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Scope and Constituency Author(s): Joseph Aoun and Yen-hui Audrey Li Reviewed work(s): Source: *Linguistic Inquiry*, Vol. 20, No. 2 (Spring, 1989), pp. 141-172 Published by: <u>The MIT Press</u> Stable URL: <u>http://www.jstor.org/stable/4178623</u> Accessed: 14/11/2012 20:11

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Scope and Constituency

Joseph Aoun Yen-hui Audrey Li

In this article we seek to provide a grammar of quantificational phrases (QPs) in English and Mandarin Chinese. We argue that the interpretation of quantificational elements in these two languages can be accounted for by two requirements: the *Minimal Binding Requirement* (MBR) stated in (I) and the *Scope Principle* stated in (II):

- Minimal Binding Requirement
 Variables must be bound by the most local potential Ā-binder.
- (II) The Scope Principle

A quantifier A has scope over a quantifier B in case A c-commands a member of the chain containing B.

We start by contrasting the behavior of QPs in English and Chinese (section 1). Chinese sentences like (1a-b), contrary to the corresponding English sentences like (2), are not ambiguous. The subject QP must have scope over the object QP. (The QPs that may have wide scope are italicized.)

- (1) a. *Meigeren* dou xihuan yige nuren. everyone all like one woman 'Everyone loves a woman.'
 - b. Yaoshi *liangge ren* zhaodao meige xiansuo . . .¹ if two men found every clue

'If two men found every clue . . .'

(2) Someone loves everyone.

We would like to thank Samuel Epstein, Norbert Hornstein, Wesley Hudson, the LI reviewers, and in particular James Huang for insightful comments.

¹ Chinese does not have an expression like *someone*. The expressions that are closest to *someone* are bare NPs or *mogeren* 'a certain person' or *you* (*yi*)*ge ren* 'there is a person'. In fact, Chinese generally does not allow an indefinite NP in subject position unless a modal occurs in the sentence, or the subject is preceded by *you* 'have, exist' (see Hudson (1986) and Lee (1986) for accounts of such phenomena), or the clause containing such a subject is an *if*-clause:

- (i) a. *Sange ren lai le.
 - three men come Asp b. Sange ren hui lai.
 - three men will come
 - c. You sange ren lai le. have three men come Asp 'There existed three men that came.'
 - d. Yaoshi sange ren lai . . . if three men came

Linguistic Inquiry, Volume 20, Number 2, Spring 1989 141-172 © 1989 by The Massachusetts Institute of Technology

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In his important work on the topic, Huang (1982) accounts for such a contrast by postulating the existence of an *Isomorphic Principle* (IP) and assuming a difference in the restructuring possibilities between English and Chinese:

(3) The Isomorphic Principle Suppose A and B are QPs. Then if A c-commands B at S-Structure, A c-commands B at LF.

The essence of this IP plus restructuring account is that restructuring nullifies the effect of the IP in English but is prohibited by the phrase structure rules in Chinese. The lack of such restructuring in Chinese makes this language display the IP effect in all cases. On the surface, then, English does not exhibit the IP effect but Chinese does.²

However, there are instances in English that seem to exhibit an IP effect and instances in Chinese that do not (see note 2 for clarifications of this statement). For example, the passive counterparts of sentences (1a-b) are ambiguous:³

(4) a.	Meige ren dou bei yige nuren zhuazou le. (ambiguous)						
	every man all by one woman arrested						
	'Everyone was arrested by a woman.'						
b.	Yaoshi liangge xiansuo bei meigeren zhaodao (ambiguous)						
	if two clues by everyone found						
	'If two clues were found by everyone'						

An English sentence like (5) containing the double object construction, [V NP NP], is unambiguous (see footnote 23):

(5) John assigned someone every problem.

- (i) You liangge xiansuo bei meigeren zhaodao le.
 - have two clues by everyone find Asp

'There were two clues which were found by everyone.'

The lack of ambiguity in (i) need not be a counterexample to our claim in the text, however. Note that you is a verb itself. The expression you yige ren can only occur in subject position:

- (ii) *Ta sha you yige ren. he killed have one man
 - 'He killed someone.'

(iii) [s' e you liangge xiansuo] [s' e bei meigeren zhaodao le] have two clues by everyone find Asp

In fact, for some speakers, (ib) is not as good as (id). We will therefore use examples like (id) in our discussion since they are acceptable to most speakers. Moreover, for the sake of simplicity, *yaoshi* 'if' will not appear in the relevant tree structures or syntactic and LF representations when no confusion will arise.

² For ease of presentation, we simplify Huang's analysis in this introduction.

³ See footnote 15 for possible variations. There are further complications for the passive construction in Chinese. The types of verbs and verb phrases that can appear in the passive in Chinese are highly constrained (see Wang (1970) and others). For instance, *xihuan* 'like' (see (1a)) cannot occur in the passive construction. This is why a different verb is used in (4a). Moreover, when the numeral NP is preceded by *you* 'have, exist', this QP must have wide scope with respect to another QP in the sentence, even in a passive sentence:

It is possible to analyze (i) as a complex sentence containing two clauses. That is, the structure of (i) may be (iii):

Examples such as (1a-b), (2), (4a-b), and (5) raise the following questions:

- (6) a. Why are active sentences unambiguous in Chinese (1a-b) but ambiguous in English (2)?
 - b. Why is the interaction of QPs in active sentences like (1a-b) in Chinese different from their interaction in the corresponding passive sentences (4a-b)?
 - c. Why is the English double object structure in a sentence like (5) unambiguous?

To answer these questions, we show that the traces of QPs raised at LF are subject to the MBR (section 2) and that the relative scope of QPs is sensitive to the chains in which the QPs occur—in other words, to the Scope Principle (section 3). The MBR and the Scope Principle straightforwardly account for the nonambiguity of active sentences in Chinese, the nonambiguity of double object structures in English, and the ambiguity of passive sentences in Chinese.

As for the ambiguity of active sentences in English, we argue that the different behavior of QPs in Chinese and English active sentences is to be traced back to a difference in the constituent structure of these languages (section 4). Specifically, various linguists (Kitagawa (1986), Koopman and Sportiche (1985), Kuroda (1985), Speas (1986), Zagona (1982)) assume that subjects in English are base-generated in the Spec(ifier) of VP and then raised to the Spec(ifier) of IP. We claim that because of the degenerate nature of Infl, this raising process (Subject Raising) is not available in Chinese. The existence of Subject Raising in English but not in Chinese, coupled with the MBR and the Scope Principle, accounts for the contrast between the nonambiguity of active sentences in Chinese such as those in (1) and the ambiguity of active sentences in English such as (2). Thus, our account and Huang's share the same spirit: in both accounts, the variation concerning the interpretation of quantifiers in English and Chinese is traced back to a difference in the constituent structure of the languages under discussion, rather than parametric differences affecting the form and functioning of LF interpretive rules.

Next we explore some consequences of our analysis and contrast the behavior of QPs in simplex sentences (section 5.1) and in Raising contexts (section 5.2). In section 5.3 we discuss the interaction of QP objects. In particular, we study the behavior of QPs in double object constructions [V NP₂ NP₁] and the corresponding dative constructions [V NP₁ to NP₂]. Finally we discuss the status of the MBR and its relation to the general grammatical modules, in particular, government theory (the Empty Category Principle (ECP)), binding theory, and control theory.

