# INTERPRETATION OF BINDING OF CHINESE AND ENGLISH REFLEXIVES BY TAIWANESE COLLEGE STUDENTS

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## ABSTRACT

This paper discusses the use of reflexives in Chinese and their relationship to the understanding of English by college students in Taiwan. Altogether, 136 third-year Chinese college students, majoring in English, participated in this study. The students were randomly divided into two groups, each given a test on reflexives in Chinese and English. One group was administered a Chinese reflexive test while the other group was given a corresponding English-version of the test. Chinese speakers demonstrated diverse preferences in each of the following four Chinese syntactic structures: bi-clause, long-distance binding clause, blocking-effect clause, and topic-orientation clause. The results also showed that first language (L1) transfer occurred in second language acquisition of the English reflexives. In addition, the locality condition exhibited different developmental patterns depending on sentence types. Three of the most difficult sentence structures were long-distance binding sentences, control-verb sentences and bi-clause sentences, in which the control-verb was not predicted by L1 interference. Possible explanations for the results of the test in addition to their implications with regard to foreign language instruction are provided.

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**Introduction**

Based on Chomsky's (1981) framework of Government and Binding (1981), a reflexive anaphor is required to be bound in its minimal governing category (GC) to either a complex NP or IP and binding is defined as a linking of a c-commanding NP with its co-indexed reflexive. However, it has been widely noted recently that in Chinese a reflexive anaphor can be bound outside its GC. In English, reflexives can only take a local (LOC) antecedent, whereas the Chinese reflexive *ziji* can have a long-distance (LD) antecedent as well as a local one.

*Ziji* in Chinese does not have an independent reference and thus must be related to some other NP. This reference-dependent relation between *ziji* and the NP it refers to may vary as *ziji* functions differently within a sentence, whether it is anaphoric or emphatic in use (Xu 1994). While an anaphoric reflexive can refer to several possible antecedents in the sentence, the emphatic reflexive mainly intensifies the subject on its left. Another classification of *ziji* is related to the morphological form of reflexives. Since Battistella (1989), Chinese has been argued to have two types of reflexives: a simple form like *ziji* "self" and a complex form like *taziji* "himself/herself." The two reflexive forms have different syntactic behavior (Cole, Hermon and Sung, 1990; Huang & Tang 1991). This paper concentrates only on the Chinese simple reflexive *ziji* used as a bound anaphor.

In the following, Chinese and English reflexives are compared in their linguistic behavior in the phenomena of long distance binding, blocking effect and subject orientation.

*(a) Long-Distance Binding*

Huang (1984) finds that reflexives in Chinese can refer to their remote antecedent. Such a phenomenon is later referred to in Chinese-language literature as long-distance binding (Cole et al., 1990, Huang & Tang 1991). Therefore, in a sentence such as (1), *ziji* refers to the long-distance NP Zhangsan.

(1) $\text{Zhangsan}_i$ xiangxin [$\text{Lisi}_j$ zhidao [$\text{Wangwu}_k$ xihuan $ziji_{i/j/k}$]]

Zhangsan believe Lisi know Wangwu like self.

Zhangsan believes that Lisi knows that Wangwu like him/himself.

### (b) Blocking Effect

Though the reflexive, *ziji* can refer to its remote antecedents where the three potential antecedents agree in person, gender and number, and the ambiguity disappears when the intermediate subject disagrees with the remote and local antecedent. This phenomenon is documented as the blocking effect (Tang 1987).

(2) $Zhangsan_i$ xiangxin [$ni_j$ zhidao[$Wangwu_k$ xihuan $ziji_{i*/j*/k}$]]

Zhangsan believe you know Wangwu like self.

Zhangsan believes that you know that Wangwu like himself.

### (c) Subject Orientation

Subject orientation of the Chinese reflexive is widely observed in literature (Tang 1987, Cole et al., 1990, Battistella and Xu 1990, Huang and Tang 1991, Progovac 1992, Cole and Sung 1994). Reflexives in Chinese tend to refer to a subject antecedent, never an object antecedent.

(3) $Zhangsan_i$ song $Lisi_j$ yi-chang $ziji_{i/j*}$ de zhaopian. (Tang 1987)

Zhangsan gave Lisi one-CL self GEN picture

Zhangsan gave Lisi a picture of himself (Zhangsan).

(4) $Mary_i$ gave $Sue_j$ a picture of $herself_{i/j}$.

Mary gave Sue a picture of Mary./ Mary gave Sue a picture of Sue.

According to Chomsky's (1981) Binding theory, c-commanding indirect objects serve as binders, just as expected in the English counterpart (4). However, in (3), though both the subject and the indirect object c-command the reflexive, only the subject NP can bind *ziji* in Chinese.

To sum up, Chinese and English reflexives behave differently in the above three aspects: namely, Chinese reflexives can have long-distance binders while English reflexives can not; Chinese has a blocking effect in long-distance binding but English does not; and Chinese reflexive binders are subject-oriented while English reflexive binders could be either subject or object NPs. An interesting question arises for Taiwan's English-language learners acquiring an interpretation of English reflexives. First, their knowledge of Chinese reflexives might not help because the parameters in setting the governing category and the possible antecedent for reflexives are quite different between

Chinese and English. Hence, the main purpose of this study is to see if L1 properties do influence the development of L2 grammar by examining the EFL students' interpretation of English reflexives. Additionally, the different parameters of English reflexives are seldom explicitly provided in instruction in the English class. With these conditions, how do English learners in Taiwan shift their parameters from L1 to L2; that is, how do they acquire the locality condition of English reflexives without receiving any formal instruction?  Or, more fundamentally, is it possible for them to acquire such a L2 condition at all?  The research questions posed in this study are as follows:

1. How do Taiwanese college students interpret Chinese reflexives?
2. What is the developmental pattern observed when English-language learners in Taiwan acquire the locality condition of English reflexives?
3. To what extent will sentence patterns affect students' interpretation of English reflexives?

