-Movement*

1 INTRODUCTION

1.1

The study of constraints in grammar has been one of the most persistent topics in generative studies. Among the most important results of this enterprise is a set of locality conditions, including most notably Ross's island constraints and Chomsky's Subadjacency Condition. These locality conditions are usually defined over certain structural configurations and a rule of movement, deletion, or at least some kind of dependency between two structural positions.

One type of inquiry that arises from studies of these conditions concerns their status in languages where there is no structural configuration or overt dependency between two structural positions meeting the definition of the various islands and constraints. For example, many languages do not have a *wh*-word fronting rule in syntax to form a *wh*-question, and some do not move any element for the purpose of subdividing a sentence into focus and presupposition (i.e., of forming a cleft sentence). Since questions and sentences with focus are universal sentence types, it is natural to ask what the proposed structural conditions have to say about these languages. It would seem that since these languages do not exhibit the defining configurations for the conditions to be applicable, they would be exempt from these conditions. If it turns out, however, that these types of sentences do show properties as if they form islands and obey island conditions, then it might seem that the conditions as formulated in structural terms must be rejected or revised. As a point of logic, however, this fact may lead us instead to ask if it is a mistake to regard these sentence types as exhibiting absolutely no structural dependencies in every possible sense. That is, although they do not show overtly the required structural properties, couldn't they be seen as actually involving them in some abstract sense?

In this chapter, I will try to demonstrate that taking this latter position, instead of concluding the invalidity of the structurally based conditions, will lead us to the prediction of certain very interesting facts and provide a

simple explanation of these facts. In particular, I will discuss certain properties of two major sentence types in Chinese, questions and cleft sentences, and show that, although they obviously do not involve any movement in Syntax, it is desirable to assume that they undergo movement in the LF component of grammar. Thus, for example, while it is clear that a *wh*-question like (1) is generated in Syntax with the *wh*-word never anywhere but in its base position, it will be argued that in the LF interpretive component the *wh*-word is moved to a position c-commanding the sentence, leaving a trace interpreted as a variable bound to it, as in (2):

(1) ni xihuan shei?
 you like who
 ‘Who do you like?’

(2) [shei_i [ni xihuan e_i]]
 who you like

The assumption that abstract movement rules of this sort exist in UG is an important feature of some recent works within the Extended Standard Theory, and is supported by a fairly wide range of facts observed in English and several other languages.¹ It will not be unreasonable to assume the existence of such abstract devices in Chinese simply as a consequence of UG, but it will be worthwhile to ask if there are some positive language-specific motivations for making such an assumption. The main purpose of this chapter is to show that there are indeed strong language-specific motivations.

1.2

The assumption that the LF representation of (1) is of the form (2) has as its immediate consequence the existence of:

- (3) a. a quantifier
 b. an empty category
 c. a movement process

and the properties associated with each of (3a–c). The main body of this chapter will be concerned with case (c), the existence of movement and its properties. Case (b) will be briefly dealt with in the Appendix. As regards case (a), a brief discussion in this section will give some support for the treatment of *wh*-words as a kind of quantifier and provide some initial motivation for the rest of the chapter. Consider the following sentences:

(4) [Zhangsan wen wo [shei mai-le shu]]
 Zhangsan ask me who bought books
 ‘Zhangsan asked me who bought books.’

(5) [Zhangsan xiangxin [shei mai-le shu]]
 Zhangsan believe who bought books
 ‘Who does Zhangsan believe bought books?’

(6) [Zhangsan zhidao [shei mai-le shu]]
 Zhangsan know who bought books
 a. ‘Who does Zhangsan know bought books?’
 b. ‘Zhangsan knows who bought books.’

The only surface difference among these sentences is in the choice of the matrix verb. In (4), *wen* ‘ask’ belongs to a class of verbs that require an interrogative complement. In (5), *xiangxin* ‘believe’ does not permit an interrogative complement. In (6), *zhidao* ‘know’ may optionally take an interrogative complement. As the translation shows, this single difference in the choice of the verb is responsible for the fact that (4) must be interpreted as a statement taking an indirect question, (5) must be interpreted as a direct question embedding no indirect questions, and (6) may be interpreted as either. It makes good sense to ask how the very different meanings of the virtually identical (4) and (5), as well as the ambiguity of (6), may be represented in an optimal theory. One natural approach to this question is to look at an indirect question like (4) as one in which the question word has scope over the embedded sentence, and a direct question like (5) as one in which the question word takes scope over the entire sentence, while in (6) the question word may take either scope. This amounts to postulating (7)–(9) as the logical forms for (4)–(6), respectively:

(7) [Zhangsan wen wo [shei_x [x mai-le shu]]]
 Zhangsan ask me who bought book
 ‘Zhangsan asked me for which x, x bought books.’

(8) [shei_x [Zhangsan xiangxin [x mai-le shu]]]
 who Zhangsan believe bought book
 ‘For which x, Zhangsan believes x bought books?’

(9) a. [Zhangsan zhidao [shei_x [x mai-le shu]]]
 Zhangsan know who bought book
 ‘Zhangsan knows for which x, x bought books.’
 b. [shei_x [Zhangsan zhidao [x mai-le shu]]]
 who Zhangsan know bought book
 ‘For which x, Zhangsan knows x bought books?’

It is a well-known property of quantifiers that they exhibit scope phenomena. Since the difference between (4) and (5) and that between the two readings of (6) are naturally seen as difference in scope of a *wh*-word, treating a

wh-word as a quantifier, as is shown in (7)–(9), is not unreasonable. Obviously, this is not the only possible way to account for these facts in Chinese, but note that these are not facts peculiar to Chinese; they are paralleled by corresponding sentences in other languages, including those in which a *wh*-word is actually moved to a quantifier position in surface form. Given that facts in UG should be treated in a uniform way for all languages and that there is already a natural representation given by the surface form of overt WH-moved languages, it is entirely natural to postulate the abstract representations like (7)–(9) for a language without overt movement.

Another construction for which a case can be made for an abstract movement rule in LF is the cleft construction in Chinese. The formation of a cleft sentence in this language clearly does not involve the dislocation of any constituent in Syntax. In surface structure a cleft sentence differs from a non-cleft in that in a cleft there is a focus marker (the copula *shi*) immediately preceding the focused constituent.² (In the glosses following, FM = Focus Marker.)

- (10) a. *shi wo mingtian yao mai neiben shu*
 FM I tomorrow want buy that book
 ‘It is I that want to buy that book tomorrow.’
- b. *wo shi mingtian yao mai neiben shu*
 I FM tomorrow want buy that book
 ‘It is tomorrow that I want to buy the book.’
- c. *wo mingtian shi yao mai neiben shu*
 I tomorrow FM want buy that book
 ‘I do want to buy that book tomorrow.’

Since a cleft sentence has the universal semantic property of dichotomizing a sentence into focus and presupposition, it is natural to provide a unified representation of this dichotomy in LF. One reasonable assumption is that the focused material is also regarded as a quasi quantifier binding a variable in the presupposition, so that (10a) can be represented as (11):

- (11) $[(\textit{shi wo})_x [\textit{x mingtian yao mai neiben shu}]]$
 FM I tomorrow want buy that book

By convention we may then interpret the operator and the open sentence in (11) as representing its focus and presupposition, respectively.³ Evidently this is not the only possible representation of the meaning of a cleft sentence in Chinese; in particular, it may appear that there is no need to assume a quantifier-variable relationship that is not visible in surface structure. However, such a representation is a reasonable one as a unified formal device to represent all focalizing constructions in this language and across languages.⁴ If we adopt the quantifier-variable representation, it also offers

a convenient way to state a generalization about the following observation. Consider (12):

- (12) Zhangsan shuo [Lisi shi mingtian lai]
 Zhangsan say Lisi FM tomorrow come
 ‘Zhangsan said that it is tomorrow that Lisi will come.’
 or ‘It is tomorrow that Zhangsan said that Lisi will come.’

In this sentence, where the focus *tomorrow* occurs in the embedded clause, two interpretations of the focus can be distinguished. It may indicate the emphasis of the speaker of the entire sentence, or it may indicate the emphasis of the matrix subject. In the former case the embedded clause is part of an indirect speech, while in the latter it may be seen as representing a direct quotation in some sense.⁵ To obtain an intuitively correct representation for each of these two meanings, we may then allow the focus to be moved either to a position c-commanding the entire sentence or to a position c-commanding only the embedded clause.

1.3

With these initial motivations, I will postulate the existence of two LF rules for Chinese, called Move WH and FOCUS.

