

## Acquiring Double Object Verbs in Mandarin Chinese

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### Abstract

The present study aims to investigate Chinese children's acquisition of double object verbs with *gei*. These verbs were classified into three types, *gei*-required, *gei*-forbidden, and *gei*-optional. The following issues were examined, i.e. the difficulty levels, unmarked/marked patterns, and development of untargeted patterns. Two tasks were employed, a grammaticality task and a sentence elicitation task. Forty-five children aged from three to five and fifteen adults participated in the experiment, who were further divided into four groups, i.e. Group 1 (three-year-olds), Group 2 (four-year-olds), Group 3 (five-year-olds), and Group 4 (native controls). The results are as follows: First, among the three types, *gei*-forbidden verbs posed the most difficulty for the children, while the other two were relatively easier. Second, with regard to *gei*-required verbs, [V-DO-*gei*-IO] was the unmarked pattern while [V-*gei*-IO-DO] was marked. Similarly, for *gei*-optional verbs, the most unmarked pattern was [V-DO-*gei*-IO], followed by [V-IO-DO], and [V-*gei*-IO-DO] the most marked. Third, a steady development was found in the children's untargeted sentences. The children began with mono-transitive use of these verbs, then added a second object, and finally generated more complex sentences.

**Key Words:** Double Object Construction, L1 Acquisition, Markedness, Chinese

### 1. Introduction

In Chinese double object constructions, one of the most crucial elements in determining the order of the direct and the indirect objects, however, is *gei*. *Gei* is a word with multiple functions and thus can be treated as belonging to different syn-

tactic categories based on its meanings. As a verb, for instance, *gei* can be used in a double object structure like (1), meaning ‘give.’ Interestingly, *gei* can also combine with other verbs such as *song* ‘give’ in the same structure, as exemplified in (2).

- (1) Wo    *gei*    *le*    Zhangsan    *yi*    *ben*    *shu*.                      (Yang 1991:11)  
       I        *GEI* *ASP* Zhangsan    one   *CL*   book  
       ‘I gave Zhangsan a book.’
- (2) Wo    *song*        *gei*    *le*    Zhangsan    *yi*    *ben*    *shu*.  
       I        give        *GEI* *ASP* Zhangsan    one   *CL*   book  
       ‘I gave Zhangsan a book.’

In both (1) and (2), *Zhangsan* is the indirect object and *yi ben shu* ‘a book’ is the direct object. The same meaning can be expressed with *gei* occurring in postobject position as in (3).

- (3) Wo    *song*    *le*    *yi*    *ben*    *shu*    *gei*    Zhangsan.  
       I        give    *ASP*    one    *CL*    book   *GEI* Zhangsan  
       ‘I gave a book to Zhangsan.’

As can be seen in (2) and (3), double object verbs co-occurring with *gei* exhibit two patterns, [V-DO-*gei*-IO] with *gei* in the postobject position, and [V-*gei*-IO-DO] with *gei* in the postverbal position.

Studies on Mandarin double object verbs abound in the literature (cf. Tang 1979), but they failed to arrive at a consensus over the syntactic categories of *gei* in the postobject and the postverbal positions (cf. Her 2006, Yang 1991). None of the studies examined these verbs from an acquisitional perspective, either. The one that examined the acquisition of dative constructions in Mandarin Chinese (Chung and Gordon 1998) revolved around the semantic constraints of such verbs and was unable to provide a whole picture of children’s acquisition of double object verbs as well as the uses of *gei* in its relevant structures. Hence, the present study aims to address the following research questions.

1. How do children at different ages respond to Chinese double object constructions?
2. Of different types of double object verbs, which type poses the most difficulties and which type is the easiest for children to acquire?

3. For the double object verbs that exhibit different patterns, which pattern is preferred by children?

## 2. Linguistic Properties and Literature Review of Double Object Verbs

### 2.1 Linguistic Properties of Double Object Verbs

In Mandarin Chinese, double object sentences come in various patterns, as illustrated in (4), where *gei* is before the object *Yuehan* ‘John’ as in (4)a, *Yuehan* ‘John’ occurs immediately after the verb without *gei* as in (4)b, and *gei* is omitted, as in (4)c.

- (4) a. Mali      dai      le    yi    ge    dangao    gei   Yuehan.  
       Mary    bring      ASP one CL    cake      GEI John  
       ‘Mary brought a cake to John.’  
       b. Mali      daying    Yuehan    yi    jian   shiqing.  
       Mary    promise   John      one CL    thing  
       ‘Mary promised John to do something.’  
       c. Mali      song      (gei)      Yuehan    yi    ben   shu.  
       Mary    give      GEI      John      one CL    book  
       ‘Mary gave John a book.’

Verbs of the same type as *dai* in (4)a usually imply physical transfer of objects and they do not involve the full meaning of ‘giving,’ i.e. [–Giving]. Therefore, when a Goal is added, the following *Gei*-insertion Rule applies to enhance the giving feature of the verb.

#### (5) *Gei*-insertion Rule

*For a double object verb with the feature [–Giving], gei must be inserted to form the double object construction.*

As for verbs like *daying* as in (4)b, although there is no physical transfer of objects, they still signify transfer of “information” from the subject to the IO (Tang 1979). That is to say, these verbs have already subsumed the meaning of transaction, i.e. [+Giving]. In this case, the *Gei*-insertion Rule does not apply. Verbs like *song* ‘give’ as in (4)c differ from the *gei*-required verbs in that *gei* can be omitted. All in all, *gei* related verbs can be classified into the following three types.

### 2.2.1 *Gei*-required Verbs (GRV)

Generally speaking, after the *Gei*-insertion Rule, the IO can either precede or follow the DO (Tang 1979), resulting in the two patterns below.

#### Pattern 1: V-DO-*gei*-IO

The first pattern for GRV is [V-DO-*gei*-IO], a pattern similar to the English to-dative counterpart where the *gei*-NP is an Adjunct PP (cf. Chang 2005).

- (6) a. Lisi        ti    yi    ge    qiu    *gei*    wo.  
         Lisi        kick one CL ball GEI I  
         ‘Lisi kicked a ball to me.’  
      b. \*Lisi        ti    wo    *gei*    yi    ge    qiu. (\*V-IO-*gei*-DO)  
         Lisi        kick I        GEI one CL ball  
         ‘Lisi kicked a ball to me.’

In (6)a, *yi ge qiu* ‘one ball’ is the DO, and *wo* ‘I’ is the IO and also the Goal. The verb *ti* ‘kick’ originally is a two-argument predicate, so it does not subcategorize for a Goal (Chang 2005), as in (7). If a Goal is added, *gei* must be obligatorily present.

- (7) A: Ni    ganggang ti        le        sheme?  
         you just            kick ASP what  
         ‘What did you just kick?’  
      B: Wo ti        le    yi    ge    qiu.  
         I    kick ASP one CL ball  
         ‘I kicked a ball.’

In (7), *wo* ‘I’ is the subject; *yi ge qiu* ‘one ball’ is the DO. Since there is no Goal, the *Gei*-insertion Rule does not apply.

#### Pattern 2: V-*gei*-IO-DO

The second pattern for GRV is [V-*gei*-IO-DO], where *gei* appears immediately after the verb to form a V-V compound (Chang 2005, Her 2006), as shown below:

- (8) a. Zhangsan    pao *gei*    Lisi    yi    shu    hua. (Huang and Ahrens 1999: 6)  
         Zhangsan    toss GEI Lisi    one CL flower  
         ‘Zhangsan tossed a bouquet to Lisi.’  
      b. \*Zhangsan    pao    *gei*    yi    shu    hua        Lisi.  
         Zhangsan    toss    GEI    one CL flower        Lisi  
         ‘Zhangsan tossed a bouquet to Lisi.’

This pattern is regarded as a double object construction in Mandarin Chinese (Chang 2005) where the IO precedes the DO as in (8)a. The opposite order of IO and DO, [[V-*gei*]-DO-IO] results in ungrammaticality, as in (8)b.

### 2.2.2 *Gei*-forbidden Verbs (GFV)

Verbs with a [+Giving] feature are *gei*-forbidden verbs, and typical examples of this type are *gaosu* ‘tell’ as in (9).

- (9) a. Xiaoming      gaosu      Xiaohua   yi   ge   mimi.  
          Xiaoming      tell        Xiaohua   one   CL   secret  
          ‘Xiaoming told Xiaohua a secret.’
- b. \*Xiaoming      gaosu      *gei* Xiaohua   yi   ge   mimi.  
          Xiaoming      tell        *GEI* Xiaohua   one   CL   secret  
          ‘Xiaoming told Xiaohua a secret.’

As can be seen above, when *gei* co-occurs with this type of verb, it will result in ungrammaticality.

### Pattern 3: V-IO-DO

For GFV, the DO always follows the IO, not vice versa:

- (10) a. Mali      gaosu      Yuehan   yi   ge   hao      xiaoxi.  
          Mary      tell        John      one   CL   good      news  
          ‘Mary told John a piece of good news.’
- b. \*Mali      gaosu      yi   ge   hao      xiaoxi      Yuehan.  
          Mary      tell        one   CL   good      news      John  
          ‘Mary told John a piece of good news.’