**Review of Literature**

The Chinese reflexive is characterized by long-distance binding; so often the antecedent and the reflexives are not coarguments of the minimal governing category. In the following, we first review two alternative accounts of long-distance *ziji* in terms of move-to-INFL analysis and the relativized SUBJECT approach. In the second part, L2 studies on the acquisition of English reflexives are evaluated.

**Previous Studies of Chinese Reflexivization**

In Government and Binding (GB) analysis, researchers have proposed various accounts of the properties of reflexives. Of these accounts, two have received increasingly more attention in recent years. One is the move-to-INFL analysis proposed by Cole, Hermon and Sung (1990). The other is a nonmovement account represented by the relativized SUBJECT approach in Progovac (1992, 1993). What is most appealing to SLA researchers in these two accounts is the attempt to explain the relationship between the domain and orientation of reflexives within the same framework; that is, in both the move-to-INFL analysis and the

relativized SUBJECT approach, LD binding entails subject orientation whereas reflexives which can have either subject or non-subject antecedents must be locally bound.

### (a) The Move-to INFL Apporach

Cole, Hermon and Sung (1990) suggest that all the reflexives are local in nature and that the long-distance interpretation is due to an invisible, successive cyclic movement at Logical Form. They propose that reflexive *ziji* in Chinese, as a head of an NP, undergoes head-movement at LF to adjoin to Infl and then to the next higher Infls. When *ziji* adjoins to a higher Infl, the subject NP of the higher clause becomes contained in the GC of *ziji* and then may bind it. Consequently, it results in surface long-distance binding while the locality restriction in the Binding Theory is maintained. In contrast, the English reflexive *himself* cannot refer to a long-distance NP because the assumed head-movement to Infl does not apply in English. Chinese ta-*ziji* cannot undergo head-movement either because the compound reflexive *ta-ziji* is a full NP, not an $N^0$. Since the covert LF movement is a head-to-head movement, *ta-ziji* cannot move to Infl and hence it exhibits no long-distance effect.

With the assumption that *ziji* adjoins to Infl at LF, Cole *et al.* believe that the subject orientation of *ziji* can be accounted for straightforwardly. Given that only the subject in each cycle can c-command the reflexive that moves to Infl, subject NPs become the only possible antecedents. Hence their analysis explains why the Chinese reflexive exhibits subject orientation. Furthermore, to account for the blocking effect displayed by *ziji*, it is assumed that when *ziji* first moves to Infl of its own clause, it will pick up its phi-features (i.e., the person, number, gender features), and that the phi-features cannot be altered at the latter cycle.

### (b) The Relativized SUBJECT Approach

In Progovac's (1992; 1993) relativized SUBJECT approach, she argues that a reflexive like *ziji* does not undergo LF movement and proposes a non-movement analysis. She suggests there is no need to invoke movement for long-distance binding but believes an Infl-chain is formed, and a reflexive, like *ziji*, can refer to a long-distance subject through this chain. Progovac

agrees with Cole et al (1990) in assuming that *ziji* and ta-*ziji* should be classified into different levels of projections: *ziji* as an $X^0$ reflexive and ta-*ziji* as an XP.

Progovac notices that the Russian bare reflexives, though local in finite clauses, can refer to a long-distance subject when contained in an infinitival clause. This contrast then causes her to suggest that, in addition to the forms of the reflexives, the type of AGR, overt or covert, plays a crucial role in determining the binding domain of a reflexive. Hence, among various languages, factors such as the forms of reflexives, the types of AGR, the infinitival or finite clause etc. will all influence the domain of governing category and therefore the binding behavior of the reflexive.

Chomsky (1981) in his binding principle A assumes two choices of SUBJECT for anaphors, i.e., AGR and a Specifier NP. An anaphor can take either one to define its GC. Progovac, however, suggests that the choice of SUBJECT should be relativized to the form of the anaphor: an $X^0$ anaphor will choose AGR, which is also an $X^0$ category, and an XP anaphor, on the other hand, will choose the Specifier, an XP, as its SUBJECT. Further, she suggests that the bare reflexive, the morphologically simpler, is classified as an $X^0$ and hence is to be bound to AGR while the compound reflexive is classified as an XP and then refer to the subject NP.

In Chinese, Progovac suggests the AGR is anaphoric due to its morphological emptiness. An anaphoric AGR will depend on co-indexation with the next higher AGR, and the AGRs will form an AGR-chain. In this way, the GC of the $X^0$ reflexive, namely the bare *ziji*, may extend with AGR-chain, and hence resulting in long-distance binding. In addition, Progovac's relativized SUBJECT approach correctly predicts that *ziji* is subject-oriented. Since *ziji*, as a head, must be bound to AGR, then by transitivity, it must be coreferential with the subject NP, which agrees with AGR.

By the Economy Principle, a more complex movement will be ruled out by a simpler movement, and the option of no movement should be preferred over that of movement. In this

way, the chain-formation hypothesis should be assessed as very economical since it involves no movement at all.

