

## DISTRIBUTIVITY IN CHINESE RECIPROCAL CONSTRUCTIONS\*

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### 1.0 INTRODUCTION

Two hypotheses regarding the nature of distributivity have been proposed in the literature: the “intrinsic” hypothesis (Heim, Lasnik, and May 1991a, b; hereafter, HLM) and the “relational” hypothesis (Williams 1991). The evidence supporting the first hypothesis comes from the problems of ambiguity known as the “grain puzzle” and “scope puzzle” in English reciprocal sentences. HLM (1991a, b) attribute these problems to the insufficient LF representation of plural NPs. In particular, the problem is that plural NPs have identical LF representations to singular NPs: both of them bear only one index. To solve these problems, they propose that plural NPs intrinsically contain a D(istributor) at LF (i.e. [<sub>NP</sub> NP D]). If D is filled by an overt distributor, the plural NP is interpreted as distributive. Otherwise, it is ambiguous between a distributive and a collective interpretation. In the case of reciprocal sentences, the D is filled by *each* (in *each other*) which contributes the distributive index to the dominating NP (i.e. the NP that dominates both the original NP and D). Therefore, a plural antecedent in reciprocal sentences is always interpreted distributively. Williams (1991), on the other hand, citing data from various kinds of reciprocal constructions, argues against this position. He shows, for example, that a plural NP subject can be interpreted both collectively and distributively with respect to different predicates in a coordinate sentence (e.g. “They collided and criticized each other’s driving.”). If distributivity is a property of an NP itself, this phenomenon of multiple interpretations for a single NP is unexplained. Distributivity, therefore, is not an intrinsic feature of a plural NP, but “a property of the relation an NP bears to something else” (Williams 1991:163). The issues here are: (i) how to characterize distributivity in general; and (ii) how to obtain the obligatory distributive interpretation for a plural subject of reciprocal sentences in particular.

This paper presents data from Chinese, showing that distributivity in Chinese reciprocal sentences cannot be obtained from either of these two theories. This is because the reciprocalized argument may be lexically empty. I shall propose an analysis that integrates the insights from both hypotheses. In the spirit of HLM (1991a), I claim that distributivity in general is a property of plurals that are derived by Quantifier Raising (QR), following the assumption that QR applies to all NPs (Clark 1992; Abe 1993). Precisely, I assume that QR has two functions: (i) to adjoin a NP to IP, leaving a variable in the original place; (ii) to substitute the NP with a power set containing all individual and subset members (Sauerland 1994). This power set provides exhaustive interpretations and serves as a range for a variable to pick its value from. As a result, three interpretations are available for a plural NP after QR: (i) the distributive reading; (ii) the subgroup reading; and (iii) the collective reading. The effect of excluding/enforcing a particular interpretation lies in the interaction of various factors, presumably, a relation between a predicate and its plural subject following Williams (1991). As for the second issue, I claim that reciprocal elements in both English and Chinese impose a symmetrical relation on a predicate. The obligatory distributive interpretation of the plural subject in reciprocal sentences simply results from the interaction of two assumptions: (i) the reciprocalized argument contains a bound variable (such as *each other* in English and the null argument in Chinese); (ii) the binding condition C applies at LF.

The organization of this paper is as follows. Section 2 explores distributivity in Chinese reciprocal sentences, showing that the problems of ambiguity, known as the “grain puzzle” and the “scope puzzle” in English, are also present in Chinese, even though reciprocals in Chinese differ from those in English in various aspects. Section 3 provides an analysis that incorporates the insight from the previous studies and attempts to account for these puzzles in both languages. The concluding remarks are given in Section 4.

## 2.0 RECIPROCAL IN CHINESE

Reciprocity in Chinese is marked by the word *huxiang* 'mutually'. Traditional analyses treat *huxiang* as an adverb as it occurs preverbally. Its distributional properties are illustrated in (1):

- (1) a. women yinggai *huxiang* guanxin, *huxiang* aihu, *huxiang* bangzhu.  
we should *mutually* care, *mutually* love, *mutually* help.  
We should care about each other, love each other, and help each other.
- b. \* women *huxiang* yinggai guanxin  
we *mutually* should care
- c. \* women yinggai guanxin *huxiang*,  
we should care *mutually*
- d. \* *huxiang* women yinggai guanxin  
*mutually* we should care

(1a) shows that *huxiang* occurs between the modal "yinggai" ('should') and the verb "guanxin" ('care'). The three conjunction VPs "*huxiang* guanxin", "*huxiang* aihu", and "*huxiang* bangzhu" share the same modal "yinggai" ('should'). This suggests that *huxiang* forms a constituent with a VP, and therefore is part of VP. If we put *huxiang* in front of the modal "yinggai", as in (1b), or after the verb "guanxin", as in (1c), or in front of the subject "women" ('we'), as in (1d), ungrammaticality results. This restriction on the distribution of reciprocal *huxiang* to the preverbal position, as well as the impossibility of preposing it to the front of the entire sentence, confirms that *huxiang* is a VP-adverb, assuming that there are two types of adverbs in Chinese: S-adverbs (capable of moving to the beginning of the entire sentence) and VP-adverbs (nonmovable) (Li and Thompson 1981; Cheng 1993). Comparing Chinese *huxiang* with English *each other*, it is clear that reciprocal elements vary from language to language in their syntactic categories and distributional properties.

