

THE DISTRIBUTION OF CHINESE REFLEXIVES

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0. INTRODUCTION:

The distribution of reflexive pronouns has been a major concern in generative grammar. The research has long focussed on the properties of local reflexives. While much about local reflexives remains to be analyzed, the observation of long-distance (LD) reflexives in a number of languages such as Chinese has evoked new controversies in the theory of grammar.

In this paper, I discuss major properties of both local and LD reflexives in Chinese. There are two basic properties of Chinese reflexives: the simplex reflexive allows LD binding constrained by a local feature-agreement restriction, and both simplex and complex reflexives are subject oriented. Assuming that the basic constraints governing the distribution of reflexive pronouns in Chinese are not different in substance from that of English reflexives, I sketch an analysis of these properties in terms of an interaction between syntax and semantics, along the tradition of Generalized Phrase Structure Grammar (GPSG). This analysis owes much to Hukari (1989), while differing in several respects. In the context of the feature instantiation system developed in Gazdar et al. (1985), I will show that syntactic domains of reflexive pronouns including LD reflexives can be defined in terms of the interaction of feature co-occurrence restrictions (FCRs) and the reflexivization metarule. I suggest that subject-orientation is independent of the lexical property of a reflexive. The difference between Chinese and English with respect to subject-orientation vs. non-orientation may be expressed in slightly different forms of semantic interpretation. As a result, not only can various complications and assumptions be avoided, but also the difference between local and LD reflexives can be reduced to a variation of feature co-occurrence restrictions.

1. THE MAJOR PROPERTIES:[1]

Chinese has two reflexive forms: morphologically simple reflexives and morphologically complex reflexives. The former occurs with the invariant form **ziji** and the latter occurs with the form of a pronoun+**ziji**, such as **ta-ziji** 'himself/herself'. While they share certain features in common, these two forms of reflexives seem to differ in two notable aspects. First, they exhibit distinct referential properties. Complex reflexives in general require strictly local binding; simplex reflexives allow LD binding. Thus in (1a) either the embedded subject **Lisi** or the matrix subject **Zhangsan** may be the antecedent of the reflexive **ziji**, but in (1b) the complex reflexive **ta-ziji** can only be understood as referring to the embedded subject **Lisi**:

- (1) a. Zhangsan_i renwei [Lisi_j xihuan ziji_{i/j}]
 Zhangsan think Lisi like self
 'Zhangsan_i thinks that Lisi likes himself/him_i'
- b. Zhangsan_i renwei [Lisi_j xihuan ta-ziji_{*i/j}]
 Zhangsan think Lisi like himself
 'Zhangsan_i thinks that Lisi likes himself/*him_i'

The other difference between simplex reflexives and complex reflexives is that while the complex reflexives have inherent person and number features, these features of a simplex reflexive seem to depend on the context in which it occurs.

- (2) Zhangsan_i xihuan ziji_i.
 Zhangsan like self
 'Zhangsan likes himself'.
- (3) Wo_i xihuan ziji_i.
 I like self
 'I like myself.'

In the following sections, I review and summarize the major properties of Chinese reflexives with respect to both simplex and complex forms.[2]

1.1. Potential Antecedents

The antecedent of a reflexive is mainly a subject. This phenomenon is referred to as subject-orientation (see Huang 1982, Huang and Tang 1991):

- (4) Zhangsan_i song Lisi_j yizhang ziji_{i/*j} de xianpian.
 Zhangsan give Lisi one-CLA self DE picture
 'Zhangsan_i gave Lisi_j a picture of himself_{i/*j}.'

In (4), the reflexive pronoun *ziji* only refers to the subject. The same is true of complex reflexives, as shown by the sentence in (5), where the local subject must be understood as the antecedent of the reflexive *ta-ziji*. [3]

- (5) Zhangsan_i shuo [Lisi_j song gei Wangwu_k yizhang
 Zhangsan say Lisi give to Wanwu one-CLA
 ta-ziji_{*i/j/*k} de zhaopian].
 him-self DE picture
 'Zhangsan_i said Lisi_j gave Wangwu_k a picture of him_{*i}/himself_{j/*k}.'

In addition, the potential antecedent of a reflexive must be animate in nature (see Tang 1989). Thus, the antecedent of a Chinese reflexive is an animate subject NP.[4]

1.2. LD Binding and Feature Agreement

While the simplex reflexive *ziji* allows LD binding, LD binding with *ziji* is constrained by a feature agreement restriction. An NP in a higher clause can be the antecedent of a reflexive *ziji* only if the NP agrees in person and number with the local subject of the predicate containing the reflexive. In fact, the local subject may always serve as the antecedent of the *ziji* and the person and number (and gender) features of a simplex reflexive must correlate with the local subject. Furthermore, a non-local NP can be the antecedent of the reflexive only if it agrees in person and number with all the NPs that are potential antecedents intervening between the reflexive and the non-local NP. Thus, while the matrix subject **Zhangsan** can be the antecedent of the reflexive in (6), in (7) the matrix subject cannot be the antecedent of the reflexive even though it agrees in person and number with the lowest embedded subject **Wangwu**, since the subject NP in the intermediate clause disagrees (in person) with the local subject of the clause containing the reflexive and thus LD binding with this intermediate subject NP or any NP in a higher clause is blocked. This is the well-known fact of blocking effect of Chinese reflexivization (see Huang Y.-H. 1984, and Tang 1989).