**Previous studies of L2 interpretation and acquisition of reflexives**

L2 researchers working within the frameworks of the move-to-INFL approach and the relativized SUBJECT approach have been interested in the implicational relationship between the locality and orientation of reflexives in second language acquisition (SLA). Among these SLA studies on binding, some argue for L1 influence (White 1995), and some for both the existence of UG and the influence of L1 (Bennett 1994). Although the acquisition of this locality condition has been extensively studied (e.g., Cook, 1990; Eckman, 1994; Lakshmanan & Teranishi, 1994; Wakabayashi, 1996), there have been only a few studies (e.g., Hirakawa, 1990; Matsumura, 1994) that have investigated it from a developmental perspective. Furthermore, the conclusions from those few studies are contradictory.

Hirakawa (1990) investigated the learning process of four groups of Japanese learners of English and found no significant difference in performance across the four levels. The distinction of finiteness/nonfiniteness and the number of embedded clauses were examined. She concluded that while most of the subjects were in the process of arriving at the correct L2 grammar, L1 influence was significant. She also found that there were 10 (out of 65) who responded 100% correctly and these subjects showed that resetting of the parameters in L2 was possible. However, she did not provide any explanation for the progress of the successful learners or for the differences between the sentence types that she designed.

In contrast, Matsumura (1994) found statistically significant development between two proficiency levels. Matsumura conducted a similar task with Japanese students at the same level as those in Hirakawa's study but regrouped his participants into two levels according to their scores on a cloze test that was independently administered prior to the task. He found that the group with higher scores performed significantly better on both

embedded that-clauses and embedded infinitival clauses than the group with lower scores.

Bennett (1994) conducted an experimental study of L2 acquisition of English reflexives by native speakers of Serbo-Croatian. The results showed that L2 learners did respond significantly differently from the controls in interpreting English reflexives, which supported the transfer hypothesis. Serbo-Croatian learners' long-distance binding did intervene with their interpretation of English reflexives. In addition, the fact that the L2 learners strongly preferred local antecedents in object control constructions, a non-existent structure in Serbo-Croatian, suggested that the learners reverted to the unmarked setting. In other words, Serbo-Croatian learners had access to UG in their L2 acquisition. Hence, Bennett argued that UG was available and L1 influence was significant in L2 acquisition.

Chen and Sung (1998) investigated whether L1 (Chinese) properties influence the development of L2 grammars by examining the EFL students' interpretations of English reflexives. The subjects were asked to take both a true-false judgment test and a multiple-choice test. The results not only support the transfer hypothesis, but also indicate that the number of years of learning slightly influences L2 learners in interpreting English reflexives. The design differences in test methodology do not play a crucial role.

From the abovementioned studies, we may provide a short summary as in the following: first, reflexive interpretations in different languages may vary due to different parameter settings in governing category and possible antecedent. Secondly, negative L1 transfer occurs but the number of years of learning may affect the degree of negative L1 transfer, as indicated in Chen and Sung (1998), and UG is also available in L2 acquisition, as shown in Bennett (1994). In this paper, in addition to reconfirming how Chinese L1 rules will influence L2 acquisition in English reflexives, we would like to focus on Chinese EFL students' development pattern in acquiring English reflexive rules, especially in different sentence structures like multi-clauses, control structure, picture NP etc. Hence, a questionnaire was

designed with different sentence structures to find out the order of the development and possibly the different weighting of L1 negative factors.

**Method**
Participants

A total of 136 third-year Chinese college students, English majors from a five-year program offered by the Department of Applied Foreign Languages at Wu Feng Institute of Technology, participated in this study. They range in age from 17 to 19 and have had at least five years of previous English instruction. The participants from three classes were randomly assigned to two groups, each consisting of 68 students. One group was administered the Chinese reflexive test while the other group was given a corresponding English-version of the test.

Materials and Procedures

In order to evaluate co-reference judgments as directly and efficiently as possible, a multiple-choice exam capable of testing subjects' interpretation of Chinese and English reflexives was compiled. In this test, a sentence and a question were given asking the subject to indicate his/her interpretation of the underlined reflexive by choosing one of the multiple-choice answers. (See Appendices A & B.) Examples of such questions are illustrated below in (5) and (6), the Chinese and English versions of the same question.

(5) 海倫覺得瑪莉知道南西討厭自己。

本句「自己」指的是 (A) 海倫 (B) 瑪莉 (C) 南西 (D) 不確定

(6) Helen felt that Mary knew that Nancy hated <u>herself</u>.

"Herself" refers to (A) Helen (B) Mary (C) Nancy (D) unsure

An additional option of "unsure" was offered to minimize students' guessing in subject responses. The vocabulary of the test material was limited to that appearing in textbooks used in junior high school. Subjects were also permitted to ask for translations of any unknown words that appeared in the test material.

The eighteen test sentences fall under nine categories. The first six syntactic structures determine the subjects' ability to learn different sentence types. The last three structures focus mainly on the acquisition of reflexives by Chinese learners in which the L1 is quite different from the L2. Sentence types using long-distance binding, blocking effects, and those with subject-orientation were all included. See Table 1 for further explanation of the nine sentence types.

Table 1 Nine types of syntactic constructions

| Type | Syntactic Construction |
|------|------------------------|
| 1 | Mono-clausal sentences (MONO) |
| | Miss Chen didn't like <u>herself</u>. |
| 2 | Bi-clausal sentences (BI) |
| | Miss Chen does not know that Jane hates <u>herself</u>. |
| 3 | ECM sentences (ECM) |
| | Nancy believes <u>herself</u> to be a good player. |
| 4 | Control sentences (CON) |
| | Mrs. Wang wants Janet to help <u>herself</u>. |
| 5 | Sentences with Picture NPs in Subject position (PS) |
| | Amy said that picture of <u>herself</u> was on sale in that store. |
| 6 | Sentences with Picture NPs with Specific Subject (SS) |
| | Mary saw Helen's picture of <u>herself</u>. |
| 7 | Sentences with Long-distance Binding (LD) |
| | Bill believes that John knows that Tom didn't like <u>himself</u>. |
| 8 | Sentences with Blocking Effects (BK) |
| | Bill told Helen that Tom criticized <u>himself</u> in the party. |
| 9 | Sentences with Subject-orientation (SO) |
| | Helen gave Nancy a picture of <u>herself</u>. |

Each subject received one test sheet, either in Chinese or English. The class teacher then explained to the students the format of the test sentences and how to mark their answer. Students were advised to ask questions if they encountered any difficulties in understanding the test sentences; however they were not informed about the purpose of this experimental study. The test took approximately 15 minutes to complete.