## 2.1 The Null Reciprocalized Argument

An important property of reciprocal constructions in Chinese is that they allow a null argument in the object position, as shown in (2a). The very same sentence allows an overt object if there is no reciprocal *huxiang*, as in (2b). Moreover, if there is an overt object referring to someone other than the individuals contained in the subject NP, as in (2c), the sentence is ungrammatical.

- (2) a. Zhangsan he Lisi *huxiang* zhize *e*  
Zhangsan and Lisi *mutually* criticize *e*  
Zhangsan and Lisi have criticized each other.
- b. Zhangsan he Lisi zhize Wangwu.  
Zhangsan and Lisi criticize Wangwu  
Zhangsan and Lisi have criticized Wangwu.
- c.\* Zhangsan he Lisi *huxiang* zhize Wangwu.  
Zhangsan and Lisi *mutually* criticize Wangwu.

The lack of an overt object in (2a) cannot be attributed to intransitivity of the verb. (3) demonstrates that omission of the object argument without the reciprocal *huxiang* gives rise to ungrammaticality. In addition to the possibility of a null argument, it is also possible for the reciprocalized argument to be the pronoun *duifang* ('other'). This is illustrated in (4) where the pronoun *duifang* is optional.

- (3)\* Zhangsan he Lisi zhize  
Zhangsan and Lisi criticize

- (4) Taliang      *huxiang*    chuipeng (duifang)  
 both of them mutually please    (other)  
 They please each other.

Comparing the object pronoun in (4) with the object NP in (2c) shows that the reciprocalized argument cannot be a definite NP. It can only be either null or pronominal. That is, the elements in this position must have no referential content. In a double object construction (5), the reciprocalized argument can be either null or the pronoun *duifang* 'other'. In the case of 3-place predicates, such as "introduce" in (6), one of the internal arguments may be reciprocalized, and therefore, may be null.

- (5) Women    *huxiang*    song    le    (duifang)    yifen    liwu.  
 we          mutually give    ASP (other)    one          gift  
 We gave each other a gift.
- (6) Wo    gei    taliang    *huxiang*    jieshao    le    *e*    yixia.  
 I      to    them    mutually introduce    ASP *e*    once  
 I introduced (each other) to them.

What we have shown so far is that the reciprocalized argument in Chinese can be either the pronoun *duifang* or lexically empty. The null argument in the object position is by no means a property of reciprocity, but a characteristic known as pro-drop in Chinese<sup>1</sup>.

If the reciprocalized argument can be empty, the question then is how can this null argument get interpreted for its referential content? In other words, there are two questions with respect to the null argument. First, what is its referential content? Second, to which empty category does it belong? The possible referential indices on the null object in (2a) are given in (7) below:

- (7) [[Zhangsan]<sub>1</sub> he [NP Lisi]<sub>2</sub> ]<sub>3</sub> *x*    *huxiang*    zhize    *e*<sub>1/2\*3\*4</sub>  
 Zhangsan and Lisi          *x*    mutually criticize    *e*<sub>1/2\*3\*4</sub>  
 Zhangsan and Lisi have criticized each other.

(7) shows that: (i) the null object can only refer to either *Zhangsan* or *Lisi*, but not both; (ii) the null object cannot refer to any individual other than *Zhangsan* or *Lisi*; (iii) if the subject variable *x* picks the index 1, the null object *e* can only pick the index 2 and vice visa. In other words, the null object in reciprocal sentences is both anaphoric and non-anaphoric in the sense that it has to refer to an individual contained in the subject NP. In addition it is disjoint in reference from the subject. This suggests that the dual nature of being both anaphoric and referring identified for the reciprocal pronoun *each other* in English by HLM (1991a) cannot be treated as a property of a certain syntactic constituent in English alone, since the null object in Chinese exhibits the same properties. As for the identification of the category this null argument belongs to, there are four types of empty categories according to the standard feature theory of NPs:

- (8)            NP-trace      [+anaphor, -pron]            PRO      [+anaphor, +pron]  
                  WH-trace      [-anaphor, -pron]            pro      [-anaphor, +pron]

The null argument in reciprocal sentences cannot be an anaphor since it cannot be A-bound by the entire NP *Zhangsan and Lisi*; it cannot be a PRO either since the object is a governed position and PRO theorem requires that PRO must be ungoverned. The remaining options are either pro or variable. If the null argument were a pro, it should be possible for this null argument to pick its reference from the discourse. However, (7) shows that it must refer to the individual contained in the subject NP. Now the only choice left is a variable. If the null argument is a variable, it has to be A-free according to Condition C. This gives the disjoint reading requirement. Meanwhile, this variable can also be A'-bound by the quantified NP to get the bound reading requirement<sup>2</sup>, a desirable result.