According to Givón’s topicality hierarchy, the “primary topic” occupies the subject position while the “secondary topic” usually occurs in the DO position. As for the IO (“prepositional object” in Givón 1984) and the DO (“accusative object”) in double object constructions, Givón argues that the IO is usually more “topical” and thus is promoted via Dative Shifting to DO position. According to his theory, we may propose a rule like (11) to ensure that the IO occurs before the DO. To be more specific, for the *gei*-forbidden verbs to which the *Gei*-insertion Rule does not apply, the IO Precedence Rule must take place.

## (11) IO Precedence Rule

*When *gei* does not co-occur with a double object verb, the IO must precede the DO.*

2.2.3 *Gei*-optional Verbs (GOV)

*Gei*-optional verbs only differ from *gei*-required verbs in that the former allows *gei* to be omitted. Verbs such as *song* ‘give,’ *fu* ‘pay,’ and *huan* ‘return,’ are of this type. As for the order of the two objects, the IO can either precede the DO or follow it. Therefore, these verbs can occur in the patterns, [V-*gei*-IO-DO], and [V-DO-*gei*-IO]. On the other hand, if *gei* is omitted, only one order is possible, i.e. [V-IO-DO]. Examples (12)a and b show such optionality.

- (12) a. Lisi      song      *gei* Xiaoling yi      zhi shoubiao.  
           Lisi      give      GEI Xiaoling one CL watch  
           ‘Lisi gave Xiaoling a watch.’  
       b. Lisi      song      Xiaoling yi      zhi shoubiao.  
           Lisi      give      Xiaoling one CL watch  
           ‘Lisi gave Xiaoling a watch.’

Table 1 summarizes the rules we proposed previously with the corresponding verbs and their patterns:

Table 1: The Application of the Two Rules with Verb Types

Rules	+ <i>Gei</i> -insertion Rule		– <i>Gei</i> -insertion Rule	
	+IO Precedence	– IO Precedence	+IO Precedence	– IO Precedence
Patterns	[V- <i>gei</i> -IO-DO]	[V-DO- <i>gei</i> -IO]	[V-IO-DO]	NA
Types	[– Giving]	[– Giving]	[+Giving]	NA

*Note: For the fourth type where none of the two rules is applied, there is no such verb or pattern in Mandarin Chinese, hence it is not applicable.*

If children have acquired the two rules, it is expected that they will have no difficulty acquiring the three patterns of double object verbs. When *gei* is missing, based on the IO Precedence Rule, they will know that the only pattern allowed is [V-IO-DO] instead of [V-DO-IO]. If they produce sentences with the IO following the DO, then the *Gei*-insertion Rule must apply and the pattern will be [V-DO-*gei*-IO]. As for the [V-*gei*-IO-DO] pattern, it should cause no difficulty since the phrase [*gei*-IO] can occur either before or after the DO in Mandarin Chinese.

## 2.2 Empirical Studies of Dative Constructions

In this section, some of the studies on the acquisition of double object verbs in English and in other languages will be reviewed.

### 2.2.1 Osgood and Zehler (1981)

Osgood and Zehler (1981) examined the effects of prototypicality and sentence complexity on children's acquisition of English double object constructions. Their subjects consisted of sixteen children in each age group, three-, four-, and five-year-olds. Thirty-two sentences were examined, sixteen of which were dative and the other sixteen ditransitive. Four levels of prototypicality along with four levels of complexity were employed. The children were asked to perform two tasks; the first was an act out task, and the second, a production task.

Their results showed that, at the first complexity level, which involved one transfer event and one transferred object, no age effect was found. In other words, at the age of three, the children had already acquired the two alternating constructions<sup>1</sup>. Second, animacy played a crucial role in their children's performance on both tasks. Third, when the children had choices to describe actions of transfer in the production task, they displayed overwhelming preference for the Basic construction<sup>2</sup>. If they used the Transform structure<sup>3</sup>, they tended to use it in sentences with typical situations. Therefore, prototypicality, like complexity, was a crucial factor in the children's performance. As the children got older, they tried to use the Transform construction more often. Fourth, the results of the comprehension task showed that as a sentence became more complex and less typical, the children's performance decreased for the Transform structure much more than their performance on the Basic structure. That is to say, the Basic structure was easier for the children than the Transform structure. To account for this, Osgood and Zehler claimed that the children tended to treat the noun closest to the verb as the DO instead of the IO. Furthermore, the sequence of V-DO in the Basic form expressed contiguity, while in the Transform sentences the IO separated the verb and the DO.

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<sup>1</sup> 'The two alternating constructions' means 'the two constructions that are interchangeable' here.

<sup>2</sup> The basic construction here refers to the construction that does not involve transformational rules.

<sup>3</sup> The transform structure is a structure that is derived from a basic construction with rules.

### 2.2.2 Mazurkewich (1984)

Mazurkewich's research on the dative alternations was based on the Markedness Theory. Instead of the acquisition of first language, she examined learners' acquisition of English as a second language, with a view to exploring second language acquisition process in comparison with that of first language acquisition. Following Chomsky's principles of UG, she suggested that the dative structure [NP PP] be the unmarked form. The experiment involved one grammaticality task in which alternating as well as non-alternating verbs<sup>4</sup> appeared in both dative and double object constructions. Subjects of two unrelated languages, French and Inuit (Eskimo), were tested, with each group further divided into three proficiency levels, basic, intermediate, and advanced. The mean ages for the two groups were 18 for the French group and 17 for the Inuit group. Two control groups were made up of six subjects with the mean age of 12;3 in one group and another six with the mean age 15;6 in the other group.

The results lent support to the prediction that dative constructions were acquired before the double object counterparts. Furthermore, overgeneralizations of the dative alternations were found not only in the experimental groups, but also in the control groups, suggesting that the subjects, L1 as well as L2 learners, had not completely acquired the alternating constraints. Decrease in the number of overgeneralizations in the older age groups, however, revealed that these would gradually disappear as the children got older. Finally, to support the view that dative constructions were the unmarked forms, Mazurkewich referred to Chomsky's Case Theory, and suggested that in the dative construction, the IO receives case from a preposition in a PP, since prepositions are case assigners. The double object construction, on the other hand, is not consistent with Case Theory because there is no structural case assigner next to the IO.

Chung and Gordon's study was based on Pinker's (1989) hypothesis of Broad Range Rules (BRR) and Narrow Range Rules (NRR)<sup>5</sup>, which specify the semantic restrictions on English dative alternations. Their purpose was to examine whether the two rules could be applied to Chinese dative constructions as well. In their study,

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<sup>4</sup> An alternating verb is a verb that can occur both in the [NP PP] pattern and in the [NP NP] pattern, but a non-alternating verb can only show up in the [NP PP] pattern.

<sup>5</sup> According to a broad range rule (BRR), the underlying meaning of a double-object construction: *X Verb Y Z* is that *X causes Y to have Z*. Therefore, Y must be the prospective possessor of Z. However, a narrow range rule defines semantic subclasses of verbs that exhibit the dative alternation.



Chinese double object verbs were divided into two classes, one datavizable and the other non-datavizable. Datavizable verbs are those that can occur in the V-NP-NP construction. These verbs correspond to Tang's (1979) Types III and IV, which cannot co-occur with *gei*. Non-datavizable verbs, on the contrary, cannot have the V-NP-NP construction, which belong to Tang's Type I and have to take the Goal marker *gei*. Therefore, the BRR determines whether verbs can have double object constructions, while the NRR further classifies these verbs into semantic subclasses. Thirty-seven children participated in their experiment. Two tasks were designed, the first syntactic and the second semantic. The syntactic task was a puppet selection task in which twenty-two verbs, eleven datavizable, and eleven non-datavizable, were tested. One puppet produced one double object construction with a verb, while the other said a dative *gei*-NP construction or other prepositional constructions. The classification of verbs and the semantic subclasses are taken from Chung and Gordon. The main purpose of the semantic task was to investigate whether the children could differentiate different meanings of sentences with deprivational verbs in double object and dative *gei*-NP constructions.

Their findings are as follows. First of all, the BRR, which specifies which verbs can exhibit double object constructions, may not be universal, since the deprivational verbs in Mandarin Chinese violate the universal linking rule. Second, concerning the linking rule that violates the universal pattern of associating the IO with a Goal or a Beneficiary, it might not be more difficult for the children as expected. Third, the results of the semantic task supported the hypothesis of the Narrow Range Rule in that it helped children classify datavizable verbs into semantic subclasses. The purpose of Chung and Gordon's study is not to differentiate verbs according to the presence of *gei*, but to investigate whether their children were able to distinguish datavizable from non-datavizable verbs. Therefore, the various patterns of double object verbs with or without *gei* have not been fully examined in their study.