It should be kept in mind that these are intended to be two instances of the general rule Move α , or the general rule Move WH as the term is used in Chomsky (1977), i.e., movement to operator positions. For easy reference, I will describe them as if they were two rules, using the term Move WH to refer only to cases of actual WH questions. Also, for expository purposes, I shall make the familiar assumption that in either case Move α moves an X phrase into a clause-initial COMP,⁶ an operation that is also involved in the mapping from DS to SS in deriving relativized and topicalized constructions, and furthermore that it may apply successive-cyclically through COMP. Each category to be moved is assumed to contain either the feature [+WH] or [+Focus]. The movement will affect a proper X phrase in accordance with (a proper version of) the A-over-A Condition (cf. Bresnan 1976; May 1977), and will leave a coindexed trace at the extraction site in accordance with the trace theory. The result of such movement will be further converted into more formal representations in the following way. Following Chomsky (1981), a moved focused constituent will be represented as an operator having the form “for x=. . . .” Thus, the focus in (11) is interpreted as the operator “for x=I” (alternatively, the focused phrase can be simply read as “it is I [that. . .],” analogous to cleft sentences in English). A moved *wh*-phrase, on the other hand, will be interpreted as the quantifier “for which x; x. . . .,” where “. . . .” is a predication indicating the domain or extension of the quantifier x from which a value may be drawn to substitute for

the trace, now interpreted as a bound variable, in fixing the truth value of the sentence. Thus, *who* is interpreted as “for which *x*; *x* a person.” More precisely, it will be assumed that the predicate *a person* is in fact a bundle of features containing all features of *who* except [+WH], i.e., [+N, +animate, +human, . . .]. This last assumption will have nontrivial consequences in our account for sentences in which a *wh*-word is clefted, as we shall see in Section 2.3.

2 CLEFT SENTENCES

2.1

We have seen that in a sentence like (12), a focused constituent may occur in a clause embedded as complement to a verb but have scope over the entire matrix sentence. However, not every embedded clause may contain a focused element. Examples (13)–(15) show that the clefted element may not occur within a relative clause or a sentential subject; the morpheme *de*, glossed as DE in (13)–(14), is a relative clause marker:

(13) *[wo xihuan [shi Zhangsan mai de neizhi gou]]
 I like FM Zhangsan buy DE that dog
 ‘*I like the dog that it is Zhangsan that bought.’

(14) *[[Zhangsan shi zuotian mai de neiben shu] hen hao]
 Zhangsan FM yesterday buy DE that book very good
 ‘*The book that it was yesterday that Zhangsan bought is very good.’

(15) *[[Zhangsan shi mingtian lai] mei guanxi]
 Zhangsan FM tomorrow come no matter
 ‘*That it is tomorrow that Zhangsan will come does not matter.’

Since in these sentences the focus cannot be interpreted as indicating the emphasis of a matrix subject (see note 5), it has to be interpreted as indicating the emphasis of the speaker. Although (12) is good with the speaker-emphasis interpretation, (13)–(15) are not. This shows that long-distance clefting is possible from verb phrase complement positions, but not from a syntactic island like a complex NP or a sentential subject. This suggests that cleft sentence formation in Chinese, although it does not involve an overt movement rule, nevertheless has to obey Subjacency. It has been claimed (e.g., Huang 1980) that relativization and topicalization in this language generally obey Subjacency. Since relative and topicalized structures are describable as involving certain overt antecedent-gap relations, it is most natural to consider them as constituting confirming evidence for

What we have witnessed here is that application of FOCUS may be blocked not only by a syntactic island like a complex NP or a sentential subject, etc., but also by what may be called a “Focus Island” formed by a previous application of the same rule. We will now show that FOCUS may also be blocked by a “Wh-Island” formed by a prior application of Move WH. Examples (23) and (24) show that no element may be clefted from within a direct or an indirect question:

(23) *_S [_S shi Zhangsan da-le shei]]?
 FM Zhangsan beat who
 ‘*Who is it Zhangsan that beat?’

(24) *_S [_S ta xiang-zhidao [_S [_S shi Zhangsan da-le shei]]]]
 he wonder FM Zhangsan beat who
 ‘*He wonders who it is Zhangsan that beat.’

In (23), both the focus *Zhangsan* and the *wh*-word *shei* ‘who’ have to be moved into the same COMP. Therefore (23) is excluded for exactly the same reason as (16). In (24), the *wh*-word has to be moved to the lower COMP, as required by the main verb *xiang-zhidao* ‘wonder,’ and the focus must be moved either to the lower or to the higher COMP. But as is the case with (20), neither interpretation of (24) is possible, since derivation of either logical form involves violation of Subjacency or filling a COMP with more than one operator.

Note that if the focus occurs on a matrix constituent and the *wh*-word is contained in an embedded clause, the sentence is fine just in the case where the *wh*-word has scope over only the embedded clause, but bad if it has matrix scope. There is a clear contrast between (25a), which is a declarative containing an indirect question, and (25b), which is a direct question:

- (25) a. shi Lisi xiang-zhidao [shei da-le ta]
 FM Lisi wonder who beat him
 ‘It is Lisi that wonders who beat him.’
- b. *shi Lisi xiangxin [shei da-le ta]
 FM Lisi believe who beat him
 ‘*Who is it Lisi that believes that beat him?’

The contrast is a direct consequence of our theory. The focus in (25a) will be moved in LF to the matrix COMP from the main clause, and the *wh*-word will only be moved into the embedded COMP from the embedded clause (since the main verb “wonder” takes an interrogative complement). No known principle of grammar is violated in the derivation of the logical form of (25a). In (25b), however, the main verb cannot take an interrogative complement, so both the focus and the *wh*-word have to be moved into the higher COMP. Example (25b) is therefore ill-formed, for reasons already

the rule Move α . There is no real rule that has to be called Move WH and not FOCUS, or vice versa; the only real rule is the rule Move α .¹⁰ Thus, we may think of *who* in (29) as a double quantifier, and interpret it formally as “for $x=who$ ” in which *who* is further interpreted as “for which x ; x a person,” i.e., as “for $x=$ for which x ; x a person.” The occurrence of such a double quantifier does not violate the c-command requirement on proper binding. Given the general convention of feature percolation, both the features [+WH] and [+Focus] in such a double quantifier c-command their trace. The situation is different from that of a doubly filled or branching COMP. In the latter situation, none of the features of either constituent in COMP c-commands a trace, since the domain of feature percolation cannot exceed a maximal projection, i.e., it is limited to endocentric constructions.

Now we turn to (28). If the embedded [+Focus] is interpreted as indicating the emphasis of the matrix subject, application of Move α will raise the focused WH word into the lower COMP, where the moved category is then interpreted as a double quantifier, as is the case with (27). However, since [+Focus] need not have only embedded scope (but only [+WH] does, as required by ‘wonder’), it is possible to represent the moved category not as a double quantifier but simply as a WH quantifier, namely:

- (30) ta xiang-zhidao [_S [_{COMP} [for which x ; x a [_i [+Focus
etc.]]] [_S x da-le ta]]
he wonder beat him

That is, the feature [+Focus] is represented not as a quantifier, but as part of the predication indicating the extension of the WH quantifier. Note that the feature [+Focus] is now outside of the lower S. This enables FOCUS to apply to move the feature matrix containing [+Focus, etc.] to the higher COMP, deriving a proper representation for the interpretation of the focus as the speaker’s emphasis, without violating Subjacency:

- (31) [_S [For $y=$ a person [_S ta xiang-zhidao [_S [for which x ; x a y]
he wonder
[_S x da-le ta]]
beat him

We thus correctly predict that (28) is well-formed with the focus indicating either the emphasis of the speaker or that of the matrix subject.

3 WH QUESTIONS

3.1

We have seen that (a) FOCUS is subject to a full range of island conditions, and (b) both Move WH and FOCUS have the effect of forming an island. It

is natural to ask if Move WH is also subject to the same island conditions. Investigation of relevant sentences in the language suggests that, in many cases, the answer seems to be yes.

- (32) *_S[_{NP}[_S, tou-le shenme de] neige ren] bei dai-le]?
 stole what DE that person by caught
 ‘*The man that stole what was caught?’
- (33) *_S[_{NP}[_S, ni weishenme mei mai de] neiben shu] hen hao]?
 you why not buy DE that book very good
 ‘*The book that you did not buy why is very good?’
- (34) *_S[_S, Zhangsan tao-le shei] zhen kexi]?
 Zhangsan marry who real pity
 ‘*That Zhangsan married whom is a real pity?’
- (35) *_S[_S, Zhangsan tao-le shei], ni zhidao-le]?
 Zhangsan marry who you know
 ‘*That Zhangsan married whom, you know?’

In these sentences, a direct question is being asked to obtain the hearer’s answer to specify the value of a WH word that occurs in a relative clause (32)–(33), a sentential subject (34), or a sentential topic (35). As indicated, these sentences are bad. On the other hand, recall that a direct question with a WH word in a sentential object complement embedded arbitrarily deep in the tree is perfectly well-formed, as shown by sentences (5) and (6). These facts seem to suggest quite strongly that, like the rule FOCUS, Move WH in Chinese should be assumed to obey Subjacency. It turns out, however, that these facts only represent a part of the whole picture. For one thing, there are a number of counterexamples to the claim that Move WH obeys the CNPC sub-case of Subjacency:

- (36) [_S [_{NP} [_S, shei yao mai de] shu] zui gui]?
 who want buy DE book most expensive
 ‘*Books that who wants to buy are most expensive?’
- (37) [_S ni xiang kan [_{NP} [_S, ta shenmeshihou pai de] dianying]]]?
 you want see he when film DE movie
 ‘*You want to see movies that he filmed when?’