- (6) Zhangsan_i zhidao [Lisi_j renwei [Wangwu_k zui xihuan
Zhangsan know Lisi think Wangwu most like
ziji_{i/j/k}]]
self
'Zhangsan_i knows that Lisi_j thinks that Wangwu likes
himself/him_{i/j} most.'
- (7) Zhangsan_i zhidao [ni_j renwei [Lisi_k zui xihuan
Zhangsan know you think Lisi most like
ziji_{i/*j/k}]]
self
'Zhangsan knows that you think that Lisi likes
himself most.'

In short, a non-local NP in general cannot be a LD antecedent of the reflexive *ziji* if the non-local NP differs in person or/and number (person-number) with the local NP or any NP which is a potential antecedent of *ziji* and intervenes between the reflexive and the non-local NP. Thus, LD antecedent is possible only if the antecedent agrees with the local subject in person-number features and there is no intervening subject that bears distinct person-number features.

Given the discussion above, the major distributional and referential properties can be summarized as follows:

- (8) a. While complex reflexives have inherent person-number features, these features of a simplex reflexive correlate with the local subject of the predicate containing the reflexive, and the local subject is always the potential antecedent of the reflexive.

b. The antecedent of a reflexive must be an animate NP, and is in general a subject in both simplex and complex reflexive cases.

c. While complex reflexives require local binding, the simplex reflexive exhibits the possibility of LD binding, subject to a restriction that requires the LD antecedent to agree in person and number features with all potential antecedents intervening between the LD antecedent and the reflexive.

Though there remains some degree of disagreement in terms of the relevant facts in certain instances, it seems that the distributional and referential facts of reflexives discussed above are well-recognized (see Tang 1989, Battistella 1989, Cole, et al. 1990, Huang and Tang 1991). In the following section, I present a phrase structure analysis.

2. CHINESE REFLEXIVES IN PHRASE STRUCTURE GRAMMAR

Following the tradition of GPSG (see Pollard and Sag 1983, and Hukari 1989), in this analysis, reflexives are treated in a syntax-semantics cooperation. More specifically, reflexive specifications are introduced by a metarule, which interacts with the foot feature principle (FFP) and the mechanism of feature co-occurrence restrictions, and binding is accomplished through a semantic interpretation procedure.[5] In the theory of GPSG (Gazdar et al. 1985), metarules applying to a set of basic (lexically-headed) ID rules define a new set of ID rules, thus capturing systematic relations among ID rules. The FFP says informally that 'the foot features instantiated on the mother in a tree fragment are identical to the unification of the foot features instantiated on the daughters' (cf. Sag et al. 1985, p. 46). FCRs are understood as absolute restrictions on the possible feature composition of a category. No categories may be specified in a way contradictory to what a FCR says.

It seems uncontroversial that simplex and complex reflexive pronouns differ from each other in feature structures. In other words, simplex and complex reflexives belong to different feature specifications, referring to different entries in the lexicon. Under this assumption, I treat simplex reflexives and complex reflexives as distinct feature specifications. I propose that the foot features SIMRE and COMRE are responsible for simplex and complex reflexive pronouns respectively. Now consider the following reflexivization metarules, which are relevant to simplex and complex reflexives respectively:

- (9) a. $VP \rightarrow w, X^2 \Rightarrow VP \rightarrow w, X^2 [SIMRE: NP]$
b. $VP \rightarrow w, X^2 \Rightarrow VP \rightarrow w, X^2 [COMRE: NP]$

Clearly, these two metarules are not unrelated; they represent two subcases of one general phenomenon:

Any category of VP that immediately dominates a BAR-2 category may associate with a reflexive feature specification, which may be either morphologically simplex or morphologically complex.

Thus, the two metarules can be collectively stated in the following form, where RE stands for the set of possible reflexive features, SIMRE and COMRE[6]

- (10) $VP \rightarrow W, X^2 \Rightarrow VP \rightarrow W, X^2[RE: NP]$
where RE is in {SIMRE, COMRE}

Note that this metarule ensures that the upperbound on percolation of the feature RE will be the category VP. Since the feature RE on a daughter node in the relevant local tree is introduced by the metarule and therefore inherited, the FFP will not require it to occur on the mother VP node. In addition to the metarule in (10), the following FCRs is crucial to Chinese reflexive binding. Remember that SIMRE pertains only to the simplex reflexives.

- (11) FCR 1: $\neg[\text{SUBJ: NP}[pn_\alpha] \ \& \ \text{SIMRE: NP}[pn_\beta]] \quad (\alpha \neq \beta)$

For discussion purpose, here I tentatively assume a monadic feature "pn" for feature specifications in person and/or number (person-number). In (11), NP[pn_α] and NP[pn_β] stand for NPs which are distinct to each other in person-number. FCR 1 says that no category may be specified both for SUBJ and SIMRE if they have distinct values for person-number features.