## 2.2 The Ambiguity Puzzles

Chinese reciprocal constructions, as with their English counterparts, exhibit the “grain” and “scope” ambiguities. This is illustrated in (9) – (12) below.

- (9) Zhangsan he Lisi huxiang tixing (duifang) tamen gai huijia le.  
 Zhangsan and Lisi mutually remind (other) they should go home ASP  
 Zhangsan and Lisi remind each other (that) they should go home.
- (10) a. Zhangsan<sub>1</sub> reminds Lisi<sub>2</sub> and Lisi reminds Zhangsan that *they*<sub>1+2</sub> should go home.  
 b. Zhangsan<sub>1</sub> reminds Lisi<sub>2</sub> that *he*<sub>2</sub> should go home and Lisi<sub>2</sub> reminds Zhangsan<sub>1</sub> that *he*<sub>1</sub> should go home.

As with the pronoun *they* in “John and Mary told each other that *they* should leave”, the embedded subject pronoun *tamen* ‘they’ in (9) has two interpretations: the collective reading in (10a) and the distributive reading in (10b). The embedded subject pronoun *taliang* ‘they’ in (11), like the pronoun *they* in “John and Mary think *they* like each other”, also has two interpretations, given in (12):

- (11) Zhangsan he Lisi renwei taliang huxiang xihuan (duifang).  
 Zhangsan and Lisi think they both mutually like other  
 Zhangsan and Lisi think they like each other.
- (12) a. Zhangsan and Lisi think they like each other.  
 b. Zhangsan<sub>1</sub> thinks *he*<sub>1</sub> likes Lisi and Lisi<sub>2</sub> thinks *he*<sub>2</sub> likes Zhangsan.

The problem here is that the distributed interpretation in Chinese reciprocals cannot be obtained from either the intrinsic hypothesis or the relational hypothesis. First, under HLM’s (1991a, b) theory, distributivity is marked on a plural NP by filling the D position with an overt distributor. Unlike the English reciprocal *each other*, the reciprocalized argument in Chinese is either null or the monomorphemic pronoun *duifang* ‘other’. Nothing can be moved to fill the D (distributor) position in the subject NP. Second, under Williams’ (1991) theory, distributivity is derived by linking a plural to a singular. However, we do not know whether the null argument or the pronoun “*duifang*” in the object position is singular or plural until it is linked to its antecedent. In other words, if it is bound by a plural antecedent, it gets a plural interpretation. If, on the other hand, it is bound by a singular antecedent, it acquires a singular reading. In the above examples, we know the their antecedents are grammatically plural, namely, *Zhangsan and Lisi*, therefore, the null argument or the pronoun *duifang* can only get a group interpretation but not a distributive reading. The current theories on distributivity, therefore, are insufficient to derive the distributive interpretation for Chinese reciprocal sentences. Our solution for this is provided in the next section.