1. Problems

It is assumed that QPs are raised during the mapping from S-Structure to LF so that the interpretations of these QPs are appropriately represented. An English active sentence like (2), for example, will have the LF representations given in (7a-b):

- (7) a. $[I'' \text{ everyone}_j [I'' \text{ someone}_i [I'' x_i \text{ loves } x_j]]]$
 - b. $[I'' someone_i [I'' x_i [VP everyone_j [VP loves x_j]]]]$

In these LF representations the QPs are adjoined to I" or VP (see May (1985), Chomsky (1986a)).⁴ These representations yield two readings: in (7a) *everyone* has scope over *someone* because it c-commands *someone*, and in (7b) *someone* has scope over *everyone* because it c-commands *everyone*.⁵

In Mandarin Chinese the sentences in (1) corresponding to the English sentence (2) are not ambiguous: the subject QP must have scope over the object QP. The reading where the object QP has scope over the subject QP is not available. A priori, two possible accounts for this contrast may be pursued. The first would trace this contrast back to distinct LF rules operating in each language. The second would consider that English and Chinese have the same LF rules and trace the contrast back to a difference in the syntactic representation of the languages under discussion rather than parametric differences affecting the form and functioning of LF interpretive rules. The first option runs counter to a commonly held view among linguists that considers the LF interpretive component not to be the locus of language variation since the language learner does not have direct access to this component (see Higginbotham (1985)). We return to this observation in section 6.

Huang (1982) accounts for the contrast between English and Chinese in terms of the second option, postulating the existence of the Isomorphic Principle as formulated in (3) (see also Lee (1986)). According to the IP, the c-command relation holding between QPs at S-Structure must be preserved at LF.⁶ Since the subject QP c-commands the object QP at S-Structure in the Chinese sentences (1a–b), this subject will c-command and have scope over the object at LF. Consequently, there is only one possible reading for (1a–b). Their English counterpart in (2), however, is ambiguous. Huang argues that this ambiguity is due to a structural ambiguity. Specifically, he assumes the existence of a restructuring process in English. This process can freely and optionally take place in a language as long as it does not violate the language's phrase structure rules. English is essentially a head-initial language. Therefore, a structure [$_{I'}$ NP₁ [$_{VP}$ V NP₂]] can be reanalyzed as [$_{I'}$ [$_{I'}$ NP₁ [$_{VP}$ V] NP₂]] without violating the head-initial pattern in this language. More precisely, an object NP in English can always be analyzed in two ways: either as a sister of V or as a phrase adjoined to I'' (restructuring takes place, either via extraposition or simply via rebracketing of the structures). Sentences like (2) thus have

⁴ In contrast to the assumption made in Chomsky (1986a) according to which I" is not a possible adjunction site for movement, we assume in this article that I" is a possible adjunction site for movement at LF. This assumption is necessary in any framework that assumes that QPs, including subject QPs, are subject to QR.

⁵ For our purposes, either definition (i) or (ii) of *c*-command may be adopted (see Reinhart (1976), Aoun and Sportiche (1983)):

- (i) A c-commands B if A and B do not dominate each other and the first branching node dominating A also dominates B.
- (ii) A c-commands B if A and B do not dominate each other and the first maximal node dominating A also dominates B.

Crucially, however, we do not adopt the definition of c-command in May (1985) or Chomsky (1986a), where the notion of exclusion is incorporated. The reasons will become clear in the later discussion.

⁶ Huang (1982) distinguishes QPs such as *sange* [Q + Classifier] from Quantificational NPs or expressions such as *sange ren* 'three men'. In this article we will use the term QP to stand for both of these phrases.

two possible structures. When restructuring does not take place, (2) has the structure in (8a); when restructuring does take place, it has the structure in (8b):



This ambiguity in structure results in ambiguity in interpretation. In structure (8a) the subject NP c-commands and, according to the IP, has scope over the object NP. In structure (8b), after restructuring, the object NP c-commands and has scope over the subject NP.

In Chinese, on the other hand, such a restructuring process is prohibited by the phrase structure constraints in this language. Chinese is essentially a head-final language, with the exception of cases involving a V/P and their complements (at the V' or P' level). An object that is sister to a V can follow the verbal head. However, when restructuring takes place and adjoins the object NP to I", this object NP would occur finally under I". It would be a nonhead occurring in final position of a constituent (I"), a violation of the head-final constraint. In other words, although sentence (1b) can have the structure in (9a), it does not have the structure in (9b) derived by restructuring (for details of the phrase structure constraints and their effects on restructuring, see Huang (1982, chaps. 2-4)):

- (9) a. yaoshi [$_{I''}$ liangge ren [$_{VP}$ zhaodao meige xiansuo]]
 - b. *yaoshi $[I_{I_1}^{"}[I_2]$ liangge ren [VP zhaodao]] meige xiansuo]

Structure (9b) is ruled out by the phrase structure constraint in Chinese. Since there is

only one possible structure for (1b)—namely, (9a)—this sentence is unambiguous. The subject QP must have wide scope according to the IP.

Huang's analysis thus has two components: the IP, which is taken to apply in both English and Chinese, and the restructuring process, which is responsible for the difference between the two languages under consideration. Since the effect of the restructuring process is not shown in other syntactic processes, we assume for the purpose of our presentation that the IP manifests itself in the interpretation of QPs in Chinese but not in English. In the remainder of the article we discuss this approach and uncover certain empirical problems facing it. In the spirit of Huang's approach, we then offer an analysis of quantifier scope that handles the discrepancy between English and Chinese.

When a wider range of data is examined, it appears that the IP (and restructuring) cannot exhaustively account for the different behavior of QPs in English and Chinese. Contrary to the observation that the IP seems to have an effect in Chinese but not in English, there are instances in English that seem to exhibit an IP effect. In addition, there are instances in Chinese that do not exhibit an IP effect, indicating that the IP may not hold even in Chinese.

Let us consider Chinese first. Contrary to the predictions of an IP approach, the passive counterparts of (1a-b) are ambiguous in Chinese, as indicated in (4a-b), repeated here:⁷

- (4) a. Meige ren dou bei yige nuren zhuazou le. (ambiguous)⁸ every man all by one woman arrested
 'Everyone was arrested by a woman.'
 - b. Yaoshi liangge xiansuo bei meigeren zhaodao . . . (ambiguous) if two clues by everyone found 'If two clues were found by everyone . . .'

⁷ It is not true that all passive sentences are ambiguous, even for speakers who find the sentences in (4) ambiguous. For instance, sentences with QPs such as *many* and *few*, as in (i), are much harder to interpret as ambiguous than those with *some*, *every*:

- (i) Henshao ren bei henduo ren jiaoguo.
 - few men by many men taught
 - 'Few men were taught by many men.'

Although this fact is interesting, it is not directly relevant to our discussion, since the same contrast is found in English. (See Ladusaw (1980) for the distinction between quantifiers like *every* and quantifiers like *many* with respect to their interaction with negation.)

⁸ An *LI* reviewer points out that sentence (4a) is vague rather than ambiguous. The argument is that, if we replace *yige nuren* 'one woman', the sentence does not have the interpretation where there are two women each of whom caught every man:

(i) Meige nanren dou bei liangge nuren zhuazou le. every man all by two women arrest Asp 'Every man was caught by two women.'

According to the reviewer, this sentence has the ALL-TWO reading. Although the sentence is true in case every man was arrested by the same two women, it only means that they were arrested by the two women as a group (two-woman group).

It is not clear, however, whether the by-QP in sentences like (i) indeed has only the group reading. It may very well be the case that pragmatic contexts favor the reading where the by-QP is construed as a group rather In passive sentences like (4a-b) the subject QP c-commands the *by*-QP at S-Structure. According to the IP, the subject QP must have scope over the *by*-QP at LF. A reading where the *by*-QP has wide scope should thus be impossible. However, this reading is in fact available in (4a-b). The Chinese sentences (4a-b) are ambiguous in the same way that the English sentence (2) and its passive counterpart (10) are ambiguous:

(10) Someone is loved by everyone.

Examples like (4a–b) show that the IP cannot exhaustively account for the determination of the relative scopes of QPs in Chinese.