As mentioned above, unlike the simplex reflexive, complex reflexives require strictly local binding. Thus, complex reflexives fall into the general binding pattern of morphologically complex reflexives observed in other languages such as English reflexives, the relevant FCR for Chinese complex reflexives is the same as the one for English (see Hukari 1989, p. 208):

- (12) FCR 2: $\neg[\text{SUBJ} \ \& \ \text{COMRE}]$

The interaction of the metarule and the FCRs defines the syntactic domain within which a specification of RE may percolate due to the effects of the FFP. It is within that domain that a reflexive must be bound and therefore be translated into intensional-logic under semantic interpretation. The semantic interpretation procedure is roughly as the following:

(13) The Semantic Interpretation for Chinese R-binding

If the mother contains a SUBJ specification but not a RE specification, while a daughter contains a RE specification, and if the value of SUBJ agrees with the value of RE, then

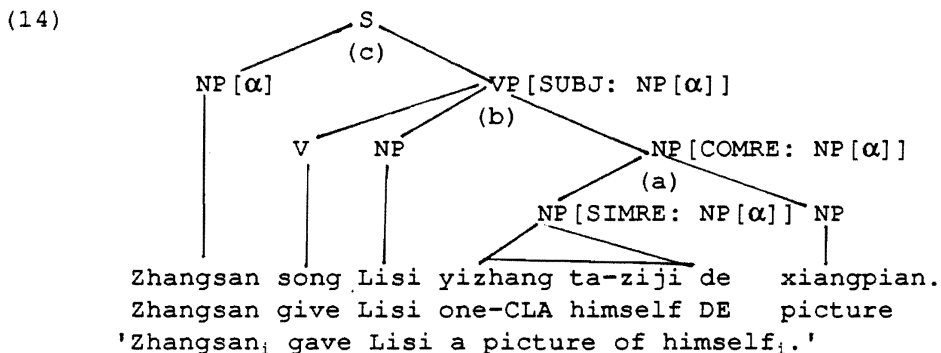
- (a) combine the daughters by normal functional application.
- (b) a subject-control binding predicate applies to the semantic combination of the daughters.

This is a simplified version of clauses (i) and (ii) of the reflexive binding schema found in Hukari (1989). When both the mother and the daughter(s) contain RE specifications, the interpretation follows the general interpretation procedure for foot features (see Gazdar et al.). Here the feature agreement between the reflexive and its antecedent is treated as a condition on binding in seman-

tics, and the binding translation crucially depends on the syntactic information available in a local tree. For instance, no interpretation of binding will obtain if the category value of RE is different from that of SUBJ, which agrees with the syntactic subject via the feature instantiation system.

Before demonstrating how the system operates, let us assume, following Cole and Sung (1991), that lexical items of simple reflexives as well as complex reflexives are specified with person and number features in the lexicon.[7] Thus, the phenomenon that the simplex reflexive depends on the subject for person-number features becomes merely apparent. Simplex reflexives pattern with complex reflexives in the sense that a reflexive must agree in person-number features with its potential antecedent. I will discuss how the blocking effect follows under this assumption later in this section.

Now RE and SUBJ feature instantiation and reflexive binding can be illustrated by the following tree digrams. As mentioned above, subject-orientation and LD binding constrained by a local feature-agreement restriction are two central properties of Chinese reflexives. First, consider a structure like (14):[8]



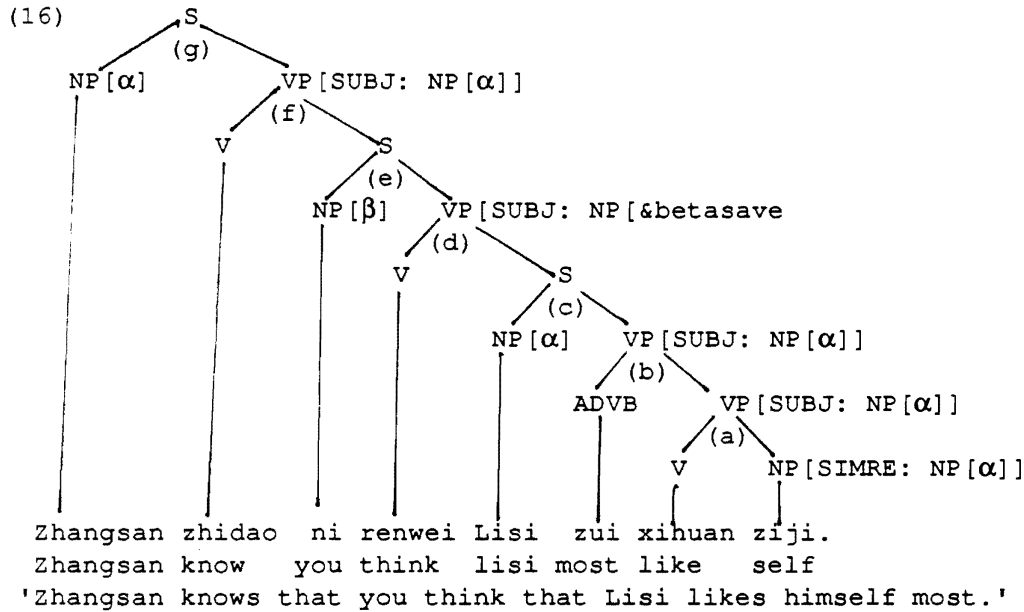
In (14), the metarule may apply only to an ID rule corresponding to the local tree (b), namely the one dominated by the VP. Thus, the relevant domain for binding will be this VP in this case. As the VP contains a SUBJ and the daughter contains a RE (i.e. COMRE), the RE specification must be interpreted and therefore be bound in the translation of the VP in accordance with (13). The reflexive pronoun translates as $\lambda\phi\phi$ denoting the identity function on NP types (see Pollard and Sag 1983, and Hukari 1989)). The subject-control binding predicate is defined as (see Hukari 1989) $\lambda\nu\lambda\phi\phi\{\lambda x[\nu(x^*)(x^*)]\}$. The translations for (14) are roughly like the following:

- (15) (a) $\lambda\phi_1(\text{yizhang}'(\phi_1)(\text{xiangpian}'))$
 (b) $\lambda\phi_2\phi_2\{\lambda x[\text{song}'(\text{yizhang}'(x^*)(\text{xiangpian}'))(\lambda\text{PP}(1))(x^*)]\}$
 (c) $\text{song}'(\text{yizhang}'(z^*)(\text{xiangpian}'))(1^*)(z^*)$

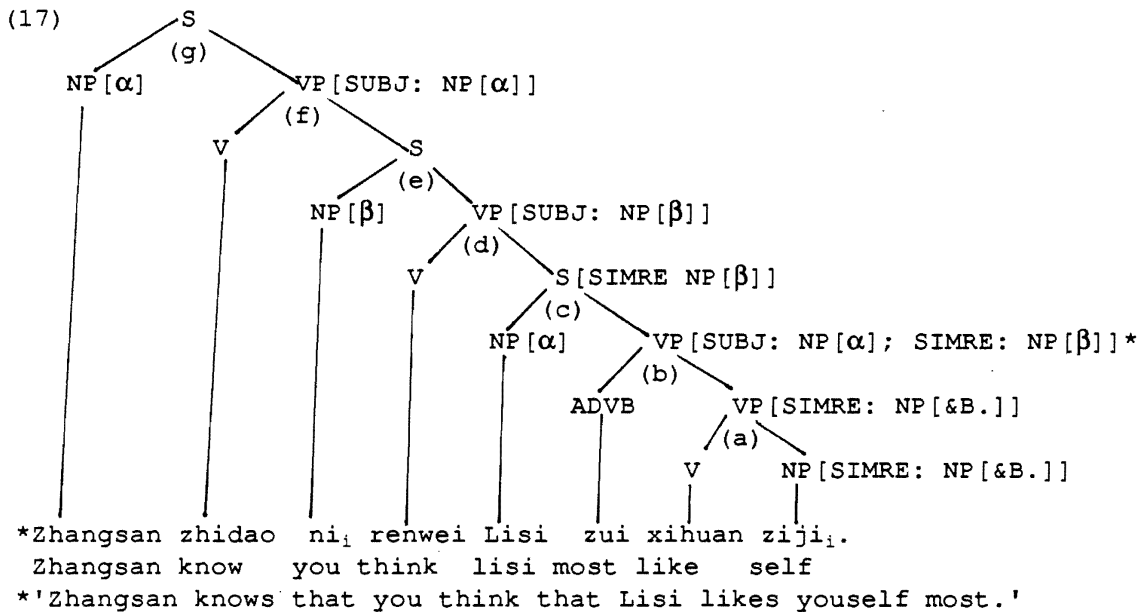
As the translation of the VP combines with the translation of the subject, the desired result of a subject antecedent is achieved.

Now consider a typical case of potential LD binding involving blocking effect, as shown in (16). In this structure, the subject of the intermediate clause differs in person-number from the the lowest subject and the matrix subject. Thus, the SUBJ specification on the intermediate VP dif-

fers in person-number from that on the lowest VP (or that on the matrix VP), i.e. [SUBJ: NP[β]] vs. [SUBJ: NP[α]]. In this case, the reflexivization metarule may apply in local trees (a), (d), or (f).



When the metarule applies in local tree (a), the lowest subject should bind the reflexive. Suppose the metarule applies in local tree (d), as shown in (17), the feature SIMRE will percolate down in accordance with the FFP. In order to be bound by the intermediate subject, the reflexive must agree with it in person-number. But if the reflexive agrees with the intermediate subject in person-number, the percolation of SIMRE is blocked by the FCR 1, when SIMRE is instantiated on the mother VP of local tree (b), since SUBJ and SIMRE in this VP disagree with each other in person-number and FCR 1 insists that no category can be specified both for SUBJ and SIMRE if they have distinct values with respect to person-number features.



Thus, this structure is correctly ruled out because of violation of FCR 1.

Now imagine that the metarule applies at the matrix VP (i.e. local tree (f) in a structure like (17)). It is not difficult to see that the percolation will not succeed and the structure will be ruled out in a similar way as the structure in (17), as the matrix subject and the intermediate subject differ in person-number features. Thus, only structure (16) is well-formed, since SIMRE specification cannot be successfully introduced at either the intermediate VP or the matrix VP. In other words, there is no well-formed antecedent-reflexive path from a non-local subject NP (or any NP in a higher position) down to the reflexive in an interpretable structure if this non-local NP or an intervening subject NP differs in person-number features from the local subject of the predicate containing the reflexive. Thus, the present system correctly predicts the blocking effect.[9]

As for cases involving embedded clauses containing a complex reflexive somewhere, the present system predicts that the local subject of the predicate containing the reflexive must be its antecedent. Further the reflexive pronoun does not have to occur in the lowest embedded clause. The metarule may apply to any VP as shown in previous cases and the FCR 2: \neg [SUBJ & COMRE] will block percolation of the feature COMRE. Thus, in a sentence like the following the subject of the intermediate clause must be the antecedent of the reflexive but not any of the others.