#### 2.2.4 Campbell and Tomasello (2001)

Campbell and Tomasello (2001) conducted a corpus study on children's acquisition of the double object, to-dative and for-dative constructions, all of which, the authors claimed, are the grammatical constructions to express transfer of objects between people, literal or metaphorical. Their purpose was to examine how these constructions were first acquired, and what kinds of verbs were used by children in

these patterns. Seven subjects from the CHILDES database were examined. The age of their first use of the three structures was recorded.

The results showed that up to the age of three, at least five of the seven children had already learned to use verbs in alternating constructions. Furthermore, five of the seven children used the double object construction earlier than the other two. In order to investigate whether parental speech was a crucial factor, they further analyzed the verbs used in both double object and to-dative constructions by the children as well as by their parents. It turned out that the children used the double object constructions first due to the high frequency of these constructions in their parental speech. Based on Goldberg's (1995) classification, they divided the verbs into three classes, i.e. central sense, non-prototypical, and metaphors. It has been found that verbs of central sense have a prototypical meaning of an Agent transferring an object to a Goal (Goldberg 1995). There are also double object verbs which have less prototypical meanings such as verbs of creation or obtaining. Finally, verbs that do not signify physical transfer of objects belong to metaphors. The semantic analysis showed that, contrary to their expectation, the verbs used by the children did not all fall into the prototypical type. Many of them belonged to the other two classes, non-prototypical and metaphors. Campbell and Tomasello thus argued that this might be attributed to frequency of parental input.

#### 2.2.5 Cho, Lee, O'Grady, Song, Suzuki, and Yoshinaga (2002)

Cho et al. (2002) investigated children's preference for the order of the IO and DO in Korean, a language which exhibits both DO-IO and IO-DO orders. Their subjects consisted of forty Korean-speaking children aged from four to seven, with ten in each age group. Four types of sentences were tested, animate IO and DO and inanimate IO and DO in two different orders. Each child was asked to act out with dolls in a comprehension task. In addition, in order to examine whether frequency of input played a role in determining the subjects' word order preference, a corpus study was conducted on maternal speech from three mothers.

The results of the comprehension task showed that the subjects' performance was much better on the DO-IO order in both animate and inanimate situations. A low accuracy rate of the IO-DO order was attributed to the children's interpretation of the IO-DO order as the DO-IO order. In addition, the subjects' performance on the DO-IO order was good for all age groups, but in terms of the IO-DO sequence, age was a crucial factor. The older children performed better than the younger ones

on the IO-DO order. The corpus study showed that among the sentences with both the IO and DO present, 70 % of them belonged to the IO-DO order. However, the children displayed preference for the DO-IO order. Thus, Cho *et al.* claimed, the IO-DO order is considered to be the pattern most frequently used and also the basic form of the two orders in Korean.

To sum up, most of these previous studies conducted a comprehension task to examine children's acquisition of the double object construction (Mazurkewich 1984, Cho *et al.* 2002). It has been found that there was an animacy effect (Osgood 1981) and that the DO-IO order was easier for children to acquire than the IO-DO sequence. However, the considerable attention was drawn only on the English double object construction. Very few studies provided an empirical view on the Chinese corresponding construction. Thus, to have a better understanding of language universality, a closer look at the Chinese double object construction is needed.

### 3. Research Design

#### 3.1 Subjects

The present study consisted of three experimental groups and one control group. The experimental groups were made up of 45 preschoolers aged from three to five from a private Catholic kindergarten in southern Taiwan. The control group was composed of 15 native Mandarin-speaking adults whose mean age was 20, as can be seen in Table 2.

Table 2: Basic Information of the Subjects

Group	Age	Mean	Gender		Number
1 (3-year-olds)	3;5~3:11	3;6	Male	9	15
			Female	6	
2 (4-year-olds)	4;5~4:11	4;6	Male	6	15
			Female	9	
3 (5-year-olds)	5;5~5:11	5;6	Male	6	15
			Female	9	
4 (control group)	18;4~22;4	20;4	Male	7	15

The experimental groups shared a similar geographical background and mainly spoke Mandarin Chinese in their daily lives. Moreover, they spend most of their time on formerly acquired skills with activities such as story-telling, writing letters or greeting cards, drawing, singing, playing the instruments, painting, and pottery, etc.

### 3.2 Materials and Methods

In order to examine how much children have acquired Chinese double object verbs, both a grammaticality judgment (GJ) task and a production (PD) task were designed. In the GJ Task, three verbs were chosen from each type to be tested (see Appendices A and B). For the *gei*-required verbs, two test items were designed for each verb with the two alternative patterns, [V-*gei*-IO-DO] and [V-DO-*gei*-IO]. For the *gei*-forbidden verbs, two test items for each verb were designed as well. For the *gei*-optional verbs, which allow three alternative patterns, [V-*gei*-IO-DO], [V-DO-*gei*-IO] and [V-IO-DO], three test items were designed for each verb. Therefore, twenty-five items, four fillers included, were designed in the GJ Task. Two well-known cartoon characters, Mickey Mouse and his girlfriend Minni Mouse, were used along with a booklet and some stickers. For each test verb, two test sentences were produced by each of the two puppets. Some of the sentences were grammatical, but some were ungrammatical. Each subject was asked to judge which of the sentences produced by the puppets was grammatical and then the subject would be given a sticker if he/she had the correct answer.

In the PD task, four test items were designed for each type of verbs. Altogether, there were sixteen test items, including four fillers (see Appendices C and D). The same puppet, Mickey Mouse, was used. Each test sentence was presented with one picture that described the context. The subjects were asked to complete a sentence with a particular verb introduced by Mickey Mouse.

### 3.3 Procedures

In the study, 45 children were recruited to conduct the two tasks, each of which consisted of two sessions: a training phase and a testing phase. For fear that our children's ability in sentence production were influenced by the test sentences they heard in the GJ task, the PD task was carried out first, in which the training phase lasted for ten minutes, and the testing phase for the GJ task took thirty minutes and the PD task fifteen minutes. In addition, all the subjects were told that stickers would be given to them as gifts at the end of each task. The whole procedure was audio-taped.

After the experiment, one point was given to a correct response. In addition, the syntactic category of each correct response to the PD task was labeled and counted. The data were then entered into SPSS 17 and processed by the computer. With regard to the sentences that received no points in the PD task, a qualitative

analysis was conducted so as to investigate the subjects' preference for patterns other than the double object construction.

#### 4. Results and Discussion

##### 4.1 Difficulty Level of the Three Types of Double Object Verbs

As can be seen in Figure 1, the three types of verbs demonstrated a developmental trend for each age group.

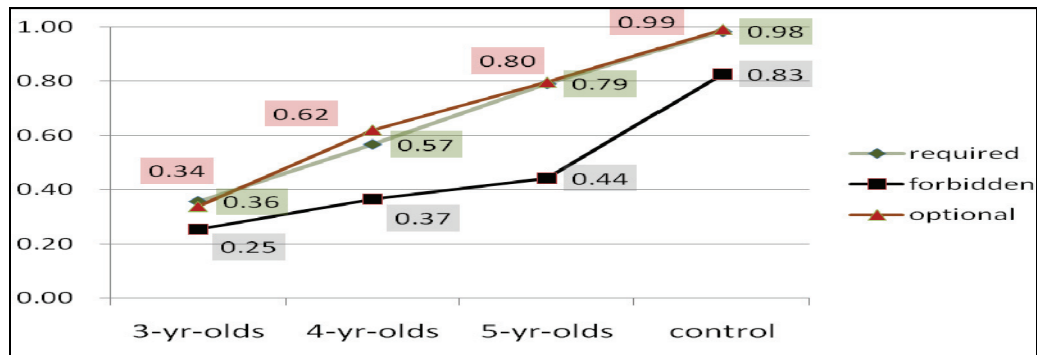


Figure 1: Subjects' Mean Scores of the Three Types of Double Object Verbs

For *gei*-required verbs, the mean scores for the three-, four-, and the five-year-olds were .36, .57, and .79, respectively<sup>6</sup>. The same trend was found in response to *gei*-forbidden and *gei*-optional verbs. As the subjects' age increased, their performance improved. The results of one-way ANOVA also revealed that the different mean scores between groups reached a significant level for all the three types of verbs ( $F(3, 56)=52.785, p=.000$  for *gei*-required verbs;  $F(3, 56)=52.926, p=.000$  for *gei*-forbidden verbs; and  $F(3, 56)=58.441, p=.000$  for *gei*-optional verbs).

The post hoc tests showed that for *gei*-required verbs, the between-group differences all reached the significant level. The five-year-olds were better than the four-year-olds ( $p=.001$ ) and the three-year-olds ( $p=.000$ ). The four-year-olds were better than the three-year-olds ( $p=.003$ ). The adults did significantly better than the three experimental groups. Like *gei*-required verbs, the results of the comparison for *gei*-optional verbs also revealed significant differences among these groups. A significant difference was found between Groups 1 (three-year-olds) and 2 (four-year-olds) ( $p=.000$ ), between Groups 2 (four-year-olds) and 3

<sup>6</sup> The mean score for each age group was derived by the correct responses divided by the four items for each verb type.

