

A Study of Reflexives in English and Chinese: Based on Minimalism Program and Optimality Theory

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Abstract

The analyses of reflexives in English and Chinese have always a hot issue in the literature. Though Binding Principle A can perfectly account for the distribution of English reflexives, it fails to explain the syntactic behaviors of Chinese reflexives, such as *subject-orientedness*, *long-distance binding* and *blocking effect*. This study targets to analyze the reflexives in English and Chinese in terms of Checking in Minimalism and Optimality Theory. By Minimalism, reflexives are assumed to bear person and number features, and binding relationships are established via checking of relevant features between antecedents and reflexives in appropriate specifier-head checking domains. By Optimality Theory, which claims that languages have in common a set of constraints which are violable, and differences among languages result from the different rankings that they impose upon these violable constraints. This study shows that reflexives in both languages can be analyzed in terms of the same set of constraints but different rankings.

Key words: reflexive, binding, minimalism, optimality theory, checking

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「極小主義」及「優選論」之中、英文反身代名詞研究

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摘要

中、英文中，反身代名詞的分析總是文獻中一個熱門的主題。雖然約束原則 A 能夠完美解釋英文反身代名詞的分布，但卻無法解釋中文反身代名詞的特徵，如主語傾向、長距離約束及阻礙效應。本研究的目的，在於利用極小主義中的特徵檢驗，及優選理論來分析中、英文的反身代名詞。在極小主義中，反身代名詞包含身、數特徵，而這些特徵將被吸引及滲入適當的檢驗範疇中，再利用特徵檢驗的方式，來建立反身代詞及前行語間的約束關係。再者，利用優選理論來分析中、英文反身代名詞，亦可顯示其間的不同句法表現，實導因於這二種語言之不同制約排序。

關鍵詞：反身代名詞、約束、極小主義、優選理論、特徵檢驗

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I. INTRODUCTION

The distributions and properties of reflexives in English and Chinese have always been a hot issue in the previous studies (Battistella, 1989; Battistella & Xu, 1990; Cole, Hermon & Sung, 1990; Huang, 1984; Huang & Tang, 1988; Kang, 1988; Sung, 1990; Tang, 1985, 1989; Tang, 1994; Xu, 1993, 1994; 程工, 1994, 1999). Reflexives in both languages share some similarities. To illustrate, English and Chinese reflexives possess *intensifying* function, in which the reflexives can be used to intensify either subjects or objects¹, as shown in (1-4) below.

- (1) John himself will finish that job.
- (2) John gave a book to Bill himself.
- (3) Changsan ziji hui wan cheng na shiang kung tzuo.
'Changsan himself will finish that job.'
- (4) Changsan gei Lisi ziji yi ben su.
'Changsan gave a book to Lisi himself.'

In addition, reflexives in both languages have *anaphoric* function as well. Anaphoric reflexives exist in argument positions, take NPs as their antecedents², and can be locally bound by their antecedents, as displayed in (5-6).

- (5) [John likes himself.]_{GC}
- (6) [Changsan xi huan ziji] _{GC} 'Changsan likes himself.'

The distributions of reflexives in English and Chinese can be accounted for by means of Binding Principle A (BPA), stating that a reflexive must be bound in its governing category (GC). In (5-6), GCs are the whole clauses, where the reflexives, the governor 'like' and the antecedents are found.

However, reflexives in both languages also differ in significant aspects, causing

¹ Intensifying reflexives in Chinese exist in non-argument positions, and can optionally take an animate or non-animate antecedent.

² Chinese anaphoric reflexives *ziji* must take animate NPs as their antecedents.

great difficulties towards the application of BPA in the interpretations of Chinese reflexives. First, unlike English, in which reflexives pick up only the nearest antecedent in subject NPs, Chinese reflexives can take multiple antecedents located in subject NP, as exemplified in (7-8)

(7) Bill'si sisterj likes herself*i/j.

(8) [Changsan_i de lau ban_j hai le ziji_{i/j}]³

Changsan DE boss hurt self 'Changsan's boss' hurt himself.'

Second, unlike English, Chinese reflexives can also take far-away antecedents (i.e. outside its GC). This property is called long-distance binding, as displayed in (9-10).

(9) Billi thinks [Johnj like himself *i/j.]_{GC}

(10) Changsani renwei [Lisij xihuan ziji i/j]_{GC}

'Changsan thinks (that) Lisi like himself.'

Third, Chinese reflexives show *blocking effects* when the antecedents and the reflexives do not share the same person feature, as demonstrated in (11-12). English, however, lacks such a property.⁴ BPA fails to explain the differences outside the GCs.

(11) Changsan_i renwei Lisi_j zhidao [Wangwu_k xihuan ziji_{i/j/k}]_{GC}

'Changsan thinks (that) Lisi knows (that) Wangwu likes himself.'

(12) Changsan_i rewei wo_j zhidao [Wangwu_k xihuan ziji *i/*j/k]_{GC}

'Changsan think (that) I knows (that) Wangwu likes himself.'

³ This phenomenon occurs when the antecedents in the subject NP have 3_{rd} person in common.

⁴ Another property that English lacks is *subject-orientedness* (Tang, 1989), which bars Chinese reflexives to have indirect objects as their antecedents. Yet, as indicated in Xu (1994), the antecedents of Chinese reflexive *ziji* are not restricted only to subjects. Objects can also function as antecedents. Please refer to Xu (1994) for more details related to this property. This study focuses on the characteristic of *subject-orientedness* in Chinese reflexives.

According to the discussions above, only BPA, though fully coping with English reflexives, is unable to account for the complex distributions of Chinese reflexives. Thereby, the distributions of Chinese reflexives are dealt with either by a revised binding principle (e.g. sub-command) or by extra conditions (e.g. feature copying, reindexing, movement, Head Movement Constraint, barrier, Empty Category Principle, percolation, etc), and some escaping hedges are provided to cover cases which do not obey BPA.

However, as stated in Speas (1997:173), “syntactic theory must account for (a) the common syntactic properties of all languages and (b) how the syntactic properties of languages can vary,” the first of which is not fully achieved by binding theory. BPA can handle the similarities shared by English and Chinese reflexives, but it is not capable of showing that how Chinese is different from English in the distributions and interpretations of reflexives.

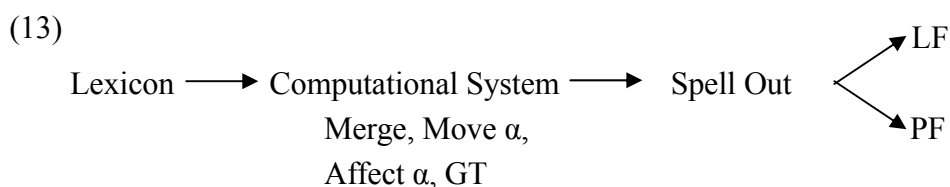
In this article, the distributions of reflexives in English and Chinese will be probed in terms of Optimality Theory (OT) and Minimalism Program (MP). OT claims that languages have in common a set of constraints which are violable, and differences among languages result from the ranking that they impose upon these violable constraints. Through OT, constraints reveal the similarities among languages whereas constraint rankings show how they are different from one another. What’s more, similar to OT, the core theme in MP is ‘economy,’ which claims that any derivations must be maximally economical and allows principles to be violable. In other words, MP makes violability explicit via economy principles. The study is organized as follows. How MP is utilized to analyze reflexives in English and Chinese is presented in Section 2. In section 3 is an OT analysis of reflexives in English and Chinese, through which it is clear that different constraint rankings lead to different distributions and interpretations of reflexives. Section 4 concludes this study.

II. ANALYSES OF REFLEXIVES IN ENGLISH AND CHINESE BY MINIMALISM PROGRAM

This section presents the basic concepts of MP developed by Chomsky (1992, 1995, 1998), followed by analyses of reflexives in English and Chinese by MP.

1. Basic Concepts of MP

The main spirit of MP is ‘Principle of Economy.’ MP tries to minimize the theoretical machinery, “to minimize the acquisition burden ... and to maximize the learnability of natural language grammar” (Radford, 1997:6). Based on the literature (程工, 1994; Ouhalla, 1999; Radford, 1999; 石定栩, 2003; Tang, 2000), the discussion will introduce the framework of MP, Checking Theory and feature percolation and attraction. The framework of MP is schematized as (13).



In MP, sentences are derived through successive merger operation and Generalized Transformations in the computational system, and then syntactic structures are transformed into two structural representations: logical form (LF) and phonetic form (PF). It has been assumed in MP that words are described in terms of sets of phonetic, grammatical, and semantic features. According to Principle of Full Interpretation (PFI), specifying “a representation for a given expression must contain all and only those elements which contribute directly to its interpretation at the relevant level” (Radford, 1997:171), PF only consists of phonetically interpretable features, managing the phonetic forms of sentences; LF merely comprises semantically interpretable features, dealing with meaning of sentences. If sentence PF

and/or LF forms satisfy PFI, then they are said to converge at PF and/or LF. If these forms violate PFI, they are said to crash. Whether it is said to converge or crash can be demonstrated in terms of Checking Theory.

Features in MP can be divided into two kinds: *uninterpretable* vs. *interpretable*.⁵ Case features (nominative, accusative, dative) and inflections are uninterpretable, whereas grammatical features (Φ -features) are interpretable. Uninterpretable features, containing no intrinsic semantic content, must be checked and erased before Spell Out. Nevertheless, interpretable features, directly relating to meaning, can survive at LF. Moreover, all features must be checked in an appropriate checking configuration within appropriate checking domains (CDs) (i.e., spec-head, head-head and verb-complement).