- (18) Zhangsan_i renwei Wangwu_j gaosu-le ta-ziji_{*i/j/*k} de laoshi
 Zhangsan think Wangwu tell-asp 3s-self DE teacher
 Lisi_k bu yuanyi lai.
 Lisi not willing come
 'Zhangsan thinks that Wangwu told the teacher of himself that
 Lisi will not come'.

However, case like the following are also allowed in Chinese, where a complex reflexive is contained in an embedded subject position.[10] In such a case, the subject of the immediately higher predicate must be taken as the antecedent of the reflexive.

- (19) Zhangsan_i zhidao ta-ziji_i de pengyou gaosu-le laoshi Lisi_k
Zhangsan know 3s-self DE friend tell-asp teacher Lisi
bu yuanyi lai.
not willing come
'Zhangsan knows that his own friend told teacher that Lisi
would not come'.

In this case, the relevant reflexive may only be licensed by applying the metarule at the matrix VP and the COMRE feature will percolate to the subject position of the intermediate clause without violating any principle in the grammar. The feature COMRE cannot percolate elsewhere, however, since the percolation would violate the FCR 2: \neg [SUBJ & COMRE], and thus no other binding is possible.

3. SUB-COMMANDING CASES

Tang (1989) reports that a sub-commanding (non-c-commanding) subject NP contained in an inanimate subject may also serve as the antecedent of a simplex reflexive:

- (20) [[Zhangsan_i de] jiaobao_j] hai le ziji_{i/*j}.
Zhangsan DE pride hurt ASP self
'Zhangsan's_i pride hurt him_i.'

This phenomenon seems to suggest that the c-command condition as given in the standard binding theory (Chomsky 1981) is inadequate and should be relaxed for Chinese *ziji* if the antecedent is contained in an NP that is itself not a potential antecedent.

While the cases above appear possible for some speakers, it seems that it is overly simplified to claim that in principle a sub-commanding NP may be the antecedent of *ziji* if it is contained in an inanimate subject NP that c-commands the reflexive. The real situation is far more complex. The following facts seem to be relevant.

First, not every inanimate NP always allows a natural interpretation of a sub-commanding subject NP as the antecedent of *ziji*. Consider the following examples:

(21) a. ??[[Zhangsan_i de] xiaoxi] hai le ziji_i.
 Zhangsan DE news hurt ASP self
 'The news about Zhangsan_i hurt him_i.'

b. ??[[Li xiaojie_i de] xiaoxi] dui ziji_i meiyou haochu.
 Li miss DE news to self not-have good
 'The news about miss Li_i will do her_i no good.'

In fact, either of the sentences above is ambiguous. In addition to the reading as indicated above, (21a), for instance, may also be interpreted as "the news Zhangsan_i spread hurt him_i". When the sentence has the reading "the news about Zhangsan_i hurt him_i" as above, the coindexing between the reflexive and the sub-commanding NP is impossible or at best marginal. The difference between the two readings is that when the sub-commanding NP is understood as the source of the proposition, a coindexing between a reflexive and a sub-commanding NP may be acceptable; otherwise such a coindexing is usually impossible. Note that it is not clear how the two possible interpretations in sentences like above can be distinguished in syntactic terms.

Another case in which a reflexive with a sub-commanding antecedent is usually acceptable is one when a sub-commanding NP is contained in an inanimate NP that denotes some inherent property of the sub-commanding animate NP, as shown by (22a-b) (and (20) above):

(22) a. [[Zhangsan_i de] taidu] hai le ziji_i.
 Zhangsan DE attitude hurt ASP self
 'Zhangsan's_i attitude hurt him_i.'

b. [[Li xiaojie_i de] taidu] dui ziji_i meiyou haochu.
 Li miss DE attitude to self not-have good
 'Miss Li's_i attitude will do her_i no good.'

A similar contrast can also be observed between the following two sentences. It seems generally agreed that (23a) is much better than (23b) though judgements vary to some extent. ,

(23) a. [[Zhangsan_i de] toufa] dangzhu le ziji_i de shixian.
 Zhangsan DE hair block ASP self DE vision
 'Zhangsan's_i hair blocks his_i own vision.'

b. ??[[Zhangsan_i de] fangzi] dangzhu le ziji_i de shixian.
 Zhangsan DE house block ASP self DE vision
 'Zhangsan's_i house blocks his_i own vision.'

In (23a), **ziji** can clearly refer to **Zhangsan**. But in (23b), **ziji** is most naturally understood as referring to someone other than **Zhangsan** (possibly the external speaker). Semantically, a part-whole relation holds between the two relevant NPs in (23a) but there is no such relation in the case of (23b), though the NP **Zhangsan** acts as the possessor in the larger NP in both (23a) and (23b). These examples indicate that when a sub-commanding subject NP may serve as the

antecedent of *ziji*, it is usually contained in one of those NPs which closely associate with the sub-commanding animate NP semantically or pragmatically. This clearly suggests that whether a sub-commanding subject NP may serve as the antecedent of a reflexive or not has a semantic (or pragmatic) basis and cannot be generally determined on the basis of structural properties.