(five-year-olds) ( $p=.013$ ), and between Groups 3 (five-year-olds) and 4 (control) ( $p=.005$ ). Concerning the subjects' performance on *gei*-forbidden verbs, the five-year-olds did not perform significantly better than the four-year-olds, although the five-year-olds outperformed the three-year-olds ( $p=.004$ ); the four-year-olds did not do better than the three-year-olds. The three experimental groups performed significantly worse than the adult group ( $p=.000$ ).

Given the results, we can infer that even at the youngest age, our children were able to discern that *gei*-forbidden verbs were different from *gei*-required and *gei*-optional verbs. As discussed earlier, *gei*-forbidden verbs denote a meaning of 'giving' for the reason that although they do not imply physical transfer of an object, they still denote a meaning of transaction metaphorically, hence with the feature [+Giving].

- (13) Ta    wen wo   yi    ge    wenti.  
       he    ask I    one CL question  
       'He asked me a question.'

According to Yang (1991), a sentence like (13) not only signifies abstract transaction of a theme but also denotes the meaning of 'giving,' i.e. [+Giving]. Verbs subsuming the meaning of giving need not co-occur with *gei*. *Gei*-required verbs which do not denote the same meaning are of the [− Giving] type, as in (14).

- (14) Wo    ji    le    yi    feng xin        gei Lisi.        (Yang 1991: 19)  
       I    send ASP one CL letter        GEI Lisi  
       'I send a letter to Lisi.'

In (14), *gei* is required if the IO is present. As shown in Figure 1, our subjects might be aware of the major difference between the two classes of verbs, [− Giving] and [+Giving]. Furthermore, their performance of the former was significantly better than that of the latter, indicating that although they were aware of the two types of verbs, the *gei*-forbidden type was more difficult for them. The former might be acquired first by them. *Gei*-optional verbs, which possess the features [+/− Giving], scored slightly higher than *gei*-required verbs, although not at a significant level. This might be attributed to the reason that *gei*-optional verbs carry both the [+Giving] and [− Giving] features. That is to say, the absence of *gei* in the double object patterns of these verbs will not result in ungrammaticality. If our subjects had not yet acquired the *Gei*-insertion Rule and did not insert *gei* in double object pat-

terns, they still could produce grammatical sentences. Therefore, it was unlikely that they would make mistakes when they encountered *gei*-optional verbs. The application of the rule, on the contrary, is necessary for *gei*-required verbs. Our children must be aware that these verbs possess the [– Giving] feature, and that they apply the *Gei*-insertion Rule to double object patterns. From our subjects' performances on *gei*-required verbs, we can postulate that they might not have fully acquired the *Gei*-insertion Rule even at the age of five, since the performance of the five-year-olds was still significantly worse than that of the adults.

On the other hand, our subjects' poor performance on *gei*-forbidden verbs can be attributed to the feature [+Giving]. This type of verbs are also different from the other two types in that they do not physically denote transfer of objects (Tang 1979). They only signify the same meaning metaphorically. That is to say, both *gei*-required and *gei*-optional verbs possess the feature [+Concrete], but *gei*-forbidden verbs are [– Concrete]. It is believed that children understand concrete objects or actions earlier than abstract ideas. In addition, concrete objects are usually more general than abstract ones. According to Clark's (1973) Semantic Feature Hypothesis, more general features are acquired first, followed by steady accretion of more specific ones. Furthermore, when a pair of words are related in a child's mental lexicon and possess similar features, it is not until the child acquires the contrasting values of positive (+) and negative (–) between these words that he is able to distinguish the two (Clark 1973). In the present study, our subjects might have been able to differentiate the positive (+) from the negative (–) value of concreteness, but those with [– Concrete] may still remain difficult. Double object verbs with the negative value might not be familiar to them compared to those with the positive value. Miller (1977) also agrees that children's early words are usually "broadly generic" and "the acquisition of later words should sharpen conceptual distinctions (1977:1004)." Compared to *gei*-forbidden verbs, words with the [+Concrete] feature are more generic and easier to understand and thus are acquired earlier and with ease. In Clark's (1993) discussion of children's ontological categories, she argued that when children create meanings for nouns, their ontological categories must contain countable objects, and the objects usually can be recognized by shape. Moreover, when children are eight months old, they can "distinguish certain activities that result in a change of state from an ongoing process (1993:46)." Gentner's (1978) findings of verb meanings also corroborate Clark's hypothesis. His results showed that semantically simple verbs are acquired earlier than semantically more complex

verbs. *Gei*-forbidden verbs, given their abstract sense of transfer of objects, do not result in a physical change of state, and are considered semantically more complex in meaning. They were therefore more difficult to acquire for our children.

With regard to the IO Precedence Rule, in our children's responses to the *gei*-optional verbs in the PD task, none of the sentences belonged to the pattern \*[V-DO-IO]. From their responses of *gei*-forbidden verbs in the PD task, none of them produced the pattern \*[V-DO-IO], either.

As can be seen in Figure 1, our children's developmental progress for *gei*-required and *gei*-optional verbs almost overlap, showing a steady increase of ability as the subjects got older. Like the development of the two types of verbs, *gei*-forbidden verbs also displayed a steady progress, although it was slower. *Gei*-required and *gei*-optional verbs scored the highest for every group, and the difference between the two types did not reach a significant level. It can be inferred that these two types of verbs were the easiest for the subjects of the three groups. In addition, the multiple comparisons showed that as the children got older, their performance not only improved but also increased significantly for the two types of verbs. Originally we would expect that the oldest group (five-year-olds) had already acquired the adult level proficiency. Contrary to our expectation, the difference between the oldest group and the adults was statistically significant, showing that they had not yet fully acquired these two types of verbs as the adults did. That is to say, although the children might have been able to differentiate the [+Concrete] feature from the [—Concrete] one, with regard to *gei*-required and *gei*-optional verbs that possess the [+Concrete] feature, they still had difficulty applying the *Gei*-insertion Rule. However, the children's acquisition of *gei*-forbidden verbs was different. As they got older, there was only a small scale of progress, indicating that the acquisition of this type of verbs was relatively slow and thus not easy to detect. Even when the children at the age of five performed quite well on *gei*-required and *gei*-optional verbs, their performance on *gei*-forbidden was still poor. *Gei*-forbidden verbs, with the feature [+Giving], which at the same time possess [—Concrete] meaning, were still new to our subjects, and therefore were more difficult. Only when they encountered more of the type of verbs as their age increased would they be able to fully produce *gei*-forbidden verbs in correct patterns.



## 4.2 Children's Preferences for Certain Patterns

Among the three types of double object verbs, *gei*-required verbs can be used in two alternative patterns, [V-*gei*-IO-DO] and [V-DO-*gei*-IO]. *Gei*-optional verbs exhibit three patterns, [V-*gei*-IO-DO], [V-DO-*gei*-IO], and [V-IO-DO]. *Gei*-forbidden verbs, however, can only be used in one pattern, [V-IO-DO]. Thus, only the former two types of verbs were examined. According to Eckman (1977), more unmarked forms or structures will be acquired more easily and earlier than marked ones (cf. Mazurkewich 1984). Thus, the degree of markedness is defined according to the degree of difficulty levels. Others explore the frequency of a certain pattern in a language or across languages as a criterion to define markedness (cf. Greenberg 1966, Liu 2001). For them, more unmarked forms are usually accompanied by higher frequency of occurrences.

As shown in Table 3, we can find that for the three-year-olds, there were only 6 grammatical double object sentences, 5 of which belonged to the dative pattern.

Table 3: Use of the *Gei*-required Patterns by Each Group

<i>Gei</i> -required	three-year-olds	four-year-olds	five-year-olds	control
[V- <i>gei</i> -IO-DO]	1 (16.67 %)	1 (3.13 %)	0 (0 %)	0 (0 %)
[V-DO- <i>gei</i> -IO]	5 (83.33 %)	31 (96.88 %)	50 (100 %)	58 (100 %)

The chi-square test revealed that although the dative pattern (83.33%) had more responses than the V-*gei* double object pattern (16.67%), there was no significant difference of frequency between the two patterns. Therefore, for the three-year-olds, no significant preference was found. The four-year-olds produced thirty-two grammatical double object sentences, thirty-one of which (96.88%) belonged to the dative pattern [V-DO-*gei*-IO]. The chi-square test showed that there existed a preference for the dative pattern:  $\chi^2=26.281$ ,  $df=1$ ,  $p=.000$ . The five-year-olds also exhibited the same preference, with all the children (100%) choosing the dative pattern, which was identical to that of the control group. Taken together, from the frequency counts, we can assume that the children, as well as the adults of the control group, all favored the dative pattern of *gei*-required verbs, despite the fact that no statistically significant preference was found in the production of the three-year-olds.