Furthermore, contrary to the observation that the IP does not manifest itself in English, we find instances where it indeed does seem to manifest itself:

(11) I assigned someone every problem.

Sentence (11) is not ambiguous for the speakers consulted: the indirect object *someone* necessarily has scope over *every problem*, as first pointed out to us by J. Higginbotham and R. Larson. This is surprising given that sentences like (2) and (10) in English are ambiguous. The lack of ambiguity for (11) seems to suggest that the IP may have applied in this instance (or that restructuring is impossible in this instance). It has been argued that in double object structures the indirect object asymmetrically c-commands the direct object at S-Structure (see Barss and Lasnik (1986)). Assuming that the IP has applied in this case (or that no restructuring has taken place to nullify the effect of the IP), it is expected that the indirect object has scope over the direct object in (11).

In brief, we have found instances in Chinese to which the IP cannot apply and instances in English that display an IP effect—instances that directly contradict the claim that the IP exists in Chinese and that a restructuring process nullifies the IP effect in English. Since the IP and the restructuring process were specifically designed to capture the differing behavior of QPs in these two languages, our examples suggest that such

- (ii) Meige nanren dou bei liangge nuren zhua guo. every man all by two women arrest Asp 'Every man has been (has the experience of being) arrested by two women.'
 (iii) Meiben shu dou bei liangge nuren du guo le.
 - every book all by two woman read Asp Par 'Every book has been read by two women.'

Sentence (ii) has the interpretation where each of the two women has arrested every man. Sentence (iii) has the interpretation where each of the two women has read every book. For the sake of completeness, the active counterparts of (ii) and (iii) are not ambiguous:

- (iv) Yaoshi liangge nuren zhua guo meige nanren . . .
 - if two women arrest Asp every man
- (v) Yaoshi liangge nuren du guo meiben shu... if two women read Asp every book

than distributively. Note that (i) denotes a single event. It is hard to imagine the situation where every man was arrested by each of the two women in a single event. That this may be a relevant consideration is shown by the following sentences, where the distributive reading of the *by*-QP is readily available:

an account is not descriptively adequate.⁹ Thus, we are left with no explanation for the original problem, stated in (6a), that the IP and restructuring were designed to account for. In addition, during our discussion of the IP we uncovered further problems, stated in (6b-c), not explained by any analysis of QPs. Our task will be to provide an account for these problems.

2. Proper Binding of Variables

We assume in this work that QPs are raised at LF and adjoined to an \bar{A} -position by the rule of Quantifier Raising (QR). Variables left by QR obey various well-formedness requirements. Thus, as argued by Aoun and Hornstein (1985), Kayne (1981), and May (1985), these variables obey some version of the ECP. In the spirit of Chomsky (1986a) (also see Obenauer (1983) and Barss (1984)), we would like to suggest that these variables obey the following locality requirement at LF (see Williams (1988) for a similar but different proposal):¹⁰

(12) Minimal Binding Requirement

Variables must be bound by the most local potential antecedent (Å-binder).¹¹

The MBR has the effect of ruling out representations (13a-b) and allowing representation (13c). In these representations the variables x_1 and x_2 are traces generated by the LF raising of QP₁ and QP₂, respectively:

(13) a. $[I'' QP_1 [I'' QP_2 [I'' x_1 [VP \dots x_2 \dots]]]]$ b. $[I'' QP_2 [I'' QP_1 [I'' x_1 [VP \dots x_2 \dots]]]]$ c. $[I'' QP_1 [I'' x_1 [VP QP_2 [VP \dots x_2 \dots]]]]$

⁹ Hoji (1985) assumes the IP formulated in (i) to account for the interaction of QPs in Japanese:

(i) At LF *QP_i QP_j $t_j t_i$, where each member c-commands the member to its right.

Condition (i) accounts for the unambiguity of basic active sentences with the structure shown in (ii):

(ii) QP-ga QP-o V

As for the ambiguity of sentences like (iii), where the object QP has been scrambled, Hoji assumes that they have the two LF representations shown in (iva) and (ivb):

- (iii) $[QP-o_j [QP-ga t_j V]]$
- (iv) a. $[s QP-o_j [s QP-ga_i [s t'_j [s t_i [v_P t_j V]]]]]$
 - b. $[s QP-ga_i [s QP-o_j [s (t'_j) [s t_i [v_P t_j V]]]]]$

In order for representation (iva) to be well-formed, Hoji assumes that the variable t_j in object position does not count when (i) is checked. In order to account for the well-formedness of (ivb), he assumes that the variable in the scrambled position is deleted. Despite the differences between Hoji's account and ours, they ultimately share one common insight: movement can induce ambiguities.

¹⁰ We discuss similarities and differences between this analysis and that of Barss and Obenauer in Aoun and Li (forthcoming).

¹¹ An element \tilde{E} qualifies as an \tilde{A} -binder for x in case it c-commands x and is in an \tilde{A} -position. Locality may be defined as in Chomsky (1982, 59):

(i) A locally binds B if A and B are coindexed, A c-commands B, and there is no C coindexed with A that is c-commanded by A and c-commands B.

(See Epstein (1986) for discussion of various definitions of locality conditions.)

In (13a) QP_2 is the first available Å-binder for x_1 and x_2 . According to the MBR, x_1 and x_2 must both be bound by QP_2 . This is not the case, however, since x_1 is coindexed with QP_1 by movement. (13a) will therefore be ruled out by the MBR. Notice that (13a) cannot be salvaged by reindexing x_1 with QP_2 . After this reindexing process, not only would both variables be bound by a single QP but QP_1 will not bind any variable, thus violating the prohibition against vacuous quantification (May (1977)) or, alternatively, the Bijection Principle (Koopman and Sportiche (1982)). (13b) is ruled out in the same manner: QP_1 is the most local potential antecedent for both x_1 and x_2 . In contrast, the traces in (13c) are properly bound. The most local potential antecedent for x_1 is QP_1; the most local potential antecedent for x_2 is QP_2. Both traces are bound by the most local potential antecedent, obeying the MBR.

Given the MBR's requirement that variables such as traces left by QR must be bound by the most local potential antecedent, it is expected that sentences where one QP asymmetrically c-commands the other are unambiguous. This expectation is fulfilled in Chinese active sentences like (1a-b) and English sentences with double object constructions like (11).

To see why (1a-b) are unambiguous, consider the S-Structure representation of (1b), given in (14) in English.



If we adopt Chomsky's (1986a) claim that adjunction is possible only to a maximal projection that is a nonargument, then in (14) QP_1 can adjoin to I" and QP_2 to VP or I". The MBR, however, allows QP_2 to adjoin to VP only. If QP_2 were to adjoin to I", the output would be similar to the ill-formed representations (13a) or (13b). Therefore, the only possible LF representation for (1b) will be (15):

(15) $[I'' \text{ two men}_i [I'' x_i [VP \text{ every clue}_j [VP \text{ found } x_j]]]$

The subject QP_1 two men c-commands the object QP_2 every clue after QR, deriving the interpretation where QP_1 has scope over QP_2 . The active sentence (1b) in Chinese is

therefore not ambiguous. The MBR stated in (12) forces sentences like (1b) to be unambiguous.

A similar analysis will account for the nonambiguity of English sentences with double object constructions like (11). Assuming Kayne's (1984) analysis of double object constructions, (11) has the structure in (16):

(16) I [vp assigned [sc someone [pred every problem]]]

According to the MBR, the direct object QP *every problem* can only adjoin to Pred, and the indirect object QP *someone* adjoins to VP (or some higher node).¹² *Someone* thus has scope over *every problem*.

The MBR offers a new perspective for the analysis of QPs. However, it clearly cannot account for the whole range of data. For instance, according to the MBR, passive sentences in Chinese ought to behave like active sentences: they should not be ambiguous. As the ambiguity of (4a-b) illustrates, however, this is not the case. We now turn to this problem.