**Results and Discussion**

This section presents the variation of the participants in the interpretation of Chinese reflexive (ziji). Consistent with previous literature, Chinese speakers demonstrate multiple references in each of the following four syntactic structures: bi-clause, long-distance binding, blocking effect, and subject orientation. Table 2 summarizes the diverse response patterns. In the bi-clause structure, as shown in sentence (3) in Table 2, more than half of the participants (57.35%) chose the matrix subject '陳小姐,' not the embedded subject '珍妮' as the reflexive binder. Long-distance structure, as illustrated in sentence (13) of Table 2, shows the same long distance binding phenomenon with more than one third of the participants (36.76%) interpreting the matrix subject as the binder of the reflexive, in contrast to one fifth (19.12%) of the participants choosing the intermediate binder, and another one third of participants (36.76%), the local binder. Though the antecedents in multi-clausal structures are all possible binders, the intermediate subject is often not chosen due to unclear pragmatic reasons, as proposed in Tang (1987). Sentence (16) in Table 2 shows the blocking effect in Chinese reflexive binding due to the different phi features of the intermediate antecedent '你'; but gender difference is not effective in blocking since the distribution of sentence (15) is more or less the same as that in sentence (13). This point is also observed in Tang (1987) and Huang and Tang (1991), among others. Sentence (17) gives a typical example of subject orientation with almost all participants interpreting the binder to be the subject instead of the object. We might predict that these structures could reflect L1 interference since Chinese and English reflexives differ greatly in these patterns.

Table 2. Four syntactic structures that may interfere with the interpretation of English reflexives

| Item | Choice | | | |
|---|---|---|---|---|
| **Bi-Clause** | | | | |
| 3. 陳小姐不知道珍妮討厭自己 | 陳小姐 | 珍妮 | 其他人 | 不確定 |
| | 57.35 | 35.29 | 2.94 | 4.41 |
| **Long Distance** | | | | |
| 13. 比爾相信約翰知道湯姆不喜歡自己 | 比爾 | 約翰 | 湯姆 | 不確定 |
| | 36.76 | 19.12 | 36.76 | 4.41 |
| **Blocking Effect** | | | | |
| 15. 比爾告訴**海倫**說湯姆批評自己 | 比爾 | 海倫 | 湯姆 | 不確定 |
| | 44.12 | 16.18 | 33.82 | 4.41 |
| 16. 約翰說**你**覺得湯姆總是傷害約翰自己 | | 你 | 湯姆 | 不確定 |
| | 11.76 | 7.35 | 76.47 | 4.41 |
| **Subject Orientation** | | | | |
| 17. 海倫給南西自己的照片 | 海倫 | 南西 | 照片 | 不確定 |
| | 91.18 | 7.35 | 0 | 0 |

Note. Values are in percentage.

In terms of the role of L1, as mentioned earlier, Chinese speakers' binding patterns differ from English speakers' in the choice of long-distance binding. If EFL learners transfer the properties of the L1 reflexives to the inter-language grammar, a systematic pattern causing the misinterpretation of English reflexives is to be expected. This point has been supported by the results shown in Table 3.

Table 3. Response Patterns of Interpretation of Chinese and English Reflexives

| Item | Choice | | | |
|---|---|---|---|---|
| **Bi-Clause** | | | | |
| | 陳小姐 Miss Chen | 珍妮 Jane | 其他人 somebody else | 不確定 unsure |
| 3. 陳小姐不知道珍妮討厭自己 | 57.35 | 35.29 | 2.94 | 4.41 |
| Miss Chen does not know that Jane hates <u>herself</u>. | 38.24 | 60.29 | 1.47 | 0 |
| **Long Distance** | | | | |
| | 比爾 Bill | 約翰 John | 湯姆 Tom | 不確定 unsure |
| 13. 比爾相信約翰知道湯姆不喜歡自己 | 36.76 | 19.12 | 36.76 | 4.41 |
| Bill believes that John knows that Tom didn't like <u>himself</u>. | 25.00 | 35.29 | 36.76 | 1.47 |
| **Blocking Effect** | | | | |
| | 比爾 Bill | 海倫 Helen | 湯姆 Tom | 不確定 unsure |
| 15. 比爾告訴海倫說湯姆批評自己 | 44.12 | 16.18 | 33.82 | 4.41 |
| Bill told Helen that Tom criticized <u>himself</u> in the party. | 27.94 | 8.82 | 58.82 | 2.94 |
| **Subject Orientation** | | | | |
| | 海倫 Helen | 南西 Nancy | 照片 picture | 不確定 unsure |
| 17. 海倫給南西自己的照片 | 91.18 | 7.35 | 0 | 0 |
| Helen gave Nancy a picture of <u>herself</u>. | 63.24 | 33.82 | 1.47 | 1.47 |