For the features to be checked, features ought to percolate or be attracted to the CDs; otherwise, they will violate PFI and incur *crash*. As indicated in Radford (1999:520), *percolation* (also known as *attraction*) is “an operation by which a feature is attracted to one category and is attached to another category higher up in the structure.”⁶ In other words, percolation moves only features, leaving phonetic forms unchanged.

2. Analysis of English Reflexives by Minimalism Program

This section presents the analysis of English reflexive in terms of MP. English reflexives are formed by means of possessives plus *self* or *selves* (e.g. myself, herself, ourselves, and yourselves).⁷ The reflexives and their antecedents should bear the same interpretable Φ -features (i.e., person, number, gender). In addition, features must be checked in one of the three CDs: specifier-head, head-head, and verb-complement, in the first two of which the feature checking between antecedents

⁵ Features can also be distinguished as *strong* or *weak*, which is irrelevant to our discussions here.

⁶ Feature percolation (or attraction) is different from X or XP movement in that the former only moves features, establishing a ‘feature chain’, while the latter moves a word, including its phonetic form, from one position from another.

⁷ Though *themselves* is an apparent exception, it does not give rise to problems in the analysis.

and reflexives should be carried out. Originally, the antecedent-antecedee relation by itself is not suitable for a checking configuration (Reuland, 2001), and, in MP, the available ways to establish the checking configurations are to move/attract the feature. In other words, if features are located in positions where feature checking can not be executed, then they will be attracted to the nearest proper CD, as defined by Chomsky (1995: 297), “K attracts F(eature) if F is the closest feature that can enter into a checking relation.”

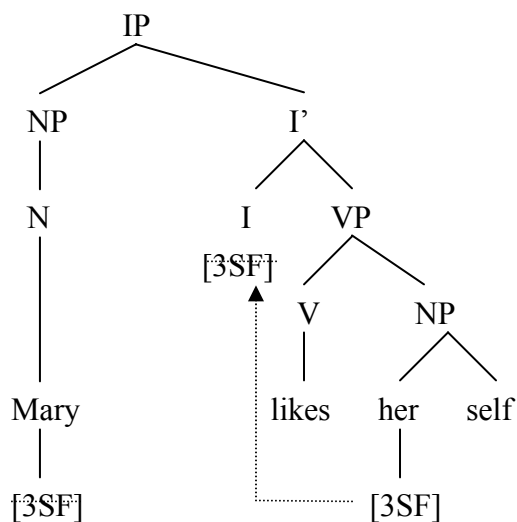
English reflexives can be analyzed simply by checking theory. Discussions will be based on the three characteristics of English reflexives.

First of all, English reflexives are locally bounded, as in (14). The structure of (14a) is shown in (15).

(14) a. Mary likes herself.

b. We like ourselves.

(15)

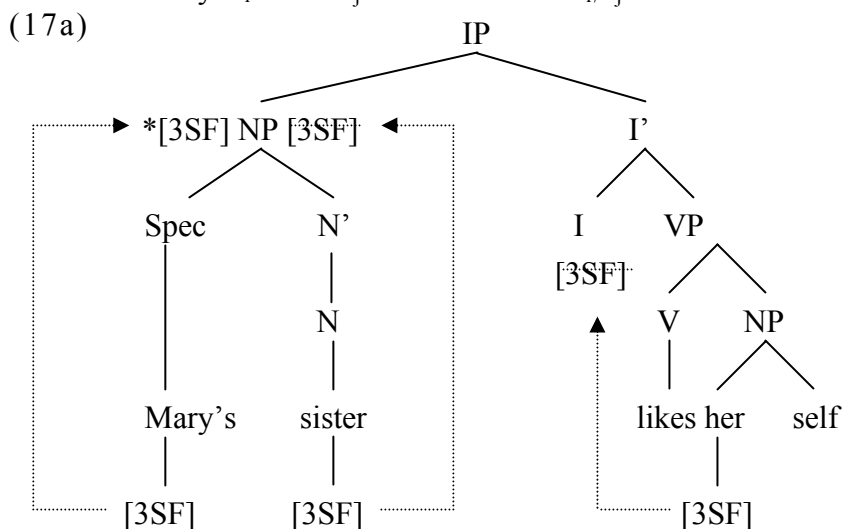


In MP, all features must be checked. In (15), [3SF] under the reflexive herself is not located in a CD, and hence is attracted and percolate into I. After the feature attraction and percolation into I, both features are located in a spec-head CD, in which the features are checked and erased. By feature checking, the reflexive herself succeeds to take Mary as its antecedent.

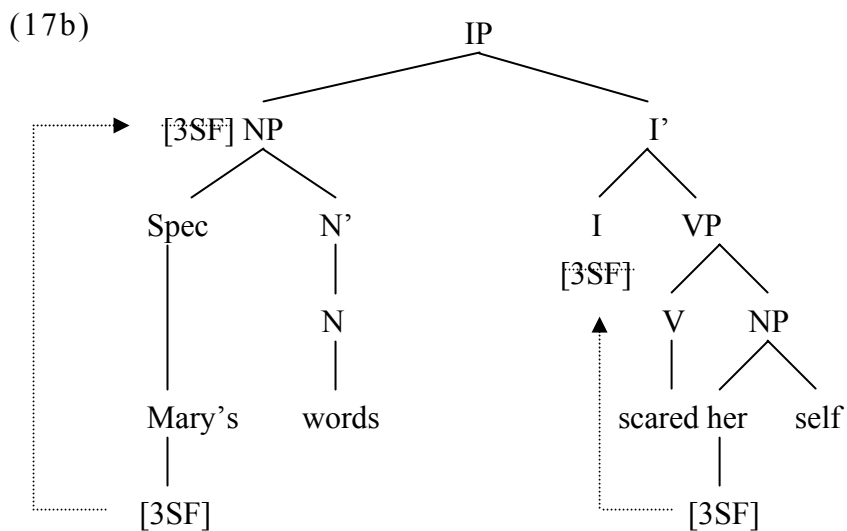
Second, English reflexives can only take the nearest ‘proper’ N in a subject NP as its antecedent. Consider the sentences in (16), and (17a&b) display the structures of

(16a&b).

- (16) a. Mary's_i sister_j likes herself_{i/j}.
 b. Mary's_i words_j scared herself_{i/*j}.



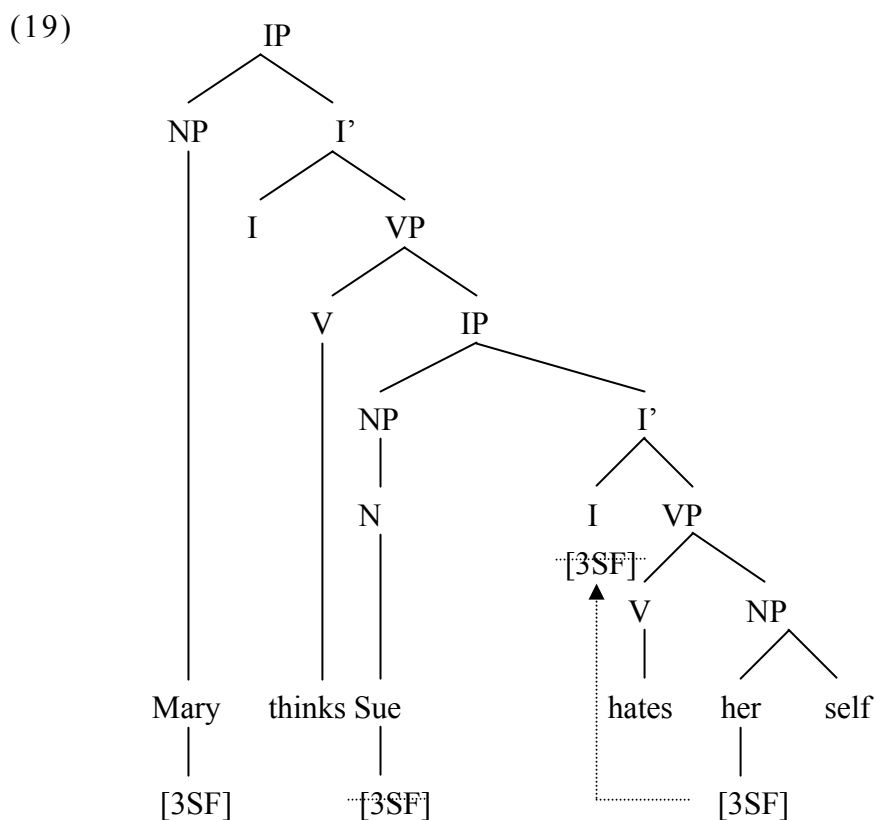
In (17a), [3SF] under the reflexives is attracted and percolate into I. Checking is possible between sister and herself in that they are located in the spec-head CD, the distance between them is the shortest and they possess the same Φ -features. For all that Mary and herself possess the same Φ -features, checking fails because, after the checking between sister and herself, the features under herself have been erased. Such feature erasure makes it impossible for Mary to be checked. Can [3SF] under Mary be checked first? The answer is 'No'. Note that the syntactic label of Mary's is Spec, but that of sister is the head N. Hence, it has a good reason for the head N in the NP to be checked first.