3. Chains

The LF structures of an active Chinese sentence such as (1a) and its passive counterpart (4a) are (17) and (18), respectively:

(17)	[meigeren _i [x _i	yige	nuren _j	[dou	xihuar	1 <i>x_j</i>]]]	
	everyone	one	woman	all	like		
(18)	[meigeren _i [x _i	yige	nuren _j	[dou	bei x_j	[zhuazou-le	$t_i]]]]$
	evervone	one	woman	all	bv	arrested	

The only structural difference between (17) and (18) is the existence of an NP-trace in (18).¹³ This suggests that the NP-trace may play a role in determining QP scopes. In fact, various studies of Quantifier Lowering (see May (1977), Aoun (1985), and the references cited there) have indicated that NP-traces do play a role in determining the scope of QPs:

(19) Someone_i seems [t_i to love everyone].

Although QR is essentially clause-bound (see May (1977), Aoun and Hornstein (1985)), (19) is ambiguous. Assuming that the matrix subject QP is interpreted from the position in which the trace occurs, (19) will be ambiguous just as (2) (*Someone loves everyone*) is ambiguous. Based on such ambiguities, it seems plausible to conclude that the determination of the scope of QPs is sensitive to the chain containing the QP and the empty

 $^{^{12}}$ We are assuming that the small clause has a predicate node. In fact, we will argue in section 5.3 that the small clause in double object constructions contains an empty verb, taking NP₁ as its object.

¹³ It has been widely assumed and has been argued in the Chinese literature that Passive involves movement (see, among others, Wang (1970), Tang (1979), Teng (1977), Huang (1982), Li (1985), Shi (1987)).

category with which the QP is coindexed. Specifically, it is possible to suggest a generalization like (20):

(20) The Scope $Principle^{14}$

A quantifier A has scope over a quantifier B in case A c-commands a member of the chain containing B.

To illustrate the application of the Scope Principle, consider the LF representation (21) of (19):

(21) $[I'' \text{ someone}_i [I'' x_i [\text{seems } [I'' \text{ everyone}_j [I'' t_i \text{ to love } x_j]]]]$

(21) does not violate the MBR: t_i is an NP-trace that needs to be A-bound. In (21) someone c-commands everyone. In turn, everyone c-commands the NP-trace t_i , which is a member of the chain containing someone. According to the Scope Principle, either QP may have scope over the other—hence the ambiguity of sentence (19).

In an approach incorporating the Scope Principle, there is no need to use a Quantifier Lowering rule to account for the ambiguity of (19). Quantifier Lowering is an LF rule that is taken to lower the quantifier to the original position in which it was generated (see May (1977)). Under a Quantifier Lowering approach, two LF representations may be derived from the S-Structure representation of (19): one by adjoining the quantified NP *someone* to the matrix clause, as in (21), the other by lowering and adjoining it to the embedded clause, as in (22):

(22) [*e* [seems [$_{I''}$ everyone_{*j*} [$_{I''}$ someone_{*i*} [$_{I''}$ *x_i* to love *x_j*]]]]]

In (21) *someone* c-commands and has scope over *everyone*. In (22) *everyone* c-commands and has scope over *someone*. Therefore, (19) is ambiguous. Notice that (22) violates the MBR. Insofar as the adequacy of the MBR will be established throughout this work, an analysis that makes use of (22) to account for the ambiguity of (19) cannot be maintained.

Having introduced the Scope Principle, we now turn to the contrast between the lack of ambiguity in the Chinese active sentence (17) and the ambiguity of its passive counterpart (18). In (17), schematically represented in (23a), both QP_1 and the variable it binds, x_1 , c-command but are not c-commanded by either QP_2 or the variable x_2 in object position. According to the Scope Principle given in (20), (17) should not be ambiguous: QP_1 must have scope over QP_2 . In (18), schematically represented in (23b), the passive subject QP_2 c-commands QP_1 and QP_1 c-commands the NP-trace of the passive subject.

(23) a. $QP_1 x_1 QP_2 x_2$ (active) b. $QP_2 x_2 QP_1 x_1 t_2$ (passive)

¹⁴ The definition of the Scope Principle given here is different from the definition given in May (1985). We discuss the interaction of QPs and *wh*-words and compare May's Scope Principle with ours in Aoun and Li (forthcoming).

According to the Scope Principle, not only does QP_2 have scope over QP_1 (QP_2 c-commands QP_1) but QP_1 also has scope over QP_2 (QP_1 c-commands a member of the chain containing QP_2). Therefore, the Scope Principle captures the contrast between the ambiguity of passive constructions and the lack of ambiguity of active constructions in Chinese.¹⁵ Moreover, as we will show, it accounts for the contrast between active sentences in English and Chinese.

4. Constituency Difference between English and Chinese

In order to offer an account for the contrast between English and Chinese active sentences such as (2) and (1a-b), we must digress somewhat to discuss the basic constituent structure of English and Chinese. We will argue that the difference in interpretation of quantifiers in English and Chinese active sentences results from structural differences between the two languages rather than from a different functioning of quantifiers.

Recently various syntactic considerations have led several linguists to assume that subjects in English are generated at D-Structure in the Spec position of VP.¹⁶ These subjects are raised to the Spec position of Infl at S-Structure (see the references mentioned in the introduction). Under this view, instead of the traditional structure in (24a), an English sentence has the structure in (24b):

(24) a. [I'' NP [I' I VP]]b. $[I'' NP_i [I' I [VP t_i VP]]]$

In the framework of Chomsky (1986a), raising to subject in general is made possible by a process of V-Raising to Infl.¹⁷ V-Raising to Infl would make Infl a lexical item, which would then allow VP₁ not to count as a barrier for Subject Raising. We would like to suggest that Subject Raising is not available in Chinese, a lack that may be traced back to the degenerate nature of Infl in this language. In other words, we suggest that the degenerate nature of Infl in Chinese prevents V-Raising from taking place. As a consequence, VP will always count as a barrier in this language. Alternatively, we may adopt the claim that an empty category must be not only properly bound but also lexically governed; see Jaeggli (1982), Stowell (1983), Aoun et al. (1987). Subject Raising in this case would be impossible because this process will leave a trace not lexically governed, Infl not being a lexical governor.

Some independent support for the absence of Subject Raising in Chinese may be derived from the existence of *double subject structures* in this language. Because of the

¹⁵ There are speakers who do not find the Chinese passive sentences to be ambiguous. It is possible that for these speakers, an NP-trace does not play a role in the determination of scope relations. This predicts that these speakers should find the English active sentences to be unambiguous. However, it is difficult to test this hypothesis because we are unable to find native speakers of both Chinese and English.

¹⁶ Although the D-Structure subject is sister of VP in (24b), we refer to this subject as the Spec of VP.

¹⁷ In Chomsky (1986a) V-Raising does not apply in every instance; for example, it does not apply when there is a modal in Infl. However, in the subsequent developments of the *Barriers* framework Chomsky generalizes V-Raising to apply in all instances.

existence of double subject structures such as (25) in Japanese, Kuroda (1985) claims that both the Spec position of I' and the Spec position of VP are Case positions. Kitagawa (1986) further claims that both positions are Case and θ positions.

(25) Yamada-san ga go-tyoonan ga daigaku ni gookakusareta.
 Yamada Nom eldest son Nom college Dat passed
 'Yamada-san's eldest son passed the entrance exam for a college.'

In (25) Yamada-san is a "major subject" (Kitagawa (1986, 225)) followed by a full clause whose subject is *go-tyoonan*. The nominative Case marker *ga* occurs with both subjects. If the existence of a double subject structure in a given language indicates that both Spec of I' and Spec of VP are Case and θ positions in this language, the existence of the double subject structure in Chinese also indicates that the Spec positions of I' and VP are both Case and θ positions:

- (26) a. Zhangsan, erzi kaoshang daxue le. Zhangsan son passed college Asp
 'Zhangsan's son passed the entrance exam for a college.'
 b. Zhangsan, tou hen teng.
 - 'Zhangsan's head aches.'