Note. Values are in percentage

As seen in Table 3, in the bi-clause sentence, 57.35% of the test participants favored the matrix clause antecedents in the Chinese version and 38.24% of them in the English version. The

percentage of local binder almost doubled (from 35.29% to 60.29%) from Chinese to English version and this could mean Chinese EFL learners are gradually changing their parameters of the binding principle from multiple binders in Chinese to a single local binder in English. In the long-distance sentence, Chinese version reflexive interpretation favored the binder to be either the matrix subject (36.76%) or the most embedded subject (36.76%), while English version reflexive interpretation favored the most local (36.76%) and the second most local binders (35.29%). This could support the gradual shift of binding parameters on Chinese EFL learners from Chinese long-distance binding to English local binding. In the blocking-effect sentence, since gender difference in Chinese does not show a blocking effect, more than one third (44.12%) of the participants favored the matrix antecedent while in the English version the majority of the participants (58.82%) favored the local binder and only few participants (8.82 %) chose the intermediate since the phi features shown on the morphological form between the reflexive and the antecedent do not match. This could cause a greater blocking effect and thus lead to much lower percentage of matrix subject in the English version (27.94%) than in the Chinese version (44.12%). As for the subject-orientation sentence, although both groups showed a clear preference for subject as opposed to object antecedents, the subject orientation is more prominent in the Chinese version (91.18%) than in the English version (63.24%), partly because in English the sentence is ambiguous with the reflexive referring to either the subject or the object. Even though the data in Table 3 showed some shift in the binding parameters from Chinese to English, the L1 interference is still very obvious since the error percentages in the English version are still high in these syntactic structures except for the subject orientation sentence, in which either interpretation is correct. Our findings here are consistent with that of Hirakawa (1990) and Bennett (1994). Both concluded that L1 properties did in fact interfere with the construction of L2 grammar in the process of L2 acquisition.

Several studies on L2 acquisition discuss the influence of different syntactic constructions. Cook (1990) and Hirakawa

(1990) found that the increased complexity of a sentence structure creates more ambiguity. Therefore, in the next part of our study, we tested to determine whether different syntactic constructions affect EFL learners' acquisition order of English reflexives. As illustrated in figure 1, we base our analysis on the participants' percentage of correct responses to the sentence structures we designed in the questionnaire: MONO (96%) was the easiest construction, ECM (92%) the second easiest, PS (81%) the third, BK (74%) the fourth, SS (71%) the fifth, BI (63%) the sixth, CON (60%) the seventh, and LD (38%) the most difficult construction. The ninth syntactic construction, the subject orientation, was excluded from the ranking because both the subject and object interpretations were correct for the English question. For example, in sentence (7) below, no matter whether the participant marked (A) or (B), the answer was correct. Due to the ambiguity of the sentence we cannot conclude that this sentence type was the easiest one among the test sentences.

(7) Helen gave Nancy a picture of herself.

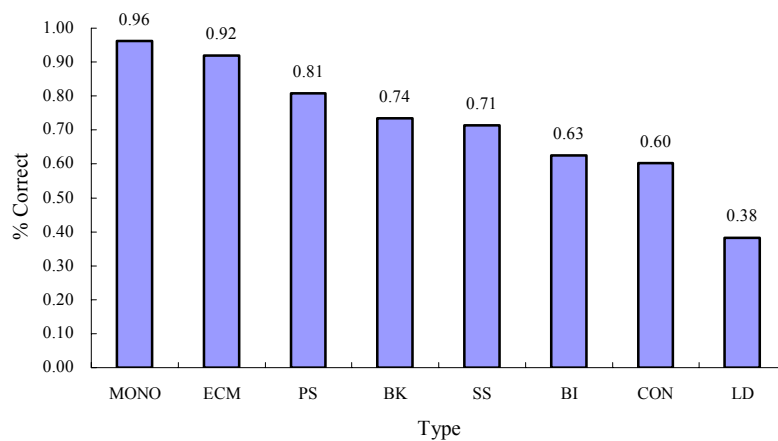"Herself" refers to (A) Helen (B) Nancy (C) picture (D) unsure

**Figure 1. Participants' Responses to the Eight Syntactic Constructions**

From the above hierarchical order, we may claim that different sentence types do affect Chinese students' interpretation of English reflexives. The four most difficult structures, LD, CON, BI, and SS, each had dual antecedents. Therefore, having more than one possible antecedent in the test constructions made it increasingly difficult for EFL learners to choose the correct referent for the reflexive.

The interpretations of the control sentences (CON) and those sentences containing picture NPs with specific subjects (SS) are worth mentioning in that the difficulty of these two syntactic structures came not from the multiple antecedents but from the different definition of GCs between Chinese and English. In Chinese, the GC of a reflexive is the entire matrix sentence while in English the GC is the local IP, either finite or infinitival, as long as the binding requirements for the anaphors are met. In Table 4, the object control verbs, such as *persuade*, have two possible antecedents for the reflexive if the matrix sentence is considered the GC domain, which is the situation in Chinese. However, in English, the GC for the object reflexive is the infinitival embedded clause and therefore the only binder is the PRO subject, which is co-indexed with the object in the matrix clause. Due to the variation in GC definition, difficulty naturally arises between English and Chinese.

The fact that the object control structure is hard to acquire for Chinese EFL learners can be viewed from another angle. The object control verbs take infinitival clauses as their complements and the structure in which these verbs appears involves both control and binding factors. When we look at the sentence in (8a) and its linguistic analysis in (8b), as an object control structure, the subject of the embedded clause (PRO) is controlled by the object *her mother*, and since the reflexive *herself* is bound by this PRO within its GC, it is thus interpreted as co-indexed with *her mother*.

(8) a. Mary persuaded her mother to love <u>herself</u>.