Take a look at (17b), in which the head N, words, is not a proper antecedent for the reflexive herself. In such a situation, Mary, though located in the specifier position, can be a potential antecedent for the reflexive. Hence, [3SF] of Mary and the reflexive percolates into NP and I, both of which develop a CD where both features are checked and erased.

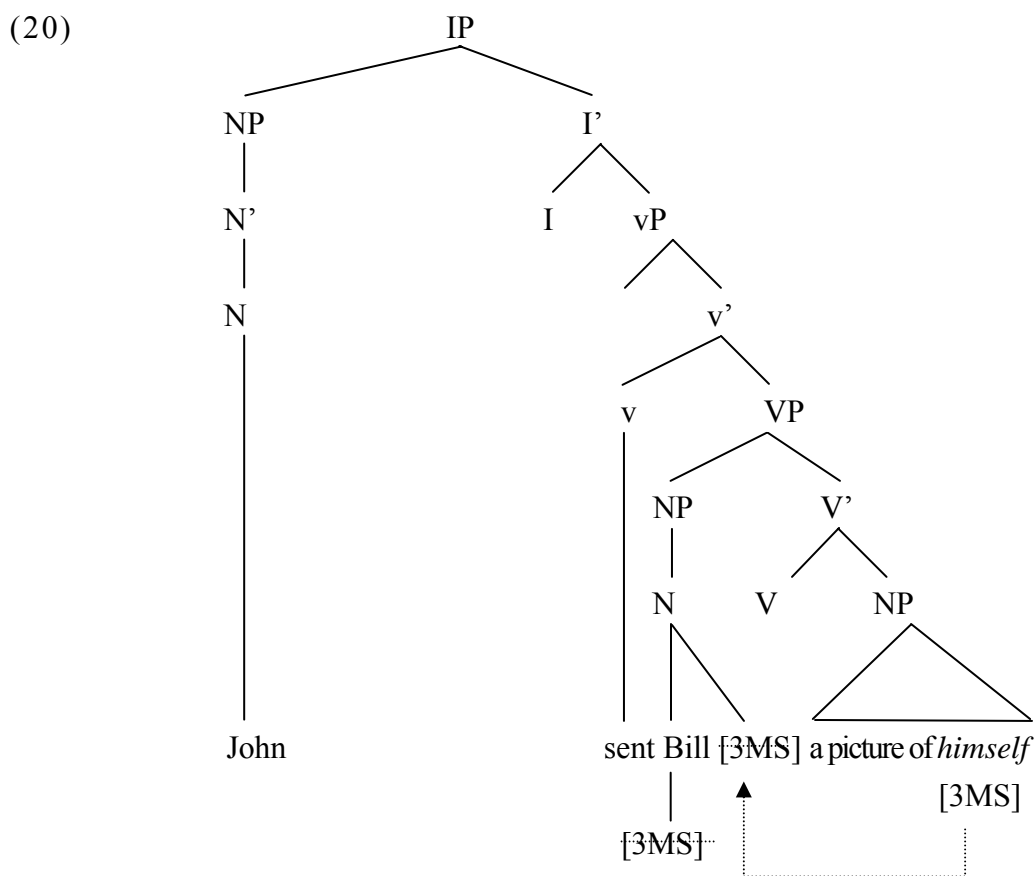
Third, English reflexives show no long-distance binding. Consider the sentences in (18), and (19) presents the structure of (18a).

- (18) a. Mary_i knows (that) Sue_j hates herself*_{i/j}.
 b. Bill_i thinks (that) Mr. Wang_j kills himself*_{i/j}.



In (19), after attraction and percolation of Φ -features into I in the spec-head CD, the features of Sue and the reflexives are checked and erased. The feature erasure makes it impossible for the features under Mary to be further checked. Hence, the reflexive herself can take as its antecedent only Sue, rather than Mary.

Fourth, how can the reflexives with objects as their antecedents be represented in the proposed framework? With John sent Bill a picture of himself as an example, its structure is shown in (20).



As stated previously, beside the spec-head CD, MP also suggests the head-head CD, in which feature checking is applied between the reflexives and their object antecedents. It is clear in (20) that the feature [3MS] of *himself* is attracted and searches for appropriate features with which it can check. During feature attraction, [3MS] encounters another [3MS] under *Bill*, forming a head-head CD, where both [3MS] features are checked and erased. The feature erasure makes it impossible for *himself* to take *John* as its antecedent.

To summarize, antecedent-antecedee relation in English reflexives is established when Φ -feature checking is possible among the antecedents and the reflexives. After checking is carried out, the Φ -features are erased, which makes further checking in the higher CDs impossible.

3. Analysis of Chinese Reflexives by Minimalism Program

This section will demonstrate how MP can be used to analyze interpretations of Chinese reflexives. Before the application of MP into Chinese reflexives, some further distinctions between English and Chinese reflexives should be made.

First, as expressed by Bouchard (1984), for an argument α to be interpreted, it must have a full specification for Φ -features. However, unlike English reflexives, whose Φ -features are fully specified, reflexives in Chinese only consist of [P(erson)] and/or [N(umber)].⁸

What is more, different from English reflexives, Chinese ones can be further divided into *compound* reflexives and *bare* reflexives (i.e. *ziji* ‘self’). Compound reflexives (e.g. *woziji* ‘myself’, *tamenziji* ‘themselves’), patterning with English ones, are locally bound and specified for [P] and [N] features. On the contrary, bare reflexives, more flexible than compound ones, shows *long-distance binding* and *blocking effect*. Moreover, this study follows Tang’s (1989) definitions that compound reflexive is specified as pronoun plus *ziji*, whereas bare reflexive is specified as an empty *pro* plus *ziji*.

What is the feature content of *bare* reflexives? As narrated in Reuland (2001), if there are fewer constraints on the interpretation of an anaphor, the anaphor has fewer Φ -features. However, if *ziji* is not specified for any Φ -features, then, theoretically speaking, *ziji* can refer to any potential antecedents. As a result, I argue that, rather than being fully specified for Φ -features, the bare reflexive *ziji* in Chinese contains only [P]. [N] should not be assigned for *ziji* on the basis of the following three arguments. First, if [N], together with [P], is assigned for bare reflexive, then why do both kinds of reflexives result in different interpretations, if they possess the same Φ -features? Second, the interpretations of *ziji* related to [N] should be regarded as a semantic, but not a syntactic issue. For example, consider the following sentences in (21).

⁸ Compound reflexives contain both features, whereas bare reflexives consist of only [person].

- (21) a. Wo_i zhidao $womin_j$ xihuan $ziji_{*i/j}$
 I know we like self 'I know (that) we like ourselves.'
 b. $Womeni$ zhidao woj xihuan $ziji_{*i/j}$
 We know I like self 'We know (that) I like myself.'
 c. Nii zhidao $nimin_j$ xihuan $ziji_{*i/j}$
 you know you like self 'You know (that) you like yourselves.'
 d. $Nimeni$ zhidao nij xihuan $ziji_{*i/j}$
 you know you like self 'You know (that) you like yourself.'
 e. Tai zhidao $tamen_j$ xihuan $ziji_{*i/j}$ ⁹
 he know they like self 'He knows (that) they like themselves.'
 f. $Tameni$ zhidao taj xihuan $ziji_{*i/j}$
 They know he like self 'They knows (that) he like himself.'

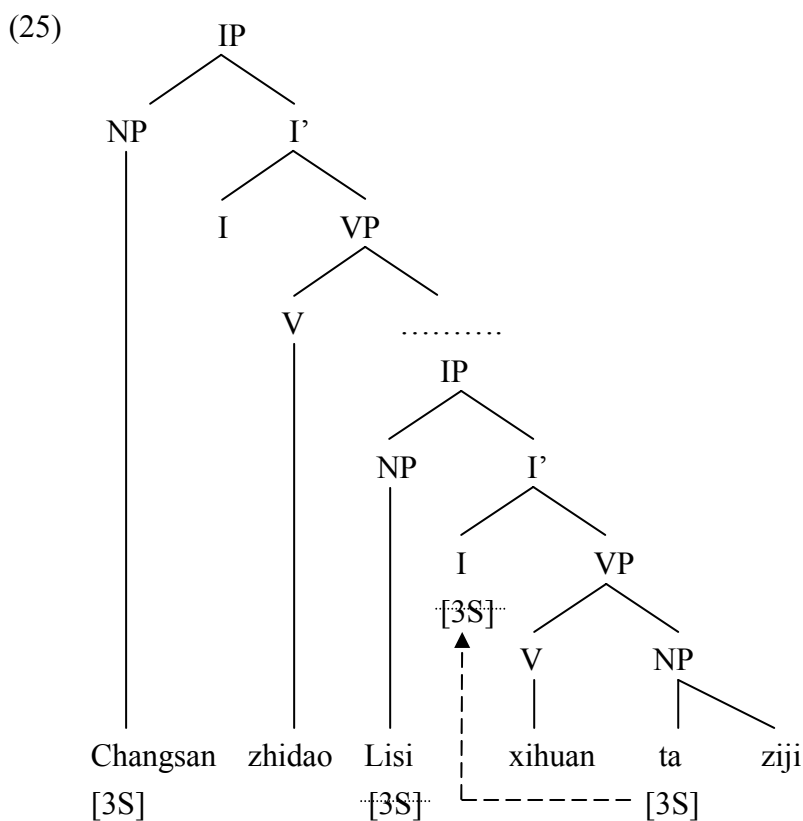
As pointed out in Tang (1994), why *ziji* refer only to the lower antecedent, but not the higher one in (21a-d) is that these two antecedents exist in a 'part-whole' relation. (21e-f) also confirm the assumption when *ta* and *tamen* also exist in a 'part-whole' relation. Third, consider the sentences in (22). Each sentence in (22) contains three potential antecedents, one of which is plural; however, the interpretation of *ziji* is not blocked in spite of the occurrence of a plural antecedent (程工, 1994).