Second, as Huang and Tang (1991) note, a sub-commanding subject in general cannot be a LD antecedent of the reflexive *ziji* regardless of whether the person-number feature agreement is satisfied:

- (24) Zhangsan_i de xin biaooshi [Lisi_j hai le ziji_{*i/j}.]
 Zhangsan 's letter indicate Lisi hurt ASP self
 'Zhangsan's letter indicates that Lisi hurt himself.
 (Huang & Tang 1991)

In other words, sub-commanding NPs differ from c-commanding NPs in terms of their potentiality of being antecedents. Given that long-distance binding with the feature agreement restriction is a central feature of Chinese reflexive binding, the fact that this feature does not pertain to reflexives with sub-commanding antecedents strongly suggests that sub-commanding cases fall outside the domain of the core cases of reflexive binding.[11]

Finally, it is not really true that a sub-commanding NP can be the antecedent of a reflexive only when it is contained in an inanimate NP. Consider now (25) and (26). In each of the examples, the subject contains two NPs in a coordination structure. In (25) the reflexive refers to both the NP **Zhangsan** and the NP **Lisi**, and in (26) it refers to both the two sub-commanding NPs **Zhangsan** and **Lisi**, which are contained in two inanimate NPs respectively.

- (25) Zhangsan he Lisi dou zhu-zai ziji de jiali.
 Zhangsan and Lisi both live-in self DE house
 'Zhangsan and Lisi both live in their own houses'.
 (26) [Zhangsan de qian] he [Lisi de shu] dou bei ziji de pengyou
 Zhangsan DE money and Lisi DE book both BEI self DE friend
 touzou le
 steal ASP
 'Zhangsan's money and Lisi's books were both stolen by their
 own friend(s)'.

Note that the NPs in a coordination structure may collectively serve as the antecedents of a reflexive. But interestingly, in (27) the reflexive can be understood as referring to **Zhangsan**, and in (28) the reflexive *ziji* will be understood most naturally as referring to **Zhangsan**.

- (27) [[Zhangsan_i de] baba he mama de shu] dou bei ziji_i de pengyu
 Zhangsan DE father and mother DE book all BEI self DE friend
 touzou le
 steal ASP
 'Zhangsan_i's father and mother's books were all stolen
 by his_i friend(s)'.
 (28) [[Zhangsan_i de] baba de qian he mama de shu] dou bei ziji_i
 Zhangsan DE father DE money and mother DE book both BEI self
 de pengyu touzou le
 DE friend steal ASP
 'Zhangsan_i's father's money and mother's books were both stolen
 by his_i friend(s)'. (Pollard & Sag 1992)

As noted by Pollard and Sag (1992, originally due to Wang 1990), Tang's judgements about the sub-commanding cases seem to reflect merely preference for a topic (or the most prominent NP in the discourse).

It should not be surprising that Chinese may allow reflexives with sub-commanding antecedents, since similar cases can also be found in English, which in general requires strictly local binding. The relevant English examples have been discussed in the literature, e.g. by Reinhart and Reuland (1991), and Pollard and Sag (1992):

- (29)a. A fear of himself_i is John_i's greatest problem. (from Higgins 1973)
 b. John's_i campaign requires that pictures of himself_i be placed
 all over the town. (from Lebeaux 1984)
 c. John's_i intentionally misleading testimony was sufficient
 to ensure that there would be pictures of himself_i all over
 the morning papers. (Sag & Pollard)
 d. Bismark_i's impulsiveness has, as so often, rebounded against
 himself_i. (from Zribi-Hertz 1989)

Pollard and Sag point out that these cases belong to a logophoric use of reflexives (more specifically a focus use of reflexive in Reinhart and Reuland's term).

Given the discussion above, there are good reasons to believe that Chinese reflexives with sub-commanding antecedents are variants of their English counterparts, which go beyond the domain of a syntactic analysis.

4. FUTURE DISCUSSION AND CONCLUSION

I have discussed major properties of reflexivization in Chinese. I have shown that the distribution of Chinese reflexives in a vast majority of cases can be represented in the feature instantiation system found in Gazdar et al. (1985), parallel to that of English reflexives as discussed in Hukari (1989). In this analysis, reflexive pronouns are represented by category-valued foot features SIMRE and COMRE, whose occurrences are introduced by a reflexivization metarule.

- (30) $X[\text{SUBJ}] \rightarrow W, X^2 \Rightarrow X[\text{SUBJ}] \rightarrow W, X^2[\text{RE: NP}]$
where RE is in {SIMRE, COMRE}

This rule entails that though simplex reflexive and complex reflexive pronouns are separate lexical items in the lexicon, they are related in syntax. More precisely, occurrences of both simplex or complex reflexives in general are associated with VP (or predicative categories) and must be related to the subject of the VP category in question. Note that what is expressed in this metarule is quite general (see Pollard and Sag 1983, and Kang 1988 for discussion). It is uncontroversial that reflexive pronouns are universally related to predicative categories and the notion of accessible SUBJECT (or AGR) plays a crucial role in reflexive binding, even for languages that allow object antecedents (see Chomsky 1981). Thus, the metarule is also relevant to languages like English. RE stands for the set of possible reflexive features, SIMRE and COMRE. It may be assumed that the reflexivization metarule universally contain both SIMRE and COMRE, and that languages like English simply does not have lexical items of simplex reflexives in the lexicon. Thus, no sentences containing simplex reflexives will be generated in English.