S.H. Teng (personal communication) also gives the following example:

- (38) [_S ni xihuan [_{NP} [_S, wo piping shei de] wenzhang]]]?
 You like I criticize who DE article
 ‘*You like articles in which I criticize who?’

In (36) the speaker is, in effect, asking which book, in terms of the identity of the person who is buying it, is the most expensive. In (37), the speaker asks which movie you want to see, in terms of the time when the movie was filmed. Similarly, (38) may be paraphrased as: “In terms of the person I criticize, tell me which articles [of mine] you like.” Each of these questions can be asked, if the context of situation so allows, and an answer can be given where the *wh*-word is given a value.

Since structurally there is no doubt that, in (36)–(38), the *wh*-word appears within a complex NP, the hypothesis that Subjacency is the principle ruling out (32)–(35) must be considered inadequate if we do not have any independent explanation for the grammaticality of (36)–(38).

A comparison of (32)–(33) with (36)–(38), where a complex NP contains a *wh*-word in each case, reveals one important difference: in the ungrammatical (32)–(33), the head noun of the complex NP is preceded by a demonstrative, while in the grammatical (36)–(38), there is no demonstrative occurring with the head. This difference suggests that the semantic notion of specificity is relevant. In the Appendix, I will show that the ungrammatical (32)–(33) should be ruled out by an independently motivated principle along the lines of the Specificity Condition proposed in Fiengo and Higginbotham (1981). The principle prohibits a quantifier contained within a specific NP from having a scope larger than that NP, i.e., specific NPs cannot contain free variables. Examples (32)–(33) are out, since in each of them the complex NP containing a *wh*-word is specific due to the presence of a demonstrative. The grammaticality of (36)–(38), on the other hand, can be accounted for if we make the stipulation that the *wh*-words in question are “wide-scope” quantifiers that need not obey Subjacency.¹¹ This has the further consequence that although *wh*-islands may block FOCUS, they do not block Move WH, a prediction supported by the fact that (39) may be answered by either (40) or (41):

(39) [ni xiang-zhidao [shei mai-le shenme]]?
 you wonder who bought what

(40) [wo xiang-zhidao [Lisi mai-le shenme]]
 I wonder Lisi bought what
 ‘I wonder what Lisi bought.’

(41) [wo xiang-zhidao [shei mai-le shu]]
 I wonder who bought book
 ‘I wonder who bought books.’

Example (40) answers (39) by replacing the embedded *wh*-subject with *Lisi* and leaves the other *wh*-word unanswered. Example (41) answers (39) by fixing the value of the embedded *wh*-object but not the *wh*-subject. (If the question is uttered with emphatic stress on *shei* ‘who’ then [40] comes as a more natural answer. If *shenme* ‘what’ is stressed, then [41] comes more

readily.) It is general practice to regard the meaning of a question as one that defines the range of acceptable answers to it. Since (40) and (41) are acceptable answers to (39), this means (39) can be a direct question containing an indirect question, with either *wh*-word having matrix scope and the other having embedded scope. The logical forms of (39) corresponding to the answers (40) and (41) are (42) and (43), respectively:

(42) [_S, shei_x [_S ni xiang-zhidao [_S, shenme_y [_S x mai-le y]]]]
 who you wonder what bought

(43) [_S, shenme_y [_S ni xiang-zhidao [_S, shei_x [_S x mai-le y]]]]
 what you wonder who bought

It is obvious that in (42) the relationship between *who*_x and its variable *x*, and in (43) the relationship between *what*_y and its variable *y*, violates Subjacency. A related fact is that Move WH may also violate the ban on movement into a COMP already filled. This is shown by the well-formedness of multiple questions like (44) and (45), where the number of occurring *wh*-words exceeds that of available COMP positions:

(44) shei mai-le shenme?
 who bought what
 ‘For which *x*, for which *y*, *x* bought *y*.’

(45) shei xiang-zhidao [shei mai-le shenme]?
 who wonder who bought what
 a. ‘For which *x*, for which *y*, *x* wonders who bought *y*?’
 b. ‘For which *x*, for which *y*, *x* wonders what *y* bought?’
 c. ‘For which *x*, *x* wonders [for which *y*, for which *z*, *y* bought *z*]?’

In (44), there is only one COMP but two *wh*-words, so both must be moved into it. In (45) there are two COMPs, one for the matrix and one for the embedded clause, but three *wh*-words, one occurring in the matrix and two in the complement. Either one of the embedded *wh*-words may be moved to the embedded COMP with the other moved to the matrix COMP, where it occurs as a sister to the matrix *wh*-word. Or both embedded *wh*-words may be moved into the embedded COMP. All the three meanings indicated in the translation are possible if the context of situation is appropriate, and in each case there is one COMP containing two *wh*-words.

Note that the result of allowing two *wh*-words to occur within one COMP will be an ill-formed output representation given the general requirement of *c*-command on proper binding. It is possible, however, to claim that while the *wh*-words may violate the ban on movement into a filled COMP, the result of such movement need not always violate the

c-command requirement of binding at the level of LF if we adopt the LF rule of Absorption as proposed and defended in Higginbotham and May (1981). The effect of this rule is to convert a series of *n* quantifiers into an *n*-ary quantifier:

$$(46) [\text{WH}_{x_1}, \text{WH}_{x_2}, \dots, \text{WH}_{x_n}] \rightarrow [\text{WH}_{x_{(1,2,\dots,n)}}]$$

A natural interpretation of this process is that it absorbs the individual feature matrices of all *wh*-words in the input into one super matrix. If so, then given the general convention of feature percolation, each of the absorbed quantifiers does c-command its variable.

3.2

We have suggested that in order to account for the grammaticality of sentences like (36)–(39) and (44)–(45), the kind of *wh*-words appearing in the examples may be stipulated to be capable of taking wide scope in Chinese without regard to island conditions. It is likely that this is a universal property of such *wh*-words in LF: as far as their movement does not take place in Syntax, they need not obey island conditions, a generalization noted for English by Baker (1970) and shown to be crosslinguistically significant by Hankamer (1975). Thus, in contrast to the two representations (42)–(43), the corresponding English sentences (47)–(48) are bad, since each *wh*-word in them has been moved in Syntax in violation of Subadjacency.¹²

(47) *What did you wonder who bought?

(48) *Who did you wonder what bought?

On the other hand, like their Chinese counterparts, (49)–(50) are good with *what* syntactically unmoved:

(49) Who bought what?

(50) Who wonders where we bought what?

The only exception is that, unlike the three-way ambiguous (45), (50) is only two-way ambiguous in being answerable by (51a) or (Sib), but not by (52):¹³

- (51) a. John does. John wonders where we bought what.
 b. John wonders where we bought the book, and Mary wonders where we bought the pencil.

(52) John wonders what we bought at the store, and Mary wonders what we bought at the train station.

If the generalization holds true that syntactically unmoved *wh*-words may violate island conditions, therefore, the wide-scope property of such *wh*-words in Chinese may be a consequence of UG and need not be learned.

Note, however, that not all *wh*-words in Chinese are exempt from islands. At least two *wh*-words, *weishenme* ‘why’ and *zenme* ‘how,’ are not exempt from the *Wh*-Island Constraint. Compare (39) with (53) and (54). All of these sentences can be interpreted as direct questions requesting information on one of the two *wh*-words in the embedded clause, but while (39) is ambiguous in being a direct question on either *wh*-word, (53)–(54) are not, since they can only be interpreted as direct questions on *who* but not on *why* or *how*:

- (53) ni xiang-zhidao [shei weishenme da-le Zhangsan]?
 you wonder who why beat Zhangsan
 ‘For which person x, you wonder why x beat Zhangsan?’
 (Not: For which reason x, you wonder who beat Zhangsan for x.)
- (54) ni xiang-zhidao [shei zenme pian-le Zhangsan]?
 you wonder who how cheated Zhangsan
 ‘For which person x, you wonder how x cheated Zhangsan?’
 (Not: For which way x, you wonder who cheated Zhangsan in x.)

The contrast between “wide scope” and “narrow scope” *wh*-words in Chinese is paralleled in English by a similar contrast. For some speakers the (a) sentences that follow are marginally acceptable, but the (b) sentences are entirely ill-formed with the interpretation indicated. For most speakers, there is at least a difference in the degree of ill-formedness:¹⁴

- (55) a. ?*What_i did you wonder [why_j I bought t_i t_j]?
 b. *Why_j did you wonder [what_i I bought t_i t_j]?
- (56) a. ?*What_i did you wonder [when_j I bought t_i t_j]?
 b. *When_j did you wonder [what_i I bought t_i t_j]?
- (57) a. ?*Who_i did you wonder [where_j I met t_i t_j]?
 b. *Where_j did you wonder [who_i I met t_i t_j]?
- (58) a. ?*Who_i did you wonder [how_j I pleased t_i t_j]?
 b. *How_j did you wonder [who_i I pleased t_i t_j]?

The (b) sentences are acceptable only if *why*, *where*, *when*, *how* are respectively interpreted as associated with the matrix, not the embedded clause.