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(8) b. Mary persuaded her mother$_i$ [PRO$_i$ to love <u>herself$_i$</u>.]

Table 4. Two difficult syntactic structures that are not predicted by L1

| Item | Choice | | | |
|---|---|---|---|---|
| Control Sentences (CON) | | | | |
| 7. Mrs. Wang wants Janet to help <u>herself</u>. | Mrs. Wang | Janet | Somebody else | Unsure |
| | 48.5 | 48.5 | 2.9 | 0 |
| 1. Mary persuaded her mother to love <u>herself</u>. | Mary | Her mother | Somebody else | Unsure |
| | 26.5 | 72.1 | 0 | 1.5 |
| Sentences with picture NPs with Specific Subjects (SS) | | | | |
| 11. Jack read Tom's story about <u>himself</u>. | Jack | Tom | story | Unsure |
| | 25.0 | 69.1 | 5.9 | 0 |
| 12. Mary saw Helen's picture of <u>herself</u>. | Mary | Helen | picture | Unsure |
| | 13.2 | 73.5 | 7.4 | 5.9 |

Note. Values are in percentage.

With regard to sentences containing picture NPs with specific subjects (SS), about 70% of the participants co-index the reflexive with the subject of the NP but still about 20% (the average of 11 and 12 in Table 3) of the participants refer to the root subject as the binder. One of the explanations for this response is that a clausal subject rather than an NP subject is important in defining the GC for the reflexive in the SS sentences for at least some native Chinese speakers. That is, for them, the NP can never be a GC for reflexives, which is again a difference in binding parameters between English and Chinese.

To conclude so far, the results we gathered from the questionnaire reveal that there are development patterns for

Chinese EFL learners in acquiring English binding rules. Sentence structures with multiple antecedents (normally multi-clausal sentences) are most difficult since Chinese allows long-distance binding. Hence, Chinese EFL learners' responded better on the MONO, ECM, PS and BK sentences than on the LD, CON, BI, and SS sentences. Moreover, sentences containing infinitival clauses or NP structures will cause confusion in defining binding GC in English and thus contribute to difficulty in reflexive interpretations. Hence, CON and SS structures, though seemingly mono-clausal in construction, are also developed later in English reflexive interpretations.

Progovac's (1992, 1993) approach appears to provide a possible account for the tensed-infinitive asymmetry. She argued that AGR in Chinese is anaphorically linked to the AGR of a higher clause when it lacks an overt referential agreement, as in infinitival clauses in English. This means that a morphologically simplex anaphor allows LD binding when it occurs in an embedded infinitival clause but does not do so when it occurs in an embedded that-clause. In this way, Progovac's account explains why some learners allow LD binding for sentences with embedded infinitival clauses but reject it for sentences with embedded that-clauses.

The above development pattern shows Chinese college students' interpretation of English reflexives acquired through exposure to positive English data and without formal instruction. As observed, most Chinese learners eventually acquire the English binding rules while some Chinese learners still stick to the Chinese binding parameter in interpreting English reflexives especially in complex syntactic structures. To see if the binding rules can be explicitly taught in English class and if formal instruction will help Chinese EFL learners learn faster and more efficiently, we carried out a follow-up experiment and compared the participants' performances before and after the instruction.

According to Manzini and Wexler's (1987) theory of the acquisition of reflexives, there are five hierarchical values to the governing category parameter. Anaphor type in English governed in the local domain is considered the least marked whereas that in

Chinese in the farthest is considered the most marked due to its long distance binding. In terms of learnability, given the grammar of the English reflexives, a child will never be exposed to positive evidence that will cause the GC parameter to be reset. On the other hand, if a child is in a Chinese-speaking environment, his initial assumption will be the local antecedent. However, the child will eventually encounter positive evidence to the possible antecedent in the farthest domain. The child will be led to reset the parameter.

When such an assumption comes to L2 acquisition, do principles of Universal Grammar constrain the range of hypotheses that L2 learners entertain about the L2? Should the L2 students be explicitly taught these formal principles? To investigate the questions, a 30-minute follow-up explicit instruction on the comparison of Chinese and English reflexives was conducted. By virtue of an informal instruction, we attempted to raise Chinese students' awareness that the acquisition of the binding domain in an L2 proceeds as does the acquisition of the binding domain in the L1. But, when learning an unmarked GC parameter in English, the Chinese learners start with the unmarked value, stay and stop at that unmarked value (local domain) and never go further. We explicitly suggest the possibility of local binding and the impossibility of Chinese-style long-distance binding. In terms of learnability, it is basically effortless for a Chinese speaker of more marked rules to acquire an unmarked rule in the target language of English. Table 5 shows the response patterns of interpretation of English reflexives with five different syntactic constructions before and after the formal instruction.

Table 5. Response Patterns of Interpretation of English Reflexives Before and After Instructions