As much discussed in the literature (see e.g., Reinhart and Reuland 1991), it seems to be generally true cross-linguistically that morphologically simplex reflexives (like *ziji*) usually allow LD binding, while morphologically complex reflexives (like *ta-ziji* and English *himself*) require local binding. Thus, while some languages may only have complex reflexives and thus exhibit only local binding, other languages may have both complex and simplex reflexives and thus allow both local and LD binding. Though the reflexivization metarule sets the upbound of the RE percolation path, it does not seem sufficient by itself to define the domain of binding in terms of simplex and complex reflexives respectively. The metarule, in fact, predicts LD binding, since a specification of RE in principle can percolate down and pass between clauses. Feature co-occurrence restrictions are employed to restrict possible percolation of RE.[12] Thus, the metarule and FCRs interact to define the domain of binding. As a result, various complications are avoided and quite a few parallels among languages, which have been seemingly unrelated, fall out directly from the general mechanisms of the grammar. Here the difference between complex reflexives (for English, Chinese, and other languages) and simplex reflexives in Chinese is simply a variation of FCRs:

- (31) a. FCR 1: $\neg[\text{SUBJ} \ \& \ \text{COMRE}]$
b. FCR 2: $\neg[\text{SUBJ: NP}[\text{pn}_\alpha] \ \& \ \text{SIMRE: NP}[\text{pn}_\beta]]$ (for *ziji*)

Complex reflexives are relatively more straightforward in the sense that they generally require local binding. While simplex reflexives universally allow LD binding, they differ from

one language to another in terms of conditions governing the LD binding in question, varying from a wide range of phenomena, though these phenomena are not totally unrelated. For instance, they all seem to be associated in some way with conditions on VP. But it does not seem possible to unify all these phenomena under one general principle. Thus, it may be appropriate to consider them as parallel but individual phenomena rather than subcases of one single phenomenon. Though the present analysis concentrate on Chinese reflexives, I would hope that it is extendible to long-distance reflexives in other languages.[13]

Although reflexive pronouns must be related to predicative categories with accessible SUBJECT cross-linguistically, languages differ in the choice of the set of possible antecedents. Some languages allow only subject antecedents, and other languages also allow object antecedents. In view of the fact that simplex reflexives are universally subject oriented, it is quite tempting to attribute subject-orientation to the lexical property of simplex reflexives. Various analysis concerning subject-orientation have been discussed in the literature. A basic idea has been that simplex reflexives are subject oriented because they lack inherent *phi*-features and in order to be interpreted, they will have to acquire *phi*-features from AGR so that they are closely associated with SUBJECT via AGR. Let me note here very briefly that complex reflexives in a language may also be subject oriented although they clearly have inherent *phi*-features, as shown by Chinese complex reflexives. Further, some languages may have both AGRs and AGRO. If acquisition of *phi*-features require association with an element carrying them, there should be some observable correlation between the existence of AGRO in a language and object-orientation (or no orientation) in the choice of antecedents for simplex reflexives in that language. But as far as I know, no such correlaton has been reported.

In the theory of GPSG, the apparent dependence of simplex reflexives on the subject for person-number features seems to suggest that subject-orientation can be achieved by stating feature agreement between the value of RE and that of SUBJ in the metarule. However, there are at least two points which indicate that this approach is undesirable. First, agreement between a reflexive pronoun and the subject (or a NP) in person-number features by itself does not guarantee binding. For instance, the reflexive in the following sentence agrees in person-number features with the object as well as the subject, but it can be bound only by the subject:

- (32) Zhangsan_i song Lisi_j yizhang ziji_{i/*j} de xianpian.
 Zhangsan give Lisi one-CLA self DE picture
 'Zhangsan_i gave Lisi_j a picture of himself_{i/*j}.'

Something independent of agreement is still needed to ensure binding. Thus, agreement and binding are distinct notions, though feature agreement is a necessary condition on binding, as the binding in the following example is not possible:[14]

- (33) *The man_i standing by Harry is scratching them_i

Second, reflexive binding has been considered a semantic matter in the theory of GPSG (see Pollard and Sag 1983, and Hukari 1989).[15] For languages like English, subject binding and nonsubject binding are achieved via semantic interpretation rules. If this is correct, it is certainly undesirable to state subject-orientation in syntax specifically for Chinese, since (subject) binding

will be stated in semantics for this language. Thus, it seems more plausible to distinguish between languages with subject-orientation and languages with no orientation in semantics. The difference of these two types of languages in terms of subject-orientation can be represented in a variation of semantic interpretation rules. The theory becomes simplified if it is assumed that a language does not have to instantiate all the interpretation rules and subject-oriented languages simply lack the interpretation rule for object binding. Thus, interpretation rules for reflexive binding for Chinese constitute a subcase of the general reflexive binding schema. In conclusion, subject-orientation is a property independent from the typology of either simplex reflexives or complex reflexives. Given the fact that complex reflexives may be subject-oriented, I consider any analysis that treat subject-orientation as a derived property of simplex reflexives inadequate.