A natural question that arises at this point is what principle determines which *wh*-operators may violate Subjacency and which *wh*-operators may not. Although it is beyond the scope of this chapter to give a full answer to this question, it will be worthwhile to consider a possible solution. It seems

that what makes the difference is whether an operator is “objectual,” i.e., of the category NP, or not. Thus, *wh*-words like *what* and *who* may violate Subjacency quite freely in LF because they are NPs, while those like *why* and *how* may not because they are either PPs or APs, not NPs. That this probably holds true universally in LF is evidenced on the one hand by the facts we see in (53)–(54) in Chinese and, on the other, by the contrast between (59)–(60) and (61)–(62) following in English. In (59)–(60) the objectual *what* may be construed as having matrix scope, violating Subjacency, but in (61)–(62) the non-objectual *why* and *how* cannot.

(59) Who remembers why we bought what?

(60) Who remembers how we bought what?

(61) *Who remembers what we bought why?

(62) *Who remembers what we bought how?

It appears, then, that the distinction between certain kinds of quantifiers is quite universal, and whatever facts follow from this distinction should follow from some principle of UG, not from any language-particular principle. When Move WH should obey Subjacency in LF, therefore, need not be learned.

If the distinction made here represents a correct generalization, it may also be extended to explain why FOCUS has to obey Subjacency while certain *wh*-words need not. As the focus marker takes the form of the copula *shi*, it is plausible to assume that the focus operator “for x=NP” is interpreted as the predicate “it is NP (that . . .),” analogous to English cleft sentences. A focus operator is therefore a non-objectual operator and, as such, it must obey Subjacency. The same explanation may also be extended to the A-not-A questions discussed in the next section. As will be clear, the operators that we propose for such questions are non-objectual, and this corresponds to the fact that interpretation of such questions is subject to Subjacency.

Whether or not this explanation is correct, it suffices, for our present purposes, to note that Move WH, as an instance of Move α , does show the property that at least in some cases it has to obey island conditions. This also constitutes support for our postulation for the existence of abstract movement rules in LF.¹⁵

4 A-NOT-A QUESTIONS

4.1

We have shown in Section 3 that while some *wh*-operators like *who*, *what* may act as wide-scope operators in LF, others, like *why* and *how*, cannot. In

this section, we will look at another type of question that demonstrates the existence of another operator of the latter type. This operator is similar to *whether* in English in many ways and occurs in what are usually called the A-not-A questions. The simplest type of A-not-A questions can be described as one in which the first syllable of a predicate is immediately followed by *bu* ‘not’ and an identical copy of the same syllable, which together with the original forms a coordinate element having the form [A, not A]. Thus, corresponding to the statement (63), we have the A-not-A question (64), where the A-not-A element is [xi-bu-xi]:

(63) ta xihuan ni
 he like you
 ‘He likes you.’

(64) ta xi-bu-xi -huan ni?
 he li-not-li -ke you
 ‘Does he or doesn’t he like you?’

An A-not-A question may be a direct question as shown by (64), or it may be indirect:

(65) [_S wo xiang-zhidao [_S, ta xi-bu-xi -huan ni]]
 I wonder he li-not-li -ke you
 ‘I wonder whether he likes you or not.’

If a clause containing the A-not-A element is embedded under a matrix verb like *renwei* ‘think,’ which does not take interrogative complements, then the entire matrix sentence must be interpreted as a direct question:

(66) [_S ni renwei [_S, ta xi-bu-xi -huan ni]]?
 you think he li-not-li -ke you
 ‘In your opinion, does he or doesn’t he like you?’
 (i.e. Do you think he likes you or do you think he doesn’t?)

And if the matrix verb is *zhidao* ‘know,’ then the sentence is ambiguous between a direct and an indirect question reading:

(67) [_S ni zhidao [_S, ta xi-bu-xi -huan ni]]
 you know he li-not-li -ke you
 a. ‘You know whether he likes you or not.’
 b. ‘As far as you know, does he or doesn’t he like you?’

4.2.

Before we discuss its relevance to the theory of bounding, a brief discussion on how an A-not-A question might be generated and interpreted is in order.

A popular analysis of a question of this type is to regard it as a special type of alternative or disjunctive questions (see, e.g., Wang 1967 among others). Thus, the sentence (64) is analyzed as part of the following paradigm:

- (68) [_S [_S ta xihuan ni] (haishi) [_S ta bu xihuan ni]]?
 he like you or he not like you
 ‘Does he like you or doesn’t he like you?’
- (69) [_S ta [_{VP} [_{VP} xihuan ni] (haishi) [_{VP} bu xihuan ni]]]?
 he like you or not like you
 ‘Does he like you or doesn’t [he] like you?’
- (70) [_S ta [_{VP} [_V [_V xihuan] (haishi) [_V bu xihuan]] ni]]?
 he like or not like you
 ‘Does he like [you] or doesn’t [he] like you?’
- (71) [_S ta [_{VP} [_V [_i [_i xi-] [_i bu xi-]] -huan] ni]]?
 he li- not li- -ke you
 ‘Does he or doesn’t [he] like you?’

That is, (64) (=71) is regarded as one of the several possible reduced forms (69)–(71) of the full disjunctive question (68). Traditionally, the reduced forms are derived via the rule of Conjunction Reduction of Ross (1967). Example (69) can be obtained by applying Conjunction Reduction once to (68). Examples (70) and (71) are the result of iterative application of the same rule to (69) and (70), respectively.

In the framework of grammar that we are assuming, there are several possibilities to achieve the same effects of Conjunction Reduction as a syntactic rule. A possibility is to assume that the same rule exists, but in the Phonological Component of grammar. In this view, the S-structure inputs to LF of (68)–(71) will be identical, i.e., the unreduced (68). Another possibility is to base-generate the empty elements in the “deletion” sites, and invoke some interpretive process of indexing that has the same effects of Conjunction Reduction. Still another possibility is to generate only the phonetically full elements, i.e., all of (68)–(71), as they are on the surface, and have an LF analogue of Conjunction Reduction. Such an analogue may take the form of a copying rule, for example.

I would like to suggest that one good way to relate (68)–(71) is to assume that they involve an instance of Move α in LF. Suppose the SS representations of (68)–(71) are as they are on the surface.¹⁶ In LF, assume that Move α raises the coordinate A-not-A element into COMP. The moved category will then be represented as a question quantifier with its extension ranging over the two members [A] and [not A], binding its trace.¹⁷

- (72) [_S [_{COMP} For which x; x a [[A], [not A]]] [_S . . . x . . .]]

The result of applying Move A-not-A to (68)–(71) will yield distinct representations at the linguistic level of LF:

(73) [_S, For which x; x [_S [_S ta xihuan ni], [_S ta bu xihuan ni]] [_S x]]
 he like you he not like you

(74) [_S, For which x; x [_{VP} [_{VP} xihuan ni], [_{VP} bu xihuan ni]] [_S ta x]]
 like you not like you he

(75) [_S, For which x; x [_v [_v xihuan], [_v bu xihuan]] [_S ta x ni]]
 like not like he you

(76) [_S, For which x; x [_i [_i xi-], [_i bu xi-]] [_S ta x -huan ni]]
 li not li- he -ke you

However, all of these forms represent the same truth values, and therefore capture the native intuition that (68)–(71) are synonymous. This is because the meaning of a question is usually regarded as the full range of possible answers to it. Thus, the logical form of the sentence “who killed Bill?”:

(77) [_S, For which x; x a [+human, etc.] [_S x killed Bill]]

conveys the truth value of the sentence, as the set of possible answers to the question “who killed Bill?” comprises all and only the set of sentences obtained by substituting for x in (77) a value that is within the extension defined by the quantifier (i.e., any [+human, etc.]). Likewise, the truth value of (73) is the set of two possible answers obtainable by substituting either choice in the quantifier for the variable in the open clause. It is easy to see that this process of instantiation will result in exactly the same set of two sentences as the truth values of (74)–(76).

If the proposal made here is a reasonable way to relate (68)–(71) as synonymous, then we may eliminate the need for the rule of Conjunction Reduction in Syntax or PF, or its LF analogue in the form of a copying or coindexing rule.

An argument in support of our analysis is that, even if one adopts the Conjunction Reduction type of analysis (or any of its analogues), the grammar must still tell us how the native speaker will invariably interpret (65) as a statement containing an indirect A-not-A question, (66) as a direct A-not-A question, and (67) as either. In the spirit of our analysis of *wh*-questions and clefts, it is natural to look at the facts shown by (65)–(67) as involving difference in scope of the A-not-A element. While it is possible to provide a device within the analysis embodying Conjunction Reduction or any of its analogues for displaying the scope differences, such required scope representations are readily available once the Move A-not-A analysis is adopted. Thus, due to the different subcategorization features of their

verbs, (65)–(67) have the intuitively correct representations in which the A-not-A operator has scope over the embedded clause, the matrix clause, or either.

Another argument comes from the fact that interpretation of A-not-A questions must obey Subjacency, as I will show immediately. This fact is an automatic consequence of the assumption that the interpretation procedure involves Move α , but not of the Conjunction Reduction type of analysis, since ordinary deletion rules generally have nothing to do with Subjacency.