When both the Spec positions of I' and VP are Case and θ positions, an NP moved from the Spec of VP to the Spec of I' would either violate the Projection Principle and the θ -Criterion, which forbid a chain to have two θ -roles, or violate the principles of Case theory that forbid a chain to have two Cases.

In brief, for the purpose of the subsequent discussion, it is crucial to assume that Subject Raising is not available in Chinese. Any analysis that would yield this result could be adopted.

Since there is no Subject Raising and since the Spec node simply does not exist if it does not dominate lexical material, the basic structure of a Chinese sentence will be either (27a) or (27b); that is, a Chinese subject occurs either in Spec position of VP or in Spec position of I' at both D-Structure and S-Structure.¹⁸

(27) a. [_{I"} NP [_{I'} I VP]] b. [_{I"}[_{I'} I [_{NP} NP VP]]]

Aoun and Hornstein (1986) have independently argued that there is a distinction between the English and Chinese basic constituent structures. They indicate that the distribution of bound pronouns in Chinese is not parallel to the distribution of referential pronouns, as the following paradigm illustrates:

¹⁸ Independent considerations, such as the existence of the passivization process in this language, will distinguish (26) from (27). However, this is not relevant to the present discussion. Suffice it to say that Subject Raising does not exist in this language.

- (28) a. Zhangsan, shuo ta, bu xihuan pijiu.
 Zhangsan said he not like beer
 'Zhangsan said that he does not like beer.'
 - b. *Meigeren, dou shuo ta, bu xihuan pijiu.
 everyone all say he not like beer
 'Everyone said that he does not like beer.'

In (28a) the pronoun in the subject position of the embedded clause can be coindexed with the matrix subject *Zhangsan*. In (28b), however, this pronoun cannot be bound by the quantificational NP *meigeren* 'everyone'. To account for the contrast between (28a) and (28b), Aoun and Hornstein argue that the domains within which a pronoun must be A-free and \bar{A} -free are not equivalent. Simplifying, pronouns must be A-free in the minimal clause or NP containing such pronouns; pronouns must be \bar{A} -free in the first maximal projection containing such pronouns and a SUBJECT. SUBJECTs, as defined in Chomsky (1981), are taken to be subjects and Agr. To illustrate, consider the LF representations of (28a-b):

- (29) a. Zhangsan, shuo [ta, bu xihuan pijiu]
 Zhangsan said he not like beer
 'Zhangsan said that he does not like beer.'
 - b. *meigeren, dou x, shuo [ta, bu xihuan pijiu]
 everyone all say he not like beer
 'Everyone said that he does not like beer.'

In (29a-b) the embedded clause is the domain in which the pronoun should be A-free, and the matrix clause is the domain in which it must be \overline{A} -free. The reason is that Chinese lacks Agr, as indicated by Huang (1982). In (29b) the pronoun is not \overline{A} -free. This is why it cannot be interpreted as a bound variable. (29b) minimally contrasts with (30a-b). In these sentences the domain in which the pronoun must be \overline{A} -free is the embedded clause @. Nothing prevents it from being \overline{A} -bound by the matrix QP:

(30) a.	Meigeren _i dou	$[x_i \text{ shuo } [$	_@ Lisi xihuan	$ta_i]].$				
	everyone all	say	Lisi like	him				
	'Everyone said Lisi likes him.'							

b. Meigeren, dou $[x_i \text{ shuo } [@ \text{ Lisi renwei } [ta_i \text{ zui } ben]]].$ everyone all say Lisi think he most stupid 'Everyone said that Lisi thinks he is most stupid.'

Turning to English, the absence of Agr in Chinese and its presence in English accounts for the unacceptability of (28b) and the acceptability of (31):

(31) Everyone_i [x_i said [he Agr is a fool]].

In (31) the domain in which the pronoun must be \bar{A} -free is the embedded clause. It can be \bar{A} -bound by the QP, which occurs outside this domain.

Though we can easily account for the contrast between (28b) and (31), the contrast between the English (32a) and the Chinese (32b) is totally unexpected:

- (32) a. Everyone's_i friend killed him_i.
 - b. *Meigerende, pengyou shadiaole ta_i.

These two sentences have identical LF representations and consequently should be treated on a par:

- (33) a. $[I'' \text{ everyone's}_i [I'' x_i \text{ friend } [VP \text{ killed } him_i]]]$
 - b. $[I_i^{"} meigerende_i [I_i^{"} x_i pengyou [VP shadiaole ta_i]]]$

In (33a-b) the domain in which the pronoun must be A-free and \overline{A} -free is the whole clause. The unacceptability of the Chinese sentence (33b) is expected since the pronoun is \overline{A} -bound in its domain.¹⁹ On the other hand, the acceptability of the English sentence (33a) is a surprise. The problem disappears, however, when the difference in the constituent structure between Chinese and English discussed in this section is assumed. After QR the LF representation of (32a) will be (34) instead of (33a):

(34) $[I'' \text{ everyone's}_i [I''_{NP}[x_i \text{ friend}]_j [VP_1 t_j [VP_2 \text{ killed him}_i]]]]$

The crucial difference between the representations in (33a) and (34) is that in (34) it is VP₁ that contains a subject t_j and so VP₁ is the domain in which the pronoun must be \bar{A} -free. Nothing prevents this pronoun from being \bar{A} -bound by the quantifier *everyone* outside its domain.

In brief, the difference in the constituent structure of English and Chinese accounts for the behavior of (bound) pronouns in contexts such as (32a-b). We have brought up these facts because they directly support the analysis of the basic constituent structures of English and Chinese put forward in this section. In the next section we will show that the difference in constituent structures has important consequences for the interpretation of QPs in English and Chinese.

5. The Analysis

5.1. QP Subjects in Simplex Sentences

Consider once again the difference in scope ambiguity between the Chinese sentence (1b) and the English sentence (2):

¹⁹ An *LI* reviewer points out that the unacceptability of (32b) might be due to a c-command requirement at S-Structure (see Reinhart (1983), Partee (1980)); that is, one might suggest that a bound pronoun in Chinese needs to be c-commanded by the quantifier at S-Structure. The acceptability of (i) rules out this possibility, since the bound pronoun is A-free in its domain, the embedded clause, as noted by another reviewer (also see Aoun and Hornstein (1986) for further details):

Meirende, pengyou shuo Lisi renwei ta, zui ben.
 nobody's friend said Lisi thought he most stupid
 'Nobody's friend said that Lisi thought that he was stupid.'

- (1) b. Yaoshi liangge ren zhaodao meige xiansuo . . . if two men found every clue
 'If two men found every clue . . .'
 - i. $2(x), \forall (y), x \text{ found } y$
 - ii. $* \forall (y), 2(x), x \text{ found } y$
- (2) Someone loves everyone.
 - i. $\forall(x), \exists(y), x \text{ loves } y$
 - ii. $\exists (y), \forall (x), x \text{ loves } y$

We can now provide a straightforward account for this contrast by assuming that the basic constituent structures of English and Chinese are different. Sentences (1b) and (2) are represented in (35) and (36), respectively:

- (35) $[I'' two men [I' I [VP_1 found every clue]]]$
- (36) $[I'' someone_i [I' I [VP_1 t_i [VP_2 loves everyone]]]]$

In (35) the subject QP two men can be raised and adjoined to I" and the object QP every clue to VP₁. Two men will then c-command and have scope over every clue (the reading represented in (1bi)). It is not possible for *every clue* to adjoin to I" to derive the reading in (1bii) because either the trace of every clue or the trace of two men would not be bound by the most local potential antecedent, thus violating the MBR. In (36) the subject QP someone can adjoin to I" and the object QP everyone to VP_2 or VP_1 . The latter possibility, adjunction of the object QP to VP_1 , is allowed despite the fact that the trace t of the subject QP is dominated by VP_1 . This is because the trace in question is an NPtrace. A *potential* antecedent for an NP-trace is an NP in an A-position, rather than an Å-position. Therefore, when the object QP adjoins to VP_1 , this raised QP will not qualify as a potential antecedent for the NP-trace but will qualify as the most local potential antecedent for the variable in the object position. The representation in (37), generated by applying QR to (36), is thus grammatical and yields two readings. In (37) QP_1 c-commands and thus has scope over QP_2 ; this generates the reading (2i). In turn, QP_2 c-commands a member of the chain containing QP_1 (namely, t) and thus has scope over QP_2 ; this generates the reading (2ii).