| Item | Choice | | | |
|---|---|---|---|---|
| **I. Long Distance** | Bill | John | Tom | unsure |
| 13. Bill believes that John knows that Tom didn't like <u>himself</u>. (before) | 25.00 | 35.29 | **36.76** | 1.47 |
| 13. Bill believes that John knows that Tom didn't like <u>himself</u>. (after) | 5.9 | 8.8 | **84.4** | 0.9 |
| II. Control Verb | Mrs. Wang | Janet | Sb else | Unsure |
| 7. Mrs. Wang wants Janet to help <u>herself</u>. (before) | 48.5 | **48.5** | 2.9 | 0 |
| 7. Mrs. Wang wants Janet to help <u>herself</u>. (after) | 17.6 | **82.4** | 0 | 0 |
| **III. Bi-Clause** | Miss Chen | Jane | Sb else | Unsure |
| 3. Miss Chen does not know that Jane hates <u>herself</u>. (before) | 38.24 | **60.29** | 1.47 | 0 |
| 3. Miss Chen does not know that Jane hates <u>herself</u>. (after) | 5.9 | **94.1** | 0 | 0 |
| **IV. Sentences with picture NPs with Specific Subjects (SS)** | Jack | Tom | Story | Unsure |
| 11. Jack read Tom's story about <u>himself</u>. (before) | 25.0 | **69.1** | 5.9 | 0 |
| 11. Jack read Tom's story about <u>himself</u>. (after) | 7.3 | **89.7** | 2.9 | 0 |
| **V. Blocking Effect** | Bill | Helen | Tom | Unsure |
| 15. Bill told Helen that Tom criticized <u>himself</u> in the party. (before) | 27.94 | 8.82 | **58.82** | 2.94 |
| 15. Bill told Helen that Tom criticized <u>himself</u> in the party. (after) | 8.8 | 0 | **91.2** | 0 |

Note. Values are in percentage

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As we expected, fewer mistakes were made by the students after the explicit instruction and in all five constructions a very high percentage (82.4% to 94.1%) of the participants answered the questions correctly. Since the learners were taught to shift the GC parameter setting from a more marked long distance binding to an unmarked local binding, their acquisition of the binding rules seemed fast and efficient. It seems easily possible to correct the negative L1 transfer by adjusting the marked Chinese parameter to the unmarked English one. At this point, we may tentatively conclude that Universal Grammar is available to L2 acquisition. However, in contrast to the development pattern before formal instruction, the order of difficulty changed to: CON is the most difficult (accurate percent is 82.4%); LD is the second most difficult (84.4%); SS is the third (89.7%); BK is the fourth (91.2%); and BI is the least difficult (94.1%) among the five constructions. BK and BI structures basically present no problem after the parameter resetting. CON and SS are still problematic after the parameter resetting because in these two constructions the local GC are unusual ones, infinitival clause and NP, and therefore hard to define for Chinese EFL learners. LD structures remain difficult before and after the explicit instruction partly because multiple antecedents are confusing in nature.

**Conclusion**

In this paper, we have discussed the distributional differences of the reflexives in English and Chinese and the developmental patterns of Chinese EFL college students in Taiwan in interpretations of English reflexives. Chinese and English reflexives differ in three aspects: in English, reflexives can only take a local antecedent, whereas the Chinese reflexive *ziji* can have one or more long-distance antecedents as well as a local one. Further, Chinese reflexives have a subject orientation but reflexives in English allow both subject NPs and object NPs as their antecedents. Also, the blocking effect could occur in Chinese if the phi features of the intermediate antecedent do not match with that of the local antecedent, but this effect does not exist in English because only local binding is allowed.

The results of this study suggest that negative L1 transfer occurs in Chinese EFL students acquiring English reflexives, especially in areas where the binding rules between English and Chinese are different. Our findings in this study support the transfer hypothesis; however, the participants' performance also exhibits different developmental patterns in terms of the parameter setting of the governing category (GC) and accessible SUBJECT, depending on the complexity of syntactic constructions. It is found that reflexives in the MONO, ECM, PS and BK structures are acquired earlier and faster than reflexives in the LD, CON, BI, and SS structures. And among the difficult structures, the development pattern is: SS > (before) BI > (before) CON > (before) LD.

The above development pattern illustrates a natural acquisition process; that is Chinese learners acquire the English binding principle by direct exposure to positive evidence from English data and no explicit binding rules were taught in their English learning experience. Our follow-up experiment shows that explicit instruction on English reflexives is possible and effective as the correct percentage is much higher after the instructions. The development pattern of the five complex syntactic structures is: BI > (before) BK > (before) SS > (before) > LD > (before) CON, which is slightly different from the order from natural acquisition. BI structures become easier than SS or even BK structures after the formal explanation that English reflexives only allow local conditions. Though appearing easier than the CON structure, the LD structure remains a difficult construction despite instruction. The LD and BK structures both contain three antecedents in each sentence and could be a source of difficulty. This could indicate that the shift of the properties in binding principle from multiple binders in Chinese to a single binder in English is a major change and it takes time and practice to master it.

CON and SS structure are also two difficult areas due to the uncommon GCs in these two constructions: infinitival IP and NP. The results show that Chinese EFL students have difficulty finding the GC for the reflexives in CON and SS structures. That

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is, there is tensed vs. infinitival clause asymmetry and clause vs. NP asymmetry in their development of English binding rules, and the former in each asymmetry pair develop earlier and better than the latter. The lowest correct percentage in CON structures further indicates that tensed-infinitival clause asymmetry is the hardest aspect to overcome and thus represents a major change in parameter resetting in learning the binding principle of English.

As the sample of this study contains only 136 junior college students, the results should be interpreted with caution. Our findings might not be generalized to other populations, such as more advanced college students. Cross-validation is recommended for future study. Other experimental tasks, such as comprehension tasks or picture identification tasks, can be conducted to investigate how learners process their knowledge. Data from natural conversation is possibly different from those in the classroom setting. It is desirable to see the differences in interpreting English reflexives at the discourse level between natural conversation and the classroom setting. Work in each of these areas will help us further understand the Universal Grammar and the parameter setting model of second language acquisition.