4.3

Now I will show that Move A-not-A must obey Subjacency. First of all, insofar as the sentence (78) is grammatical, it can only be answered by (79), not by (80):

(78) [ni xiang-zhidao [shei xi-bu-xihuan ta]]?
 you wonder who like-not-like him

(79) [wo xiang-zhidao [Lisi xi-bu-xihuan ta]]
 I wonder Lisi like-not-like him
 ‘I wonder whether Lisi likes him or not.’

(80) [wo xiang-zhidao [shei xihuan ta]]
 I wonder who like him
 ‘I wonder who likes him.’

In (78), the embedded clause contains a *wh*- and an A-not-A operator. Since *xiang-zhidao* ‘wonder’ is a verb requiring interrogative complements, it is necessary to interpret one of the two question operators as having embedded scope. But it is possible to interpret the other operator as having matrix scope, i.e., interpret (78) as a direct question. The grammaticality of (79) as an answer, which specifies a value for *shei* ‘who’ shows that (78) can be a direct question on *who*. On the other hand, the ungrammaticality of (80) as an answer, which specifies a value from the two choices *xi*- and *bu xi*-, shows that (78) cannot be interpreted as a direct A-not-A question. The logical form of (78) having (79) as an answer has *who* occurring in the matrix COMP and the A-not-A operator occurring in the embedded COMP. This is okay since, as we have seen in the previous section, *wh*-words like *who* and *what* should be allowed to violate Subjacency. The island formed by A-not-A may therefore be crossed by *who*. On the other hand, the logical form of (78) having (80) as an answer, with A-not-A in the matrix COMP and *who* in the embedded COMP, must be considered ill-formed due to the fact that (80) is not an appropriate answer. If we assume that Move A-not-A

must obey Subjacency, this prediction will follow. For Subjacency will prevent Move A-not-A from crossing an island formed by the application of Move WH in the embedded clause.

This assumption makes the further correct prediction that a direct A-not-A question cannot be formed by embedding the A-not-A element within a relative clause, a sentential subject, or a sentential topic:

- (81) *_S [_{NP} [_S ni mai-bu-mai de] shu] bijiao gui?
 you buy-not-buy DE book more expensive
 ‘*The book that you will buy or will not buy is more expensive?’
- (82) *_S [_S Zhangsan nian-bu-nian shuxue] bijiao hao?
 Zhangsan study-not-study math more good
 ‘*That Zhangsan studies math or doesn’t study math is better?’
- (83) *_S [_S Zhangsan tao-bu-tao Li Xiaojie], ni bijiao zancheng?
 Zhangsan marry-not-marry Miss Li you more agree
 ‘*That Zhangsan should or shouldn’t marry Miss Li, you agree more?’

Note incidentally the sentence (78) cannot be interpreted as a declarative containing an indirect question, although the main verb *xiang-zhidao* ‘wonder’ takes interrogative complements. This means that the embedded COMP cannot take both *who* and A-not-A. The same fact is shown in (84)–(86), although the relevant COMP is the matrix one:

- (84) *shei lai-bu-lai?
 who come-not-come
 ‘*Will who come (or not)?’
- (85) *ni xiangxin [shei lai-bu-lai]?
 you believe who come-not-come
 ‘*Who do you believe will come or not?’
- (86) *shei xiangxin [Zhangsan lai-bu-lai]?
 who believe Zhangsan come-not-come
 ‘*Who believes Zhangsan will come or not?’

Since, as we have seen, *wh*-words like *who* and *what* need not obey the ban on movement into a filled COMP, the ill-formedness of (84)–(86), as well as that of the indirect question reading of (78), cannot be accounted for by this restriction on movement. It will not do to require just that Move A-not-A operate only into an unfilled COMP, since although the unwanted LF representations can be blocked by such a restriction if Move WH applies before Move A-not-A, they are still derivable if Move A-not-A applies before Move WH.

A more plausible explanation is to say that the ill-formedness of these sentences is due to the reason that, although *who* and A-not-A may be moved into the same COMP, they may not undergo Higginbotham and May's (1981) rule of Absorption. The failure of application of Absorption will leave *who* and A-not-A as two constituents of a branching COMP, neither of which c-commands or properly binds its variable. This conjecture seems at least intuitively correct. It seems that only objectual quantifiers, in particular those capable of having an indefinite membership in their extension, may undergo absorption. Thus, *who*, *what*, *which man*, *what year*, etc., may be absorbed, but *whether*, "For x=John," etc., may not.¹⁸

Note further that Move A-not-A also forms islands. This effect was not seen in (78) with the meaning appropriate for (79) as an answer, because *shei* 'who' does not obey Subjacency anyway. However, its effect is obvious when we consider other operators that do obey Subjacency:

- (87) *ni xiang-zhidao [ta weishenme lai-bu-lai]?
 you wonder he why come-not-come
- (88) *ni xiang-zhidao [ta shi mingtian lai-bu-lai]
 you wonder he FM tomorrow come-not-come
- (89) *ni xiang-zhidao [ta ren-bu-renwei [Lisi lai-bu-lai]]?
 you wonder he think-not-think come-not-come

In these sentences, the operator *lai-bu-lai* 'come-not-come' may be moved to the COMP immediately below the verb *xiang-zhidao* 'wonder' to satisfy its subcategorization requirement. Suppose that Move A-not-A did not have the effect of forming an island, then it would be possible to move the operator *weishenme* 'why' of (87), "for x=tomorrow" of (88), and *ren-bu-renwei* 'think-not-think' of (89) to the matrix COMP. In other words, it would be possible to interpret (87) and (89) as direct questions on *why* and *think-not-think* respectively, and (88) as a sentence containing a focus indicating the speaker's emphasis. The fact that none of these sentences have the interpretation in question (in fact, they have no interpretation at all) indicates that Move A-not-A does form islands.

5 APPARENT EXCEPTIONS AND CONCEPTIONS OF BOUNDING CONDITIONS

5.1

The preceding discussion has shown that FOCUS, Move WH, and Move A-not-A have both the property of forming an island and that of obeying island conditions, with the exception of some *wh*-words that may disregard

islands. There is, however, a systematic class of counterexamples to our claim about their island-forming effect when we look for evidence of their island effect on the syntactic instances of Move α , topicalization, and relativization. First of all, note that the following sentences are perfectly grammatical:

- (90) neizhi gou, shi Zhangsan xiang wo mai-de.¹⁹
 that dog FM from me bought
 ‘That dog, it was Zhangsan that bought [it] from me.’
- (91) neizhi gou, Zhangsan shi xiang wo mai-de.
 that dog FM from me bought
 ‘That dog, it was from me that Zhangsan bought [it].’

The semantics of a topic-comment sentence like (90)–(91) is such that given a topic, the speaker makes a comment about it. In making the comment the speaker also puts emphasis on one of the constituents. That is, (91) can be represented at LF as (92) with the focus operator in the COMP of the comment clause and the topic outside the scope of the focus:²⁰

- (92) [_S [_{TOP} neizhi gou]_i [_S For $x=xiang\ wo$ [_S Zhangsan $x\ mai\ t_i$]]]
 that dog from me Zhangsan buy
 The English counterparts of (90) and (91) are ungrammatical:

- (93) *That dog_i, it was John_j that t_j bought t_i from me.
 (94) *That dog_i, it was [from me]_j that John bought $t_i\ t_j$.

If we assume, following Chomsky (1977), that both topicalization and clefting in English involve movement of an NP into COMP followed by subsequent deletion of the moved category in PF (obligatory for topicalization and optional for some cases of clefting), then the LF representation of (94) is (95):

- (95) [_S That dog_i, [_S [_{COMP} that dog_i]] [_S it was from me_j [_{COMP} t_i from me_j]]
 [_S John bought $t_i\ t_j$]]]]]

In this structure, the COMP in the embedded S is doubly filled. Therefore, neither t_i nor *from me_j* in the COMP c-commands its respective trace. The ill-formedness of (94) may be expected, therefore, since an ill-formed LF representation is derived from it. The problem is not why the English (94) is bad, however, but rather why the Chinese sentence (91) is good. Under the same analyses of topicalization just mentioned, the actual LF representation of (91) should also contain a doubly filled COMP directly under the S' in (92), with the moved *that dog* yet to

be deleted in PF and the operator “for x=from me.” The same problem remains even if the derivation does not involve a doubly filled COMP. Suppose that the movement involved in moving the topicalized NP from the embedded object position does not move it through the embedded COMP, so that in (95) the lower COMP contains only one element, the clefted PP *from me*. In this case, every variable is properly c-commanded by a quantifier. However, the trace t_i will be separated from its quantifier *that dog_i* by two S nodes at LF, violating Subjacency. Therefore, (94) and (93) are also ruled out. The problem is still why sentences like the following in Chinese are well-formed with the focus contained in the embedded clause interpreted as either the speaker’s emphasis or that of the matrix subjects’:

- (96) [_S neizhi gou_i [_S [_S ta shuo [_S [_S Zhangsan shi xiang wo mai t_i de]]]]
 that dog he said Zhangsan FM from me buy DE
 ‘That dog, it was from me that he said that Zhangsan bought [it].’
 or ‘That dog, he said that it was from me that Zhangsan bought [it].’