Thus, the problem in (6a), the contrast between Chinese and English active sentences, is solved. As in Huang's account, the difference in interpretation between Chinese and English is traced back to a structural difference between the two languages and not to a parametric variation affecting the form or functioning of LF interpretive rules.

5.2. QP Subjects in Raising Structures

Before pursuing this approach to quantifier scope, we would like to point out one direct consequence of our analysis. We have assumed that in Chinese, contrary to English, no Subject Raising takes place in simplex sentences, and we have traced the absence of



Subject Raising back to the absence of V-Raising. As a consequence, VP is always a barrier for extraction, and movement from Spec of VP to Spec of I' is impossible. The same reasoning leads us to expect the absence of any other Subject Raising process in Chinese even in *seem*-type constructions. However, Subject-to-Subject Raising seems to occur in (38), where the matrix subject has been raised from the embedded subject position (see Teng (1977), Hou (1979), Li (1985) for arguments that *keneng* 'likely' is a Raising verb):

(38) $\begin{bmatrix} I^{n'} \text{ women}_i \begin{bmatrix} VP \text{ keneng } [I^{n'}[I^{n'} t_i \text{ bu } \text{ lai}]] \end{bmatrix}$ we likely not come 'We are likely not to come.'

If Subject Raising is not possible at all in Chinese, the derivation in (38) should not be allowed. The existence of such derivations indicates either that the claim regarding the lack of Subject Raising in Chinese is wrong or that structures like (38) are not standard Raising structures. In fact, the behavior of QPs in sentences like (38) demonstrates that the second possibility is correct.

First observe the following sentence:

(39) Yaoshi liangge ren keneng kandao meigeren . . .
 if two men likely see everyone
 'If it is likely for two men to see everyone . . .'

If (39) were a Raising structure, its S-Structure representation would be (40):



In (40) NP₃ everyone can adjoin to the embedded I" or VP₂ (t_1 is an NP-trace; the MBR is not violated) and NP₁ two men can adjoin to the matrix I". If two men adjoins to the embedded I", it will c-command t_1 and be c-commanded by two men. According to the Scope Principle, everyone can have either wide or narrow scope with respect to two men, since it is c-commanded by two men and c-commands t_1 , a member of the chain containing the QP two men. In brief, (39) should be ambiguous if (40) were a Raising structure in Chinese. But in fact it is not ambiguous: two men must have scope over everyone. In other words, t_1 in (40) seems to be invisible for determining scope relations. (39) behaves like a simplex sentence rather than a complex one. The lack of ambiguity in (39) may be accounted for if we assume that a reanalysis process takes place in these structures.²⁰ As a consequence of this process, the two verbs are reanalyzed into one

²⁰ Alternatively, in the spirit of Guéron and Hoekstra (1987), we may claim that the so-called Raising verbs in Chinese actually are not the same type of verb as the English Raising verbs. In English such verbs select an S as their complement, but in Chinese they select a VP. If only a VP is selected, there is no empty category in NP₂ position in (40). Thus, no ambiguity exists in (40).

Another possibility is to claim that the Raising verbs are actually in Infl (Aux) position, as suggested by O. Jaeggli (personal communication). The Raising process then does not exist; therefore, no traces are generated.

V and the I" boundary is erased:

(41) Liangge ren [v keneng kandao] meigeren.
 two men likely see everyone
 'Two men are likely to see everyone.'

One may wonder why reanalysis must take place in Chinese. The answer lies in the status of t_1 in (40). t_1 is an offending trace in (40); since V-Raising does not occur in Chinese, VP₁ is a barrier for t_1 . t_1 will therefore not meet the ECP (see Chomsky (1986a)). On the other hand, when reanalysis takes place in (40)–(41), the offending trace t_1 will not be visible and the ECP will not be relevant. The sentence therefore becomes acceptable. This amounts to saying that movement takes place freely: *two men* is moved from NP₂ to NP₁ position in (40). The output of this movement process will either be ruled out or be salvaged by a reanalysis process.²¹ This reanalysis process makes t_1 invisible; t_1 will not participate in the determination of QP scopes. This is why "Raising" structures in Chinese do not display any scope ambiguity.

Summarizing, we have shown that the Subject-to-Subject Raising cases in Chinese are forced to undergo reanalysis because of the lack of V-Raising in this language. The existence of such a reanalysis process is supported by the lack of ambiguity of such structures.

5.3. QP Complements

In the previous discussion we concentrated on the interaction of subject and object QPs. In what follows we will study the interaction of the complements within VP. In particular, we will study double object constructions of the form [V NP NP] and dative constructions of the form [V NP PP].

5.3.1. Double Object and Dative Constructions. Various proposals have been made with respect to the structure of dative and double object constructions (see, among others, Stowell (1981), Kayne (1984), Chomsky (1986b), Larson (1987)). Although the proposals vary, they contribute to understanding and capturing various properties of these constructions.

Kayne (1984) (see also Stowell (1981)) notes that in double object constructions $[V NP_2 NP_1]$, NP_2 is interpreted as the possessor of NP_1 . According to Kayne, double object constructions have the structure in (42) and the corresponding dative constructions

 $^{^{21}}$ Given that a reanalysis process is possible in the Raising structure in (39), one *LI* reviewer suggests an interesting alternative to the lack of Raising from Spec of VP to Spec of IP in Chinese. This reviewer suggests that movement is free, but the barrierhood of VP forces reanalysis, as in (i). That is, after Raising, the ECP and the barrierhood of VP force the trace to be reanalyzed with the following V as a V.

⁽i) $\begin{bmatrix} I'' & NP_i \end{bmatrix} \begin{bmatrix} I' & I \end{bmatrix} \begin{bmatrix} VP & t_i & VP \end{bmatrix} \end{bmatrix}$

 $[V NP_1 to NP_2]$ have the structure in (43):



In (42) the verb selects a small clause: NP₂ is the subject and NP₁ is the predicate. The subject and the predicate bear a possession relation; that is, the predicate assigns a possessor θ -role to the subject. In (43) the V assigns Case and θ -role to NP₁ and P assigns Case and θ -role to NP₂.

Structures (42) and (43) cannot be adopted as they are, however. In (42) NP₁ and NP₂ c-command each other, and in (43) neither NP₁ nor NP₂ c-commands the other. However, Larson (1987), based on Barss and Lasnik (1986), argues that the following structural relations hold in double object and dative constructions:

- (44) a. In $[V NP_2 NP_1]$, NP₂ asymmetrically c-commands NP₁.
 - b. In [V NP₁ P NP₂], NP₁ asymmetrically c-commands NP₂ (and the PP).

Evidence for these c-command relations comes from the facts concerning anaphor binding in (45), quantifier binding in (46), weak crossover in (47), the superiority effect in (48), the distribution of *each* . . . *the other* in (49), and the licensing of negative polarity items in (50):

- (45) Anaphor Binding
 - a. I showed Mary herself.
 - *I showed herself Mary.
 - b. I showed/presented Mary to herself.
 - *I showed/presented herself to Mary.