As Table 4 shows, there were slight differences among the three experimental groups. The three-year-olds expressed their preference not only for the double object [V-IO-DO] but also for the V-*gei* [V-*gei*-IO-DO] pattern, which seemed to deviate from the other children.

Table 4: Subjects' Use of the *Gei*-optional Patterns by Each Group

<i>Gei</i> -optional	three-year-olds	four-year-olds	five-year-olds	control
[V- <i>gei</i> -IO-DO]	3 (42.86 %)	4 (10.26 %)	0 (0 %)	0 (0 %)
[V-DO- <i>gei</i> -IO]	0 (0%)	19 (48.72%)	31 (67.39 %)	41 (69.49%)
[V-IO-DO]	4 (57.14%)	16 (41.03%)	15 (32.61%)	18 (30.51%)

The chi-square test, however, indicated that the distribution of the youngest group failed to confirm the existence of preference for any particular pattern:  $\chi^2=.143$ ,  $df=1$ ,  $p=1.000$ . Therefore, no preference was found in the youngest group. As for the four-year-olds, there were still some responses of the V-*gei* pattern, but the percentage was low (10.26 %). The majority of these children favored the other two patterns, with slightly more children (48.72 %) preferring the dative [V-DO-*gei*-IO] to the double object pattern [V-IO-DO] (41.03 %). Although the chi-square test confirmed the existence of preference, there was no difference between the frequency counts of the dative [V-DO-*gei*-IO] and the double object [V-IO-DO] patterns ( $p=.736$ ). In other words, from the results we can only infer that the four-year-olds favored both the dative pattern [V-DO-*gei*-IO] and the double object pattern [V-IO-DO]. Their preference for the dative pattern was not significant. As we examine the distribution of the oldest group, we can see that their preference resembled that of the adults. A majority of the responses was of the dative pattern [V-DO-*gei*-IO] (67.39%), while none of them belonged to the V-*gei* pattern. The chi-square test further confirmed their preference for the dative pattern [V-DO-*gei*-IO] ( $p=.026$ ), a result similar to that of the control group.

Table 5 summarizes the subjects' preferences in both tasks. With regard to the second research question, for *gei*-required verbs, in the GJ task, although the children's mean score of the dative pattern [V-DO-*gei*-IO] was higher than that of the [V-*gei*] pattern, no significance was found. When it came to language production, however, both the experimental and the control groups favored the dative pattern. Therefore, it can be claimed that for the two patterns of *gei*-required verbs, the unmarked one is the dative pattern, and the marked one is the [V-*gei*] pattern.

Table 5: Subjects' Preferences for Patterns in Both Tasks

Task	Group	<i>Gei</i> -required	<i>Gei</i> -optional
PD	experimental	[V-DO- <i>gei</i> -IO]>[V- <i>gei</i> -IO-DO]	[V-DO- <i>gei</i> -IO]>[V-IO-DO]> [V- <i>gei</i> -IO-DO]
	control	[V-DO- <i>gei</i> -IO]>[V- <i>gei</i> -IO-DO]	[V-DO- <i>gei</i> -IO]>[V-IO-DO]> [V- <i>gei</i> -IO-DO]
GJ	experimental	[V-DO- <i>gei</i> -IO]>[V- <i>gei</i> -IO-DO]	[V-DO- <i>gei</i> -IO]>[V- <i>gei</i> -IO-DO] >[V-IO-DO]
	control	[V-DO- <i>gei</i> -IO]=[V- <i>gei</i> -IO-DO] <sup>7</sup>	[V-DO- <i>gei</i> -IO]=[V- <i>gei</i> -IO-DO] =[V-IO-DO]

For *gei*-optional verbs, as discussed previously, there was no significance among the mean scores of the three patterns in the GJ task. That is to say, the children performed equally well on the three alternative patterns in the Comprehension task. For the PD task, a preference indeed existed both for the children and the adults. All of the subjects preferred the dative pattern [V-DO-*gei*-IO], and the [V-*gei*] pattern was the least favored. Therefore, the dative pattern can be said to be the most unmarked, followed by the double object pattern [V-IO-DO]. The [V-*gei*] pattern, like that of *gei*-required verbs, is the most marked pattern.

Originally it was expected that among the three patterns of *gei*-optional verbs, the [V-IO-DO] pattern would be the most preferred since the pattern is shorter and thus more economical to produce. The results failed to confirm this view for both the experimental and control groups. The most preferred pattern was still the dative pattern [V-DO-*gei*-IO], despite the insignificant difference between the two patterns found in the experimental group.

Our results corroborated Liu's (2001) typological study. In terms of distribution, Liu claimed that sentences with the [V-IO-DO] pattern can be changed into the [V-DO-*gei*-IO] pattern. However, not all the sentences with the dative pattern [V-DO-*gei*-IO] can be changed into the double object counterpart [V-IO-DO]. In other words, what Liu meant is that *gei*-optional verbs which allow the [V-IO-DO] pattern can all appear in the dative pattern, while *gei*-required verbs, which allow the dative pattern, cannot appear in the [V-IO-DO] pattern<sup>8</sup>. Therefore, in Liu's

<sup>7</sup> In the GJ task, the adults attained 100 % accuracy for all the verbs.

<sup>8</sup> It might be argued that contrary to what Liu claimed, *gei*-forbidden verbs, which can appear in the double object pattern, cannot appear in the dative pattern. A possible reason is that *gei*-forbidden verbs are different from the other two types in that they do not denote physical transfer, which is the dominant criterion in Liu's typological study.

words, based on the wider distribution of the dative pattern than the double object pattern, the dative pattern [V-DO-*gei*-IO] is more unmarked than the [V-IO-DO]. In addition to distribution, Liu's discussion of the structural distance and linear distance of arguments suggested that the DO should be closer to the verb than the IO. The pattern [V-IO-DO] violates the linear order because the IO is closer to the verb than the DO. As for the V-*gei* pattern [V-*gei*-IO-DO], the V-*gei* sequence conforms to the structural order because the IO is introduced by *gei* and it is structurally closer to *gei* as well, but it violates the linear order in that the DO is even farther from the verb. For the above reasons, Liu suggested that [V-DO-*gei*-IO] is the most unmarked and the other two patterns are marked. To explicate the relative degrees of markedness of the two patterns [V-IO-DO] and [V-*gei*-IO-DO], Liu claimed that although the DO is farther from the verb in the V-*gei* pattern, these two patterns are similar in that V-*gei* can be considered a compound. The difference of the two can be attributed to the economy principle, which states that it is more economical to express the same meaning with fewer elements (cf. Liu 2001). Therefore, the [V-IO-DO] pattern is considered more economical since *gei* is omitted. In addition to the notion of distance and the economy principle, Liu also discussed other issues such as heavy NPs and topicalization, which can determine the relative order of the DO and the IO. In Liu's comparison of the above factors, conceptual and linear distances are two of the most dominant in determining the word order.

In addition to the degree of markedness, we have also discussed the order of thematic roles. Givón's (2001) thematic hierarchy, proposed in 1984, was discussed with regard to the order of the DO and the IO. Since Givón's hierarchy is based on the degree of topicality, it is aligned with the notion of animacy (Levin and Hovav 2005). A prototypical IO, i.e. the recipient, which is animate, is considered more prominent than the prototypical inanimate DO on the topicality continuum. Therefore, the recipient (IO) will tend to precede the theme<sup>9</sup> (DO). In Givón's investigation of the frequency distribution in texts, 84% of the DO positions were occupied by the DAT/BEN objects, i.e. the recipient, while only 16% of them were the ACC objects, i.e. the theme. Following Givón, Chang (2005) examined the double object *gei* constructions in Mandarin Chinese and conducted a frequency count of the two orders of the DO and the IO in live texts. His result paralleled what Givón has observed: 85% of *gei* double object constructions fell into the V-*gei* pattern

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<sup>9</sup> In the study, "theme" is used instead of "patient."

[V-*gei*-IO-DO], 15% of which belonged to the dative pattern [V-DO-*gei*-IO]. The results of the present study, however, contradicted what they have claimed. For *gei*-required verbs, the majority of the responses (97.7%) in the children were of the dative pattern [V-DO-*gei*-IO]. For the adults, all of them favored the same pattern. With regard to *gei*-optional verbs, it was originally expected that the [V-IO-DO] pattern would be the most preferred since it would be more economical compared to the other two patterns in which *gei* cannot be omitted. Surprisingly, more children (50 responses) preferred the [V-DO-*gei*-IO] pattern to the double object pattern [V-IO-DO] (35 responses), although not at a significant level. The adults' results confirmed that for the *gei*-optional verbs, the [V-DO-*gei*-IO] pattern was also more favored.