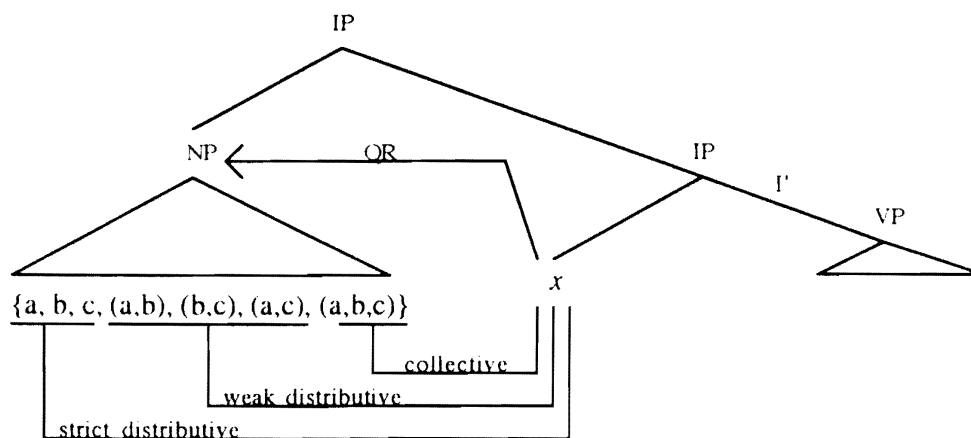
## 3.0 THE NATURE OF DISTRIBUTIVITY

The questions raised in the debate between the two hypotheses are: (i) how to characterize the distributivity for plural NPs in general; (ii) how to ensure the obligatory distributivity in reciprocal sentences in particular. In this section, I address these two questions and propose an analysis. Following HLM (1991a, b), I treat distributivity as a LF feature that is derived by QR for all plural NPs, assuming that QR applies to all NPs (Abe 1993). Abe argues that all NPs can be treated as quantificational and can undergo Quantifier Raising at LF, leaving a trace in the original place. The traces left by QR are interpreted as variables bound by their antecedents. Assuming that Abe is right, what we need to do is to make explicit exactly what QR does. I assume that QR is a process that does two things: (i) It adjoins a NP to IP, leaving a variable in the original place. (ii) It substitutes the NP with a power set containing all individual and subset members (Sauerland 1994). The whole idea that QR substitutes a plural NP with an antecedent set which contains individuals and subsets is simply a spelling out of Williams’ implicit idea that “a plural variable is a variable that ranges over plural entities subsets of some domain” (1991:162). For example, if a NP contains “John and Mary”, then QR turns it into a power set {John, Mary, (John, Mary)}<sup>3</sup>, shown in (13) below:

- (13) LF representation for a plural NP  
 [IP [NP(John, Mary, (John, Mary))] [IP ... x... ]]

If the variable takes {John} or {Mary} as its value, it gets the distributive interpretation. If, on the other hand, it takes the subset {(John, Mary)} as its value, it gets the collective (or “group” in Williams’ term) interpretation. A singular NP, however, can only have a singular interpretation since the power set created by QR for a singular NP has only one value, that is, the single individual contained in the original NP. Furthermore, if a plural NP contains more than two individuals, say three here, the antecedent set created by QR could contain all individual members and subsets like {a, b, c, (a, b), (a, c), (b, c), (a, b, c)}. This can be represented graphically in (14) below:

- (14) LF representation for an NP with three individuals



(14) shows that a plural NP is potentially 3-way ambiguous: (i) the first three members in the antecedent set will give the variable a strict distributive interpretation; (ii) the middle three subsets will give the variable a weak distributive interpretation, and (iii) the last subset will give it a collective interpretation. This is similar to the intrinsic hypothesis in that distributive interpretation is available for all plural NPs at LF. But our proposal differs from HLM's in two aspects. First, there is no D(istributor) at LF needed in our proposal. The distributive interpretation is solely derived by QR for plural NPs. Second, our solution offers 3-way ambiguity (strict distributivity, weak distributivity and nondistributivity or collective reading), which is exactly what we need in reciprocal sentences (I address this issue below), whereas HLM's theory offers only two-way ambiguity: distributed or none. Also, our proposal, compared with HLM's, is simple with no covert D(istributor) stipulated. The only assumption we need is that QR applies to all NPs which is independently motivated (see Abe 1993 for detailed arguments).

If all plural NPs are potentially 3-way ambiguous with respect to the distributivity, as we proposed above, why is it that a plural subject in reciprocal sentences must not be interpreted collectively, as observed in previous studies (Higginbotham 1980, 1985; Farmer 1987; HLM 1991a, b, Williams 1991, Moltmann 1992, Dalrymple, Mchombo and Peters 1994)? In other words, how can the collective interpretation for plurals in our system be excluded in reciprocal sentences? Following the spirit of Williams (1991) that distributivity has no necessary connection with reciprocals, I propose that distributivity and reciprocity are obtained by different processes: the former is the result of QR for plural NPs, while the latter is the result of predicate-marking by a reciprocal element. The distributive interpretation of a plural NP in reciprocal sentences is seen as a consequence of a conspiracy among several factors, such as QR, the binding condition C, as well as reciprocalization of a predicate.

Before we show how to obtain the obligatory distributive interpretation in reciprocal sentences, four assumptions must be made explicit. First, I assume that the binding condition C applies at LF. Second, I assume that the reciprocal element (such as *each other* in English and *huxiang* in Chinese) imposes a symmetric condition on a predicate. This process can be called “reciprocalization”. Third, the reciprocalized argument (which is filled by *each other* in English and