- (46) Quantifier Binding
 - a. I gave every worker_i's mother his_i paycheck.
 *I gave his_i mother every worker_i's paycheck.
 - b. I gave/sent every check_i to its_i owner.
 ??I gave/sent his_i check to every worker_i.

(47) Weak Crossover

- a. Which man_i did you send his_i check?
 *Whose_i pay did you send his_i mother?
- b. Which check_i did you send to its_i owner?
 *Which worker_i did you send his_i check to?
- (48) Superiority
 - a. Who did you give which check?*Which paycheck did you give who?
 - b. Which check did you send to who?
 *Whom did you send which check to?
 (*To who did you send which check?)
- (49) Each . . . the other
 - a. I showed each man the other's socks. *I showed the other's friend each man.
 - b. I sent each boy to the other's parents. *I sent the other's check to each boy.
- (50) Negative Polarity
 - a. I showed no one anything. *I showed anyone nothing.
 - b. I sent no presents to any of the children.
 - *I sent any of the packages to none of the children.

The contrast in acceptability between the two (a)-sentences in each of (45)-(50) shows that NP₂ asymmetrically c-commands NP₁ in double object constructions [V NP₂ NP₁]. The contrast between the two (b)-sentences in each case shows that NP₁ asymmetrically c-commands the PP, [P NP₂], in dative constructions [V NP₁ P NP₂].

To capture these asymmetric c-command relationships is the main goal of Larson's analysis (1987). He suggests that the structure underlying both dative and double object constructions is (51), where V_2 and PP form a predicate, V'_2 , whose subject is NP₁. NP₁ and V'_2 form a VP that is sister to an empty V, V_1 . The verb *gave* is base-generated in V_2 position and assigns an inherent Case to its dative complement. This inherent Case is realized as *to*. [*gave to Mary*] is predicated of NP₁ *a book*. In this structure NP₁ is



Caseless; therefore, the verb in V_2 position must move to V_1 position in order to assign Case to NP₁, generating sentence (52):

(52) He gave a book to Mary.

In this sentence *a book* asymmetrically c-commands *Mary* (see (51)), capturing the facts in (45)-(50).

As for the corresponding double object construction $[V NP_2 NP_1]$ in (53), it is derived from (51) via a process similar to passivization, according to Larson.

(53) John gave Mary a book.

As with passivization, the (inherent) Case of V, realized as to, is absorbed. The subject NP₁ is generated in an adjunct position, as in (54):



Then the Caseless *Mary* moves to NP₀ position. As a result, *Mary* asymmetrically c-commands *a book* in NP₁ position. NP₁ is assigned Case by V'₃ via a V'-reanalysis process: V'₃ is reanalyzed as a V, and this reanalyzed V is able to assign a structural accusative Case to NP₁. (53) is thus the passive counterpart of (52).

In brief, both Kayne's and Larson's analyses shed some light on the structure of dative and double object constructions. Kayne's small clause analysis captures the possession relation between NP_2 and NP_1 in $[V NP_2 NP_1]$ structures but does not capture the asymmetric c-command relation between NP_2 and NP_1 . Larson's analysis, on the other hand, captures the asymmetric c-command relation between the two complements in dative and double object constructions but does not capture the possession relation between NP_1 and NP_2 in double object constructions.

In light of these considerations, it seems necessary to elaborate an analysis of double object constructions that incorporates the semantic (possession) relation as well as the structural (asymmetric c-command) relation between the two complements. With this in mind, we take the basic representation of the double object structure to be the one given in (55):



In (55) the possession relation between *Mary* and *a book* is expressed by the postulation of an empty verb, *e*, denoting possession, taking *Mary* as subject and *a book* as object. In this structure the verb *gave* assigns Case to *Mary* and the empty verb assigns Case to *a book*, deriving the double object construction *gave Mary a book*. *Mary* asymmetrically c-commands *a book*, capturing the generalization in (44).²²

²² In our analysis, we postulate the existence of an empty verb, denoting possession. One may assume that give is base-generated as the verb of the small clause and is raised to V_1 position, as shown in (i):

Moreover, adopting Larson's insight that dative and double object constructions are related by a passivelike process, we assume that dative constructions are derived from double object structures such as (55) by the application of this process:



In (56) passivization applies within the small clause. The verb *e* does not assign Case to its object NP₂ and the subject *Mary* is adjoined to VP. This allows *the book* to move to NP₁ position, which is a Case and $\bar{\theta}$ position. *Mary* can be assigned Case by *to*. This derives the dative construction *gave a book to Mary*. Notice that *a book* in this structure, after movement to NP₁ position, asymmetrically c-commands *to Mary*, capturing the facts in (45)–(50).



This analysis does not seem to be semantically plausible because Mary does not give the book but instead is the recipient of the book. Moreover, it requires the trace e of the verb after Raising to have different Case-assignment properties than its antecedent. That is, when its antecedent give is passivized as in (57), the trace still must assign Case to the NP a book.

The structures (55)-(56) also derive the well-known contrast between the passivizability of the two objects in double object constructions (see, for example, Stowell (1981)). Only the indirect object and not the direct object can be passivized:

- (57) a. Mary was given a book.
 - b. ??A book was given Mary.
 - c. A book was given to Mary.

We first consider double object constructions, as in (55). When the verb give is passivized in the passive structure, Mary in NP₁ position cannot receive Case. It must move to Spec of I' position to satisfy the Case Filter. A book in NP₂ position still satisfies the Case Filter because the empty verb is not passivized and still assigns Case. This derives (57a). Notice that a book in this structure cannot be raised to the Spec of I'; if it were, NP₁ Mary would remain Caseless. (57b) thus cannot be derived.

The dative structure in (56), the passive counterpart of double object constructions, cannot derive the unacceptable sentence (57b), either. Recall that *a book* is raised to NP₁ position and receives Case from the verb *gave*. When the verb *gave* itself is passivized, *a book* must move to Spec of I' position to receive Case. This generates sentence (57c), which is represented in (58):



Notice that to Mary in (56) cannot be raised to the Spec of I'; if it is, a book will be Caseless. The unacceptable sentence (57b) will not be generated.

In brief, the structures in (55) and (56) are semantically and syntactically desirable. Semantically, the possession relation is captured by a predication relation between the complements. Syntactically, the asymmetric c-command relation between the complements is captured and the contrast between the passivizability of the complements is accounted for.

With the structures of dative and double object constructions established, we proceed to the analysis of the interaction of QPs in these structures.

5.3.2. Analysis. As noted earlier, various speakers interpret a double object structure containing QPs, like (59), as unambiguous:

(59) Mary gave someone every book.

(59) will have the S-Structure representation (60):



In (60) someone adjoins to VP_1 . Every book adjoins to VP_2 and cannot adjoin to a higher position; otherwise, the MBR would be violated. This derives only the interpretation where the QP someone has wide scope. (59) is therefore unambiguous.

On the other hand, we predict dative constructions to be ambiguous (see the discussion in section 3), a prediction that is empirically borne out.²³ The ambiguity arises because a sentence like (61) will have the S-Structure representation (62):

 23 Although there has been no disagreement concerning the nonambiguity of the double object structures containing QPs in Chinese (see Huang (1981), Huang (1982), Lee (1986)), an *LI* reviewer points out that double object constructions in English may be ambiguous, as in the following sentences:

- (i) a. The committee gave some student every book in the library.
 - b. Mary showed some bureaucrat every document she had.
 - c. John asked two students every question.