Since the children's preferences were in contrast to Chang's (2005) findings and Givón's (2001) thematic hierarchy, to account for the results, we refer to the notion of Case Theory in the field of generative grammar. In fact, Mazurkewich (1984) also referred to Chomsky's Case Theory to account for her results. She argued that the [NP PP] is more unmarked than the [NP NP] because the dative noun is introduced by a P in the [NP PP] pattern, but in [NP NP], there are two NPs. In generative syntax, it is suggested that according to the Case Filter, every overt NP must be case-marked, though it does not necessarily have an overt morphological realization (Haegeman 1997). That is to say, every overt NP must be assigned one case by its head. Among the NPs in English, for example, the objects of transitive verbs and prepositions are assigned Accusative case by their heads, V and P respectively. If we apply the Case Filter to the different patterns of double object verbs in English, we can find that in the [V-DO-to-IO] pattern, both the DO and the IO receive case from their heads, V and P respectively. In the [V-IO-DO] pattern, however, there is only one case assigner V, but two NPs, the IO and the DO, on the surface form. Furthermore, in such a pattern, there is an intervening element between the verb and the DO, which contradicts the adjacency condition on case assignment. In other words, it is generally assumed that the NP and its case assigner must be adjacent. The surface pattern [V-IO-DO] obviously violates the adjacency condition (Haegeman 1997). Therefore, for the children in the study, the one which conforms to Case Theory as well as the adjacency condition was expected to be easier and thus used more widely.

Our results lend support to what Osgood and Zehler (1981) had found in their subjects. The relative order of the DO and the IO should be the DO preceding the IO.

Their subjects preferred the [S-V-DO-to-IO] to the [S-V-IO-DO] because they tended to regard the object closest to the verb as the DO. Therefore, no matter whether the first object is the theme or the dative object, the children considered it to be the theme. To explain this, Osgood and Zehler argued that the V-DO sequence expresses contiguity, because there is a “natural linkage between the transferring action and the object being transferred (1981: 382).” In Cho et al.’s (2002) study, the DO-IO sequence received a higher production rate than the IO-DO sequence. They also found that their children tended to consider the first non-subject NP to be the DO, and the second to be the IO in double object constructions. In the present study, the subjects’ preference for the dative pattern [V-DO-*gei*-IO] for the *gei*-required and the *gei*-optional verbs was consistent with both of the two hypotheses proposed in their study, the Hierarchy Hypothesis and the Iconicity Hypothesis. Their Hierarchy Hypothesis, which is concerned with the accessibility of NPs to various transformations such as topicalization and relativization, predicts that the DO is ranked higher than the IO. On the other hand, the Iconicity Hypothesis, which states that the word order iconic with the corresponding situation is more preferred for children, predicts the same order of DO-IO. Cook (1976), in his study of children’s performance on the TO construction (e.g. Give a bone to the dog.) and the ORDER construction (e.g. Give the dog a bone.), found that his subjects, aged five to ten, preferred the TO construction. The older they grew, the greater accuracy they showed for the ORDER construction, i.e. the double object construction in the present study, [V-IO-DO].

To conclude, it has been found that for *gei*-required verbs, the most preferred pattern is [V-DO-*gei*-IO], and it is also more unmarked. For the *gei*-optional verbs, the most favored pattern is still [V-DO-*gei*-IO], followed by [V-IO-DO]. The [V-*gei*-IO-DO] pattern is the least favored and is considered the most marked pattern.

#### 4.3 Other Patterns Elicited

In this section, attention will be drawn to the subjects’ production data other than the expected double object constructions. Although the children, especially the three-year-olds, did not perform well on the three types of double object verbs, a closer look at the data showed that most of their sentences that were not of the double object patterns were still grammatical.

First of all, from the analysis of their sentences of *gei*-required verbs, there was a steady decrease in the number of their unintended responses as their age grew. In addition, among them the majority fell into the mono-transitive use, [V-NP], for all the three groups, the percentage being especially large for the three-year-olds (75.93 %). The subjects' sentences only contained the verb and the DO, with the IO missing, such as the following sentence.

- (15) Xiaoming na gushishu (gei Xiaomei).  
 Xiaoming take story book (GEI Xiaomei)  
 'Xiaoming gave a story book (to Xiaomei).'

In addition to the mono-transitive use, the [V-NP-V-*gei*-NP] pattern, in which an additional verb was added to the double object sentences, was the second favored pattern for the four- and the five-year-olds, 34.48% and 22.22% respectively. In (16), an additional verb *yao*, "want" was added before *gei*.

- (16) Xiaoming xie kapiān yao gei Xiaomei.  
 Xiaoming write card to GEI Xiaomei  
 'Xiaoming wrote a card in order to give it to Xiaomei.'

Interestingly, none of the three-year-olds produced sentences with such a pattern. This might be attributed to the reason that instead of using complex sentences, i.e. more than one VP, the youngest children tended to respond with the mono-transitive pattern, resulting in a high percentage for this pattern. For them, the second favored pattern was [V-*gei*-NP-(NP)], 11.11%, with the omission of the DO. For the four-year-olds, the third favored pattern was [V-NP-*gei*-NP-VP], 10.34%. This was similar to the second favored pattern in that an additional verb was added, resulting in a more complex sentence like (17):

- (17) Xiaoming na shu gei ta kan.  
 Xiaoming take book GEI her look  
 'Xiaoming took a book for her to read.'

One thing worth noticing was that among the three age groups, two children produced the double object pattern without *gei*, which resulted in an ungrammatical sentence like (18):

- (18) Xiaoming    ji                    \*(gei)    Xiaomei    liwu.  
          Xiaoming    send            \*(GEI)    Xiaomei    present  
          'Xiaoming sent Xiaomei a present.'

One of them was a girl in the three-year-old group; the other was a five-year-old boy. For the rest three test items of *gei*-required verbs, the three-year-old girl produced one grammatical double object sentence, and two mono-transitive sentences with the [V-NP] pattern. The five-year-old boy produced one grammatical double object sentence, another of the mono-transitive pattern, and the other of the [V-NP-V-*gei*-NP] pattern. Their production data showed that they indeed were able to use the verbs in different patterns with occasional errors (only one) in the task.

As for the sentences of *gei*-optional verbs, like that of *gei*-required, most of the sentences fell into the mono-transitive [V-NP] pattern, 81.13% for the three-year-olds, 85.71% for the four-year-olds, and 100% for the five-year-olds. In such a pattern, the IO was likely to be omitted. The second favored pattern consisted of the verb and the IO without the DO, all of which were produced by the children in the two younger groups. This pattern only constituted a small proportion of all the responses, 7.55% and 9.52% for the three- and four-year-olds respectively. The percentage of the no/inappropriate elicitation category was small, and it was only produced by Group 1 and the number decreased in Group 2. None of the five-year-olds produced such responses, indicating that these verbs became easier as the children grew older.

The children's responses to *gei*-forbidden verbs were somewhat different from those of the above two types. It was found that the no/inappropriate elicitation category constituted more than half (56.90%) of the responses produced by the three-year-olds. For the four- and the five-year-olds, the percentage of this category declined to around 35%, and it further dropped to 0% for the adults, obviously indicating a developmental sequence concerning the children's responses to this type of verbs. Furthermore, among the responses found in this category, some of them were irrelevant to the intended sentences because the children did not know how to respond to the question, as can be seen in (19):

- (19) Ni      yao            jide                     $\phi$ .  
          you    have-to    remember          it  
          'You have to keep it in mind.'



The children's responses such as the above did not contain the given double object verbs. They were merely phrases or sentences relevant to the pictures or descriptions in the PD task. The high percentage found in this category throughout the three age groups indicated that this type of verbs was more difficult than the other two types. The younger the children were, the more difficulty they encountered in producing the intended patterns of *gei*-forbidden verbs.

Aside from this category, the most preferred pattern for this type was, like the other two types discussed earlier, the mono-transitive use, [V-NP], 32.76%, 50.00%, and 38.78% for the three-, four-, and five-year-olds respectively. When we look at the two patterns (i.e. [V-NP-VP] and [V-VP]) in which there were more than one VP, we can see that these two patterns made up to 10 % for the youngest group, 12% for the four-year-olds, and 24% for the oldest children, indicating that their ability to construct complex sentences was accompanied by the growth of their age.

- (20) Xiaomei    daying    ta    zuo   shiqing.  
               Xiaomei    promise   him   do   thing  
               'Xiaomei promised him to do something.'

One response belonged to the [V-NP-*gei*-NP-VP] pattern, like that of *gei*-optional verbs. The only ungrammatical pattern, i.e. with the insertion of *gei*, was produced by one girl of the four-year-old group. For the four test items of *gei*-forbidden verbs, this girl only produced one ungrammatical sentence. Two of her responses were grammatical, and for one item she did not know what to say. Therefore, it can be inferred that the girl was able to produce grammatical sentences with *gei*-forbidden verbs with only minor errors.

In English, double object verbs like *give* have to take two objects. Omitting either the DO or the IO will lead to ungrammaticality. In Mandarin Chinese, however, verbs like *fu*, 'pay,' can be used as a mono-transitive verb and they only take an object. As expected, for the responses of the verb *fu*, all the sentences belonged to the [V-NP] pattern like (21):

- (21) Xiaoming        fu    er-shi        yuan.  
               Xiaoming        pay   two-ten        dollars  
               'Xiaoming paid 20 dollars.'