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**Appendix A.** 台灣學生中文反身代名詞的詮釋

基本資料：1. 性別：□男　□女　　2. 年齡：＿＿＿歲　　3. 已學英文　＿＿＿＿年

1. 陳小姐不喜歡自己。
   本句「自己」指的是　(A) 陳小姐 (B) 其他人 (C) 不確定

2. 約翰欣賞自己。
   本句「自己」指的是　(A) 約翰 (B) 其他人 (C) 不確定

3. 陳小姐不知道珍妮討厭自己。
   本句「自己」指的是　(A) 陳小姐 (B) 珍妮 (C) 其他人 (D) 不確定

4. 比爾認為王先生喜歡自己。
   本句「自己」指的是　(A) 比爾　(B) 王先生　(C) 其他人 (D) 不確定

5. 南西相信自己是一個好球員。
   本句「自己」指的是　(A) 南西　(B)其他人 (C) 不確定

6. 哈利認為自己是一個偉大的音樂家。
   本句「自己」指的是　(A) 哈利　(B)其他人 (C) 不確定
7. 王太太要珍妮幫助自己。
   本句「自己」指的是　(A) 王太太　(B) 珍妮　(C) 其他人 (D) 不確定
8. 瑪莉勸她媽媽要愛自己。
   本句「自己」指的是　(A) 瑪莉　(B) 她媽媽　(C) 其他人 (D) 不確定
9. 艾咪說自己的照片在那家店大拍賣。
   本句「自己」指的是　(A) 艾咪　(B) 照片　(C) 其他人 (D) 不確定
10. 約翰認為自己的照片在那家店大拍賣。
    本句「自己」指的是　(A) 約翰　(B) 照片　(C) 其他人 (D) 不確定
11. 傑克閱讀有關湯姆自己的故事。
    本句「自己」指的是　(A) 傑克　(B) 湯姆　(C) 故事 (D) 不確定
12. 瑪莉看到海倫自己的照片。
    本句「自己」指的是　(A) 瑪莉　(B) 海倫　(C) 照片 (D) 不確定
13. 比爾相信約翰知道湯姆不喜歡自己。
    本句「自己」指的是　(A) 比爾　(B) 約翰　(C) 湯姆 (D) 不確定
14. 海倫覺得瑪莉知道南西討厭自己。
    本句「自己」指的是　(A) 海倫　(B) 瑪莉　(C) 南西 (D) 不確定
15. 比爾告訴海倫說湯姆批評自己。
    本句「自己」指的是　(A) 比爾　(B) 海倫　(C) 湯姆 (D) 不確定
16. 約翰說你覺得湯姆總是傷害自己。
    本句「自己」指的是　(A) 約翰　(B) 你　(C) 湯姆 (D) 不確定
17. 海倫給南西自己的照片。

本句「自己」指的是　(A) 海倫　(B)　南西　(C) 照片　(D) 不確定

18. 比爾寄給約翰自己的照片。
    本句「自己」指的是　(A) 比爾　(B)　約翰　(C) 照片　(D) 不確定

## Appendix B. 台灣學生英文反身代名詞的習得

基本資料：1. 性別：□男　□女　　2. 年齡：＿＿＿歲　　3. 已學英文　＿＿＿＿年

1. Miss Chen didn't like <u>herself</u>.
   "Herself" refers to (A) Miss Chen (B) somebody else (C) unsure
2. John admires <u>himself</u>.
   "Himself" refers to (A) John (B) somebody else (C) unsure
3. Miss Chen does not know that Jane hates <u>herself</u>.
   "Herself" refers to (A) Miss Chen (B) Jane (C) somebody else (D) unsure
4. Bill thinks that Mr. Wang loves <u>himself</u>.
   "Himself" refers to (A) Bill (B) Mr. Wang (C) somebody else (D) unsure
5. Nancy believes <u>herself</u> to be a good player.
   "Herself" refers to (A) Nancy (B) somebody else (C) unsure
6. Harry considers <u>himself</u> a great musician.
   "Himself" refers to (A) Harry (B) somebody else (C) unsure
7. Mrs. Wang wants Janet to help <u>herself</u>.
   "Herself" refers to (A) Mrs. Wang (B) Janet (C) somebody else (D) unsure
8. Mary persuaded her mother to love <u>herself</u>.
   "Herself" refers to (A) Mary (B) her mother　(C) somebody else (D) unsure
9. Amy said that picture of <u>herself</u> was on sale in that store.
   "Herself" refers to (A) Amy (B) picture (C) somebody else (D) unsure
10. John thought that picture of <u>himself</u> was on sale in that store.

"Himself" refers to (A) John (B) picture (C) somebody else (D) unsure

11. Jack read Tom's story about <u>himself</u>.
    "Himself" refers to (A) Jack (B) Tom (C) the story (D) unsure
12. Mary saw Helen's picture of <u>herself</u>.
    "Herself" refers to (A) Mary (B) Helen (C) the picture (D) unsure
13. Bill believes that John knows that Tom didn't like <u>himself</u>.
    "Himself" refers to (A) Bill (B) John (C) Tom (D) unsure
14. Helen felt that Mary knew that Nancy hated <u>herself</u>.
    "Herself" refers to (A) Helen (B) Mary   (C) Nancy (D) unsure
15. Bill told Helen that Tom criticized <u>himself</u> in the party.
    "Himself" refers to (A) Bill (B) Helen (C) Tom (D) unsure
16. John said that you felt that Tom always hurt <u>himself</u>.
    "Himself" refers to (A) John (B) you (C) Tom (D) unsure
17. Helen gave Nancy a picture of <u>herself</u>.
    "Herself" refers to (A) Helen (B) Nancy (C) picture (D) unsure
18. Bill sent John a picture of <u>himself</u>.
    "Himself" refers to (A) Bill (B) John (C) picture (D) unsure