Consider only the interpretation with the focus having embedded scope. The logical form for such an interpretation will have the topicalized object NP moved to the higher COMP c-commanding t_i in (96), and the focus moved to the lower COMP. Suppose that the topicalized object has not moved successive-cyclically through the lower COMP, then at LF the lower COMP is not doubly filled. The representation is still ill-formed, however, since the topicalized NP in the higher COMP is separated from its trace by two S nodes. We thus need an explanation as to why the Chinese sentence is good while an English sentence with the same configuration is bad.

I would like to suggest that the problem we are facing bears upon what a proper conception of the bounding theory should be and may be solved once a proper conception of the theory is adopted. In Sections 2–4, we have assumed that the theory of bounding may be construed either as a set of well-formedness conditions applied at LF or as a set of constraints on the rule Move α , i.e., either as (97) or as (98).²¹

- (97) As conditions on representation:
 a. Subjacency applies at LF
 b. Doubly-filled COMPs ruled out at LF by the c-command requirement on proper binding
 c. Movement applies freely
- (98) As conditions on movement:
 a. Movement obeys Subjacency
 b. No movement into a COMP already filled
 c. Movement obeys the Strict Cycle

Both hypotheses (97) and (98) assume that movement may or may not leave a trace in an intermediate COMP.²² Thus, given the ungrammatical sentence:

(99) *What did you wonder who bought?

Theory (97) rules it out by Subjacency (97a) if movement of *what* does not leave a trace in the lower COMP, and by the c-command requirement (97b) if it does leave a trace in that COMP:

(100) [_S what_j [_S did you wonder [_S who_i [_S t_i bought t_j]]]]

(101) [_S what_j [_S did you wonder [_S [t_j who_i] [_S t_i bought t_j]]]]

On the other hand, theory (98) prevents the derivation of (99) in the following way. If *who* moves to the embedded COMP before *what* moves to the matrix COMP, the latter movement is blocked by Subjacency (98a) if it does not take place successive-cyclically, and by the doubly filled COMP constraint (98b) if it does. On the other hand, *what* cannot move successive-cyclically to the matrix COMP before *who* moves to the embedded COMP, since such a derivation violates the Strict Cycle (98c), whether or not *what* has left a trace in the lower COMP. If a trace is left in the lower COMP, (98b) will also prevent *who* from being moved into it, but if no intermediate trace is left, the Strict Cycle is independently needed to block it.

It should be pointed out that a tacit assumption of any theory embodying the Strict Cycle principle is that the principle is interpreted as imposing ordering requirements only on rules belonging to or applied in the same component of grammar. That is, rules of the PF or LF component may apply within the domain of a cycle already past in Syntax, as far as they are ordered strict cyclically within their own component. This is clearly the case with cyclic rules in phonology, and must be with interpretive rules in LF, as we shall see.

The two conceptions of the bounding theory just described are vastly different both conceptually and empirically. Theory (97) predicts that representations of the same relevant configurations are either all bad or all good, while theory (98) allows two identical output representations to have different grammatical status. In theory (98), one of two identical representations may involve an illegitimate history of derivation (and is thus unavailable at the output level), while the other may not. It is clear that theory (97) cannot be the proper conception of the bounding theory that both excludes the ill-formed English sentences (93)–(94) and allows the well-formed Chinese sentences (90)–(91) and (96), since their LF representations are identical in all relevant respects. It remains to see if theory (98) can be the proper conception. I will show now that once the bounding theory is properly construed as (98), it is possible to account for the observed contrasts.

In order to allow for the well-formed sentences in Chinese under (98), we will make the assumption that deletion of the moved category in COMP, a process involved in topicalization, takes place at SS, rather than in PF. This has the effect that an island formed due to the presence of the moved category in COMP will cease to be an island after the category is deleted. Thus, take the sentence (91), for example. In Syntax, topicalization takes place and moves the object NP (*that dog*) into the COMP in S. An island is now formed due to the presence of the moved category in COMP, but after the category is deleted at SS, it ceases to be an island. In LF, therefore, FOCUS may apply and move the focus *from me* into the previously filled, but now vacated, COMP, deriving (92). Since no known principle of grammar is violated, (91) is well-formed. Similarly in deriving (96), movement of *that dog* from the embedded object position under topicalization in Syntax may apply successive-cyclically into the COMP of the higher S. Since the moved category in this position will be deleted at SS, and since topicalization need not have left an intermediate trace in the lower COMP, both COMP positions may be vacant when derivation enters the LF component. This allows FOCUS to apply, which moves *from me* into the higher COMP, again violating no known principle of grammar. Example (96) is therefore predicted to be well-formed.

Note that the assumption we make also allows us to exclude the English sentences (93) and (94) as ill-formed. Since both clefting and topicalization take place in Syntax, and the deletion of the topicalized NP in COMP takes place at SS after both clefting and topicalization, an island formed by application of either of the rules will always have the effect of blocking application of the other. As indicated in (95), the clefted PP *from me* has to be moved to the lower COMP, and the topicalized embedded object NP *that dog* moved to the higher COMP. By the Strict Cycle, *from me* is moved first. But this immediately forms an island to block movement of the topicalized embedded object. The latter cannot be moved to the higher COMP without violating (98a) or (98b).²³

We see, therefore, that an otherwise puzzling difference between English and Chinese falls out as a consequence of a single parameter of whether a focus is moved in Syntax or in LF. Since clefting applies before topicalization in English, the island formed by the former has the effect of blocking application of the latter. But in Chinese, no island is formed before topicalization applies in Syntax, and when FOCUS applies in LF it need not cross any island to derive a representation like (92). Note that while clefting precedes topicalization in English as required by the Strict Cycle, the order is reversed in Chinese, not as a result of any stipulation, but as a consequence of the organization of our grammar, where Syntax feeds into LF.

5.2

The proposal we have made to solve the apparent problem just noted is supported independently by similar contrasts observed between English

and Chinese in topicalized sentences containing questions. As mentioned earlier, a topic-comment sentence represents a situation where given a topic, the speaker makes a comment about it. Semantically, there is no reason why, instead of making a comment, the speaker cannot ask a question about the topic, or make a comment containing an indirect question about the topic. That this is at least semantically possible is shown by the following sentences, in both English and Chinese, in which a resumptive pronoun is retained and interpreted as referring to the topic:

(102) That boy, do you know him?

(103) That boy, who knows him?

(104) That boy, I wonder whether you know him or not.

(105) That boy, I wonder who knows him.

(106) neige nanhaizi, ni ren-bu-renshi ta?
that boy you know-not-know him
'That boy, do you know him?'

(107) neige nanhaizi, shei renshi ta?
that boy who knows him
'That boy, who knows him?'

(108) neige nanhaizi, wo xiang-zhidao [ni ren-bu-renshi ta]
that boy I wonder you know-not-know him
'That boy, I wonder whether you know him or not.'

(109) neige nanhaizi, wo xiang-zhidao [shei renshi ta]
that boy I wonder who know him
'That boy, I wonder who knows him.'

An interesting contrast appears, however, when the resumptive pronoun is dropped. While the English sentences are bad, the Chinese ones are completely fine:

(110) *That boy, do you know?

(111) *That boy, who knows?

(112) ?*That boy, I wonder whether you know or not.

(113) ?*That boy, I wonder who knows.

- (114) neige nanhaizi, ni ren-bu-renshi?
 that boy you know-not-know
 ‘That boy, do you know [him]?’
- (115) neige nanhaizi, shei renshi?
 that boy who know
 ‘That boy, who knows [him]?’
- (116) neige nanhaizi, wo xiang-zhidao [ni ren-bu-renshi].
 that boy I wonder you know-not-know
 ‘That boy, I wonder whether you know [him] or not.’
- (117) neige nanhaizi, wo xiang-zhidao [shei renshi].
 that boy I wonder who know
 ‘That boy, I wonder who knows [him].’

Under the conception of the bounding theory as a set of conditions on output representations, there is no reason why (110)–(113) should differ from (114)–(117). It is possible to rule out (110)–(113) under this theory, but the problem is how to allow the well-formed (114)–(117). Thus, suppose that topicalization moves an NP into COMP but that the moved category is deleted in PF, not at SS. Suppose further that the SS and LF representation of a direct yes/no question in English contains the element *whether* in the matrix COMP. Then, (110) and (111) are represented at LF each with a COMP doubly filled, violating (97b):

- (118) That boy [_S [that boy_i, whether][_S do you know t_i]]
- (119) That boy [_S [that boy_i, who_j] [_S t_j knows t_i]]

Similarly, the LF representations of (112)–(113) either contain a doubly filled COMP or violate Subjacency (97a), depending upon whether or not the topicalized object NP has moved successive-cyclically and left a trace in the lower COMP:

- (120) That boy, [_S that boy_i [_S I wonder [_S [t_j, whether][_S you know t_i]]]
- (121) That boy, [_S that boy_i [_S I wonder [_S [t_j, who_j][_S t_j knows t_i]]]
- (122) That boy, [_S that boy_i [_S I wonder [_S [whether][_S you know t_i]]]
- (123) That boy, [_S that boy_i [_S I wonder [_S [who_j][_S t_j knows t_i]]]

But the same theory would wrongly predict that (114)–(117) are also out, since the LF representations of these sentences are identical to those of

(110)–(113) point by point, with an A-not-A operator occurring in the position of *whether* in (118)–(123).