In this analysis, the percolation of RE is regulated by the FFP (and the relevant FCRs). This predicts correctly that in principle reflexive pronouns may occur in adjuncts and island constructions.[16] Thus, LD antecedent-reflexive dependencies differ substantially from antecedent-gap dependencies. LD reflexives allow quite a general path and they can occur in all possible NP positions, in contrast to empty categories, which can occur only in certain positions. Though it may be useful to explore how the relation between reflexive binding and antecedent-gap relation can be best represented, it is certainly incorrect to consider LD reflexive binding essentially the same as the phenomena of extraction.

NOTES

* I wish to thank Tom Hukari and WPLC editors for their comments and suggestions.

- [1] Like reflexives in other languages, Chinese reflexive pronouns can be used as anaphors and intensifiers, which can be largely distinguished by the relative distributions as discussed in the literature (see e.g., Tang 1989). This paper focuses on the discussion of the anaphoric reflexives.
- [2] The simplex reflexive *ziji* may also be used with other functions. For instance, it may occur to mean "1st person singular pronoun". See Battistella and Xu (1990) for discussion and references of other occurrences of *ziji*. As mentioned earlier, this paper will restrict its attention to occurrences of *ziji* as a bound anaphor.
- [3] Cole and Sung 1991 claim that in sentences like (5), the indirect object **Wangwu**, may also be a potential antecedent of the reflexive **ta-ziji** even though the subject is preferred to the object. However, I do not share this judgement, and none of the native Chinese speakers that I have talked to have obtained the object antecedent in sentences like (5) in normal circumstance. As discussed in the literature (e.g., Sells 1987), logophoric and contextual factors may play an important role in the determination of possible antecedents for reflexives. If one takes the viewpoint of the individual in object position, an object antecedent maybe possible for some speakers. But it should be clear that this is logophoric binding rather than a syntactic one. Thus, following the judgement generally adopted in the literature (see e.g., Tang 1989, Huang and Tang 1991), I assume that both simplex and complex reflexives in Chinese are subject oriented.
- [4] In Chinese, as in English, a logophoric verb may allow the antecedent of a reflexive to be in a position other than a subject or controlling object position. The following is an example:

- (i) Ziji de shibai shi Zhangsan shifen shangxin.
 self DE failure make Zhangsan very sad
 'The failure of himself made Zhangsan very sad.'

In this paper, I will not discuss logophoric binding.

- [5] In Xue (1990), reflexives are analyzed in terms of the following FCRs and FSD without invoking metarules.

- (a) FCR 1: \neg [SUBJ: NP[pn_α] & RE: NP[pn_β]] ($\alpha \neq \beta$)
 (b) FCR 2: [SUBJ & RE] \supset [RE: NP[pn]]
 (c) FCR 3: [+V] \supset [SUBJ]
 (d) FSD 1: \neg [RE: NP[pn]]

This analysis entails free instantiation of the foot feature RE and thus requires a relativized formulation of the FFP (see Hukari 1989). As pointed out to me by Tom Hukari (personal communication), if FCR 1 above is correct, the grammar becomes overly restrictive due to the interaction of FCR 1 and the relativized FFP.

- [6] This is a simplified version of the reflexivization metarule, since reflexive pronouns may associate with various types of predicative categories including VP, predicate AP, possessed NP, and certain cases of predicate PP. This can be accomplished by assuming that the application of the metarule is restricted to PRED(icative) categories, which contain SUBJ specifications in virtue of the FCR: [+V or [+PRED]] \supset [SUBJ]. See Hukari (1989) for discussion.
- [7] As Cole and Sung note, technically a simplex reflexive *ziji* may either be specified with person and number features in the lexicon or be assigned person and number features in some way by the subject of the predicate containing the reflexive. There does not seem to be empirical differences favoring one approach over the other.
- [8] The left-branching node of the lowest local tree in (14) is here tentatively assumed as NP[+[DE]; RE: NP[α]]. Due to the printing difficulty, I omit [+DE] in the tree.
- [9] One way to accomplish the animate condition is to assume that the lexical entry for *ziji* carries the feature [+ANIMATE] in the lexicon. Thus, the application of the reflexivization metarule will not generate a well-formed sentence if the subject is [-ANIMATE].
- [10] Chinese even allows reflexives to be nominative.
- [11] Haung and Tang note that since both long-distance binding and binding by a sub-commanding NP each represents a marked case, long-distance binding by a sub-commander would be doubly marked and thus not allowed.
- [12] The metarule and a FCR (particularly that for complex reflexives) seem to be somewhat overlapping, since both of them state that a RE specification cannot percolate beyond the predicative category containing the reflexive. But they become overlapping only when the binding domain involves monoclausal structures.
- [13] See Kang (1988) for an GPSG analysis of LD reflexives in Japanese, Korean and Icelandic.

- [14] I am indebted to Tom Hukari (personal communication) for this point.
- [15] Also see Bach and Partee 1980 for discussion arguing for a semantic approach to binding.
- [16] See Huang and Tang (1991), and Sung and Cole (1991) for discussion and examples of LD binding of *ziji* across relative clauses and adjunct adverbial clauses. LD reflexives extending into relative clauses and adverbial clauses are also found in other languages such as Icelandic (see e.g., Maling 1984, Sells 1987).

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