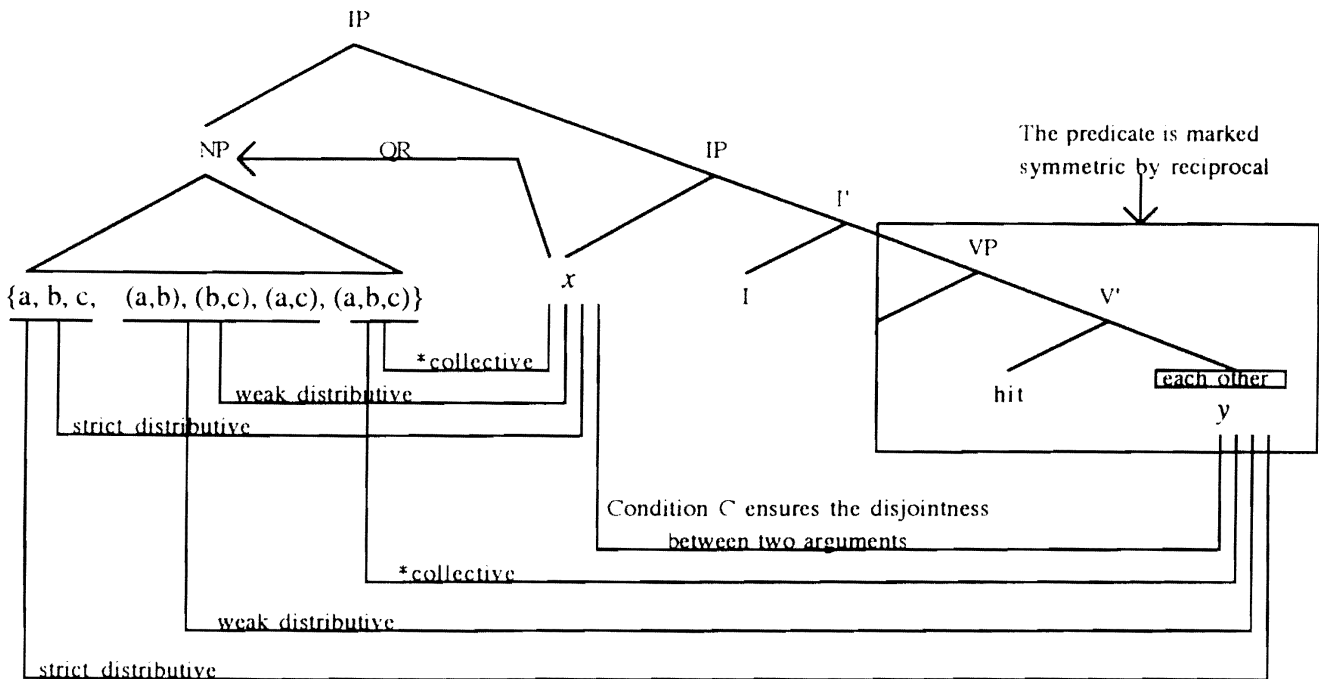
*duifang* or null in Chinese), must be interpreted as a bound variable. Fourth, I will follow Heim (1982) and Diesing (1992) in assuming that there is an obligatory process of existential closure that binds any NPs inside its scope<sup>4</sup>. Thus, reciprocity can be stated as in (15) below:

- (15) Logical formulation of reciprocity  
 $xy (x, y P) xy (xRy yRx)$

The formulation in (15) is read as “there is an *x* and there is a *y*, both *x* and *y* belong to the same power set *P*, such that *x* has a relation with *y*, and *y* has the same relation with *x*”. The multiple lambda abstraction entails a symmetric relation for a reciprocal predication. To illustrate how these assumptions interact to derive the distributive interpretation for the plural subject in reciprocal sentences, consider the simple example in (16). The LF representation is given in (17) for the case where the plural subject in (16) consists of three individuals.

- (16) They hit *each other*.

- (17) LF representation for (16)



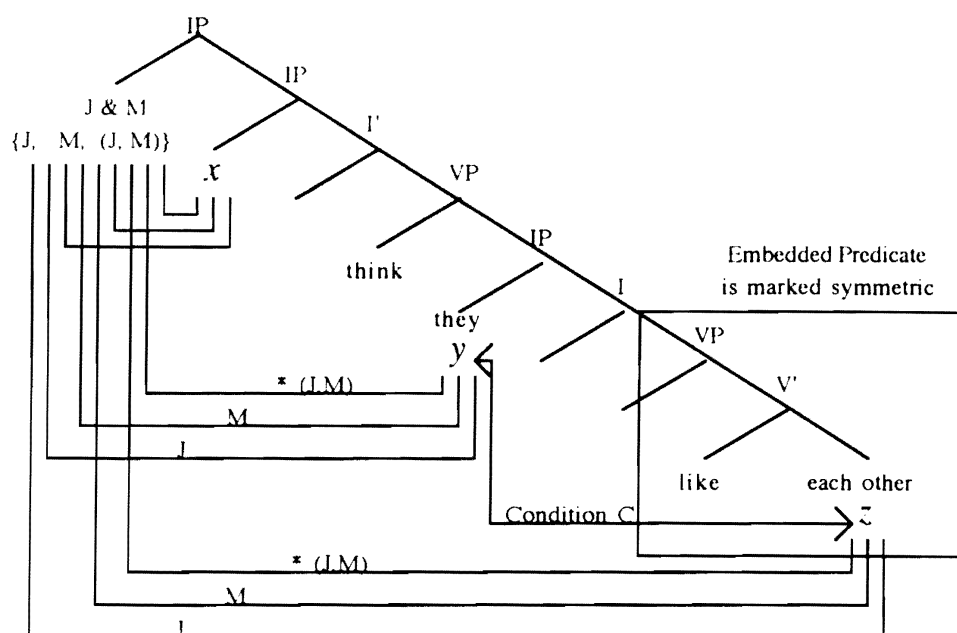
In (17), first, QR raises the subject NP to IP and turns it into a power set. This set contains seven members: three of which are individual elements, and the rest are subset members. This means that all three interpretations (the collective, weak distributive, and strict distributive) are potential values for the variables to pick up. Second, there are two variables in this sentence. The one in subject position (i.e. *x*) is derived by QR, while the one in the object position (i.e. *y*) is originally a reciprocal pronoun which is interpreted as a bound variable. Both variables must be bound by the same antecedent power set, the one created by QR. Third, the two variables must pick up different values at any one time: if *x* picks up *a* as its value, *y* must pick up any value other than *a*. Otherwise, a condition C violation results. Moreover, Condition C will rule out the last subset as a possible value for the variables since no matter which variable picks it as its value, Condition C would be violated. Hence, the collective reading is eliminated, and only the distributive readings (either strict or weak or both) can be obtained.