In fact, both *gei*-required and *gei*-optional verbs can take only one object and are still grammatical. Besides, judging from the children's responses, the object they

took was the DO, not the IO, which corroborates the claim made in the previous section that the verb and the DO have a closer relationship than the verb and the IO. The grammaticality of the [V-DO] pattern without the IO also confirms what Osgood and Zehler (1981) postulate. It was found that the verb and the DO did express contiguity. In addition, the wide use of the mono-transitive pattern without the IO clearly shows that the conceptual distance between the verb and the DO is closer than that between the verb and the IO, as Liu (2001) claims. That is to say, if the children have to choose an object when using these verbs, they will choose the DO, not the IO.

In addition to the choice of the DO and the IO, it was also worth mentioning that although the children's mean scores of the production task were low, the analysis of their sentence patterns indicated that they actually were able to produce sentences with the three types of verbs. Moreover, most sentences they produced were mono-transitive instead of the intended ditransitive patterns, which might be the main cause of their poor performance. Compared to the mono-transitive pattern [V-NP], ditransitive patterns of either [V-(*gei*)-IO-DO] or [V-DO-*gei*-IO] required more elements such as additional NPs and the insertion of *gei*, and thus were more complicated for them. After extensive use of the mono-transitive pattern for all the three types of verbs as illustrated in (11), the children started to insert the IO by adding *gei* for *gei*-required and *gei*-optional verbs, resulting in the [V-*gei*-NP] pattern. As for their ability to use *gei*-forbidden verbs, they began to learn to use the verbs in complex sentences by adding an extra VP. As their age increased, they learned to add more elements into sentences.

Children are expected to produce simple sentences earlier and more frequently than complex ones. As mentioned by Ervin-Tripp (1973), children's use of verbs appear early, usually with only one or two of the arguments of a three- or four-argument verb like *give*. She also suggested that the IO may appear early but the number of occurrences is small. In Limber's (1973) study of children's syntactic development, he concluded that at the age of three, English-speaking children have already been able to produce syntactically complex expressions, by which he meant to be able to form complements and relatives. In addition, Limber found that during this year, the "N-V-N sequence is the common simple sentence (1973:182)," and that children's production of complex sentences is generated from their storage of simple ones. In analyzing children's utterances, Bowerman (1973) found that before the age of two, her subjects' utterances displayed three patterns,

subject-verb, verb-object, and subject-verb-object, with the first pattern the most frequently used. In the present study, the children's responses indeed confirmed this view. When they did not produce the intended double object sentences with the given verbs, the majority of them produced simple sentences of subject-verb-object. As they got older, their ability to produce double object sentences progressed, as can be seen from the performance of the five-year-olds in the present study.

Aside from the mono-transitive pattern, the rest of the children's responses mainly consisted of the two patterns, [V-NP-*gei*-NP-VP] and [V-(NP)-VP], which were regarded as complex sentences (Limber 1973). In Limber's study of three-year-olds' production of object complements, he categorized children's use of English verbs into two patterns, [(NP)-{main V}-(object NP)] and [(NP)-main V-{(NP)-V-(NP)}], the latter a complex structure. Consistent with Limber's view, in the present study, the children, the three-year-olds included, were able to produce complex sentences spontaneously. Take *gei*-forbidden verbs for example, the three-year-olds might not be able to produce the intended double object patterns. They tended to paraphrase the descriptions of the pictures with complex sentences like (22):

- (22) Xiaomei    daying    bangmang.  
       Xiaomei    promise    help  
       'Xiaomei promised to help.'

Another issue worth noticing is that in the [V-NP-*gei*-NP-VP] pattern, *gei* was inserted. This was not the intended double object pattern because an additional VP was added. Indeed, such pattern is not uncommon in Mandarin Chinese. In Her's (2006) comprehensive analysis of the use of *gei*, this pattern was categorized as the purposive use of *gei*<sup>10</sup>, which can be found in everyday conversations. Consider the following example.

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<sup>10</sup> In Her's analysis, the main focus is on the syntactic category of *gei* in different positions. Her refers to various sentences in Mandarin Chinese to support his claim that therefore *gei* in the pattern [V-NP-*gei*-NP-VP] is a complementizer. The syntactic category of *gei*, however, is not the main issue in the present study. Therefore, it will not be explored here. Readers can refer to Huang and Ahrens (1999) and Her (2006) for their detailed discussion.

- (23) Xiaomei chang ge gei mama ting.  
 Xiaomei sing song GEI mother hear  
 ‘Xiaomei sang a song for her mother.’

The verbs that can be used in the pattern include not only the double object verbs examined in the present study, but also mono-transitive or even intransitive verbs like *fei* “fly,” a verb used by Her (2006) in his analysis. Therefore, it was not surprising to find this pattern in the children’s production data.

To sum up, the children’s developmental progress can be presented in the following figure. From their production data, the mono-transitive pattern [V-NP] was the most widely used for *gei*-required, *gei*-optional, and *gei*-forbidden verbs. It was obvious that this pattern was the earliest for the children to acquire. As can be seen from Figure 2, at the initial stage, the mono-transitive use first appeared in the children’s development of double object verbs. At this stage, they had not yet acquired the [+/- Giving] feature.

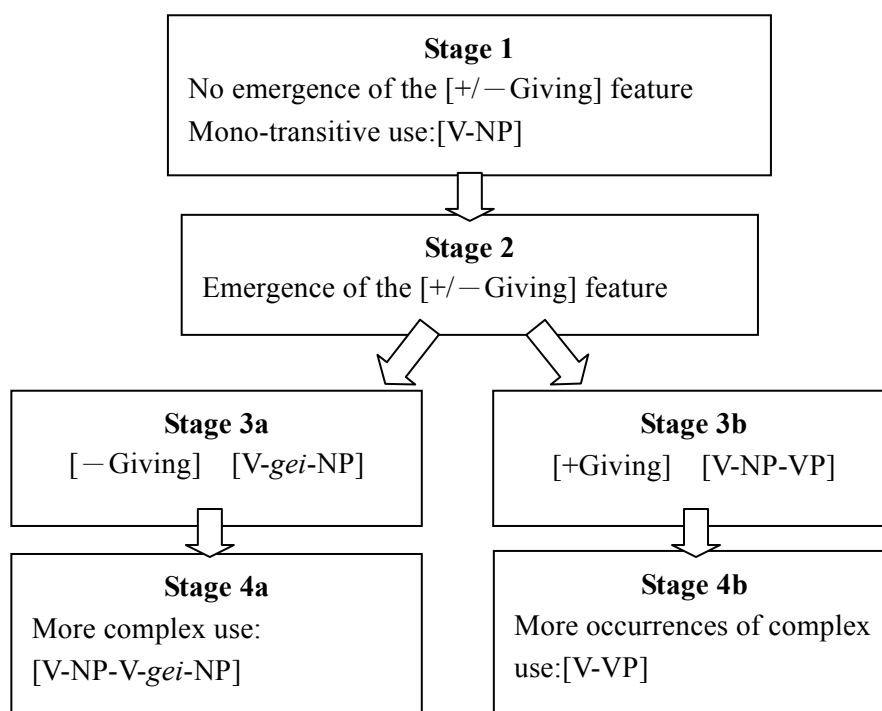


Figure 2: Children’s Development of the Double Object Verbs

Therefore, the children were not able to discern whether these verbs could be used in double object constructions or not. For them, these verbs were like other mono-transitive verbs in Mandarin Chinese. After Stage 1 came the second stage, with the emergence of the [+/- Giving] feature. At Stage 2, the [+/- Giving] feature appeared. The children began to learn that these verbs indeed possess the feature and that they could be used in double object constructions. When the children entered Stage 3, they learned to differentiate the verbs with [+Giving] from those with [- Giving]. They began to use these verbs in double object constructions more often and began to apply the *Gei*-insertion Rule to the verbs with the [- Giving] feature, i.e. Stage 3a. At this stage, the children needed not only to learn the [+/- Giving] feature, but they also needed to learn the [+/- Concrete] feature at the same time, since some of these double object verbs with the [- Concrete] feature might be more difficult for them. Once they entered Stage 4, they had less difficulty with the double object verbs and therefore were able to use them in more complex sentences. That is to say, to acquire the *gei* construction, our subjects went through different stages of rule formations to capture the generalization (Nini 1999), rather than y relied on the surface forms to acquire the construction (cf. Goldberg 2006).

## 5. Conclusion

In the studies on Mandarin double object verbs, many researchers have focused on the classification of these verbs (Huang and Ahrens 1999, Tang 1979, Yang 1991). Some contribute to the syntactic analysis of the alternation of the double object construction and its dative counterpart (cf. Chang 2005, Her 2006, Yang 1991). Some (cf. Chang 2005, Her 2006, Huang and Ahrens 1999) discuss the syntactic status of *gei* in these constructions. However, few of them have examined Chinese children's acquisition of these verbs, especially with regard to the occurrence of *gei*. The present study, though conducted on a small scale, wished to shed some light on the issue. In doing so, we hope to provide some suggestions for researchers interested in future study.