If the bounding theory is construed as a set of conditions on movement, however, the problem will not arise and the contrast between (110)–(113) and (114)–(117) is predicted. We shall assume that the process of topicalization involves deletion of the moved category in COMP at SS rather than in PF. Since Move WH and Move A-not-A do not apply in Syntax in Chinese, application of topicalization in this language is not blocked by any WH island or A-not-A island. After the topicalized NP is deleted from the COMP of (114)–(115) at SS, Move WH and Move A-not-A may apply to move an operator into that COMP without violating any principle of grammar. Moreover, since topicalization need not have left a trace in COMP, the lower COMP of (116) and (117) may be empty at SS. Movement of an operator into this COMP in LF is therefore possible.

On the other hand, the English sentences (110)–(113) are still correctly predicted to be ungrammatical by the same theory. Assume, as before, that direct yes/no questions are headed by a base-generated *whether* at DS, like indirect yes/no questions; but unlike the latter, they undergo deletion of *whether* at SS. Therefore, both (110) and (112) are out by the ban on movement into a filled COMP (98b) or by Subjacency (98a). Furthermore, since both Move WH and topicalization occur in Syntax, the Strict Cycle requires that Move WH apply before topicalization. Application of the former, however, will result in an island to block the latter, thus rendering (111) and (113) underivable.

Note again that while the Strict Cycle requires the ordering Move WH before topicalization in English, it allows the ordering to be reversed in Chinese, since the two rules concerned do not belong to the same component in this language. What is clear, then, is the generalization that an island-forming rule has island effects only on the application of rules applied after it, not on that of any preceding rules. This generalization, if correct, can be captured only if the bounding theory is construed as a set of conditions on movement, not on output representations.

The account suggested here treats the contrast between English and Chinese with respect to the interaction of certain rules with topicalization as a simple consequence of the typological difference between having and not having those rules in overt form. A further prediction of this account is that we should find exactly the same typological contrast in relative clauses containing questions and clefts. This is a correct prediction, as we shall see now, and provides additional support for our account. One crucial contrast is seen in sentences containing indirect questions within relative clauses:

(124) ?*This is the boy that you wondered whether I know or not.

(125) ?*This is the boy that you wondered who knows.

- (126) zhe jiushi [_{NP} [_S ni xiang-zhidao [_S wo ren-bu-renshi] de neige
 this is you wonder I know-not-know DE that
 nanhaizi]]
 boy
 ‘? *This is the boy that you wondered whether I know or not.’

- (127) zhe jiushi [_{NP} [_S ni xiang-zhidao [_S shei renshi] de] neige nanhaizi]
 this is you wonder who know DE that boy
 ‘? *This is the boy that you wondered who knows.’

At the output level of LF, (124)–(127) do not differ in any relevant way as far as the bounding theory is concerned. But if the bounding theory is construed as (97), applied at LF, there is no reason why (124)–(125) should differ from (126)–(127) in acceptability. On the other hand, if the bounding theory is construed as (98), applied to the rule Move α , the typological contrast is not a problem, but is predicted. Thus, since *whether* is base-generated in (124) and *who* is moved before relativization takes place in (125) as required by the Strict Cycle, (124) and (125) involve a violation of the *wh*-island constraint in English. But since relativization precedes Move A-not-A and Move WH in Chinese, no known principle of grammar is violated in deriving a proper representation for (126)–(127).

The same contrast is seen when a focus is embedded within a clause used as a verbal complement contained within a relative clause. In such a situation, the sentence is fine if the focus is interpreted as having only scope over the complement clause contained within the relative, as indicated in (128a). But the corresponding English sentence (128b) is bad:

- (128) a. zhe jiushi [_{NP} [_S ta shuo [_S shi Lisi renshi] de] neige nanhaizi]
 this is he said FM Lisi know DE that boy
 ‘This is the boy that he said that it is Lisi that knows [him].’
 b. *This is the boy that he said that it is Lisi that knows.

Our theory predicts this difference, because clefting in English precedes relativization in deriving (128b) and therefore forms an island to block the latter, whereas in Chinese FOCUS follows relativization in deriving an appropriate LF representation for (128a) and therefore has no island effect on the latter.

For the sake of clarity, note that the contrast between English and Chinese crucially involves question and focus operators that have scope over an embedded clause within a relative clause. For sentences like the following are ill-formed (as their English counterparts are):

- (129) a. *zhe jiushi [_{NP} [_S ni ren-bu-renshi] de] neige nanhaizi]
 this is you know-not-know DE that boy

- b. *_{[NP [S, ni xiangxin [S, wo ren-bu-renshi de]] neige nanhaizi]}
 you believe I know-not-know DE that boy
 lai-le
 came

(130) a. *zhe jiushi [_{NP [S, shei renshi de] neige nanhaizi]}
 this is who know DE that boy

- b. *_{[NP [S, ni xiangxin [S, shei renshi de]] neige nanhaizi] lai-le}
 you believe who know DE that boy came

In these sentences the A-not-A operator *ren-bu-renshi* ‘know-not-know’ and the *wh*-operator *shei* ‘who’ cannot have scope over a complement clause within a relative clause either because they do not occur within a complement within the relative clause (the a-sentences), or because the main verb of the relative clause *xiangxin* ‘believe’ does not permit an interrogative complement (the b-sentences). Therefore the operators must be associated with the matrix sentence or with the relative clause S’. If they are to be moved to the matrix COMP, i.e., if they are to be interpreted as direct questions, their ill-formedness is already predicted, given Subjacency and the Specificity Condition of Fiengo and Higginbotham (1981) mentioned earlier. If the operators are to be moved to the COMP of the relative clause, this will amount to interpreting the relative clause as an indirect question. Since all of (129)–(130) are ill-formed under any interpretation, this interpretation must also be ruled out by the grammar. What we have said up to now in this chapter does not explain the ungrammaticality of these sentences, but it is safe to assume that these are ruled out by independent considerations. There is a universal restriction on the occurrence of questions to the effect that indirect questions may occur only as arguments (including complements), but not as modifiers. Thus indirect questions may occur as subjects and objects but not as relative clauses. It has been general practice to distinguish between relative clauses and noun phrase complement clauses (cf. Rosenbaum 1967). Following is evidence from indirect questions that shows this distinction clearly:

(131) NP Complement:

- zhe shi [_{NP [S, ni gai-bu-gai li ta de] wenti]}
 this is you should-not-should heed her DE question
 ‘This is a question of whether or not you should pay attention to her.’

(132) Relative Clause:

- *zhe shi [_{NP [S, ni gai-bu-gai li [e_i] de] wenti_i]}
 this is you should-not-should heed DE question
 ‘*This is the question that whether you should pay attention to or not.’

Similarly, note that (128a) is fine only if the focus is interpreted as indicating the emphasis of *ta* ‘he,’ the subject of the relative clause. If it is interpreted to have scope over the entire sentence, the interpretation

procedure will be blocked by Subjacency, as we have seen in connection with sentences (13) and (14) in Section 2. Also it cannot be interpreted as having the relative clause as its sole scope. As noted in note 5, in order to qualify as the sole domain of a focus, an embedded clause must be capable of being interpreted as a direct-discourse complement to a verb or a noun. Since a relative clause is not a complement, it does not qualify as the sole domain of a focus any more than it does as the sole domain of a question operator. The contrast between (131) and (132) is paralleled by the following:

(133) NP complement:

wo xiangxin [_{NP} [_S Lisi shi zuotian lai] zheju hua]
 I believe Lisi FM yesterday come this statement
 'I believe the statement that it was yesterday that Lisi came.'

(134) Relative Clause:

*wo xiangxin [_{NP} [_S Lisi shi zuotian shuo [_{e_i]} de] zheju hua]_i
 I believe Lisi FM yesterday said DE this statement
 '*I believe the statement that it was yesterday that Lisi said.'

6. CONCLUSION

To summarize, I have argued that for certain syntactic constructions it is desirable to assume that they involve Move α , if not in Syntax then in LF, and that the theory of bounding obtains in both modules of grammar. I have illustrated three instances of Move α in the LF of Chinese, Move WH, FOCUS, and Move A-not-A, and shown that, like topicalization and relativization (two instances of Move α that apply in Syntax), they have the effect of forming islands. Furthermore, although the various islands do not have the same range of island effects—in particular, while islands formed in Syntax block Move α in LF, those formed in LF do not block Move α in Syntax—it has been shown that this is a direct consequence of our assumption of the bounding theory as a set of conditions on movement and of the ordering of rule application imposed by the organization of grammar.

Investigation of *wh*-movement-like phenomena in languages involving no overt structural dependency has in the past led some to the rejection of the theory of structural constraints. An example is Rodman's (1972) study. Based on observations of the island properties of several languages involving no overt movement in forming *wh*-questions, Rodman concludes that the structural constraints are to be replaced by the following nonstructural principle:

(135) A sentence, or part of a sentence, once subject to [semantic] subdivision, may not be further subdivided by a foregrounding operation.