- (22) a. [$Changsan_i$ renwei $Lisi_j$ zhidao $tamen_k$ xihuan $ziji_{i/j/k}$]
 'Changsan thinks (that) Lisi knows (that) they like himself/themselves.'
 b. [$Changsan_i$ renwei $tamen_j$ zhidao $Wangwu_k$ xihuan $ziji_{i/j/k}$]
 'Changsan thinks (that) they know (that) Wangwu likes himself/themselves.'
 c. [$Tamen_i$ renwei $Lisi_j$ zhidao $Wangwu_k$ xihuan $ziji_{i/j/k}$]
 'They think (that) Lisi knows (that) Wangwu likes himself/themselves.'

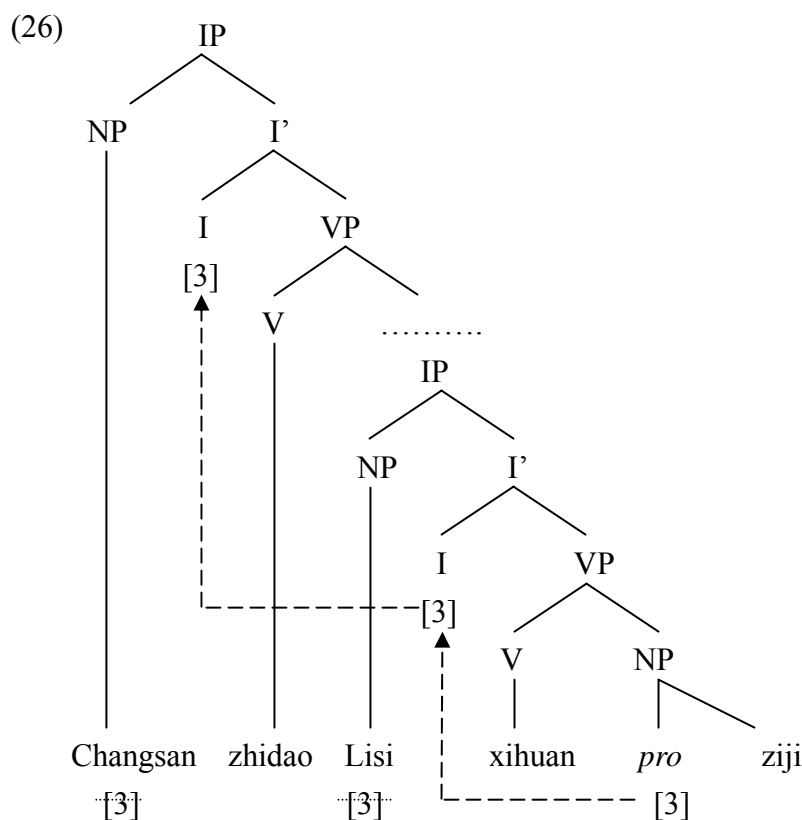
To sum up, compound reflexives in Chinese are fully specified for [P] and [N], whereas bare reflexives only [P]. However, another question to ask is where [P] of bare reflexives comes from? The [P] of bare *ziji* will recover from the closest

⁹ Some people may possess the intuition that *ziji* can refer to both *ta* and *tamen*. To attain objective results, one hundred subjects (50 Chinese-major and 50 non-Chinese-major seniors in NKNU) are invited to respond to a questionnaire. The sentence (20e) is used as an item, under which three answers related to the antecedents are provided (e.g., *ta*, *tamen* or both). The result shows that sixty-six subjects prefer *tamen*, but not *ta*, as the antecedent of *ziji*.

- (24) a. Changsan_i zhidao Lisi_j xihuan taziji_{*i/j} (compound)
 ‘Changsan knows Lisi like himself’
 b. Changsan_i zhidao Lisi_j xihuan ziji_{i/j} (bare)
 ‘Changsan knows Lisi like himself’



In (25), compound reflexives in Chinese consist of the [P] and [N] features. Similar to the analysis of English reflexives, the [P] and [N] features are attracted and percolate into I. In the spec-head CD, the features are checked and erased. Checking the features enables *ziji* to be referred to *Lisi*, whereas feature erasure makes further checking impossible. Thereby, *taziji* and *Changsan* cannot be coreferential.



In (26), bare reflexives are made up of only [P]. After the attraction and percolation of [P] into the lower I, it is checked with [P] under *Lisi*, and *ziji* and *Lisi* are coreferential. However, different from compound reflexives, which are formed by an overt pronoun plus *ziji*, [P] cannot be erased or deleted in bare reflexives according to the Principle of Recoverability of Deletion (PRD) to the effect that a checked feature cannot be deleted if it fails to be recovered. Bare reflexives are formed by a covert *pro* plus *ziji*. If deleted, the Φ -features cannot be recovered because of the invisibility of the covert *pro*. As a result, [P] is further attracted and percolate into the upper I, which enables [P] under *Changsan* to be checked and erased. Accordingly, *ziji* can refer to both *Lisi* and *Changsan*.¹⁰

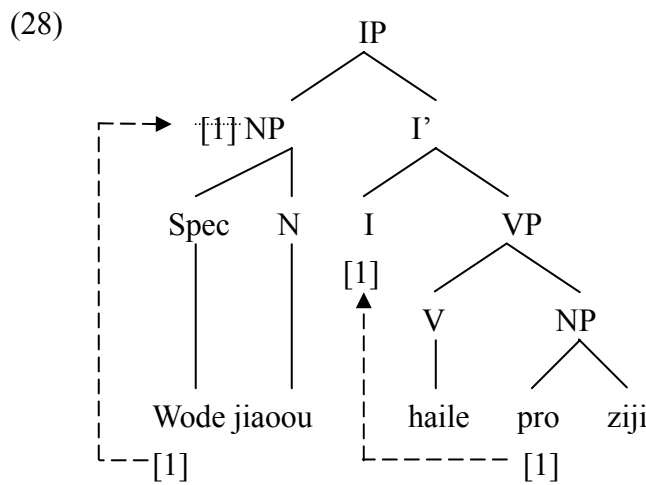
¹⁰ To my knowledge, there is one exception to the generalizations. Consider the following sentences.

(26a) wo_i $zhidao$ $Changsan_j$ $xihuan$ $ziji_{i/j}$ 'I know Changsan like myself/himself.'

(26b) ni_i $zhidao$ $Changsan_j$ $xihuan$ $ziji_{*i/j}$ 'You know Changsan like *yourself/himself.'

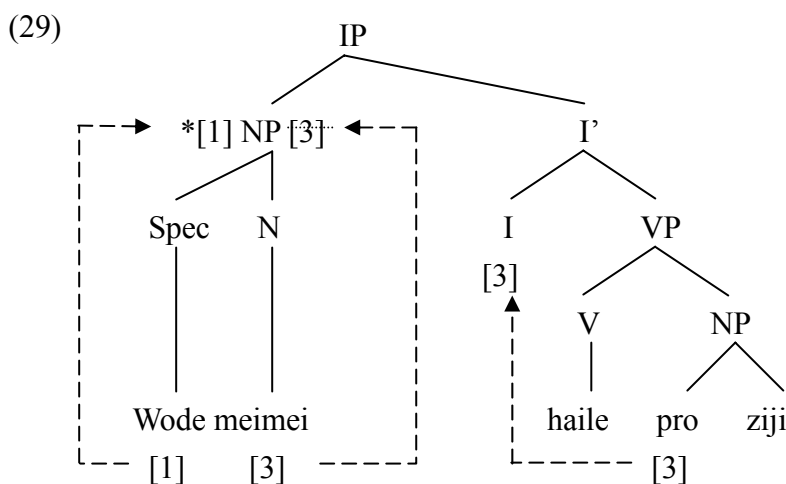
Second, how can *ziji* pick out antecedents in subject NPs as far as MP is concerned? Consider the following sentences in (27) and the structures are exhibited in (28-30):

- (27) a. [wo_i de jiaouou hai le ziji_i]
 I De pride hurt self 'My pride hurt myself.'
 b. [wo_i de meimei_j hai le ziji_{*i/j}]
 I DE sister hurt self 'My sister hurt herself.'
 c. [Changsan_i de lau ban_j hai le ziji_{i/j}]
 Changsan DE boss hurt self 'Changsan's boss' tricks hurt himself.'