It is important to note that the analysis presented here provides a set of exhaustive interpretations for a plural NP. This does not seem restrictive enough for certain cases of reciprocal

sentences where reciprocity sometimes involves partition, namely, a plural NP is divided into subgroups and the symmetric relation of a reciprocal predicate holds between subgroups rather than individuals<sup>5</sup>. In our proposal, the partition or subgroup reading is one of the possible interpretations for any plural NP, but not a unique one just for a particular reciprocal sentence. This gives a reflexivity for a plural NP in a reciprocal sentence to be interpreted either as weak (subgroup) distributive or strict distributive. Sentence (16) (“they hit each other”), for example, “describes a general melee, it is compatible with a situation in which there were some nonhitters” (Williams 1991:162). Also, it is compatible with a situation in which everyone is a hitter. Our analysis, thus, provides all possible interpretations, but is not capable of determining an absolute interpretation for each particular reciprocal sentence. Now let us look at the complex example where the so called “scope puzzle” is involved. The sentence in (18) has the LF representation in (19):

- (18) John and Mary think they like *each other*.  
 a. John thinks John likes Mary and Mary thinks Mary likes John.  
 b. John and Mary think that John likes Mary and Mary likes John.

(19) LF representation of (18)



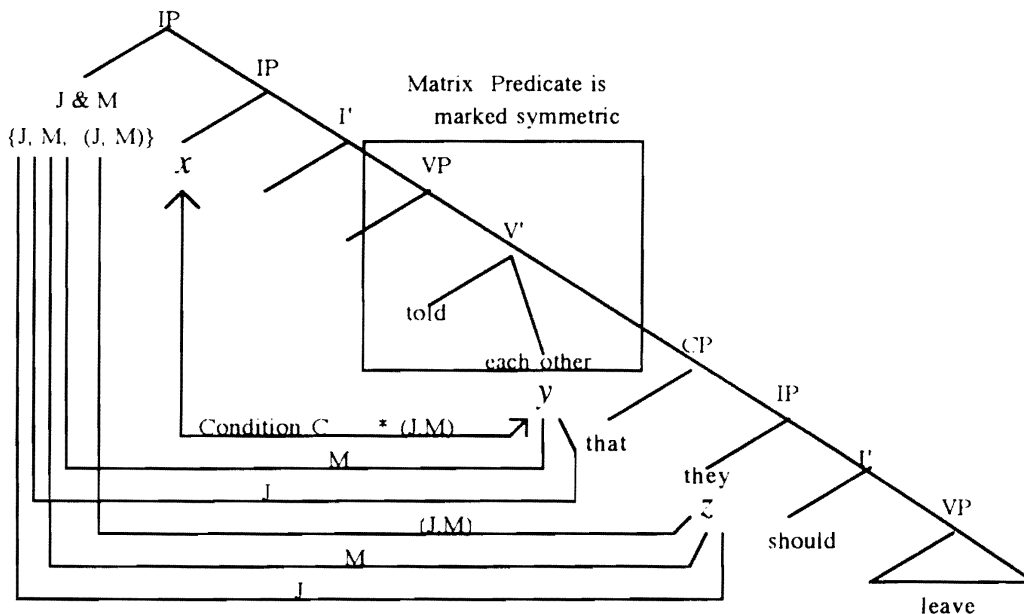
There are three variables in (19). The variable in the matrix subject position (i.e.  $x$ ) can pick up any value from the antecedent power set and, therefore, can be interpreted as either distributive or collective. The embedded subject pronoun and the reciprocal pronoun are both interpreted as bound variables. Since the symmetric relation is only marked on the embedded predicate by the reciprocal pronoun *each other* in the embedded clause, the two variables in the embedded clause cannot pick up the same value from the antecedent set at the same time. In other words, if  $y$  picks *John* as its value,  $z$  can only pick up *Mary*, or vice versa. Furthermore, Condition C rules out the collective interpretation for both variables in the embedded clause, since it would result in a violation of Condition C. The “scope” ambiguity, which is attributed to the scope of *each*, is now accounted for without scope assignment needed. In our account, the ambiguity in (19) arises from different values the matrix subject variable picks from the antecedent set, and has nothing to do with the reciprocal pronoun *each other*. It is predicted that any sentence with a similar structure without the reciprocal *each other* would have the same ambiguity problem (Williams 1991).