Such a statement could be said to achieve descriptive adequacy if the facts in all languages were as follows:

- (136) All processes form islands and all observe island constraints, whether or not they involve actual antecedent-gap relations.

This is, of course, false, as we have seen. It is also hard to see how Rodman's principle may be revised in a natural way to accommodate exactly the facts we have presented here.

The approach taken here, if correct, has several significant implications for linguistic theory. Among others, it offers evidence for the structural basis of island constraints. It also lends some support to the organization of grammar assumed here, with Syntax feeding into LF. But the most interesting implication, in my view, is that it suggests a refreshing way of looking at certain problems in typological studies. Thus, according to the view taken here, language families do not differ in whether or not they have a particular movement rule; nor do they differ in whether or not they are subject to Subjacency, etc. Rather, languages may be considered to incorporate certain substantive universals and formal conditions, but to differ in where these universal rules apply, in Syntax or in LF. Considerations of this kind have led us to the findings of this chapter concerning several similarities and differences between two typologically different languages. This provides strong support for the view that a good theory of typology should be, in the words of Ken Hale, "the by-product of a good theory of language."²⁴

APPENDIX

The purpose of this appendix is to show that *wh*-words and certain other elements in Chinese behave like empty categories at the output level of LF. To the extent that this is correct, it provides confirming evidence for our hypothesis that they undergo abstract movement in LF. It will be shown that a number of facts can be most naturally explained if they are considered to involve the notion of variables subject to the Specificity Condition as proposed and defended in Fiengo and Higginbotham (1981). This condition states in effect that variables contained within a specific NP must be bound within that NP, namely:

- (137) A specific NP may not contain a free variable.

Since a specific NP or a name is in the Fregean sense an NP that is inherently referential, while an open NP (one that contains free variables) must depend upon the value of a variable for its reference, it is a matter of logic that an NP cannot be both a name and an open NP. Therefore, it is possible to consider that (137) simply spells out a special case of the law of

contradiction and need not even be stated as a principle of grammar. And if certain linguistic facts can be analyzed as falling under this principle, the cost for their explanation is virtually nil.

Now consider the contrast that follows:

- (138) [shei mai-de shu] zui hao?
 who bought-DE book most good
 ‘The book that who bought is best?’
- (139) *[shei mai-de neiben shu] zui hao?
 who bought-DE that book most good
 ‘That book that who bought is best?’

The only difference between (138) and (139) is the existence of a demonstrative in the complex NP of (139) but not in that of (138). An intuitive observation is that they differ in specificity of the complex NP containing a *wh*-word. The same contrast occurs between a complex NP with a common noun head and one with a proper noun head:

- (140) a. [ai kan dianshi de xiaohai] mei chuxi
 love see TV DE child no future
 ‘Children that love to watch TV have no future.’
- b. [ai kan shenme de xiaohai] mei chuxi?
 love see what DE child no future
 ‘Children who love to watch what have no future?’
- (141) a. [ai kan dianshi de Xiaoming] zhen mei chuxi
 love see TV DE real no future
 ‘Xiaoming, who loves to watch TV, really has no future.’
- b. *[ai kan shenme de Xiaoming] zhen mei chuxi?
 love see what DE real no future
 ‘*Xiaoming, who loves to watch what, really has no future?’

Similarly, the head noun *niao* ‘birds’ may be interpreted as generic (= specific in our technical sense) only in (142) but not in (143):

- (142) [zai tianshang fei de niao] zhen ziyou
 at sky fly DE bird real free
 ‘Birds, which fly in the sky, are really free.’
 (or ‘Birds that fly in the sky are really free.’)
- (143) [zai nali fei de niao] zui ziyou?
 at where fly DE bird most free
 ‘Birds that fly where are most free?’

Furthermore, if Givon (1973) is correct in claiming that ‘past’ and ‘factivity’ contribute to the specificity of an NP or a proposition while ‘future’ and ‘non-factivity’ contribute to nonspecificity, the following contrast involving sentential subjects is also related to specificity:

(144) [Lisi tao shei] zui heshi?
 Lisi marry who most appropriate
 ‘That Lisi should marry who is most appropriate?’

(145) *[Lisi tao-le shei] zhen kexi?
 Lisi married who real pity
 ‘*That Lisi married who was a real pity?’

If it is assumed, as we do in this chapter, that the *wh*-words in each of these sentences are subject to movement to the matrix COMP in LF, all the contrasts we have seen so far fall out under the Specificity Condition (137). It might be argued that the facts need not involve the notion of a variable and an abstract movement rule and may be accounted for by some principle having the form of (146):²⁵

(146) No element within a specific NP may be questioned.

Obviously, (146) is much less general than the Specific Condition (137), and should be abandoned if it can be shown that there are indeed facts falling under (137) but not (146). In fact, (146) is not even sufficient to explain facts about questions alone in Chinese. For example, it would wrongly exclude the following perfectly grammatical sentence, in which an indirect question is formed within a relative clause, even though the head is specific:

(147) zhe jiushi [_{NP} [_S ni xiang-zhidao [_S shei xihuan de]] neige nanhaizi]
 this is you wonder who like DE that boy
 ‘This is the boy that you wondered who likes.’

It will not do to restrict the applicability of (146) to only direct questions, since the following indirect question is ill-formed, like (139):

(148) *ta xiang-zhidao [_S [_{NP} shei mai de neiben shu] zui hao]
 he wonder who buy DE that book most good
 ‘*He wonders the book that who bought was the best.’

Putting together (139), (147), and (148), the correct generalization is clearly that a *wh*-word cannot occur within a specific NP and have scope larger than that NP. In a framework that does not look at the facts in terms of the scope properties of a *wh*-quantifier, it is difficult to state a simple and general principle that explains all of the facts so far observed,

but if *wh*-words are subject to obligatory movement in LF, the facts simply fall out from the Specificity Condition.

The real superiority of the condition (137) over any alternative specifically designed for question facts in Chinese lies in the fact that it enables one to account for the same range of facts involving traces left by overt *wh*-movement and those left by May's QR. The effect of (137) on traces left by overt movement in Syntax cannot be directly seen in English or Chinese, because overt movement is subject to Subjacency, unlike the LF movement of *who* and *what*, and S is a bounding node in both languages. In French, where S is a bounding node (cf. Sportiche 1981), the contrasts shown next cannot be explained under Subjacency, but fall out under (137).

- (149) a. De qui as tu vu des photos/une photo/la photo(s)?
'Of whom did you see pictures/a picture/the picture(s).'
b. *De qui as tu vu sa photo/ces photos/la photo de Jean?
'*Of whom did you see his picture/these pictures/John's picture?'
- (150) a. C'est la personne de qui j'ai vu des photos/une photo/la photo(s).
'This is the person of whom I saw pictures/a picture/the picture(s).'
b. *C'est la personne de qui j'ai vu sa photo/ces photos/la photo de Jean.
'*This is the person of whom I saw his picture/these pictures/John's picture.'

The effect of (137) on traces left by QR has been demonstrated by Fiengo and Higginbotham (1981) for English, and essentially the same facts also obtain in Chinese. Thus, observe that (151) is ambiguous in that the quantificational NP *sange ren* 'three men' may have scope over either the relative clause S or over the entire matrix sentence. According to the first interpretation, the books I have read involve three authors altogether but each book need not be a book with joint-authorship, but according to the second interpretation, I have read books each of which is a three-author book. If *he* 'jointly' is placed within the relative in (151), this will force a unique narrow-scope reading—as shown in (152)—but if *yigong* 'altogether' is placed in the matrix clause of (151), a unique wide-scope reading will be forced—as shown by (153).

- (151) wo kanguo [_{NP} [_S sange ren xie de] shu]
I read three men write DE books
'There are three men x such that I have read books that x wrote.'
or 'I have read books that three men wrote [jointly].'
- (152) wo kanguo [sange ren he xie de shu]
I read three men jointly write DE book
'I have read books jointly written by three authors.'

- (153) wo yigong kanguo [sange ren xie de shu]
 I altogether read three men write DE book
 ‘There are altogether three men whose books I have read.’

Predictably, then, the following sentence is out with ‘altogether’ appearing in the matrix and ‘jointly’ appearing in the relative clause:

- (154) *wo yigong kanguo [sange ren he xie de shu]
 I altogether read three men jointly write DE book

Now, note that if the head of the relative clause in (151) is made specific by a demonstrative, the sentence can have only the narrow-scope reading even though *he* ‘jointly’ does not appear in the relative, and uninterpretable if the matrix contains *yigong* ‘altogether’:

- (155) wo kanguo [sange ren xie de neiben shu]
 I read three men write DE that book
 ‘I have read the book that three men [jointly] wrote.’

- (156) *wo yigong kanguo [sange ren xie de neiben shu]
 I altogether read three men write DE that book

The ill-formedness of (156) may be explained if we assume the condition (137) and May’s QR. Since the meaning of ‘altogether’ forces a wide-scope interpretation of a quantificational NP, QR must move *sange ren* ‘three men’ to a position c-commanding the matrix S. But in doing so, the trace left behind will be free within a specific NP in (156), violating (137) at LF. The unavailability of the wide-scope reading of (155) also falls out.²⁶