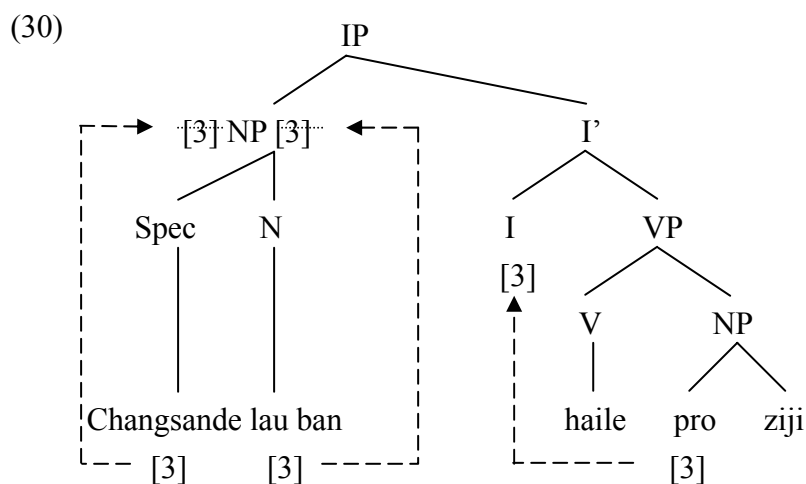


In (28), [P] of the bare reflexive is specified as [1] under GCT and RE, for *wo* is the closest antecedent for *ziji*. Both features are attracted to percolate into NP and I respectively, developing a checking configuration in which the features are checked. Hence, *ziji* can refer to *wo*.

In (26b), *ziji* can refer only to *Changsan*, but not to *ni*. However, in (26a), *ziji* can take both *wo* and *Changsan* as antecedents. However, close investigation reveals that, in (26a), *wo* not only functions as the sentence subject, but also for the discourse speaker. Hence, this exception may not be a syntactic issue, but should be a discourse one.



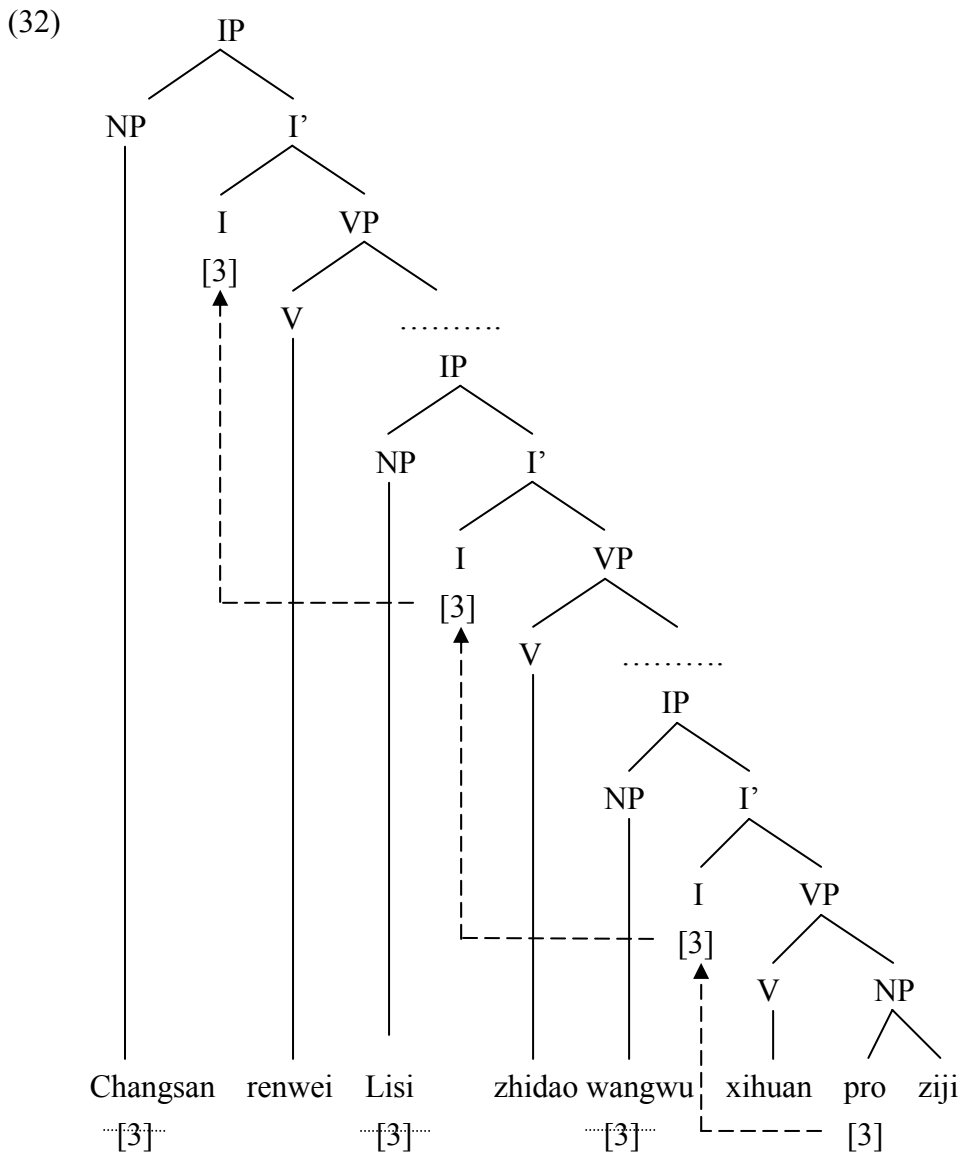
Similar to (28), [P] of the bare reflexive in (29) is specified as [3], which is then attracted to percolate into I. *Wo* and *meimei* are fully specified [1] and [3], both of which percolate into NP, forming a spec-head CD together with I. However, feature checking succeeds in [3], but fails in [1]. Hence, *ziji* can only take *meimei* as its antecedent, but not *wo*.



In (30), [P] of *ziji* is specified as [3], for *lau ban* is the closest antecedent for *ziji*, and then it is also attracted and percolate into I. Different from (29), both potential antecedents, *Changsande* and *lau ban*, in (30) are specified as [3]. As a result, when the features percolate into NP, both can be checked with [3] under I in the spec-head CD. On the basis of the discussions, MP can successfully account for the antecedents of *ziji* located in subject NPs.

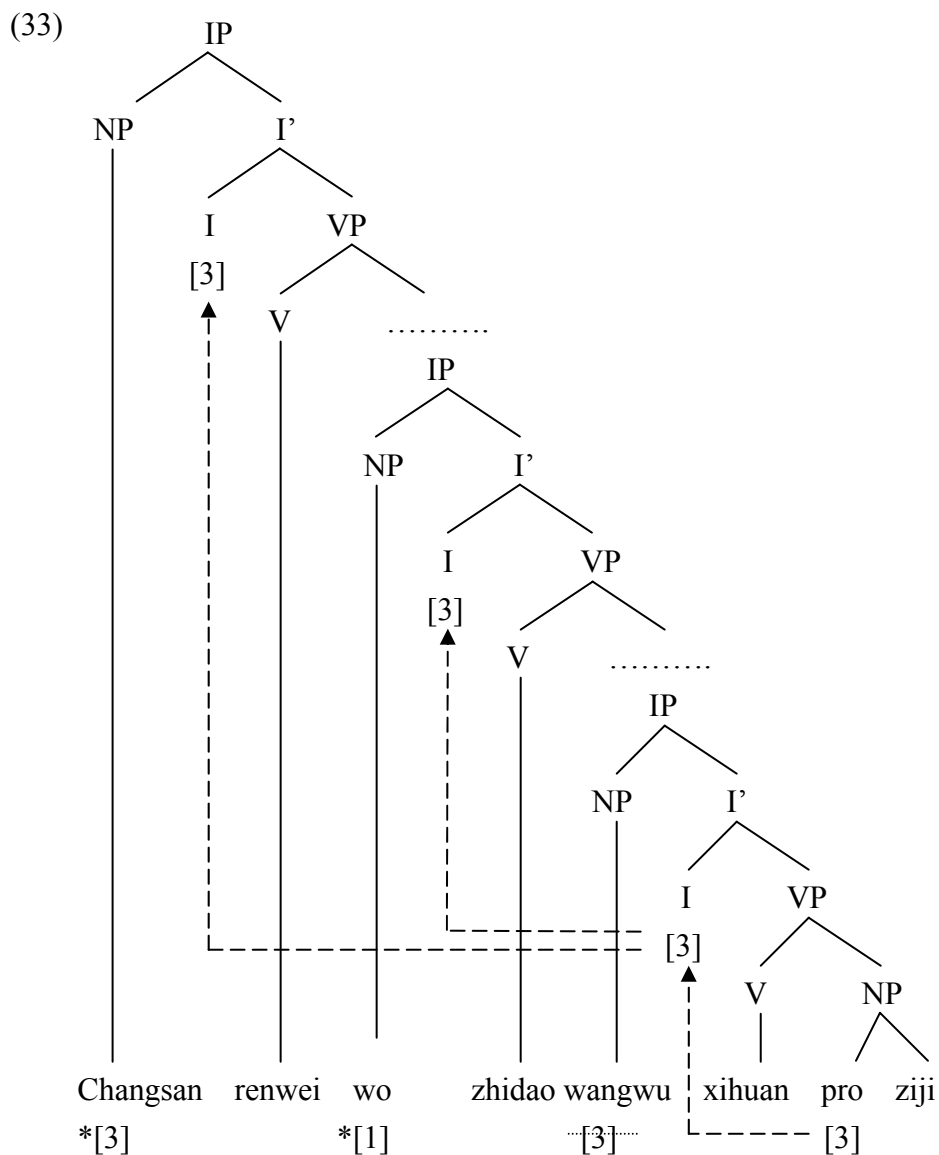
Third, long-distance binding and blocking effect are characteristics of Chinese bare reflexives. How can MP handle these phenomena? Consider the sentences in (31), whose structures are displayed in (32) and (33) respectively.