First of all, the age groups can be expanded. In the present study, only three age groups were investigated. According to the subjects' mean scores on the GJ task, although a steady developmental progress was found, the performance of the oldest group ( i.e. the five-year-olds), was still significantly worse than that of the adults', indicating that age five might not be the cutting age of our children's full acquisition of double object verbs. Thus, older children may be examined to iden-

tify the cutting age of full acquisition of double object verbs.

Second, when examining Chinese double object verbs, verbs of consumption are usually discussed in the literature (Tang 1979, Yang 1991), but they were not investigated in the present study. Consider the following examples taken from Yang (1991, p.28):

- (24) Xiaoming tou le Zhang laoban yi zhe biao.  
Xiaoming steal ASP Zhang boss one CL watch  
'Xiaoming stole a watch **from** Boss Zhang.'  
'\* Xiaoming stole a watch **for** Boss Zhang.'
- (25) Xiaoming tou le yi zhe biao gei Zhang laoban.  
Xiaoming steal ASP one CL watch GEI Zhang boss  
'Xiaoming stole a watch **for** Boss Zhang.'  
'\* Xiaoming stole a watch **from** Boss Zhang.'

Although this type of verbs can have two alternative patterns listed above, the patterns are totally different in meaning. The major difference of this type of verbs lies in the person (i.e. the subject), of the action of transfer. The subject is the Source of the transfer instead of the Goal. Therefore, it will be interesting to examine whether children are able to differentiate between the Source and the Goal of the transfer of objects.

Last but not least, our subjects' preference for the relative order of the DO and IO contradicted what Givón (2001) has found concerning his Thematic Hierarchy<sup>11</sup>. Therefore, to have a complete picture of the use of the alternative patterns of double object verbs, it would be necessary to also investigate children's daily use of these verbs. That is, a corpus study can be conducted to see whether their preferences for certain pattern are consistent with the results we obtained or the Thematic Hierarchy proposed by Givón (2001).

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<sup>11</sup> As pointed out by one of the reviewers, our findings seem to support Pinker's (1989) claim of associating thematic hierarchy with the linking rule.

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### Appendix A: Test Structure of the GJ Task

Type	Item	Question No.	Type	Item	Question No.
GRV	<i>ji</i>	Q4	GFV	<i>gaosu</i>	Q2
		Q23			Q11
	<i>dai</i>	Q7		<i>daying</i>	Q6
		Q20			Q22
	<i>xie</i>	Q16		<i>huida</i>	Q14
		Q18			Q17
GOV	<i>song</i>	Q5	Fillers	<i>chi</i>	Q3
		Q19		<i>chuan</i>	Q9
		Q24		<i>xi</i>	Q12
	<i>huan</i>	Q13		<i>bian</i>	Q1
		Q15			
		Q21			
	<i>fu</i>	Q8			
		Q25			
		Q10			

## Appendix B: Test Sentences Used in the GJ Task

- |                       |                    |
|-----------------------|--------------------|
| 1. 米奇：*小明變小美給魔術看。     | 米妮：小明變魔術給小美看。      |
| 2. 米奇：*小明告訴一個秘密小美。    | 米妮：小明告訴小美一個秘密。     |
| 3. 米奇：小明請小美吃糖果。       | 米妮：*小明請糖果吃小美。      |
| 4. 米奇：*小明寄小美一封信。      | 米妮：小明寄一封信給小美。      |
| 5. 米奇：小明送小美生日禮物。      | 米妮：*小明送生日禮物小美。     |
| 6. 米奇：小明答應小華一件事情。     | 米妮：*小明答應一件事情小華。    |
| 7. 米奇：小明帶一張照片給小美。     | 米妮：*小明帶小美一張照片。     |
| 8. 米奇：小美的哥哥付 10 元給老闆。 | 米妮：*小美的哥哥付 10 元老闆。 |
| 9. 米奇：*小美穿小明給新衣服看。    | 米妮：小美穿新衣服給小明看。     |
| 10. 米奇：*小美付一支鉛筆小明。    | 米妮：小美付小明一支鉛筆。      |
| 11. 米奇：小明告訴小美一件事情。    | 米妮：*小明告訴給小美一件事情。   |
| 12. 米奇：*小美幫衣服洗媽媽。     | 米妮：小美幫媽媽洗衣服。       |
| 13. 米奇：小美還給小明新玩具。     | 米妮：*小美還新玩具小明。      |
| 14. 米奇：*小明回答給老師一個問題。  | 米妮：小明回答老師一個問題。     |
| 15. 米奇：小明還一支筆給小美。     | 米妮：*小明還一支筆小美。      |
| 16. 米奇：*小明寫一張卡片小美。    | 米妮：小明寫一張卡片給小美。     |
| 17. 米奇：*小美回答一個問題小明。   | 米妮：小美回答小明一個問題。     |
| 18. 米奇：*小美寫小明一封信。     | 米妮：小美寫一封信給小明。      |
| 19. 米奇：小華送玩具給小明。      | 米妮：*小華送玩具小明。       |
| 20. 米奇：*小美帶一份薯條小明。    | 米妮：小美帶給小明一份薯條。     |
| 21. 米奇：小明還小美一本書。      | 米妮：*小明還一本書小美。      |
| 22. 米奇：*小美答應給小明一件事情。  | 米妮：小美答應小明一件事情。     |
| 23. 米奇：小美寄給小明一個禮物。    | 米妮：*小美寄一個禮物小明。     |
| 24. 米奇：*小美送一張卡片姊姊。    | 米妮：小美送給姊姊一張卡片。     |
| 25. 米奇：小明付給小美 20 元。   | 米妮：*小明付 20 元小美。    |

### Appendix C: Test Structure of the PD Task

Type	Item	Direct Object	Question No.
GRV	<i>ji</i>	<i>yi ge liwu</i> 'one present'	Q14
	<i>dai</i>	<i>yi zhi yusan</i> 'one umbrella'	Q9
	<i>na</i>	<i>yi ben manhuashu</i> 'a comic book'	Q1
	<i>xie</i>	<i>yi zhang kapian</i> 'one card'	Q8
GFV	<i>gaosu</i>	<i>yi ge gushi</i> 'one story'	Q11
	<i>huida</i>	<i>yi ge wenti</i> 'one question'	Q5
	<i>daying</i>	<i>yi jian shiqing</i> 'one thing'	Q16
	<i>wen</i>	<i>yi ge wenti</i> 'one question'	Q2
GOV	<i>song</i>	<i>yi zhi xiong</i> 'a toy bear'	Q3
	<i>fu</i>	<i>20 yuan</i> '20 dollars'	Q4
	<i>huan</i>	<i>gushi shu</i> 'story book'	Q7
	<i>jie</i>	<i>10 kuaiqian</i> '10 dollars'	Q6
Fillers	<i>qian</i>	<i>shou</i> 'hand'	Q10
	<i>tiao</i>	<i>wu</i> 'dance'	Q13
	<i>ge</i>	<i>shou</i> 'finger'	Q12
	<i>chang</i>	<i>ge</i> 'song'	Q15

# Appendix D: Test Pictures Used in the PD Task

1. 拿... (一本漫畫書)	2. 問... (一個問題)	3. 送... (一隻熊)	4. 付... (二十元)
			
5. 回答... (一個問題)	6. 借... (十元)	7. 還... (故事畫書)	8. 寫... (一張卡片)
			
9. 帶... (一支雨傘)	10. 牽... (手)	11. 告訴... (一個故事)	12. 割.. (手指頭)
			
13. 跳... (舞)	14. 寄... (一個禮物)	15. 唱... (歌)	16. 答應... (一件事)
			

## 華語雙賓動詞的母語習得

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### 摘要

本研究旨在探討以華語為母語的學齡前兒童雙賓動詞的母語習得。華語雙賓動詞可細分為三類：必加「給」的動詞、不能加「給」動詞、以及可隨意加「給」動詞。主要的研究議題包含以下五種：各類動詞的困難度、句型的標記性、非雙賓句型之句子分析。本研究共設計兩個測驗：句子選擇以及引導造句。研究對象為 45 位學齡前兒童及 15 位大學生。受試兒童再分為三組：第一組（三歲）、第二組（四歲）、和第三組（約五歲）。研究結果顯示：第一，不能加「給」的動詞對學童困難度最高，而另外兩類動詞困難度差異不大。第二，必加「給」的動詞中，[V-*gei*-IO-DO]比[V-DO-*gei*-IO]更具有標記性。對於可隨意加「給」的動詞而言，[V-*gei*-IO-DO] 最具有標記性，[V-IO-DO]居於第二，而[V-DO-*gei*-IO]最無標記性。第三，從學童的非雙賓動詞句型使用分析得知，他們傾向於先把這些動詞當作一般及物動詞使用，接著加入第二個賓語，最後他們說出越來越多的複雜句子。

**關鍵詞：**雙賓動詞結構，母語習得，標誌性，華語