Having demonstrated how the “scope puzzle” can be solved without positing a D(istributor), we now turn to the “grain puzzle”. The ambiguity of the “grain puzzle” differs from that of the “scope puzzle” in that the symmetric relation is marked on the matrix predicate rather than marked on the embedded predicate. In particular, the reciprocal pronoun *each other* occurs as the object of the

matrix clause in (20), while it appears as the object of an embedded clause in (18). The sentence in (20) has a LF representation, shown as in (21).

- (20) John and Mary told *each other* that they should leave.  
 a. John told Mary that *he* should leave and Mary told John that *she* should leave.  
 b. John told Mary and Mary told John that *they both* should leave.

(21) LF representation of (20)

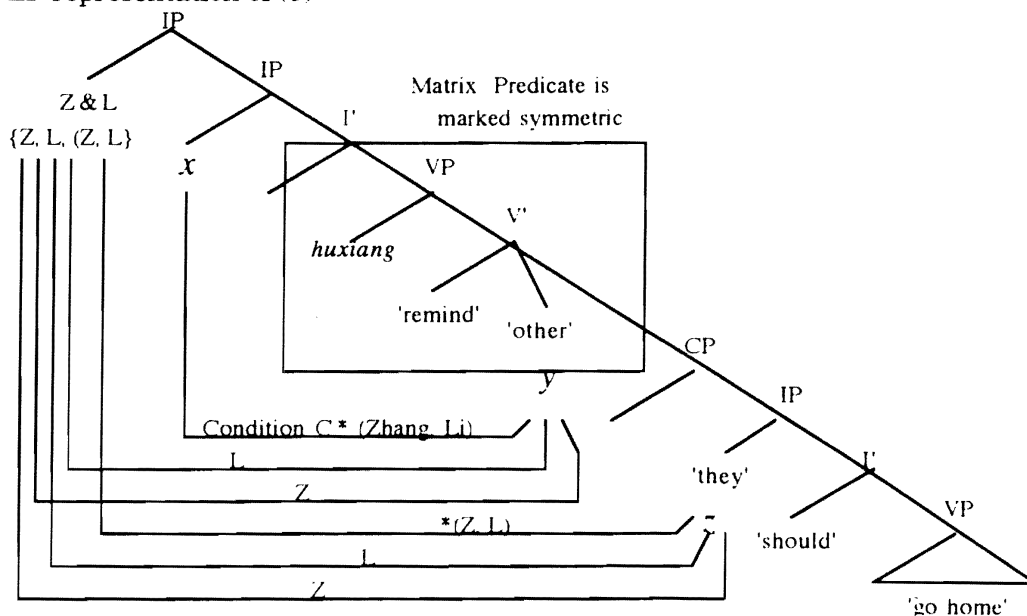


There are three variables in (21). The two variables  $x$  and  $y$  in the matrix clause cannot be bound by the subset member in the antecedent set, since symmetric relation is imposed on the matrix predicate and Condition C rules out the collective interpretation for both  $x$  and  $y$ . Also, Condition C prevents both  $x$  and  $y$  from being bound by the same member from the antecedent set at the same time, since that would violate Condition C as well. The only choice is that  $x$  and  $y$  pick different members as their values each time. If  $x$  picks *John*,  $y$  picks *Mary*, or vice versa. Hence, the two variables in the matrix clause can only get the distributive readings. The embedded subject pronoun (which is interpreted as a bound variable here), on the other hand, can freely choose any member in the antecedent set as its value since Condition C is not imposed on the embedded predicate. Hence, the "grain puzzle" is solved without invoking a D(istributor). Notice that our solution for both puzzles reveals Williams's insight that different variables have different relations with the same antecedent. The difference between our account and Williams' is that we treat distributivity as a LF feature for all plurals, while Williams defines it case by case.

Our analysis has so far worked for reciprocal sentences in English. Now we turn to Chinese cases where the reciprocalized argument may be either a pronoun or null. The sentences (9) and (11) have LF representations in (22) and (23), respectively.