- (31) a. [Changsan_i renwei [Lisi_j zhidao [Wangwu_k xihuan ziji_{i/j/k}]]]
 Changsan think Lisi know Wangwu like self
 ‘Changsan thinks (that) Lisi knows (that) Wangwu likes himself.’
 b. [Changsan_i rewei wo_j zhidao Wangwu_k xihuan ziji_{*i/*j/k}]
 ‘Changsan think (that) I knows (that) Wangwu likes himself.’



In (32), on account of the recovery from the closest possible antecedent

Wangwu, [P] of *ziji* should be specified as [3], which is, then, attracted to the lowest I for the sake of feature checking. The feature is checked with [3] under *Wangwu*. However, after checking, the feature is not deleted owing to the disability of recovery of the feature content from *pro*. Without being deleted, the feature is further attracted to the intermediate and the highest I, and is checked with the [3] features under *Changsan* and *Lisi*. After the whole derivations in (32), *ziji* can refer not only *Wangwu*, but *Changsan* and *Lisi* as well. It is clear that long-distance binding between *ziji* and its antecedent can be achieved ‘economically’ through feature checking in MP.



In (33), [P] of *ziji* is specified as [3], which is further attracted to the lowest I for the sake of feature checking. In the spec-head CD, [P] is checked with [3] of *Wangwu*. Hence, *ziji* and *Wangwu* are coreferential.

Without being omitted, the [P] is then attracted to the next CD (i.e. intermediate IP), and is checked with [1] under *wo*; unfortunately, checking fails. In other words, *ziji* can not take *wo* as an antecedent.

Can [3] be directly attracted to the highest CD (i.e. percolation into the highest I)? One may think that, because both *ziji* and *Changsan* are specified as [3], checking will be feasible if [3] can be attracted from the lowest I to the highest I,

skipping the intermediate I. Unfortunately, the answer is ‘No’. The reason is that such a feature attraction violates one of the economical principles: ‘Shortest Movement/Attraction’ in MP. Note that, after the feature checking in the lowest IP, the next target for the feature to be checked is the intermediate spec-head CD. Regardless of having [3] in common, skipping the intermediate CD will incur a violation of Shortest Movement/Attraction in MP. Namely, *ziji* can not refer to *Changsan*. Based on (33), *ziji* can take neither *Changsan* nor *wo* as its antecedents.

In a nutshell, the difference between compound and bare reflexives can be accounted for in terms of MP. Moreover, the binding relations between bare reflexives *ziji* and their antecedents (i.e. antecedents in subject NPs, long-distance binding, blocking effect) can also be ‘economically’ handled by MP.

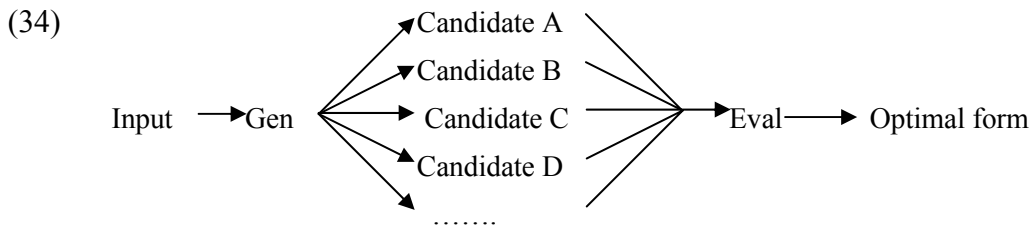
III. ANALYSES OF REFLEXIVES IN ENGLISH AND CHINESE BY OPTIMALITY THEORY

Based on the discussions in section 2, MP provides economical analyses (i.e. recoverability, feature checking and feature deletion) to English and Chinese reflexives. No revised binding theory or extra conditions are required. On the basis of MP, this section will present OT analyses of English and Chinese reflexives. It will be clear that the differences among English and Chinese reflexives result from the different ranking of the same set of constraints.

1. Basic Concepts in Optimality Theory

Optimality Theory, initially proposed in phonology by Prince and Smolensky (1993) and McCarthy and Prince (1993), is a framework in which *input*, *Gen(erator)*, *Eval(uator)* and *optimal output* are involved (Archangeli & Langendoen, 1997; Archangeli, 1999; Kager, 1999; McCarthy, 2004). Given an input (e.g. a group of words from lexicon), *Gen* will yield a set of possible sentence structures as output candidates. The functions of *Gen* are similar to those of Merger, Generalized Transformations or Affect α in MP. The set of output candidates are evaluated for optimality by *Eval*, which comprises a set of violable and ranked constraints. The

candidate which incurs the least violations of constraints is regarded as the optimal form.¹¹ These constraints reveal the universal properties of languages; each language has its own ranking for these constraints. Differences in the constraint ranking lead to different patterns among languages and result in systematic variations between languages. The framework is schematized in (34).



To analyze the reflexives in English and Chinese, the following set of constraints, listed in (35), are essential. The constraints, though they are dependent upon MP, are formed in terms of OT formats. In (35), DELETE (F) and ATTRACT (F) belong to markedness constraints, whereas MAX (F) and STAY (F) are faithfulness ones. What differentiate English reflexives from Chinese ones lies in the different interaction between markedness and faithfulness constraints.

¹¹ Violation of a lower ranked constraint may be tolerated in order to satisfy a higher ranked constraint.

(35) Procedures in MP and their Correspondent Constraints in OT		
MP	OT	Violation Marks
Recoverability	RECOVER (F)	F(eature) must be recovered. If not, it will incur a violation mark.
Feature Checking	CHECK (F)	Every potential antecedent should be checked in the CD where F of reflexives exist. Checking failure between the antecedent and the reflexive will incur a violation mark.
Feature Deletion	DELETE (F)	F must be deleted immediately after being checked. Not deleting of F of reflexives will incur a violation mark.
Attraction	ATTRACT (F)	F should be attracted and percolate to CDs. Besides, if F is not deleted, it should be further attracted to the next higher CD, if there is one. If not, a violation mark will be incurred.
Close Feature	CLOSE (F)	F should be check with the nearest F; otherwise, a violation mark will be incurred.
	MAX (F)	F cannot be deleted. If F is deleted, a violation mark will be incurred.
	STAY (F)	F should be linked to the same category. If it is attracted and percolate to other categories, one violation mark will be incurred for each attraction.

2. Analysis of English Reflexive by Optimality Theory

Based on section 2.2, in the analysis of English reflexives, attraction of Φ -features must precede feature checking, which further precedes feature deletion. Hence, the constraint ranking for English reflexives is narrated as (36). CLOSE (F) and DELETE (F), and MAX (F) and STAY (F) are in a nondominated order.

(36) Constraint Ranking for English Reflexives (and Chinese Compound Reflexives)
 ATTRACT (F) » CLOSE (F), CHECK (F) » DELETE (F) » MAX (F), STAY (F)

With (36), now consider how this constraint ranking can help explain why English reflexives (a) are locally bound, (b) can only take the nearest antecedents in subject NPs, and (c) lack long-distance binding.

Consider the first property and take *She likes herself* for example. Note that Φ -features are represented by sub-indexes and the checked and deleted Φ -features

are placed in parentheses.

(37) She likes herself.

Input: She likes herself.	ATTRACT (F)	CHECK (F)	DELETE (F)	MAX (F)	STAY (F)
a. She _{3SF} likes herself _{3SF} .	*!				
b. She _{3SF} _{3SF} likes herself.		*!			*
☞ c. She _(3SF) _(3SF) likes herself.				*	*
d. She _{3SF} _{3SM} likes himself.		*!			*

The candidate (37a) violates ATTRACT (F), for Φ -features are not attracted to I; consequently it incurs a fatal violation. The candidates (37b) and (37d) incur violations of CHECK (F), for Φ -features are not checked. The optimal form is candidate (37c). It satisfies the highest three constraints, for Φ -features are attracted, checked and deleted. Violations of the low-ranked constraints MAX (F) and STAY (F) are tolerated on account of the satisfactions of the higher-ranked ones.

Now, consider the second property which English reflexives lack. When two potential antecedents appear in the subject NP, an English reflexive can take only the closest one as its antecedent. To account for this phenomenon, one extra constraint CLOSE (F) should be considered. Take for instance *Mary's sister hates herself* and the evaluations are shown in (38)

(38) Mary's sister hates herself.

Input: Mary's sister hates herself.	ATT (F)	CLOSE (F)	CHE (F)	DEL (F)	MAX(F)	STAY(F)
a. Mary's _{3SF} sister _{3SF} hates herself _{3SF} .	*!					
b. Mary's _{3SF} sister _{3SF} _{3SF} hates herself.			**!			*
☞ c. Mary's _{3SF} sister _(3SF) _(3SF) hates herself.			*		*	*
d. Mary's _(3SF) sister _(3SF) _(3SF) hates herself.		*!			*	*
e. Mary's _(3SF) sister _{3SF} _(3SF) hates herself.		*!	*		*	*

(38a), without feature attracted, incurs a violation of the highest-ranked constraint. (38d) and (38e) violate CLOSE (F); in the former, one of the checked antecedent is not the closet, while, in the latter, not the closet antecedent is checked.