Numerous native speakers of English consulted indicate that (ia) and (ic) are not ambiguous. Some of them, however, find (ib) to be ambiguous. The contrast between the possibility and the impossibility of interpreting the double object structures in English as ambiguous in fact may be accommodated by our approach. This is so because of the proposal that Subject Raising is possible in English but not in Chinese and because of the proposed structure for the double object construction that involves a small clause. In this respect, one LI

(61) Mary gave some book to everyone.



In (62) some book adjoins to VP_1 and everyone adjoins to VP_2 . The raised everyone then c-commands the trace generated by NP Movement of some book and is c-commanded by the raised QP some book.

The same analysis can readily be extended to the Chinese counterparts of these English sentences, since double object constructions containing QPs are unambiguous (see Huang (1981), Huang (1982), Lee (1986)) and dative constructions are ambiguous in this language:

- (63) Wo song sange ren meiben shu. (unambiguous)I give three men every book
 - a give three men every book
 - 'I gave three men every book.'
- (64) Wo song sanben shu gei meigeren. (ambiguous)I give three books to everyone'I gave three books to everyone.'

(ii) I consider someone responsible for every error.

reviewer suggests attributing the ambiguity of sentences in (i) to the possibility of Subject Raising in the small clause structure. The question then is why there are variations among speakers and among different types of verbs. In the absence of a better account for such variations, we can only speculate that some speakers allow the verbs in double object structures to select a fuller clausal structure in the sense that there are two Spec positions (Spec of V' and Spec of VP). See Kitagawa (1985) for a discussion of fuller small clauses. For these speakers, the sentences in (i) will be ambiguous. On the other hand, some speakers allow verbs in double object only a small clause structure that does not have an extra Spec position for the subject NP to move into. For these speakers, the sentences in (i) will not be ambiguous. Finally, for some speakers, a fuller clausal structure is selected only for certain verbs such as *show*. For these speakers, sentence (ib), but not (ia) and (ic), will be ambiguous.

We should also point out that sentence (ii) is ambiguous in English for all the speakers consulted. This suggests a full clausal structure with Raising for (ii):

The null hypothesis is to assume that the Chinese double object and dative constructions essentially have the same structures as (59) and (61) in English. The interpretation of (63) and (64) is captured by an analysis identical to the one given in English.²⁴

6. Conclusion

The analysis we have presented has three main features:

- (i) The Minimal Binding Requirement (12), which requires traces to be bound by the most local potential antecedent
- (ii) The Scope Principle (20), which states that the determination of the relative scope of QPs is sensitive to the chain in which they occur
- (iii) A structural difference between the basic constituent structures of English and Chinese

It accounts for the following facts:

- (i) The lack of ambiguity of active sentences in Chinese (1a-b)
- (ii) The ambiguity of passive sentences in Chinese (4a-b)
- (iii) The contrast between the ambiguity of active sentences in English and the nonambiguity of their Chinese counterparts ((1a-b) versus (2))
- (iv) The contrast between the ambiguity of English sentences in *seem*-type contexts and the nonambiguity of their Chinese counterparts ((19) versus (39))
- (v) The nonambiguity of double object constructions and the ambiguity of dative constructions

We have restricted our discussion to one type of variable: those bound by QPs such as *every* and *some* or numeral quantifiers such as *one* and *three*. We have not discussed variables bound by *wh*-operators. A priori, the behavior of variables bound by *wh*operators does not seem to be sensitive to the MBR:

(65) a. ?What_j did you wonder who_i to talk to x_i about x_j? (from Pesetsky (1982))
b. What_j did everyone_i x_i buy x_j? (from May (1985))

In (65a–b) the variable x_j does not seem to be bound by the first available Å-binder. We discuss facts like these in Aoun and Li (forthcoming) (including further applications of the Scope Principle, such as its application to *wh*-operators). There, following Chomsky (1981), we assume, first, that variables coindexed with *wh*-operators are namelike expres-

²⁴ The cases of [V NP PP] discussed so far involved double object constructions where the NP c-commands the PP. However, there exist other cases where the NP does not c-command the PP:

(i) John did everything for someone.

The various tests discussed in (45)–(50) would indicate that *everything* does not c-command *someone* in (i). In (i) *something* necessarily has scope over *everyone*. This interpretation is generated by adjoining *someone* to VP_1 and *everything* to VP_2 in the following structure of (i):

(ii) [John $[VP_1[VP_2]$ did everything] for someone]]

Other cases of [V NP PP] are discussed in Aoun and Li (forthcoming).

sions that are subject to Principle C of the binding theory. Second, following Aoun and Hornstein (1985), we assume that variables coindexed with standard QPs are not subject to Principle C. Third, we define *potential binder* as follows:

(66) A qualifies as a potential Å-binder for B iff A c-commands B, A is in an Åposition, and coindexing of (A,B) would not violate any grammatical principle.

With this in mind, consider representations (65a–b). In (65a) x_i c-commands x_j , as argued in Pesetsky (1982). The *wh*-operator *who* in (65a) does not qualify as a possible \bar{A} -binder for x_j . Indeed, coindexing of *who* with x_j would trigger a Principle C violation. x_j would end up being A-bound by x_i . In (65b) x_i c-commands x_j . In this representation the QP *everyone* does not qualify as a possible \bar{A} -binder for x_j either, because x_j would end up being A-bound by x_i in case *everyone* and x_j were coindexed. In brief, the most local \bar{A} -binder for x_j in (65a–b) is *what*. The MBR is not violated in these representations.

As a final remark, we would like to briefly discuss the status of the MBR. So far, we have not related this requirement to other principles in the grammar. There are obvious candidates. Chomsky (1986a) proposes, as part of the ECP, a minimality requirement constraining extraction. This requirement essentially blocks government of A by B in case a closer governor @ intervenes between A and B. Rizzi (1987) argues that the characterization of the intervening @ must be relativized as follows: the @ that blocks government of A by B must be of the same categorial nature as A and B. For instance, a @ that is an X⁰ category will block government of A by B if and only if A and B are X⁰ categories. A @ that is an XP category will block government of A by B if and only if A and B are XP categories. Our MBR and Rizzi's minimality appear very similar. One might raise the possibility of deriving our MBR from the ECP as formulated by Rizzi. Essentially, our MBR will be an instance where antecedent government of a variable x by a QP will be blocked by another intervening QP.

On the other hand, in the spirit of Chomsky (1986b), one might try to relate the MBR to a general requirement constraining the binding module: one might devise an analysis of anaphors according to which an anaphor must be bound by the first available antecedent. In the same vein, we argue in Aoun and Li (1988) that natural languages exhibit disjointness effects that are sensitive to some kind of minimality. Roughly, these effects can be formulated as follows: A must be free with respect to its first potential binder. In case this disjointness requirement proves to be sustainable, we would have an instance of minimality that cannot be subsumed under a constraint on gaps generated by extraction such as the ECP. It is also well known since the work of Rosenbaum (1967) that control theory incorporates a minimal distance principle (see Chomsky (1980)). To the extent that government theory, binding theory, and control theory are separate theories, the existence of very similar minimality requirements in these theories supports the view originally advocated by Koster (1978), according to which the same locality effects are pervasive throughout the grammatical modules.

To conclude: A commonly held view among linguists considers that the LF interpretive component is not the locus of language variation since the language learner does not have direct access to this component. The results reached in this work reinforce this view. Indeed, we have shown that instances of language variation affecting QPs are due to a difference in the constituent structure of the languages under discussion rather than a parametric difference affecting the form or functioning of LF interpretive rules. We argued that purely interpretive principles such as the Minimal Binding Requirement and the Scope Principle are common to Chinese and English. Our approach argues that constituent structures directly affect LF interpretive rules. To the extent that this approach adequately accounts for the different behavior of quantificational elements in Chinese and English, it seems possible to claim that the study of interpretive rules provides a window into the constituent structures of natural languages. This constitutes, we hope, one of the main results of this work.

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