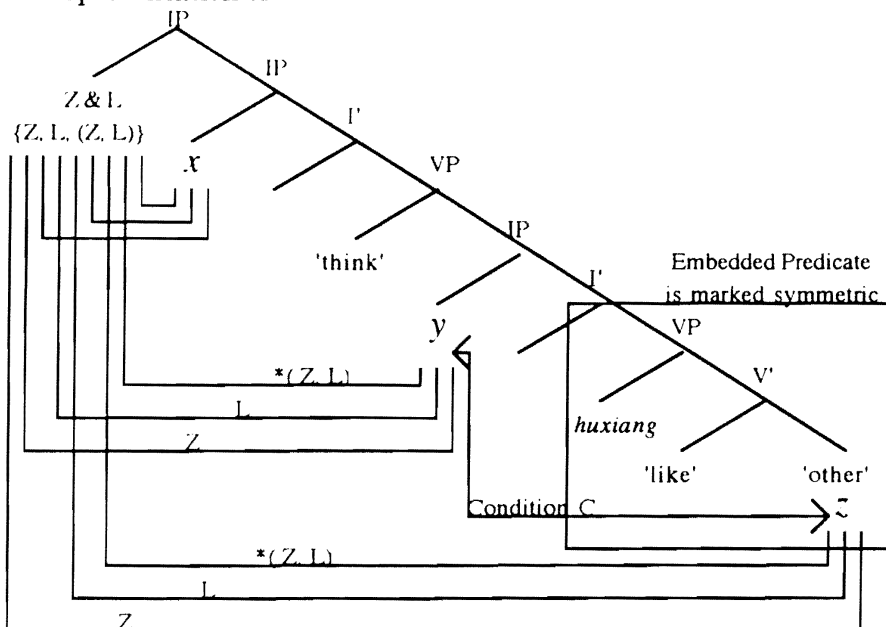


(22) LF representation of (9)



As with its English counterpart, (22) contains three variables: the variable in the matrix subject created by QR ( $x$ ), the null argument or the optional pronoun in the matrix object ( $y$ ), and the pronoun in the embedded subject ( $z$ ). The symmetric relation is marked on the matrix predicate by the reciprocal *huxiang* which appears before the verb. First, Condition C prevents both variables in the matrix clause from picking the subset member as their values, since no matter which variable in the main clause is bound by the subset member, Condition C would be violated. Second, Condition C ensures the disjointness between the two arguments, so that the variable  $x$  and  $y$  cannot be bound by the same member from the antecedent set at the same time. Thus, the variables in the matrix clause can only have distributed interpretations. The pronoun in the embedded clause, however, can be interpreted either distributively or collectively, since there is no Condition C violation in the embedded clause. The “grain puzzle” in Chinese is solved in the same way as in English.

(23) LF representation of ( )



(23) also contains three variables: the variable in the matrix subject position, and the two variables in the embedded clause. The difference between (22) and (23) is that Condition C applies to the matrix predicate in the former, while it only applies to the embedded clause in the latter. As a result, the variable in the matrix clause can be interpreted as either distributive or collective, while the variables in the embedded clause can only have distributive readings, since the collective interpretation is ruled out by Condition C. Also, Condition C only allows  $y$  and  $z$  to be bound by different members in the antecedent set each time: if  $y$  picks Zhangsan as its value,  $z$  must pick Lisi, and vice versa.

#### 4.0 CONCLUDING REMARKS

I have shown that reciprocal sentences in Chinese exhibit the same ambiguity puzzles as those found in English. Also, the distributivity in Chinese reciprocals can be derived neither from the intrinsic hypothesis nor from the relational hypothesis. To account for these puzzles in both languages, we treat distributivity as a general feature of plurals derived by QR. By assuming that QR applies to all NPs and that QR creates a power set, we offer 3-way interpretations for a plural NP containing more than two individuals. In assuming that Binding Condition C applies at LF, and that reciprocity involves a symmetric relation marked on a predicate, the collective interpretation that is available for all plurals is excluded for a reciprocalized predicate. The "scope puzzle" comes from the possibilities of the variable in the matrix subject being bound by either the individual members or the subset members, and the "grain puzzle" results from the variable in the embedded subject being bound either by individual members or by the subset members in the antecedent set. The problems of ambiguity that are found in both English and Chinese are thus accounted for without need to postulate a D(istributor) for plurals in general and to treat *each* in *each other* as a quantifier for reciprocal sentences in particular.

#### NOTES

- \* I am greatly indebted to Hamida Demirdache for her teaching, as well as her inspiration on this topic. Not only did the specifics emerge from many conversations with her, but the paper as a whole bears the indelible imprint of her constant input and guidance. I also wish to thank Henry Davis and Rose-Marie Déchaine for their insightful comments. All errors are my own.
- 1 We do not address pro-drop here, since it is not directly related to our topic. What is relevant here is that a null argument in an object position is allowed in Chinese, and this null argument in a reciprocal sentence is interpreted as a bound variable.
- 2 I owe this insight to Dr. Demirdache (p.c.).
- 3 I do not include the null member in the power set for the reason of eliminating vacuous quantification.
- 4 There is a difference regarding the exact scope of the existential closure between Heim (1982) and Diesing (1992). The scope of the existential closure is the nuclear scope (i.e., the VP) for Diesing, while it is the entire S for Heim.
- 5 This has been pointed out to me by Dr. Demirdache (p.c.).

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