(38b) and (38c), without any violations of ATTRACT (F) and CLOSE (F), violate CHECK (F). The optimal form is (38c), because (38b) have one more violation mark of CHECK (F) than (38c). Note that CLOSE (F) must outrank CHECK (F). If the reversed order is taken, the optimal form will be (38d) rather than (38c).

Third, English reflexives lack long-distance binding. Take into consideration the sentences *Mary thinks Sue knows Cathy likes herself*.

(39) Mary thinks Sue knows Cathy likes herself

Input:	ATT (F)	CHE (F)	DEL (F)	MAX (F)	STAY (F)
Mary thinks Sue knows Cathy likes herself.					
a. Mary _{3SF} thinks Sue _{3SF} knows Cathy _{3SF} likes herself _{3SF} .	*! **				
b. Mary _{3SF} thinks Sue _{3SF} knows Cathy _{3SF} likes herself.	*! *	*			*
c. Mary _{3SF} thinks Sue _{3SF} knows Cathy _(3SF) likes herself.				*	*
d. Mary _{3SF} thinks Sue _{3SF} knows Cathy _(3SF) likes herself.	*! **	*!	*		**
e. Mary _{3SF} thinks Sue _(3SF) knows Cathy _(3SF) likes herself.			*!		**
f. Mary _{3SF} thinks Sue _(3SF) knows Cathy _(3SF) likes herself.			*! *		** *
g. Mary _(3SF) thinks Sue _{3SF} knows Cathy _(3SF) likes herself.	*!		*		**

(39c) is the optimal form, with the less and the lowest violation marks. (39a, b, d and g) violate the highest ranked constraint ATTRACT (F), incurring fatal violation marks. Note that the “Shortest Move/Attract” in MP is replaced by ATTRACT (F) in OT. In the violation of CHECK (F), (39b) and (39d) incurs a violation mark. In (39e and f), Φ -features should be deleted right after the checking between the antecedents and the reflexive; nonetheless, Φ -features are not deleted, an apparent violation of DELETE (F).

To sum up, as claimed by OT, languages can be represented in terms of a set of constraints. Hence, the analysis of English reflexives in MP in section 2.2 can also be captured by means of OT. With the constraints in (35) and their ranking in (36), the interpretations of English reflexives can be correctly evaluated.

3. Analysis of Chinese Reflexive by Optimality Theory

How can OP analysis be utilized into the interpretations of Chinese reflexives? As indicated in section 2.3, Chinese comprises compound and bare reflexives, the first of which patterns with English reflexives, which provides a good starting point for the following discussion.

If compound reflexives in Chinese are actually parallel with English ones, then the constraint ranking in (36) for English reflexives can also be made use of in Chinese compound ones. Consider the sentence *Mary xihuan taziji* ‘Mary likes herself’.

(40) *Mary xihuan taziji*

Input: <i>Mary xihuan taziji</i> .	ATTRACT (F)	CHECK (F)	DELETE (F)	MAX (F)	STAY (F)
a. <i>Mary</i> _{3S} <i>xihuan taziji</i> _{3S} .	*!				
b. <i>Mary</i> _{3S} <i>3Sxihuan taziji</i> .		*!			*
☞ c. <i>Mary</i> _(3S) <i>(3S)xihuan taziji</i>				*	*
d. <i>Mary</i> _{13S} <i>2Sxihuan niziji</i> .		*!			*

By virtue of the constraint ranking in (36) and the evaluation in (40), compound reflexives can be correctly evaluated, for only the optimal form (40c) survives. (40a) violates ATTRACT (F) because of no feature attractions. In obvious violations of CHECK (F), Φ -features in (40b) and (40d) fail to be checked.

How can bare reflexives in Chinese be handled by OT? As shown in section 2.3, bare reflexives, unlike compound ones, exhibit long-distance binding and blocking effect. In addition, bare reflexives can take the antecedents in the subject NPs, as long as they have the [P] in common. Furthermore, as expressed in section 2.3, [P] and [N] of compound reflexives are deleted immediately after feature checking; however, deletion of [P] of bare reflexives is impossible. With so many differences, it seems impossible to take advantage of the same constraint ranking. Hence, with the same constraints, I will argue that the constraint ranking that bare reflexives should obey is described in (41).

(41) Constraint Ranking for Chinese Bare Reflexives

RECOVER (F)》ATTRACT (F)》CHECK (F), MAX (F)》CLOSE (F), DELETE (F), STAY (F)

For the interpretations of bare reflexives, [P] feature must be recovered and be attracted to the possible CDs. Hence, RECOVER (F) and ATTRACT (F) must outrank other constraints. CHECK (F) must outrank Moreover, though long-distance binding is possible, skipping of potential antecedents is not allowed, and can be ruled out by ATTRACT (F). DELETE (F), because only after feature checking, can Φ -features be deleted. What is more, in the MP analysis in section 2.3, [P] of bare reflexives cannot be deleted, which make MAX (F) outrank DELETE (F). With (40), the following discussion will show how (41) can account for the interpretations of bare reflexives in Chinese.

First, consider the sentence *wo xihuan ziji* ‘I like myself’.

(42) wo xihuan ziji

Input: wo xihuan ziji	RECOV (F)	ATT(F)	CHE (F)	MAX (F)	DEL (F)	STAY (F)
a. wo ₁ xihuan ziji	*!					
b. wo ₁ xihuan ziji ₁		*!				
c. wo ₁ xihuan ziji			*!			*
d. wo ₍₁₎ xihuan ziji					*	*
e. wo ₍₁₎ xihuan ziji				*!		*

(42a) and (42b), violating RECOVER (F) and ATTRACT (F), incur fatal violations. In (42c), though [P] is attracted into the spec-head CD, checking does not occur, leading to a violation of CHE (F). With [P] deleted, (42e) violates MAX (F) and is evaluated out.

Next, bare reflexives can have multiple antecedents in a subject NP. Such a characteristic makes CLOSE (F) low-ranked. Consider the sentence *Mary de lau ban haile ziji* ‘Mary’s boss hurt himself/herself.’ Note that the bare reflexive can take both *Mary* and *lau ban* as antecedents.

(43) Mary de lau ban haile ziji

Input:	RECOV (F)	ATT (F)	CHECK (F)	MAX (F)	DEL (F)	STAY (F)	CLOSE (F)
Mary de lau ban haile ziji							
a. Mary ₃ de lau ban ₃ haile ziji.	*!						

b. Mary ₃ de lau ban ₃ haile ziji ₃ .		*!					
c. Mary ₃ de lau ban ₃ ₃ haile ziji.			*!*			*	
d. Mary ₃ de lau ban ₍₃₎ ₍₃₎ haile ziji.			*!	*		*	
e. Mary ₍₃₎ de lau ban ₃ ₍₃₎ haile ziji.			*!	*		*	*
f. Mary ₍₃₎ de lau ban ₍₃₎ ₍₃₎ haile ziji.				*!		*	*
☞ g. Mary ₍₃₎ de lau ban ₍₃₎ ₃ haile ziji.					*	*	*

According to (43), (43a) and (43b), in the violations of the highest two constraints, fail to be the optimal forms. CHECK (F) is violated in (43c-e). When [P] is attracted and percolate into I, a spec-head CD is formed. However, in (43d-e), one of the potential antecedents is not checked, incurring one violation mark. Two are incurred in (43c) for two unchecked antecedents. (43f), with [P] deleted, violates MAX (F), which is fatal as compared with (43g).

Third, long-distance binding and blocking effect can also be explained in terms of the constraint ranking in (41). Take the sentences in (44) for expository examples. The evaluations of both sentences are shown in (45) and (46).

- (44) a. Mary_i renwei Bill_j zhidao John_k xihuan ziji_{i/j/k}
 b. Mary_i renwei wo_j zhidao John_k xihuan ziji_{i*/j*/k}

(45) Mary renwei Bill zhidao John xihuan ziji

Input:	RECOV (F)	ATT (F)	CHE (F)	MAX (F)	DEL (F)	STAY (F)
Mary renwei Bill zhidao John xihuan ziji						
a. Mary ₃ renwei Bill ₃ zhidao John ₃ xihuan ziji	*!					
b. Mary ₃ renwei Bill ₃ zhidao John ₃ xihuan ziji ₃ .		*!**				
c. Mary ₃ renwei Bill ₃ zhidao John ₃ ₃ xihuan ziji.		*!*	*		*	*
d. Mary ₃ renwei Bill ₃ zhidao John ₍₃₎ ₍₃₎ xihuan ziji.				*!		*
e. Mary ₃ renwei Bill ₃ zhidao John ₍₃₎ ₃ xihuan ziji.		*!*			*	*
f. Mary ₃ renwei Bill ₃ ₃ zhidao John ₍₃₎ ₃ xihuan ziji.		*!	*		*	**
g. Mary ₃ renwei Bill ₍₃₎ ₍₃₎ zhidao John ₍₃₎ ₃ xihuan ziji.		*!		*		**
h. Mary ₃ renwei Bill ₍₃₎ ₃ zhidao John ₍₃₎ ₃ xihuan ziji.		*!			*	**
i. Mary ₃ ₃ renwei Bill ₍₃₎ ₃ zhidao John ₍₃₎ ₃ xihuan ziji.			*!		*	***
j. Mary ₍₃₎ ₍₃₎ renwei Bill ₍₃₎ ₃ zhidao John ₍₃₎ ₃ xihuan ziji.				*!		***
☞ k. Mary ₍₃₎ ₃ renwei Bill ₍₃₎ ₃ zhidao John ₍₃₎ ₃ xihuan ziji.					*	***

l. Mary ₃ renwei Bill ₃ zhidao John ₍₃₎ xihuan ziji.		*!	*		*	**
m. Mary ₍₃₎ renwei Bill ₃ zhidao John ₍₃₎ xihuan ziji.		*!		*		**

In the evaluation, (45a), violating the highest RECOVER (F), is evaluated out. (45b-c), (45e-h) and (45l-m) are in the violations of ATTRACT (F) and cannot survive as the optimal forms. In (45i), only of the potential antecedent fails to be checked, incurring a violation mark of CHECK (F). In (45d) and (45j), after feature checking, the feature is deleted, violating MAX(F). Only (45k), which violates the lowest-ranked constraints can survive to be the optimal form.

Now consider the blocking effect of Chinese bare reflexives. The derivation is shown in (46).

(46) Mary renwei wo zhidao John xihuan ziji

Input:	RECOV (F)	ATT (F)	CHE (F)	MAX (F)	DEL (F)	STAY (F)
Mary renwei wo zhidao John xihuan ziji						
a. Mary ₃ renwei wo ₁ zhidao John ₃ xihuan ziji	*!					
b. Mary ₃ renwei wo ₁ zhidao John ₃ xihuan ziji ₃ .		*!**				
c. Mary ₃ renwei wo ₁ zhidao John ₃ xihuan ziji.		*!*	*		*	*
d. Mary ₃ renwei wo ₁ zhidao John ₍₃₎ (₃)xihuan ziji.				*		*
e. Mary ₃ renwei wo ₁ zhidao John ₍₃₎ xihuan ziji.		*!*			*	*
f. Mary ₃ renwei wo ₁ zhidao John ₍₃₎ xihuan ziji.		*!	*		*	**
g. Mary ₃ renwei wo ₁ zhidao John ₍₃₎ xihuan ziji.		*!	*		*	**
h. Mary ₍₃₎ renwei wo ₁ zhidao John ₍₃₎ xihuan ziji.		*!		*		**

From (46), (46a) is ruled out for its violation of the highest-ranked constraint. The violation of ATTRACT (F) in (46b, c, d, e) also prevents these candidates to be optimal. (46g) and (46h) violate SA(F), resulting in fatal terminations. (46d), with lowest-ranked constraints violated, survives to be the optimal form. Note that the [P] feature is deleted in (46d). Non-deletion of such a feature, as shown in (46e), with MAX(F) satisfied, violates the higher-ranked ATTRACT (F).

To make a long story short, with only RECOVER (F) added into the constraint

set, Chinese reflexives can be analyzed in terms of the same set of constraints, as utilized in the analysis of English reflexives. However, their differences in the interpretations of reflexives can be described by means of the different constraint ranking.

IV. CONCLUSION

As stated in section 1, though BPA can account for English reflexives, but it fails to provide multi-facet accounts for the complex syntactic behaviors of Chinese reflexives. This study tries to unify MP and OT, both of which are two sides of a coin. By checking theory in MP, reflexives in English and Chinese are analyzed as economically as possible. Structural requirements (e.g., sub-command, barrier, Head Movement Constraint, etc) are by no means demanded. By OT, it is clear that the same set of constraints with different rankings can correctly predict the interpretations of reflexives in English and Chinese.

Appendix

Abbreviations in This Study

GC	Governing Category
BPA	Binding Principle A
OT	Optimality Theory
MP	Minimalism Program
CD	Checking Domain
GCT	Generalized Control Theory
RE	Referential Economy
PRD	Principle of Recoverability of Deletion

REFERENCES

- 程工 (1994)。生成語法對漢語「自己」一詞的研究。《*國外語言學*》，3，30-40。
- 程工 (1994)。Chomsky 新論：語言學理論最簡方案。《*國外語言學*》，3，1-9。
- 程工 (1999)。漢語「自己」一詞的性質。《*當代語言學*》，1(2)，33-43。
- 石定栩 (2003)。Chomsky 句法理論的最新動向。《*當代語言學*》，5(1)，33-40。
- Archangeli, D., & Langendoen, D. T. (1997). *Optimality theory: An overview*. Malden, Mass.: Blackwell Publishers, Ltd.
- Archangeli, D. (1999). Introducing optimality theory. *Annual Review of Anthropology*, 28, 531-552.
- Barss, A. (1986). *Chains and anaphoric dependence: On reconstruction and its implications*. Doctoral dissertation, MIT, Cambridge, Mass.
- Battistella, E. (1989). Chinese reflexivization: A movement to INFL approach. *Linguistics*, 27, 987-1012.
- Battistella, E., & Xu, Y. H. (1990). Remarks on the reflexive in Chinese. *Linguistics*, 28, 205-240.
- Bouchard, D. (1984). *On the content of empty categories*. Dordrecht: Foris.
- Burzio, D. (1989). On the non-existence of disjoint reference principles. *Revista di Grammatica Generativa*, 14, 3-27.
- Burzio, D. (1991). The morphological basis of anaphors. *Journal of Linguistics*, 27, 81-105.
- Chomsky, N. A. (1992). A minimalist program for linguistic theory. Distributed by *MIT Working Papers in Linguistics*. Department of Linguistics and Philosophy, MIT, Cambridge.
- Chomsky, N. A. (1995). *The minimalist program*. Cambridge, Mass.: The MIT Press.
- Chomsky, N. A. (2000). Minimalist inquiries: The framework. In Roger Martin, David Michaels, and Juan Uriagereka (Eds.), *Step by step: Essays on minimalist*

- syntax in honor of Howard Lasnik* (pp. 89-155).
- Cole, P., & Sung, L. M. (1994). Head movement and long-distance reflexive. *Linguistic Inquiry*, 25, 355-406.
- Cole, P., Herman, G., & Sung, L. M. (1990). Principles and parameters of long distance reflexives. *Linguistic Inquiry*, 21(1), 1-22.
- Cole, P., & Sung, L. M. (1996). Antecedents and blockers of long-distance reflexives: The case of Chinese *ziji*. *Linguistic Inquiry*, 27(3), 357-390.
- Huang, C. T. (1984). On the distribution and reference of empty pronouns. *Linguistic Inquiry*, 15(4), 531-576.
- Huang, C. T. (1989). Pro-drop in Chinese: A generalized control theory. In O. Jaeggli, and K. J. Safir (Eds.), *The Null Subject Parameter* (pp. 185-214). Kluwer, Dordrecht.
- Huang, C. T., & Tang, C. C. J. (1988). The local nature of the long-distance reflexives in Chinese. *NELS 19*, Amherst, MA.
- Huang, C. T., & Tang, C. C. J. (1991). The local nature of the long-distance reflexive in Chinese. In J. Koster and E. Reuland (Eds.), *Long Distance Anaphora* (pp.263-282). Cambridge, Mass.: Cambridge University Press.
- Kang, B. (1988). Unbounded reflexives. *Linguistics and Philosophy*, 11, 415-456.
- Kager, R. (1999). *Optimality theory*. N.Y.: Cambridge University Press.
- Li, Y. (1993). What makes long distance reflexive possible? *Journal of East Asian Linguistics*, 2, 135-166.
- McCarthy, J., & Prince, A. (1993). *Prosodic Morphology I*. Unpublished manuscript, University of Massachusetts, Amherst and Rutgers University.
- McCarthy, J. (Ed.). (2004). *Optimality theory in phonology: A reader*. Oxford: Blackwell Publishing Inc.
- Ouhalla, J. (1999). *Introducing transformational grammar: From principles and parameters to minimalism*. N.Y.: Oxford University Press.
- Prince, A., & Smolensky, P. (1993). *Optimality theory: Constraint interaction in generative grammar*.
- Radford, A. (1997). *Syntax: A minimalist introduction*. Mass.: Cambridge University

Press.

- Radford, A. (1999). *Syntactic theory and the structure of English: A minimalist approach*. N.Y.: Cambridge University Press.
- Reuland, E. (2001). Primitives of binding. *Linguistic Inquiry*, 22(3), 439-492.
- Speas, M. (1997). Optimality theory and syntax: Null pronouns and control. In D. Archangeli and D. T. Langendoen (Eds.), *Optimality theory: An overview* (pp. 171-199). Mass.: Blackwell Publishers.
- Sung, L. M. (1990). *Universals of reflexives*. Doctoral dissertation, University of Illinois.
- Tang, C. C. J. (1985). *A study of reflexives in Chinese*. M.A. thesis, National Taiwan Normal University.
- Tang, C. C. J. (1989). Chinese reflexives. *Natural Language and Linguistic Theory*, 7, 93-121.
- Tang, T. C. (1994). *Studied on Chinese morphology and syntax: 5* (in Chinese). Taipei: Student Book Co., Ltd.
- Tang, T. C. (2000). *An introduction to minimalist analysis: Basic concepts and principles* (in Chinese). Taipei: Pyramid Press.
- Xu, L. (1993). The long-distance binding of ziji. *Journal of Chinese Linguistics*, 21, 123-142.
- Xu, L. (1994). The antecedent of ziji. *Journal of Chinese Linguistics*, 22, 115-137.